ABSTRACTS

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**TTD #1**

**WHAT STANDARDS DO WE NEED FOR NEW NICOTINE-DELIVERY PRODUCTS?**

Moderators: Thomas Eissenberg, PhD, Virginia Commonwealth University, and Aian Shihadeh, PhD, American University of Beirut

The US Food and Drug Administration (FDA), as well as other government agencies around the world, are authorized to regulate tobacco products, and some already announced plans to regulate e-cigarettes as tobacco or medicinal products. Government agencies will need to make a number of regulatory decisions about product safety that could have major effects on public health and will face many challenges. During this transdisciplinary session we will discuss potential regulatory approaches for product standards that address the varying types of nicotine solutions, the capacity of the cartridges containing the solution, the nature of the heating element and battery, the types of additives and flavorings, and nicotine and the potential toxicants released in the vapor.

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**TTD #2**

**ELECTRONIC CIGARETTE ADVERTISING: THE GOOD, THE BAD, AND THE UGLY**

Moderators: Robert Jackler, MD, Stanford University, and Bonnie Halpern-Felsher, PhD, Stanford University

In a span of just a few years electronic cigarette advertising has revived a broad spectrum of techniques long banned for combustible tobacco products. Whether public health advocates should strive to have such tactics reigned in, or allowed to continue in part or whole to encourage transition to potentially less harmful products, will be debated. Discussion will also consider the limits of what is achievable through regulation with regard to issues such as healthfulness claims and youth targeting.

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**TTD #3**

**CONTINUUM OF RISK - PROS AND CONS IN TOBACCO REGULATION**

Moderators: Scott Leischow, PhD, Mayo Clinic, and Jennifer Pearson, PhD, MPH, Schroeder Institute for Tobacco Research and Policy Studies

In the United States, the US Food and Drug Administration is now responsible for regulating tobacco products, and the law requires them to make decisions on relative risk of products. One key challenge is that the criterion for determining ‘continuum of risk’ has not been well characterized, so the process for making decisions has the potential to result in unintended consequences. This session will explore the concept of ‘continuum of risk’ from multiple angles, including the exploration of individual and population risk.

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**TTD #4**

**SMOKING CESSION IN THE WORKPLACE-BUTTIN IN, HOW COMPANIES CAN HELP EMPLOYEES QUIT**

Moderators: Kathryn Saulsgiver, PhD, University of Pennsylvania, and Elle Alexander, MPH, Vitality Group

Workplace settings are ideal for the administration of initiatives to improve health, and according to the Towers-Watson 2013/14 NBGH Employer Survey, it has become increasingly important to many companies to invest in the wellness of their workforce. Behavioral economics and the use of incentives has become a very hot topic in the corporate world and many companies have tried to harness the power of a nudge in engaging their workforce. Researchers at the Center for Health in Behavioral Economics (CHIBE) have collaborated with employers (CVS Caremark, GE) and wellness providers (The Vitality Group) to design efficacious treatments for tobacco use, bringing evidence-based techniques for improving health related behaviors from the lab to company wellness programs. Lessons learned, strategies for the future, and the benefits of collaborating with employers will be discussed. We hope that the session will stimulate interest in the audience about behavioral economics, employer based programs, and partnerships between academic organizations and employers and that this interest translates into a productive, informative panel.

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**TTD #5**

**MARIJUANA AND TOBACCO USE: WHAT COMMON CONCERNS ARE THERE REGARDING USE, CO-ADMINISTRATION, MARKETING, AND SOCIAL NORMS?**

Moderators: Carla J. Berg, PhD, Emory University Rollins School of Public Health, and Gillian L. Schauer, MPH, Emory University Rollins School of Public Health, Centers for Disease Control and Prevention Office on Smoking and Health

This session aims to interactively engage participants in discussions regarding concerns about dual use of marijuana and tobacco, the sequence of use, and reasons for joint use. We will also discuss changing social norms of marijuana use and how they might impact tobacco use and how the changing tobacco control environment might be changing the way marijuana is used. We will also examine how marijuana is being marketed and how this might be similar or different from the ways in which tobacco has been marketed.

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**TTD #6**

**RESEARCH NEEDS FOR STRENGTHENING TOBACCO CONTROL IN LOW- AND MIDDLE-INCOME COUNTRIES**

Moderators: Geoffrey Fong, PhD, University of Waterloo, and Olekan Ayo-Yusuf, PhD, University of Pretoria

Although the FCTC has progressed rapidly with the adoption of strong guidelines in many important domains (e.g., pictorial warnings, comprehensive bans on TAPS, higher taxes to lower demand), the pace of implementation of FCTC policies has been slow, especially in the majority of Low- and Middle-Income countries (LMICs), where the tobacco epidemic will take its greatest toll in this century. We will hold a discussion of the current state of tobacco control research in LMICs, what kinds of research might be most beneficial in strengthening tobacco control in LMICs, and possible avenues for promoting research and increasing research capacity in LMICs.

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**TTD #7**

**VAPING IN PUBLIC PLACES - PROS AND CONS**

Moderators: Maciej Goniewicz, PharmD, PhD, Roswell Park Cancer Institute, and Mark Travers, PhD, Roswell Park Cancer Institute

Although there is consensus that e-cigarettes are much safer than tobacco cigarettes, there is lack of data on their long-term effects on bystanders and public health. There have been regulations put in place to protect nonusers from potential secondhand exposure to vapors. There are controversies whether e-cigarettes should be allowed indoors or not. During this transdisciplinary session we will discuss concerns on e-cigarette safety and effects on bystanders and pros and cons for implementing new regulations so e-cigarettes are not allowed in public places.
Current practice in smoking cessation is to provide smokers with a particular, fixed modality of treatment, regardless of the smoker’s demonstrated success or failure. Yet, attending to a smoker’s initial treatment response (or non-response) may afford opportunities to change the treatment approach in order to improve the chances of success. This requires us to characterize trajectories of success and failure early in the cessation process, in a way that is very different from the public-health-driven focus on distal and stable outcomes. In this symposium, varied approaches to the monitoring and modification of early outcomes will be discussed. Dr. Piper will present results of a fractional factorial randomized clinical trial of specific treatment components designed to foster initial abstinence among primary care patients. This research helps to identify optimal interventions for the early phases of cessation and help identify mechanisms of action of specific treatment components and combinations. Dr. Witkiewitz will present results of a repeated measures latent class analysis that identifies five different trajectories of smoking and abstinence in the first month of cessation. She will also show that pharmacotherapies influence these initial smoking patterns which, in turn, predict six-month abstinence. Dr. McCarthy will present results from a randomized clinical trial designed to prepare individuals for cessation by practicing quitting for progressively longer periods of time on a tailored, adaptive schedule in the weeks preceding a quit attempt. Dr. Kidwell will provide an introduction to design and analytical issues in adaptive research designs and will provide examples of Sequential Multiple Assignment Randomized Trial (SMART) trials. Dr. Shiftman will serve as discussant and will lead a discussion of the opportunities, challenges, and intervention implications of early outcome monitoring in studies of smoking change.

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SYM1A
INITIAL EFFECTS OF PREQUIT AND EARLY CESSATION INTERVENTION COMPONENTS

Megan E. Piper, PhD*, Jessica W. Cook, PhD*, Tanya R. Schlam, PhD*, Linda M. Collins, PhD*, Robin Mermelstein, PhD*, Michael C. Fiore, MD, MPH*, and Timothy B. Baker, PhD*, University of Wisconsin, 2Pennsylvania State University, 3University of Illinois, Chicago

Most relapse occurs within the first 2 weeks of quitting smoking when withdrawal symptoms tend to be the worst. Therefore, it is important to identify treatments that prevent people from returning to smoking during the first 2 weeks of a quit attempt. A randomized clinical trial conducted in primary care clinics (N=637) examined the effects of prequit treatment and intensive early cessation treatment during the first 2 weeks post quit. In this 2x2x2x2 fractional factorial design, participants were assigned to 1 of 32 conditions formed by 6 intervention components: Prequit Nicotine Patch (ON vs OFF), Prequit Nicotine Gum (ON vs OFF), Prequit Counseling (ON vs OFF), In-person Counseling (Intensive vs Minimal), Phone Counseling (Intensive vs Minimal), and Extended Medication (16 vs 8 Weeks of Combination Nicotine Patch + Nicotine Gum). Outcomes were number of abstinent days in the first 2 weeks postquit and mean postquit withdrawal and self-efficacy assessed via automated evening calls participants completed every other day for 2 weeks postquit. Participants receiving Intensive In-person Counseling differed from those receiving Minimal In-person Counseling in both complete abstinence over 14 days (8.5% vs. 40.6%, respectively) and in having no days of abstinence (17.8% vs. 30.9%, respectively; χ²=12.61, p<.002). General linear models examined the main and 2-way interaction effects of treatment on mean postquit withdrawal symptoms and self-efficacy. There were no main effects of treatment on withdrawal, but those who received Intensive In-person Counseling reported greater self-efficacy (p=.02). There were many 2-way interactions showing that different combinations of treatment produced nonlinear effects on negative affect, concentration, and craving (p<.008–.04). For instance, the combination of Prequit Gum and Intensive In-person Counseling was especially effective in reducing postquit sadness. These findings show that prequit and intensive early cessation treatments interact meaningfully. Therefore, smoking treatment packages should be constructed based on understanding their main and interactive effects in order to yield optimal early cessation outcomes.

JUSTIFICATION: This factorial design generated new knowledge about specific intervention combinations and components of interventions that promoted early abstinence and improved withdrawal symptoms or quitting self-efficacy.

FUNDING: This research was funded by grant 5R01CA143188 from the National Cancer Institute to the University of Wisconsin-Center for Tobacco Research and Intervention (UW-CTRI), grants 1K05CA139871 and T32HP10010 from NIH, and the Wisconsin Partnership Program. This research represents a collaborative team effort between the UW-CTRI, University of Illinois at Chicago, and Pennsylvania State University.

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SYM1C
RESPONSE TO A TAILORED BEHAVIORAL CESSATION PREVENTION INTERVENTION

Danielle E. McCarthy, PhD; 1 Krysten W. Bold, MS; 2 Hanuka Minami, PhD; 2 Vivian M. Yeh, PhD; 2 Yasmin Omar, BA; 1 Rutgers, The State University of New Jersey, 1Yale University, 2Brown University, 3Cahn School of Medicine at Mt. Sinai

Smoking in the first days of a cessation attempt is highly predictive of later smoking status in longitudinal cessation studies. Helping smokers develop the ability to abstain for a full day prior to attempting to quit permanently may help promote success during quit attempts. The current study was a randomized clinical trial that tested the efficacy of a practice-quitting intervention in which 46 individuals were asked to abstain for progressively longer periods of time (starting with 150% of their longest typical interval between cigarettes) every other day for two weeks before engaging in a quit attempt with nicotine patch and counseling support. A control group (n=47) received the nicotine patch and counseling but were asked only to monitor, not change, their smoking in the two weeks preceding a target quit day. Latent growth curve analyses were conducted to assess treatment effects on abstinence duration over successive practice quit attempts to verify that those assigned to the practice quitting condition did so. These models also tested the extent to which treatment condition and pre-quit abstinence duration predicted abstinence during an attempt to quit permanently. Results indicated that the practice quitting intervention resulted in longer average periods of abstinence pre-quit and greater increases in abstinence duration over sessions. Longer periods of abstinence during practice quitting sessions did not predict greater odds of achieving 7-day-point-prevalence abstinence 4 weeks post-quit, however. Practice quitting condition had no significant effect on 4-week abstinence. Prolonged abstinence rates at 10-weeks (i.e., no smoking at least 7 days in a row between weeks 2 and 10) post-quit were marginally higher among those in the practice quitting condition and there was a small but significant indirect effect of practice quitting on 10-week prolonged abstinence through greater average practice quitting abstinence duration. Thus, success in practice quitting pre-quit did not predict early abstinence status but did appear to reduce the risk of relapse over 10 weeks indirectly through increased abstinence pre-quit.

JUSTIFICATION: This paper evaluates a practice-quitting intervention designed to improve smoking cessation success that seemed to protect against relapse rather than promote initial cessation.

FUNDING: The data for this study were collected as part of a randomized clinical trial (Clinical Trial Registry # NCT01368653) funded by National Institute on Drug Abuse Grant R21DA026511 awarded to Dr. McCarthy.

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SYM1D
USING SMART DESIGN TO TAKE ADVANTAGE OF EARLY TREATMENT RESPONSE AND CONSTRUCT EFFECTIVE ADAPTIVE INTERVENTIONS

Kelly M. Kidwell, PhD, University of Michigan

For many, smoking cessation is an ongoing process with repeated attempts and relapses. In addition, recent research shows that changes in smoking status occur quickly and frequently among people trying to change. Whereas current practice is to provide a single, unchanged treatment, regardless of early success or failure, this suggests the potential for adaptive interventions involving a sequence of treatments personalized to the individual and changing over time in response to individual characteristics and behaviors. Adaptive interventions (AIs) address this type of treatment with a set of decision rules that lead to an individualized sequence of treatments based on measures of response, burden or adherence over time. A novel type of trial, the Sequential Multiple Assignment Randomized Trial (SMART), constructs and investigates AIs to guide clinical practice and improve long-term outcomes. A SMART re-randomizes participants based on early treatment response to investigate effective treatment sequences to sustain response or salvage those who have not yet responded. SMARTs can address questions about the timing, sequencing, and delivery methods of interventions using the same participants throughout the trial. As opposed to other trial designs, SMARTs can investigate treatment synergies and discover tailoring variables to lead to personalized AIs, as well as take advantage of within and between person heterogeneity. This talk will introduce SMARTs with application to smoking cessation research discussing the benefits, challenges, and practical implications of such a design.

JUSTIFICATION: This paper will educate clinical tobacco researchers about study designs and analytical approaches that can inform early treatment response monitoring and adaptive intervention development.

FUNDING: No funding.

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SYM2
TRANSLATING CLINICAL RESEARCH INTO PRACTICE IN U.S. HEALTH CARE: NEW RESULTS OF NIH-FUNDED TRIALS IN THE CONSORTIUM OF HOSPITALS ADVANCING RESEARCH ON TOBACCO (CHART)

Chair: Nancy A. Rigotti, MD*, Tobacco Research and Treatment Center, Department of Medicine, Massachusetts General Hospital and Harvard Medical School

Presidents: Nancy A. Rigotti, MD, Scott Sherman, MD, MPH, Kim R undrich, PhD, Kathleen Harrington, Jeffrey L. Fellows, PhD, Sonia A. Duffy, PhD, RN, FAAN, Shu-Hong Zhu, PhD, Tobacco Research and Treatment Center, Department of Medicine, Massachusetts General Hospital and Harvard Medical School, New York University School of Medicine and VA New York Harbor Healthcare System, Department of Preventive Medicine and Public Health, University of Kansas School of Medicine, The University of Alabama at Birmingham, Pulmonary Division, Kaiser Permanente Center for Health Research, University of Michigan School of Nursing and Ann Arbor VA Center for Clinical Management Research, University of California, San Diego School of Medicine Discusant: Michael G. Fiore*, MD, MBA, MPH, Center for Tobacco Research and Intervention, University of Wisconsin School of Medicine

Hospitalization offers smokers a unique opportunity to stop smoking and the efficacy of initiating tobacco dependence treatment during hospitalization has been demonstrated. The challenge is to optimize the implementation and reach of this intervention by identifying effective, cost-effective, and sustainable strategies for hospitals of all types. To this end, in 2010 NHLBI, NCI, and NIDA jointly funded the Consortium of Hospitals Advancing Research on Tobacco (CHART), a network of 8 clinical trials. Each assessed the effectiveness of smoking interventions begun during hospitalization. CHART projects use common measures to facilitate cross-site and subgroup analyses and assess clinical outcomes (hospital readmissions) and tobacco abstinence for 6 months after discharge. CHART studies have enrolled over 9613 hospitalized smokers admitted to a diverse group of 21 private, public, academic, and community hospitals in 8 states (AL, CA, KS, MA, MI, NY, PA, OR). Studies include in-hospital components and test ways to sustain tobacco dependence treatment after discharge. They use a range of strategies (e.g., automated telephone calls, web- and e-mail messages, nurse education, and referral to quit lines) to provide behavioral and pharmacologic treatment to hospitalized smokers. All studies have completed enrollment, are finishing final follow-ups, and will have smoking status results available before February 2015. Overall, the combined data from the CHART studies will represent the largest and most diverse dataset of hospitalized smokers receiving smoking cessation assistance. The symposium will consist of brief abstract-length (10-minute) presentations of the study design and principal findings by the Principal Investigators of 6 studies (Drs. Sonia Duffy [MI], Jeff Fellows [OR], Kathleen Harrington [AL], Kim R undrich [KS], Scott Sherman [NY], and Shu-Hong Zhu [CA]). Two discussants will then address how the findings will inform future implementation and dissemination efforts and research (Dr. Rigotti) and facilitate the adoption of public policies such as the U.S. Joint Commission’s Tobacco Measure Set of hospital quality standards (Dr. Fiore).

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SYM2A
IMPLEMENTATION OF THE NURSE-ADMINISTERED TOBACCO TACTICS INTERVENTION VERSUS USUAL CARE IN TRINITY HEALTH COMMUNITY HOSPITALS

Sonnia A. Duffy, PhD, RN, FAAN1,2, David L. Ronis, PhD2, Lee A. Ewing, MPH2, Andrea H. Waltje, RN, MS1, Stephanie Hall, MPH2, Lisa Friedman, RN, MS1, Sue Klotz, BSN, RN-BC3, Kimberly A. Maguire, RN, BSN, MBA/HCM4, Christine Werkema, MS, RN, OCN, AOCNS2, Patricia L. Thomas, PhD, RN, University of Michigan School of Nursing and Ann Arbor VA Center for Clinical Management Research, 1University of Michigan School of Nursing, 2Ann Arbor VA Center for Clinical Management Research, 3Saint Joseph Mercy Health System, 4Trinity Health Saint Mary’s, 5Trinity Health

BACKGROUND: Hospitalization provides an excellent opportunity for patients to quit smoking as they are a captive audience, are often motivated to quit due to illness, and often quit temporarily due to hospital smoking bans. DESIGN/METHODS: This study used the RE-AIM implementation framework to assess the reach, effectiveness, adoption, implementation, and maintenance of the nurse-administered Tobacco Tactics intervention versus usual care. This was a mixed methods, quasi-experimental design in 6 Michigan community hospitals of which 3 were to receive the nurse-administered Tobacco Tactics intervention and 3 were to receive usual care. Nurses and patients were surveyed pre- and post-intervention. Main Measures: Reach: receipt of materials; Effectiveness: quit rates; Adoption: staff training participation; Implementation: staff feedback; Maintenance: continuation of services. RESULTS: Reach: Among the 1,370 smokers, there were significant pre- to post-intervention increases in the intervention hospitals in self-reported receipt of print materials (p<.001). Effectiveness: In the intervention hospitals, pre-to post-intervention 6-month quit rates significantly increased from 6.8% to 17.6% (p<.001), while there were no significant changes in quit rates in the control hospitals. Adoption: In the intervention hospitals, 76% (n=1,028) of targeted nurses and 317 additional staff participated in the training, and 90% were extremely or somewhat satisfied with the training. Implementation: Nurses in the intervention hospitals reported increases in providing advice to quit, counseling, medications, handouts, and video (p<.05) and reported decreased barriers to providing smoking cessation services (p<.001). Maintenance: Nurses continued to provide the intervention after the study ended. CONCLUSION: Given that nurses represent the largest group of front-line providers, this intervention, which meets Joint Commission requirements, has the potential to reach a wide audience of hospital patients and help to meet Joint Commission tobacco intervention requirements. FUNDING: NIH/NHLBI #U01HL105218

SYM2B
“WARM HANDOFF” VERSUS FAX REFERRAL TO QUITLINE FOR POST-DISCHARGE CARE: QUITLINE ENROLLMENT, ADHERENCE, OUTCOMES, AND COST-EFFECTIVENESS

Kimber P. Richter1, Babalola Fasera2, Theresa I. Shireman3, Edward F. Elliotbeck4, Kristopher J. Preacher2, Taniesha Scheuermann3, Laura M. Mussulman4, Niaman Nazir3, Terry Bush5, Beatriz H. Carlini1, 1Department of Preventive Medicine and Public Health, University of Kansas Medical Center, 2Vanderbilt University Department of Psychology & Human Development, 3Department of Preventive Medicine and Public Health, University of Kansas Medical Center, 4Alere Wellbeing Incorporated, 5University of Washington Alcohol and Drug Abuse Institute, Seattle

Linking hospitalized smokers with tobacco quitlines is a promising way to provide the post-discharge treatment that is key to evidence-based care, and that complies with quality measures. Post-discharge fax referral is widely used but poorly evaluated. This two-arm RCT compared the effects of Warm Handoff (WH) versus Fax (F) on quitline or proxy-verified 7-day abstinence at 6 months post-enrollment, using an intent-to-treat approach. Other outcomes included quitline enrollment and adherence; pharmacotherapy use, and incremental costs. Data sources included patient self-report; saliva samples; and hospital and quitline records. Dedicated tobacco counselors in two hospitals recruited 1054 inpatient smokers who were planning to quit and randomized them to study arms. Patients in both arms received the same cessation booklet. In F, counselors provided a 20-minute in-hospital intervention and at discharge fax-referral patients to the state quitline. In WH, counselors provided brief intervention, immediate warm handoff to the quitline, and a brief check-back visit. Counselors performed the warm handoff by calling the quitline and transferring the call to the patients’ mobile or bedside hospital phone for quitline enrollment and an initial counseling session. Follow-up was excellent (83% at 6 months) and did not differ by arm. Significantly more in WH enrolled in quitline (99.6% vs 59.6%; p<0.001). One in four study participants were verified to be abstinent at 6-months; this did not differ between groups (25.4%, WH; 25.2%, F). Cost per smoker did not differ by arm ($89.57, WH; $89.11, F); the higher costs of nearly 100% quitline enrollment in WH were offset by higher pharmacotherapy use/costs in F ($61.86, WH; $65.95, F). Both WH and F to quitline are excellent ways to provide post-discharge care. Quit rates were surprisingly high for such minimal interventions. F performed as well as WH, perhaps because all patients were motivated to quit. The in-hospital “sample” of quitline counseling provided by WH should be tested as a treatment induction strategy for smokers not ready to quit.

JUSTIFICATION: This paper describes the processes, outcomes and costs of two highly feasible hospital interventions, which will enable clinicians, administrators, and policy makers to decide whether to incorporate these strategies into clinical practice.

FUNDING: National Heart Lung and Blood Institute grant no. U10HL105232

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SYM2C
EFFECTIVENESS OF SMOKING CESSATION INTERVENTIONS FOR URBAN HOSPITAL PATIENTS

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BACKGROUND: Hospitalization is an under-appreciated window of opportunity to promote cessation, particularly given a higher prevalence of smoking among hospitalized patients and the time of enforced abstinence and heightened vulnerability. Prior studies with hospitalized smokers have primarily been efficacy studies, with narrowly defined populations. We attempted to enroll every smoker admitted to two “safety net” hospitals into a post-discharge cessation intervention. METHODS: We used the electronic medical record to identify smokers admitted to Bellevue Hospital Center or VA New York Harbor Healthcare System and attempted to enroll all of them. Patients were eligible for inclusion if they: smoked at least one puff of a cigarette in the past 30 days; spoke English, Spanish, or Mandarin; were not incarcerated or in police custody; were not pregnant or breastfeeding; had a U.S. phone number, and were able to provide informed consent. At discharge,
participants were randomized to a) receive multi-session telephone counseling from study staff or b) referral to the state Quitline for proactive outreach. We sent nicotine replacement therapy to participants who did not receive cessation medications on discharge. We contacted all participants at 6 months to assess smoking status. The primary outcome was 30-day point prevalence abstinence reported at 6 months. RESULTS: From July, 2011 to April, 2014, we identified 18,797 hospitalized patients who currently smoked. Of these, 3,047 (16%) were discharged before we could talk to them, 3,273 (17%) were not current smokers, 4,026 (21%) did not have a US phone number, 2,831 (15%) were ineligible for other reasons and 3,983 (21%) refused participation. 1,619 (9%) subjects enrolled in the study (71% at Bellevue, 29% at the VA). Among the first 1,502 subjects, the overall abstinence rate at 6 month follow-up was 25%. Outcomes will be unblinded after follow-up is completed in December, 2014, so we will present results by treatment arm. CONCLUSIONS: At urban, safety net hospitals, many patients were not eligible for enrollment even with minimal exclusion criteria. Among those enrolled, the long-term abstinence rate was excellent.

JUSTIFICATION: This study examines the effectiveness of post-discharge smoking cessation treatment for smokers in two public ‘safety net’ hospitals.

FUNDING: #1U01HL105229-01

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SYM2D INTEGRATING AN ASSISTED REFERRAL TO OUTPATIENT CESSATION FOR HOSPITALIZED SMOKERS

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Linking hospitalized smokers to outpatient smoking cessation services improves the likelihood of quitting. The Inpatient Technology-Supported Assisted Referral (ITSPAR) trial evaluated the effectiveness of brief bedside quit consult and an assisted referral to post-discharge cessation counseling and medications for smokers admitted to Kaiser Permanente Northwest (KP), Oregon Health and Science University (OHSU), and Legacy Emanuel (LE) hospitals in Portland, Oregon. Tobacco Treatment Specialists (nurses or health educators) were integrated into existing clinic operations. They used electronic records and staff referrals to identify eligible smokers, provided tobacco consult services, managed nicotine withdrawal, and assessed interest in remaining abstinent and study participation. All smokers received a bedside cessation consult with printed materials about available quit services. A 2:1 patient randomization procedure was used to assign patients to the active intervention or usual care (UC), respectively. Intervention patients received an assisted referral to available post-discharge quit counseling (bedside phone or fax referral to service providers) and/or discharge medications, and four interactive voice recognition (IVR) follow-up phone calls over 7 weeks post-discharge (AR). The IVR call provided brief case management. UC patients were encouraged to obtain available services and medications on their own. Eligible patients were ≥18 years, smoked ≥5 days per week at the past 30 days, lived within 50 miles of the hospital, spoke English, had a working phone, and were physically and cognitively able to participate; critical care, labor and delivery, and psychiatric units were excluded. Over 2 years, 900 of 2908 (31%) smokers with a bedside consult visit were randomized to AR (n=599) or UC (n=301); KP: 624, LE: 195, OHSU: 81. For AR recipients, IVR completion rates were 53% for call 1, 48% call 2, 41% call 3, and 34% call 4. Follow-up was completed for 72% of AR and 19% of UC patients reported being abstinent more than 30 days, assuming non-responders are smokers.

JUSTIFICATION: This study evaluates the effectiveness of a practical, Joint Commission standard-compliant, intervention that is easily implemented into routine hospital care.

FUNDING: NHLBI U101HL105232 as part of six studies funded by NIH that make up the Consortium of Hospitals Advancing Research on Tobacco (CHART)

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SYM2E RESULTS AND LESSONS LEARNED FROM A WEB-BASED SMOKING CESSION INTERVENTION TRANSITIONING HOSPITALIZED SMOKERS FROM INPATIENT TO OUTPATIENT

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Transitioning smokers from inpatient to outpatient cessation efforts with sufficient follow-up has been shown effective for increasing quit rates. Finding interventions that are scalable and low cost is important. High rates of internet and email use make this a potentially viable avenue. The effectiveness of a web-based intervention with tailored email messages (WEB) was compared to brief cessation advice (usual care-UC) among hospitalized smokers in a randomized controlled trial. The WEB intervention consisted of access to the Decide2Quit website, post-discharge telephone to promote website, and automated tailored email messages. Reported 30-day point prevalence abstinence at 6-months was the primary outcome. Access to the intervention website and e-mail messages, biochemically confirmed abstinence, and smoking reduction were secondary outcomes. 1488 smokers with internet/email access and varied motivation to quit were recruited. Trained staff registered those assigned to the WEB intervention to the Decide2Quit website (n=740); 73% were registered at bedside, 25% at home with telephonic guidance. 64% received the post-discharge calls, 35% were left a detailed message. The website was accessed an average of 2.3 times on 1.9 days viewing 5.1 pages. An average of 141.5 (sd 90.8) emails were sent. Six-month follow-up was completed by 1237 (83%). There were no differences between study arms for self-reported 30-day point prevalence smoking abstinence (31.3% WEB vs. 31.4% UC) or smoking reduction (66.2% WEB vs. 68.5% UC). Significantly higher quit rates were reported by those with quit plans: intending to stay quit (50.2%), planning to try to quit (28.6%), unsure (14.4%) and no plans to quit (6.1%) (p<0.001). The results suggest that this web-based intervention was underutilized and did not impact smoking cessation more than brief cessation advice during hospitalization. Even brief counseling during hospital stays appears to result in good quit rates.

JUSTIFICATION: The results of this study can inform future intervention efforts for smoking cessation among hospitalized patients.

FUNDING: NIDA-U101DA031515

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SYM2F HELPING HOSPITALIZED SMOKERS QUIT: A FACTORIAL DESIGN TO TEST THE EFFECTS OF TELEPHONE COUNSELING AND NICOTINE PATCHES

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This study examined the effects of providing nicotine patches and telephone counseling to hospitalized smokers. Five hospitals from 3 hospital systems in California participated in the study: Scripps Health, University of California, San Diego, and University of California, Davis. Each hospital has its own smoking policy and smoking cessation service for their patients while they are in hospital. This study focused on the effects of providing nicotine patches and telephone counseling after patients were discharged from the hospital. The service smokers received while in hospital was considered usual care in this study. Study participants were assigned into one of the four groups in a 2x2 factorial design, Telephone Counseling X Nicotine Patch. Thus, the patients could receive either Usual Care, Telephone Counseling, Nicotine Patch or Telephone Counseling plus Nicotine Patch. Nicotine patches (8 week course) were provided to patients upon discharge. If patients left the hospital without patches, patches were mailed to them post-discharge. Telephone counseling was provided after patients left the hospital and could last up to two months post-discharge. Six counseling sessions were intended per smoker. However, less than 50% of those assigned
to counseling actually received any due to difficulty in reaching smokers and missed appointments, highlighting the challenges in serving this population. A total of 1,270 smokers from five hospitals were recruited into the study, and they were randomized into these four conditions, stratified by hospital. Participants were followed 6 months post-discharge. At the time of abstract submission, the 6-month follow-up evaluation had just finished and only preliminary analysis was conducted. The 6-month follow-up rate was 51.1%. The primary outcome measure is self-reported 30 day abstinence at 6-months post-discharge. The preliminary analysis based on the complete cases shows that there is a significant effect for nicotine patches, but the effect of telephone counseling did not reach statistical significance. More detailed analysis is in progress and the results will be presented as part of the CHART symposium.

JUSTIFICATION: The study will help inform hospital policy on smoking cessation.

FUNDING: Supported by National Cancer Institute, Grant Number: U01 CA159533

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SYM3
REDDUCING TOXICANTS IN TOBACCO PRODUCTS

Dorothy K. Hatuskami, PhD1, Stephen Hecht, PhD1, Irina Stepanov, PhD1, Maciej Goniewicz, PhD2, Mark Greenwald3*, University of Minnesota, 2Roswell Park Cancer Institute, 3Campaign for Tobacco Free Kids

The Family Smoking Prevention and Tobacco Control Act and Article 9 of the Framework Convention on Tobacco Control provide government regulatory agencies the authority to establish tobacco product standards, including establishing maximum levels for harmful and potentially harmful constituents. In the current market, tobacco products, including electronic nicotine delivery devices, demonstrate significant variability in these levels both across and within categories of products. Yet, few countries have implemented product standards. This symposium will explore the history and rationale for product standards, describe current research examining the levels of harmful and potentially harmful constituents in different types of tobacco products, and then provide recommendations for establishing standards. Dr. Stephen Hecht will provide a historical perspective on the identification of specific carcinogens in tobacco products, on the introduction of the concept of reducing these carcinogens in tobacco products, and the rationale for establishing product standards. He will also describe the differences in exposures across types of tobacco products. Dr. Irina Stepanov will describe the variability of harmful and potentially harmful constituents in cigarettes, her research that explores the relationship between the levels of some of these constituents and levels of exposure, and challenges for establishing standards for cigarettes. Dr. Dorothy Hatuskami will describe her current research on smokeless tobacco products, focusing on variability of smokeless tobacco carcinogens globally and within the United States, the variability of exposure to these carcinogens across brands of U.S. smokeless tobacco, and recommendations for standards for specific constituents. Dr. Maciej Goniewicz will focus on the toxicants and exposures to these toxicants observed in electronic nicotine delivery devices, how the design and user behavior can influence toxicant exposure and his recommendations for product standards. Finally, Mr. Mark Greenwald will be the discussant and provide a legal perspective for the implementation of product standards.

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SYM3A
CARCINOGENS IN TOBACCO SMOKE CONSTITUENTS: BRAND VARIATIONS AND TOXICANT EXPOSURE

Irina Stepanov*, University of Minnesota

Background: Reduction in cigarette smoke of selected carcinogens and toxicants is now possible in the U.S. under the Family Smoking Prevention and Tobacco Control Act. However, the issue of how to test and regulate the contents of cigarette smoke represents a substantial challenge. The currently used standard machine testing methods do not account for the complexities of smoke-carcinogen interaction and are widely recognized to be inadequate for the prediction of human exposure. Methods. One of the proposed solutions is to institute constituent limits per milligram of nicotine. This approach would allow for standardized comparisons among cigarette brands, while shifting toward characterization of product toxicity and away from attempts to reproduce human smoking behaviors. For this approach to be implemented, however, it is important to understand whether the constituent per milligram nicotine emissions in cigarette smoke are predictive of the constituent exposures in smokers, and which factors may affect this relationship. This can be achieved by measuring biomarkers of selected constituent uptake in habitual smokers of cigarette brands that differ in the constituent per milligram nicotine yields. Results. Preliminary analysis of the limited available data on several smoke constituents indicates that there is a substantial variation in constituent per milligram nicotine yields among various U.S. cigarette brands. To verify these preliminary findings, our laboratory is currently characterizing the variation of the constituent per milligram nicotine yields in a large sample of U.S. cigarette brands. Results of these analyses will allow us to determine whether the constituent per milligram nicotine yields in cigarette smoke are more relevant to human exposures than the ‘per cigarette’ emissions, and thus should be adopted by the FDA as an approach for establishing constituent standards for cigarette smoke.

JUSTIFICATION: This presentation describes the best way to measure potential toxicant exposure from cigarettes that can then be used to establish product standards for toxic constituents.

FUNDING: This research is supported by NIH grants CA179246 and CA138338.

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SYM3B
CANCER-CAUSING AGENTS IN TOBACCO PRODUCTS AND THE NEED FOR REGULATION OF TOBACCO-SPECIFIC NITROSAMINES

Stephen S. Hecht, PhD, University of Minnesota

The 1964 Surgeon General’s Report that classified cigarette smoking as a cause of lung cancer lists benzo[a]pyrene and 6 other polycyclic aromatic hydrocarbons (PAH) carcinogens in tobacco smoke, and mentions the presence of co-carcinogens of unknown structure. Presently, we know that there are 72 carcinogens in cigarette smoke that have been evaluated by the International Agency for Research on Cancer as having sufficient evidence for carcinogenicity in either laboratory animals or humans, and there are certainly others that have not yet been fully characterized or evaluated. Carcinogens in cigarette smoke include the PAH and other hydrocarbons such as styrene and 1,3-butadiene, volatile nitrosamines, tobacco-specific nitrosamines, aromatic amines, heterocyclic compounds, aldehydes, phenols, metals, various volatiles, and others. Smokeless tobacco products have lower carcinogen content because they lack the combustion products, but do often contain relatively high levels of tobacco-specific nitrosamines. The tobacco-specific nitrosamines NNK and NNN are among the strongest carcinogens present in tobacco products—over 40 years of data firmly establish these compounds as prime targets for reduction in tobacco products. This is based on a formidable data base concerning their mechanisms of formation in tobacco products, powerful carcinogenicity in laboratory animals including recent studies that confirm and extend earlier observations, uptake, metabolism, and DNA adduct formation in laboratory animals and users of tobacco products, and relationship to cancer in people who use tobacco products. The agricultural practices, blending, and related technology for significant reduction of their levels in tobacco and related products are well-known and can be applied in tobacco products, but are not yet required by law. Thus, tobacco-specific nitrosamines are a prime target for establishment of product standards to reduce human exposure. The current lack of regulation of these carcinogens stands in stark contrast to policies regarding other potential sources of human carcinogen and toxicant exposure.

JUSTIFICATION: This presentation describes the importance of establishing product standards for tobacco-specific nitrosamines as policy measure.

FUNDING: R37 CA081301

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SYM3C
PRODUCT STANDARDS FOR CARCINOGENS IN SMOKELESS TOBACCO

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Background: Smokeless tobacco (ST) products sold in the U.S. and globally vary significantly in yields of nicotine and tobacco-specific nitrosamines (TSNA). To date, the scientific literature shows that countries with ST products with higher levels of TSNA report higher risks for oral cancer and ST users who are switched to lower TSNA ST products with similar levels of nicotine show a substantial reduction in carcinogen related biomarkers. These findings suggest that establishing product standards for ST products would be prudent. The Family Smoking Prevention and Tobacco Control Act and Article 9 of the Framework Convention on Tobacco Control provide the U.S. FDA and other government agencies, respectively, with the authority to establish product standards. However, limited data exist determining the relative roles of pattern of ST use versus constituent levels in the ST product in exposure of users to carcinogens. Methods: ST users of brands varying in nicotine and TSNA content were recruited from three different regions in the U.S. Participants underwent two assessment sessions. During these sessions, demographic and ST use history information along with urine samples to assess biomarkers of exposure and effect were collected. Between data collection sessions, ST users recorded the amount and duration of ST use on a daily basis using their diary cards. Results: Levels of TSNA in ST products played a significant role in carcinogen exposure levels, independent of pattern of ST use and nicotine yields. Conclusion: These study results demonstrate that reducing levels of TSNA in ST products are likely to decrease exposure to these toxicants with the potential to reduce cancer risk. Recommendation for ST product standards will be discussed.

JUSTIFICATION: This presentation provides evidence of the importance of establishing product standards on toxic constituents in smokeless tobacco products.

FUNDING: This study was funded by NIH R01 CA141531.

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SYM4D
INTERNATIONAL EVIDENCE ON E-CIGARETTE USE AND DEMAND

Richard J. O’Connor, PhD*, Warren K. Bickel1, Bryan W. Heckman2, Theodore L. Wagener3, Sara C. Hitchman4, Roswell Park Cancer Institute, 5Virginia Tech Carilion Research Institute, 6Medical University of South Carolina, 7University of Oklahoma Health Sciences Center, 8King’s College London

This symposium will present experimental and observational evidence on the use of e-cigarettes among smokers in the United States, United Kingdom, and the Netherlands. Dr. Bickel will present findings related to a novel ‘marketplace’ method for assessing demand for e-cigarettes in the context of a wide range of other nicotine-containing products. Dr. Heckman will present data from a web-based survey in the Netherlands, comparing simulated demand for traditional cigarettes, e-cigarettes, and low-nicotine cigarettes. Dr. Wagener will present survey data describing the knowledge, attitudes, and behaviors of dual users of e-cigarettes and cigarettes, in the context of a state Quitline. Dr. Hitchman will present longitudinal data on the impact of e-cigarette use on smoking cessation among participants in the International Tobacco Control surveys. Dr. O’Connor will serve as discussant and place the findings in context, pointing to research gaps and opportunities, and potential relevance for tobacco control policy.

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SYM3D
USING BIOMARKERS TO ASSESS HARM REDUCTION AMONG SMOKERS WHO SwitchED FROM TOBACCO TO ELECTRONIC CIGARETTES

Maciej L. Goniewicz, PharmD, PhD*, Roswell Park Cancer Institute

Background: Tobacco cigarettes are the most harmful nicotine delivery products because they deliver nicotine in conjunction with numerous toxicants and carcinogens. E-cigarettes are purported to deliver nicotine vapor without toxic combustion products. If e-cigarettes substantially reduce exposure to tobacco smoke toxicants, the risk of specific diseases may be also reduced. The application of a harm reduction strategy could result in substantial reductions in mortality and morbidity in those smokers who do continue to smoke. Methods: Actual harm reduction (that is, reduced illness secondary to cigarette smoking) is difficult to assess in typical clinical trials of healthy smokers. Biomarkers of exposure can be used as surrogate markers for harm reduction. These include assessments of: 1) nicotine intake (using levels of multiple nicotine metabolites in urine); 2) gas phase exposure (carbon monoxide and volatile organics); and 3) tar exposure (urinary NNAL and polycyclic aromatic hydrocarbons (PAHs)). Results: In a longitudinal within-subjects observational study, we measured nicotine metabolites and biomarkers of exposure in the urine of smokers, at baseline, and after two weeks of smoking cessation and use of e-cigarettes. We observed a significant decrease in toxin levels in urine with no change in nicotine uptake from e-cigarettes compared to regular cigarettes. In a cross-sectional study of regular cigarettes smokers and long-term e-cigarette users, we did not find significant differences in urine nicotine metabolites but levels of biomarkers of selected toxicants were significantly lower in e-cigarette users when compared to smokers. Conclusions: Validated biomarkers are useful tools to study exposure from e-cigarettes. Since there is a significant variability across e-cigarettes in nicotine and toxicant levels, future research should assess effects of various brands of e-cigarettes on harm reduction among smokers who effectively substituted their regular cigarettes with these new products. Studies with biomarkers would provide important information for establishing quality and product standards for e-cigarettes.

JUSTIFICATION: Biomarkers of exposure demonstrate significant less toxicants in e-cigarettes compared to cigarettes and can be used to help establish product standards for the diverse electronic nicotine delivery devices that are currently in the market.

FUNDING: No funding was received.

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SYM4A
THE EXPERIMENTAL TOBACCO MARKETPLACE: EXTENDING BEHAVIORAL ECONOMICS TO MULTIPLE PRODUCTS

Warren K. Bickel1, Amanda Quisenberry1, Chris Franck1, Mikhail Koffarnus1, Leonard H. Epstein1, Addiction Recovery Research Center, Virginia Tech Carilion Research Institute, 1University at Buffalo

The proliferation of new tobacco products suggests the importance of accurate assessments of the substitutability among these products. Behavioral economic studies of tobacco products have traditionally examined substitution between 2 products and, rarely, 3 products. Thus, a need exists to examine substitution in more complex arrangements that more closely mirror the tobacco marketplace. Here we leverage approaches developed in obesity research to examine the experimental tobacco marketplace (ETM). The ETM is an “Amazon”-like web page that displayed pictures, information, and prices for several tobacco products. Two studies were conducted. In Study 1, smokers were endowed with an amount of money comparable to their weekly tobacco purchases. They then made purchases from 7 tobacco/nicotine products under 4 price conditions for conventional cigarettes while the other products remained at a constant price. One of the 4 sets of purchases was enforced and smokers were provided the products purchased and unspent money. Smokers returned one week later to report tobacco/nicotine use and return unused products for a refund. In Study 2, cigarette consumption decreased as a function of price. Substitution was shown most robust for cigarillos, followed by E-cigarettes. In Study 2, we replicated Study 1 with one exception; that is, cigarillos were eliminated from the ETM. In Study 2, cigarette consumption decreased as a function of price. Substitution was most robust for E-cigarettes, followed by Snus, and then by dip. These findings support the use of the ETM.
as an experimental tool to examine substitution with a larger number of products. Moreover, the ETM may provide a robust context to examine a broad range of phenomena that can influence tobacco purchases.

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SYM4B
DO SMOKERS HAVE DIFFERENTIAL DEMAND FOR CONVENTIONAL, VERY LOW NICOTINE, AND ELECTRONIC CIGARETTES?

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The Netherlands has been identified as a potential test market for a very low nicotine (VLN) cigarette called Gold Magic. In anticipation of the launch of this product we undertook a survey to assess consumer attitudes and beliefs about VLN cigarettes as well as other tobacco products. This paper uses a behavioral economic approach to test whether smokers had differential demand (relative value) for conventional, VLN, and electronic cigarettes (e-cigarettes). The parent study was a web-based consumer survey of smokers and nonsmokers, aged 16 years or older, in the Netherlands conducted in April 2014. Daily smokers who completed purchase tasks for each product were included in the current study (N=1215). Participants indicated the number of cigarettes they would consume in a 24 hour period, across a range of prices (0-30 euro per cigarette). The relationship between consumption and price was quantified through demand curve analyses, which generated five indices of demand: 1) peak consumption (intensity), 2) price that generates peak consumption (Pmax), 3) price that suppresses consumption to zero (breakpoint), 4) maximum expenditure (Omax), and 5) price sensitivity/slope of the demand curve (elasticity). Differential product demand was examined with generalized estimating equations (GEE), with Bonferroni-adjusted significance tests for pairwise comparisons. Greater demand was observed for conventional relative to VLN cigarettes across all demand indices (p<.001). Similarly, conventional cigarettes were in greater demand than e-cigarettes (p<.001). There was no difference in demand between VLN cigarettes and e-cigarettes for Pmax, breakpoint, and elasticity; however, intensity and Omax indicated greater demand for VLN cigarettes (p<.001). Thus, smokers valued conventional cigarettes more than VLN cigarettes or e-cigarettes, and conventional cigarettes were less sensitive to price increases. Unless preferences change (e.g., via positive experiences from use), VLN cigarettes and e-cigarettes will need to be priced lower than conventional cigarettes if they are to serve as viable substitutes for conventional cigarettes.

FUNDING: Supported by supplemental funds for NCI grant # P01 CA138389 (Effectiveness of Tobacco Control Policies in High vs. Low Income Countries).

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SYM4C
DUAL USERS CALLING A STATE QUITLINE: WHAT DO THEY DO AND WHAT DO THEY WANT?

Theodore L. Wagener, PhD,1 Laura A. Beebe, PhD, Lindsay Boeckman, MS, Stephen R. Gillaspy, PhD, Oklahoma Tobacco Research Center & University of Oklahoma Health Sciences Center

Dual use of e-cigarettes (ECs) and combustible cigarettes is becoming more common among callers to state tobacco quitlines. How to treat these dual users is unclear, as little is known about the prevalence of dual use among callers, as well as their reasons for dual use, frequency and quantity of use, level of nicotine dependence, and intention to quit both or just one product. Moreover, it is unclear how dual use with e-cigarettes will influence callers’ treatment compliance and outcomes. To begin to address these questions, we analyzed data from 16,959 callers to the Oklahoma Tobacco Helpline who registered for intervention between October 2013 and June 2014. Seven-month follow-up data collection is ongoing and was not analyzed. Approximately 13% (n=2,135) of callers were dual users. Among dual users, 58% were non-daily users of ECs and 42% were daily users; 32% vapor <1mL of e-liquid per day and 25% vapor between 1 to 5mL. The most common EC type used was a tank system (69%). The majority of dual users reported that they began using ECs to quit other tobacco (50%) or cut down on other tobacco (38%). The overwhelming majority of dual users (92%) were also thinking about quitting ECs. Compared to cigarette-only users, dual users had similar levels of nicotine dependence (p=.48), but they were more likely to be female (p<.0001), White (p<.0001), and smoke fewer cigarettes per day (p=.05). In terms of treatment adherence, dual users and cigarette-only users completed a similar number of quitline intervention calls (p=.17). The prevalence of dual use of ECs among quitter callers was significant; however, compared to cigarette-only users, dual users were less sensitive to price increases. Unless preferences change, dual use dual users to appear to undermine the number of intervention calls they completed. Interestingly, the majority dual users were interested in quitting both combustible cigarettes and ECs. As 7-month follow-up data collection is ongoing, it is still not yet clear how dual use affected smoking cessation outcomes.

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SYM4D
DO E-CIGARETTES HELP SMOKERS TO QUIT? FINDINGS FROM THE ITC COHORTS IN THE UNITED KINGDOM AND UNITED STATES SURVEYS

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Background: E-cigarettes are increasing in popularity globally and evolving rapidly. Whilst studies have suggested that e-cigarettes may increase the effectiveness of a quit attempt, there have been few longitudinal studies. Aim: To conduct a longitudinal study among a nationally representative cohort of smokers in two countries to measure the effectiveness of e-cigarettes when they were used by smokers in their attempt to quit. Methods: Data were drawn from Waves 8 and 9 (collected in 2010 and 2013, respectively) of the International Tobacco Control Policy Evaluation Study (ITC) surveys in the UK and the US; the ITC cohorts in each country are national probability samples of adult smokers. Smokers at Wave 9 who reported having made a quit attempt since Wave 8 were included and we focused on the last quit attempt made before Wave 9. The primary outcome was self-reported abstinence at Wave 9 for at least 30 days. The effectiveness of e-cigarette use for their last attempt to quit was examined using logistic regression adjusting for differences in age, gender, ethnicity, education, income, smoking dependence and intentions to quit smoking at baseline in Wave 8. Results: In the UK cohort 254 smokers reported making a quit attempt between Waves 8 and 9. Those who reported using e-cigarettes in their last attempt to quit were more likely to be abstinent than those who quit without using e-cigarettes (OR 2.71, 95%CI=1.23-5.97, p<.005). Out of the 37 respondents who reported using an e-cigarette in their last quit attempt, 19 (51%) had been quit for at least 30 days at Wave 9. At the time of writing, the US data were still being processed. Conclusions: Among the general population of UK smokers, those using e-cigarettes during a quit attempt were more likely to be abstinent than those who quit without e-cigarettes, after controlling for factors related to cessation success. We will assess whether the same relationship was found in the ITC US cohort and how quitting with e-cigarettes compares with quitting using established effective treatments using the combined sample.

FUNDING: Supported by NCI grant # P01 CA138389 (Effectiveness of Tobacco Control Policies in High vs. Low Income Countries)

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Animal models provide the foundation for identifying the behavioral and biological basis of nicotine addiction. They offer insight into the molecular mechanisms of nicotine’s actions and allow the development and testing of smoking cessation agents. Neuroimaging approaches in humans provide a direct window into brain circuits and related behavioral outcomes, and enable the investigation of brain phenotypes as a function of genotype. The integration of information from animal models and human neuroimaging studies can have a tremendous impact on the development of novel and targeted anti-smoking interventions. This symposium brings together scientists at different stages of their career that will present translational research ranging from the study of the role of nicotinic receptor subtypes in cortico-amygdalar plasticity and the effects of metabotropic glutamate receptor activation on nicotine seeking to human fMRI and PET imaging for the prediction of relapse in abstinent smokers. Dr. Talmage from Stony Brook University will explore how nicotine facilitates glutamate release at cortico-amygdalar synapses by activating alpha 7 nAChRs. Dr. Xia Li from the University of California San Diego will summarize findings from animal studies on the effects of selective activation of presynaptic mGluR2 and mGluR7 receptors in modulating the direct pharmacological effects of nicotine and cocaine. Dr. James Longhead from the University of Pennsylvania will discuss the use of fMRI as a prognostic marker for early smoking relapse. Finally, Dr. Dubroff, from the University of Pennsylvania will discuss how imaging of brain nicotinic acetylcholine receptor activity to serum biomarkers of hepatic nicotine metabolism and tobacco cessation therapy.

**SYM5A**
**PRESYNAPTIC ALPHA 7 NICOTINIC ACETYLCHOLINE RECEPTORS ARE CRITICAL FOR PLASTICITY AT CORTICOLIMBIC SYNAPSES**

David A. Talmage*, Department of Pharmacological Sciences and Center for Nervous System Disorders, Stony Brook University

Presynaptic targeting of neuronal nicotinic acetylcholine receptors (nAChRs), including those containing the alpha 7 subunit (the product of the CHRNA7 gene) allows nicotine to modulate the release of numerous neurotransmitters. I will summarize the results of recent investigations into the mechanisms by which alpha 7 nAChR activation increases glutamate release at cortico-limbic synapses. Our key findings are: 1) brief nicotine or acetylcholine activation of presynaptic alpha 7 nAChRs results in sustained changes in glutamate release at both hippocampal-nucleus accumbens and cortico-amygdala synapses; 2) brief nicotine exposure or stimulated release of endogenous ACh potentiates cortico-BLA synapses; 3) LTP of glutamate release is absent at cortico-BLA synapses in alpha7 nAChR heterozygous mice; and 5) activation of presynaptic alpha7 nAChR converts a transient ionotropic response into sustained second messenger regulated calcium signaling.

**SYM5B**
**PRESYNAPTIC MGLUR2 AND MGLUR7 RECEPTORS CRITICALLY MODULATE PSYCHOSTIMULANT DEPENDENCE**

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The motivation to maintain drug self-administration (SA), seeking and dependence involves alterations in glutamate neurotransmission. The presynaptic metabotropic glutamate receptor (mGluR) 2/3 and mGluR7 regulate glutamate release in the ventral tegmental area (VTA) and the nucleus accumbens (NAC) shell, two brain areas critically involved in reward and motivation. Collaborative studies in our laboratories assessed the role of mGluR2 and mGluR7 in drug taking and drug seeking behaviors involving the psychostimulants cocaine and nicotine, by using the intravenous SA and cue-induced reinstatement of drug-seeking behavior in rats. We found that the mGluR2/3 agonist LY379268 decreased cocaine and nicotine, but not food, SA in rats. The inhibition of mGluR3 activation on the reinforcement of cocaine and nicotine was mediated, at least partly, by the mGluR2/3 in the VTA and NAC because intra-VTA or intra-NAC of LY379268 also decreased cocaine and nicotine SA. In addition, LY379268 attenuated cue-induced reinstatement of nicotine seeking by blocking nicotine-induced increases in the NAC shell dopamine only when tested in the presence of a nicotine-motivated context. Interestingly, nicotine SA downregulated mGluR2/3 function in corticolimbic rat brain sites including the VTA and the NAC. Moreover, selective activation of mGluR2 with positive allosteric modulators (PAMs) also produced similar inhibitory effects on cocaine and nicotine SA and cue-induced reinstatement of drug seeking. Further, systemic and intra-VTA administration of the mGluR7 PAM AMN082 decreased nicotine taking and nicotine seeking, suggesting the involvement of the VTA mGluR7 in nicotine dependence. Similarly, lentiviral vector-induced overexpression of mGluR7 in the VTA decreased nicotine SA and cue-induced reinstatement of nicotine-seeking behavior. Altogether, these findings indicate an important role for mGluR2 and mGluR7 in mesolimbic areas, such as the VTA and the NAC shell, in modulating the direct pharmacological effects of psychostimulant drugs, such as nicotine and cocaine, as well as the conditioned behavioral and neurochemical effects of contexts/stimuli associated with drugs of abuse.

**SYM5C**
**DECREASED NICOTINE RECEPTOR AVAILABILITY AND CRAVING FOLLOWING OVERNIGHT ABSTINENCE IN SMOKERS WITH SLOWER HEPATIC NICOTINE METABOLISM**


The nicotine metabolite ratio, NMR, is defined as the ratio of 3'-hydrocotinine (3-HC) to cotinine and has proven to be a reproducible predictive biomarker of nicotine cessation therapy. Smokers with decreased CYF4502A6 hepatic nicotine metabolism, as reflected by lower NMR levels, are more likely to quit using nicotine replacement therapy. In order to determine if this relationship is mediated by nicotinic acetylcholine receptor (nAChR) behavior, we used 2-18F-NMR.
FA positron emission tomography (PET) brain imaging to identify differences in nAChR α4β2* subtype availability between abstaining smokers with low NMR levels (<0.25, within the lowest quartile) to those with normal values (n=12 in each experimental group, n=24 total). Participants were recruited as part of a larger treatment study (Pharmacogenetics Research Network Grant) and imaged following overnight abstinence as quit attempts most often fail within the first 24 hours. Nicotine craving was measured using the questionnaire of smoking urges (GSU-brief) prior and following PET imaging. We found smokers with lower NMR levels had significantly decreased nAChR availability in thalamus (ANOVA, P=0.04) compared to those with normal NMRs. Although statistical significance was not achieved for other brain regions, there was also a whole brain trend for this relationship. Nicotine craving decreased in those with low metabolism while remaining stable in those with normal NMR levels (P=0.02). Because the 2-16F FA radioligand directly competes with nicotine to bind to nAChRs and a period of overnight abstinence is inadequate for complete elimination of nicotine from the brain, this data indicates persistent binding of nicotine in smokers with lower NMR levels that subsequently may reduce nicotine craving. This data also suggests that nAChR mediated changes underlie differences in nicotine cessation therapy success.

JUSTIFICATION: The techniques and data presented can be directly used in patients

FUNDING: PNAT: Pharmacogenetics Research Network Grant (NIDA/NCI/NHGRI/ NIGMS), Abramson Cancer Center at the University of Pennsylvania, Institute for Translational Medicine and Therapeutics of the Perelman School of Medicine at the University of Pennsylvania (NIH), McCabe Pilot Award (UPENN). CTRC: National Center for Research Resources and the National Center for Advancing Translational Sciences, National Institutes of Health (UL1TR000033). NIH grant T32 GM08076 to Randall Pittman.

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SYM5D
PREDICTING SMOKING RELAPSE FROM WORKING MEMORY-RELATED NEURAL ACTIVITY

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Brief abstinence from smoking impairs cognition, particularly executive function, and this plays a role in relapse to smoking. This functional MRI (fMRI) study examined whether activity in working memory-related brain circuitry predicts subsequent smoking relapse, above and beyond standard clinical and behavioral measures. Seventy-three treatment-seeking smokers completed two fMRI sessions (smoking as usual vs. 24hr. abstinence) during performance of a visual N-back working memory task. Brief counseling and a short-term quit attempt followed. Relapse during the first 7 days was biochemically confirmed by the presence of the nicotine metabolite cotinine. Mean percent signal change was extracted from a priori regions of interest in the brain’s executive control and default mode networks: bilateral dorsolateral prefrontal cortex (DLPFC), medial frontal cingulate gyrus (MFCG), posterior cingulate cortex (PCC), and ventromedial prefrontal cortex (vmPFC). Signal from these brain regions and additional clinical measures were used to model outcome status, which was then validated with resampling techniques. Relapse to smoking was predicted significantly by increased withdrawal symptoms, decreased left DLPFC and increased PCC-BOLD percent signal change (abstinence minus smoking). Results of whole-brain analysis were consistent. Receiver Operating Curve (ROC) analysis demonstrated 81% area under the curve (AUC) using these predictors, a significant improvement over the model with clinical variables only. The combination of abstinence-induced decreases in left DLPFC activation and reduced suppression of left PCC may be a prognostic marker for early smoking relapse.

JUSTIFICATION: Changes in working memory-related activity detected with fMRI techniques may be a prognostic marker for early smoking relapse.

FUNDING: NCI P50143187

CORRESPONDING AUTHOR: James Lougheed, PhD, Department of Psychiatry and Center for Interdisciplinary Research on Nicotine Addiction, University of Pennsylvania, USA

SYM6M
CURRENT PRECLINICAL RESEARCH ON THE RELATIONSHIP BETWEEN NICOTINE, OBESITY, AND METABOLIC DISORDERS

Laura E. Rupprecht, BS*, Patricia E. Grebenstein, PhD*, Laura O’Dell, PhD, Paul Kenny, PhD*, Marina Picciotto, PhD*, Department of Neuroscience, University of Pittsburgh, 1Department of Medicine, Minneapolis Medical Research Foundation and University of Minnesota, 2Department of Psychology, The University of Texas at El Paso, 3Department of Pharmacology and Systems Therapeutics, Ichan School of Medicine at Mount Sinai, 4Department of Psychiatry, Yale University School of Medicine

Smoking and obesity are the two leading causes of death in the United States. Smoking prevalence is greater in people with obesity and associated metabolic disorders, such as diabetes, than in the general population. The nature of the relationship between these disorders is not well understood and may be bidirectional. On one hand, smoking and smoking cessation have direct influences on appetite, body weight, and metabolism. On the other hand, obesity and metabolic disorders can directly modulate the behavioral and neuropharmacological effects of nicotine and smoking. Understanding the mechanisms underlying the relationship between nicotine, obesity, and metabolic disorders is important for identifying effective treatments to reduce their enormous adverse impact on public health. The purpose of this symposium is to provide an overview of recent preclinical research exploring the behavioral, neuropharmacological, and metabolic factors mediating the relationships between nicotine, food intake, metabolism, and body weight. Laura Rupprecht will discuss how low-dose nicotine self-administration can influence body weight independent of changes in food intake and its implications for nicotine reduction policy. Dr. Patricia Grebenstein will discuss a novel animal model for examining the differential effects of self-administered nicotine and nicotine withdrawal on concurrent intake of different types of foods (chow versus sucrose) and its impact on metabolism and body weight. Dr. Laura O’Dell will discuss how insulin dysfunction in an animal model of diabetes influences the reinforcing effects of nicotine and associated changes in dopamine release in the nucleus accumbens. Dr. Paul Kenny will describe the role of G-protein coupled receptor 151 (GPR-151) in the medial habenula in nicotine self-administration, food intake, and body weight using GPR-151 knockout mice. Dr. Marina Picciotto will serve as the discussant and examine the scientific and clinical implications of this work.

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SYM6A
LOW DOSES OF SELF-ADMINISTERED NICOTINE SUPPRESS BODY WEIGHT Gain INDEPENDENT OF FOOD INTAKE: IMPLICATIONS FOR NICOTINE REDUCTION POLICY

Laura E. Rupprecht, BS*, Tracy T. Smith, MS*, Rachel L. Schassburger, MS*, Deanne M. Buffalari, PhD*, Eric C. Dubey, PhD*, Alan F. Sai, PhD*, 1Department of Neuroscience, University of Pittsburgh, 2Department of Psychology, University of Pittsburgh

The ability of nicotine (NIC) to suppress body weight (BW) is often cited as a primary factor impacting smoking initiation and the failure to quit. Despite the BW-suppressive effects of NIC, smokers and non-smokers report equal daily caloric intake. Furthermore, the FDA has the authority to implement a policy markedly reducing the allowable NIC levels in cigarettes; such a reduction could have a detrimental effect on BW. Thus, a better understanding of BW-related health outcomes of NIC reduction is important in considering potential policies. Adult male rats fed ad libitum standard chow self-administered (SA) intravenous infusions of NIC (0 or 60 ug/kg/infusion) in daily 1-h sessions. SA NIC suppressed BW but not food intake, indicating that NIC suppresses BW independent of food intake. These data are in contrast with the idea that NIC suppresses BW secondary to reduction in food intake, but are consistent with data from human smokers. To model new smokers of reduced NIC content cigarettes, we assessed the effects of a range of SA doses of NIC on BW gain in food-restricted rats. Adult rats were restricted to 80% ad libitum food intake and SA NIC across a range of doses (0, 3.75, 7.5, 15, or 60 ug/kg/infusion). NIC dose-dependently suppressed BW. A low dose of NIC (3.75 ug/kg/infusion) that resulted in relatively little daily NIC intake suppressed BW compared to saline (p<0.05). We modeled NIC reduction in current smokers in a separate group of food-restricted rats that SA 60 ug/kg/infusion NIC before immediate reduction (0, 1.875, or 3.75, 7.5, 15 ug/kg/infusion) or a gradual stepped dose reduction (dose halved every 10 days to 1.875 ug/
Both immediate and gradual reductions resulted in BW significantly greater than constant 60 ug/kg/infusion NIC (p<0.005). Immediate reduction to low NIC doses trended towards BW gain greater than reduction to saline (p<0.07). Reduction of NIC in cigarettes to a dose that will not maintain smoking will likely cause significant weight gain in current smokers. However, in new smokers low NIC levels may still restrict BW, possibly motivating continued use and maintaining exposure to harmful chemicals in cigarette smoke.

**JUSTIFICATION:** This research describes the extent to which FDA imposed reductions in the nicotine content of cigarettes may facilitate increases in weight gain, as well as increased motivation to continue smoking to prevent or delay weight gain.

**FUNDING:** U54DA031659

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**SYM6B**

**EFFECTS OF SELF-ADMINISTERED NICOTINE AND WITHDRAWAL ON CONCURRENT CHOW AND SUCROSE INTAKE AND ENERGY METABOLISM IN ADULT MALE RATS**

Patricia E Grebenstein, PhD*, Mark LeSage, PhD, Department of Medicine, Minneapolis Medical Research Foundation and The University of Minnesota

Smokers weigh less than nonsmokers and quitting smoking results in weight gain, which is characterized by changes in metabolism and food intake. Evidence in human smokers suggests that carbohydrates may be preferentially increased after quitting. Attempts to model these effects in rodents have been typically limited to investigations of noncontingent nicotine administration. This presentation will describe our research characterizing changes in body weight, metabolism, and chow and sucrose pellet intake during 23h IV nicotine self-administration (NSA) and saline extinction. In this model, NSA decreases chow intake, whereas sucrose intake remains unchanged. Total food intake has not been correlated with total nicotine intake, which is likely due to the insensitivity of sucrose intake to nicotine. During extinction, both chow and sucrose intake increases, but the percent increase in sucrose intake (97%) is greater than chow intake (26%). Sucrose intake is also increased above baseline levels. This supports the human literature and suggests that a preferential increase in sweet food intake may occur in individuals quitting smoking, which may lead to increased weight gain and risk for Type II Diabetes. To evaluate changes in energy metabolism, we have calculated food efficiency ratios [food efficiency = (total weight gain / # of days) / (total food intake / # of days)]. Compared to saline controls, food efficiency is decreased during NSA and increased above saline during extinction. These results suggest that withdrawal from nicotine increases metabolic efficiency, such that less food is needed to gain weight. This model may be useful for studying mechanisms mediating the effects of smoking and smoking cessation on energy intake and metabolism.

**JUSTIFICATION:** This research provides information regarding changes in food intake that are specific to food type, which can have long-term effects on the development of obesity and metabolic disorders in individuals smoking cigarettes.

**FUNDING:** R01-026444

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**SYM6C**

**ENHANCED REWARDING EFFECTS OF NICOTINE IN A RODENT MODEL OF DIABETES**

Laura O’Dell, PhD*, Department of Psychology, The University of Texas at El Paso

Rationale: Patients suffering from metabolic disorders, such as diabetes display greater vulnerability to tobacco use. However, it is unclear if they experience greater rewarding effects of nicotine. Moreover, the mechanisms that mediate enhanced vulnerability to tobacco use in diabetic persons are unclear.

Method: To address this issue, we conducted a series of studies comparing the rewarding effects of nicotine in diabetic and healthy control rats using place conditioning and self-administration procedures. The rewarding effects of nicotine are modulated, in large part, via dopamine in the nucleus accumbens (NAcc). We also conducted a series of studies comparing various biomarkers of dopamine transmission in the NAcc of diabetic and control rats using in vivo microdialysis and Western Blot procedures. Our studies employed a rodent model of diabetes involving streptozotocin (STZ) administration, a drug that is toxic to insulin-producing cells in the pancreas and produces hyperglycemia. Results: Our results from both behavioral models revealed that diabetic rats display enhanced rewarding effects of nicotine compared to controls. Diabetic rats also displayed suppressed dopamine release in the NAcc in response to nicotine administration and a down regulation of D1 receptors and dopamine transporters. Conclusion: Taken together, our data suggest that diabetic rats display enhanced rewarding effects of nicotine. This effect appears to be related to overcompensation for suppressed dopamine systems in the NAcc. Recent evidence also suggests that the high levels of nicotine intake observed in diabetic rats are normalized following insulin replacement. These data have important implications for understanding enhanced vulnerability to tobacco use in persons with metabolic disorders, such as diabetes. Furthermore, proper insulin regulation is likely an important element of tobacco cessation approaches in persons with diabetes.

**JUSTIFICATION:** This research has important implications for understanding enhanced vulnerability to tobacco use in individuals with metabolic disorders and the importance of insulin regulation in individuals with diabetes who are trying to quit smoking.

**FUNDING:** NIDA R01 (2DA021274)

**CORRESPONDING AUTHOR:** Laura O’Dell*, PhD, Department of Psychology, The University of Texas at El Paso, 500 West University, El Paso, TX 79902, USA

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**SYM6D**

**HABENULAR REGION OF FOOD AND NICOTINE INTAKE**

Richard O’Connor, PhD, George Voren, BA, Maria Dao, Paul J. Kenny, PhD*, Department of Pharmacology and Systems Therapeutics, Icahn School of Medicine at Mount Sinai

Cholinergic neurons arising in the medial habenula (MHb) and projecting to the interpeduncular nucleus (IPN) densely express nicotinic acetylcholine receptors (nAChRs). Recent evidence suggests that nAChR signaling in the MHb-IPN pathway plays a key role in regulating aversive effects of nicotine that limit consumption of the drug. Our laboratory has investigated the role for other receptors that show dense expression in the MHb-IPN pathway in controlling nicotine intake. G-protein coupled receptor 151 (GPR-151) is an orphan receptor with expression restricted primarily to MHb neurons. We found that mice with null mutation in the GPR-151 gene self-administered far more nicotine across the entire nicotine dose-response curve than wildtype littermate mice when tested under a fixed ratio 5 time-out 20 sec (FR5TO20) schedule of reinforcement. GPR-151 knockout mice were also resistant to the anorectic effects of nicotine on food intake. This was reflected in the absence of nicotine-induced suppression of responding for food pellets (25 mg) in knockout mice that was otherwise observed in wildtype mice when tested under a FR5TO20 reinforcement schedule. Interestingly, GPR-151 knockout had increased baseline body weight, and responded at far higher rates for food rewards, than wildtype littermates. When provided with access to a palatable high-calorie diet, GPR-151 knockout mice gained more weight, and demonstrated more exaggerated hyperleptinemia and hyperinsulinemia, than wildtype mice. These data further support a key role for the MHb-IPN system in regulating nicotine intake. Moreover, MHb-IPN neurons may play a previously unsuspected role in controlling food intake and in regulating body weight.

**JUSTIFICATION:** This research explores the role of the medial habenula in nicotine and food reinforcement and suggests novel targets for future pharmacotherapies for the treatment of obesity and nicotine addiction.

**FUNDING:** R01DA020686

**CORRESPONDING AUTHOR:** Paul J. Kenny, Department of Pharmacology and Systems Therapeutics, Icahn School of Medicine at Mount Sinai, One Gustave L. Levy Place, New York, NY 10029-6574, USA
SYM7 NEW DATA ON MENTHOL CIGARETTES: STILL A BURNING ISSUE
Anne M. Hartman, MS, MA*, 1 Pebbles Fagan, PhD, 1 Jonathon Foulds, PhD, 1 Cristina D. Delnevo, PhD, MPH, 1 Andrea C. Villanti, PhD, 1 David B. Abrams, PhD, 1 Division of Cancer Control and Population Sciences, National Cancer Institute, NIH, 2 University of Hawaii Cancer Center, 3 Penn State, College of Medicine Cancer Institute, 4 Center for Tobacco Studies, Rutgers School of Public Health and Cancer Institute of New Jersey, 5 The Schroeder Institute for Tobacco Research and Policy Studies, Legacy

The U.S. Food and Drug Administration (FDA) was given authority to regulate tobacco products in June 2009. As part of this authority, FDA is required to examine whether or not menthol in cigarettes has a harmful impact on the U.S. population’s health including use among children, young adults, women, African-Americans, Hispanics, and other racial/ethnic minorities. To add to the scientific evidence base and support FDA’s ability to determine regulatory policy regarding menthol in cigarettes, this symposium presents new research to help fill the gaps in knowledge about the impact of menthol cigarettes both from a clinical and population perspective. Dr. Fagan will describe the results of a laboratory based study comparing biomarkers of tobacco exposure among young adult daily menthol and non-menthol smokers to assess impact of menthol on nicotine metabolism. Dr. Foulds will present results from a randomized trial investigating whether preference for menthol cigarettes influences quit rates after one month of smoking cessation treatment. Dr. Delnevo will provide national population information about the impact of menthol cigarette use on one-year trajectories of cigarette use among a young adult population, 18-34 years old. Dr. Villanti will outline a conceptual framework and common analytic strategy to strengthen causal inference and propagate high quality research on the role of menthol in smoking initiation and progression in longitudinal studies. Finally, Dr. Abrams will comment on the implications of the prior presentations. Ms. Hartman will mention national public use datasets that contain items relevant to menthol cigarette use for future research, and there will be time allotted for audience participation.

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SYM7A THE INFLUENCE OF MENTHOL SMOKING ON YOUNG ADULTS’ SMOKING TRAJECTORIES
Cristine D. Delnevo, PhD, MPH* 1, Andrea C. Villanti, PhD, MPH 1, Olivia A. Wackowski, PhD, MPH 1, Daniel Giovenco 1, 1 Center for Tobacco Studies, School of Public Health, Rutgers, the State University, 2 Cancer Institute of New Jersey, Rutgers, the State University, 3 The Schroeder Institute for Tobacco Research and Policy Studies, Legacy, 4 Department of Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health

Background: Young adulthood is a critical period in establishing health or risk behaviors, including smoking. This study examines one-year cigarette use trajectories in young adults and the potential influence of menthol cigarette on these trajectories. Methods: Data are from 909 young adult (aged 18-34) respondents of the 2011 National Young Adult Health Survey who had smoked 100 cigarettes in their lifetime, and described their smoking behavior one year ago as “every day,” “some days,” or “not at all.” Cigarette smoking trajectories from one year ago were categorized as: 1) Maintained current smoking level; 2) Remained quit; 3) Quit; 4) Decreased smoking level; 5) Increased smoking level (i.e., “some days” to “every day”); or 6) Increased smoking via relapse or initiation (i.e., “not at all” to “some” or “every day”) smoking). Participants were also asked about their current use of menthol cigarettes and other tobacco products (“OTP”; i.e., cigars, smokeless tobacco, and hookah) and ever use of e-cigarettes. Results: Only 73.1% reported stable tobacco use behaviors while 26.9% reported changes, with 8.2% having quit, 5.8% reporting that they smoke on fewer days, 5.0% increasing from some day to daily smoking, and 8.0% increasing from not at all to current smoking. In a multivariable model, the youngest smokers (18-20) had significantly higher odds (AOR=2.6) of increasing their cigarette use over the past year compared to those aged 30-34, as did blacks versus whites (AOR=2.85). Menthol cigarette use nearly doubled (AOR=1.87) the odds of increased smoking behavior. E-cigarette and OTP use was not associated with increasing smoking but OTP use was negatively associated with remaining quit from cigarettes. Conclusions: Young adulthood is a critical period for smoking interventions to both encourage cessation and prevent initiation, particularly among those most vulnerable, i.e. black and younger young adults. Policy efforts to restrict menthol cigarettes may reduce young adult smoking initiation.

JUSTIFICATION: This study provides novel information on the impact of menthol cigarette use on young adult smoking behavior that is of direct interest to FDA’s proposed ban on menthol in cigarettes.

FUNDING: This work was supported by a grant from the National Cancer Institute (R01CA149705).

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SYM7B DOES MENTHOL PREDICT SHORT-TERM QUIT RATES IN SMOKERS SEEKING INTENSIVE TREATMENT?
Jonathan Foulds, PhD, Susan Veldheer, MS, RD, Jessica Yingst, Shari Harabovsky, RN, MSN, Arthur Berg, PhD, Chris Sciamanna, MD, Public Health Sciences and Psychiatry, Penn State University

Objective: To investigate whether preference for menthol cigarettes influences quit rates after a month of group smoking cessation treatment. Design: Randomized Controlled Trial Setting: Outpatient medical practices in Hershey Pennsylvania area. Methods: Participants were 225 smokers of at least 5 cigarettes per day, aged over 21 years and willing to make a quit attempt in the next 30 days. 105 (47%) were menthol smokers. At the initial visit all participants completed a comprehensive baseline assessment. 120 were randomly allocated to receiving motivational feedback on their lung function. All participants were then offered 6 weekly group smoking cessation sessions and transdermal nicotine patches and followed up 28 days after the target quit date. The primary outcome measure was 7-day point prevalence tobacco abstinence, biochemically-confirmed by exhaled carbon-monoxide less than 10ppm. Results: Menthol and non-menthol smokers had similar baseline cigarettes per day (17.7 v 17.5) and plasma cotinine concentrations (244 v 238 ng/ml). Menthol smokers were less likely to quit, (47 v 56%), and this was significant (p<0.024) when controlling for other significant baseline predictors (dependence, confidence, weight concern, baseline stress, and having received substance use treatment). There was no effect of lung function feedback on smoking cessation. Conclusion: Consistent with many prior studies, menthol smokers appear to have a lower quit rate when trying to quit.

JUSTIFICATION: This study provides novel information that is of direct relevance to FDA's proposed ban on menthol in cigarettes.

FUNDING: The Cancer Institute at Penn State College of Medicine

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SYM7C NICOTINE METABOLISM IN YOUNG ADULT DAILY MENTHOL AND NON-MENTHOL SMOKERS
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Background: Menthol cigarette smoking may increase the risk for tobacco smoke exposure and inhibit nicotine metabolism in the liver. The nicotine metabolite ratio (NMR) is a phenotypic proxy for CYP2A6 activity, but no studies have examined differences in this biomarker among young adult daily menthol and non-menthol smokers. Objective: This laboratory based study compared biomarkers of tobacco exposure among young adult daily menthol and non-menthol smokers (N=179). Methods: Young adults aged 18-35 were recruited via Craigslist.com, newspaper advertisements, and peer-to-peer referrals to participate in a laboratory study. All
participants completed a brief survey and height, weight and carbon monoxide levels were measured. Saliva samples were used to examine levels of nicotine, cotinine, trans 3'-hydroxycotinine, and the NMR in menthol and non-menthol smokers. Results: Overall, 68% of young adult daily smokers were menthol smokers. Seventy-seven percent of women, 87% of Native Hawaiians, 72% of Filipinos, and 47% of Whites reported menthol cigarette smoking. Participants reported a mean body mass index of 28 and body mass index was significantly higher among menthol compared to non-menthol smokers (29.4 versus 24.5, p < 0.0001). The geometric means for nicotine, cotinine, the cotinine/cigarette per day ratio, and carbon monoxide were higher among menthol smokers, but scores did not significantly differ from non-menthol smokers. The NMR was significantly lower among menthol compared to non-menthol smokers after adjusting for race/ethnicity, gender, and BMI (0.19 versus 0.24, p < 0.04). Sub-analyses showed that White young adult menthol smokers had significantly higher cotinine, nicotine, and the cotinine/cigarettes per day ratio than White young adult non-menthol smokers. White menthol smokers had a lower NMR in the unadjusted models, but the differences were marginally significant in the adjusted model (0.28 versus 0.37, p = 0.06). Conclusion: Young adult daily menthol smokers have slower rates of nicotine clearance as indicated by the NMR. Studies are needed to determine how this information can be used to inform cessation interventions for young adults.

JUSTIFICATION: This study could potentially inform the development of appropriate therapeutics for cessation interventions.

FUNDING: American Legacy Foundation and University of Hawaii Cancer Center

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SYM8
LIGHT AND NONDAILY SMOKING AMONG AFRICAN AMERICANS, HISPANIC/LATINOS, AND NON-HISPANIC WHITES: IMPLICATIONS FOR TREATMENT

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Light and nondaily smoking (NDS) is becoming increasingly common as the prevalence of heavier smoking continues to decline. Light and NDS is particularly prevalent among members of ethnic minority groups. Prevalence of light and NDS differs among the three largest ethnic groups in the US: 76.8% of Latino smokers and 66.5% of African American (AA) current smokers are light and NDS compared to 40.4% of non-Hispanic White (White) smokers. This symposium will examine national and state data to inform the understanding and treatment of light and NDS among AAs, Latinos, and Whites. Presenters will provide data on prevalence of light and NDS among AAs, Latinos, and Whites. Presenters will provide data on prevalence of heavier smoking continues to decline. Light and NDS is particularly prevalent among members of ethnic minority groups. Prevalence of light and NDS among AAs, Latinos, and Whites continues to decline. Light and NDS is particularly prevalent among members of ethnic minority groups. Prevalence of light and NDS among AAs, Latinos, and Whites. Presenters will provide data on prevalence of heavy smoking among AAs, Latinos, and Whites. Presenters will provide data on prevalence of heavy smoking among AAs, Latinos, and Whites.

FUNDING: This study was funded by Legacy.

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SYM7D
EVIDENCE ON ROLE OF MENTHOL AND SMOKING INITIATION: A WAY FORWARD

Andrea C. Villanti, PhD, MPH1,2, Allison M. Glasser, MPH1, David B. Abrams, PhD1,2, Cristine D. Delnevo, PhD, MPH1,2, Gary A. Giovino, PhD2, Robin Mermelstein, PhD1, Raymond S. Niaura, PhD1,2, The Schroeder Institute for Tobacco Research and Policy Studies, Legacy, 3Department of Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health, 4Department of Oncology, Georgetown University Medical Center, Lombardi Comprehensive Cancer Center, 5Center for Tobacco Studies, School of Public Health, Rutgers, the State University, 6Cancer Institute of New Jersey, Rutgers, the State University, 7Department of Community Health and Health Behavior, School of Public Health and Health Professions, University at Buffalo, 8The State University of New York, 9Institute for Health Research and Policy, University of Illinois at Chicago

A number of cross-sectional studies show that a greater proportion of youth smokers and recently-initiated youth smokers smoke menthol cigarettes compared to young adults and adult smokers. The question remains as to whether initiation with menthol cigarettes facilitates progression to established cigarette use in young people, and only a small number of recent studies have addressed this issue. In September 2013, the Schroeder Institute convened a two-day menthol methodology meeting to: 1) discuss the current evidence on menthol in cigarettes as it relates to initiation, cessation, and population health; 2) frame research questions to address gaps in the current evidence base; and 3) recommend study designs to address priority research questions. The overall goal of the meeting was to delineate the types of studies that will be critical to informing the FDA’s potential ban on menthol in cigarettes and that will be able to withstand scientific and legal scrutiny. This presentation builds on the discussion and findings of this expert panel. We provide a systematic review of existing evidence on the role of menthol in smoking initiation, define key constructs for measurement (including menthol cigarette use, cigarette experimentation, initiation, and progression) in current and future studies, outline challenges in causal inference based on observational studies, and propose a conceptual framework to stimulate research questions on this topic. We outline the essential elements of a common analytic strategy to strengthen causal inference and propagate high quality research on this topic and present preliminary data on various research questions as examples of how to operationalize these strategies in longitudinal studies.

JUSTIFICATION: This presentation will guide future research to inform FDA’s proposed ban on menthol in cigarettes.

FUNDING: This study was funded by Legacy.

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SYM8A
LIGHT AND INTERMITTENT SMOKING AMONG CALIFORNIA AFRICAN AMERICAN, HISPANIC/LATINO, AND NON-HISPANIC WHITE MEN AND WOMEN
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The prevalence of light and intermittent smoking (LITS) is increasing as the prevalence of heavier smoking continues to fall. The purpose of this study was to examine changes in LITS over time among African Americans (AA), Hispanic/Latino (Latinos) and Non-Hispanic Whites (Whites) and to deconstruct smoking patterns by sex for different ethnic groups given established differences in smoking behaviors between AA and Latino men and women. Data from the California Tobacco Surveys from 1990, 1992, and 1996 (Time 1; T1) were combined and compared to data from 1999, 2002, 2005, and 2008 (Time 2; T2). T1 participants (n = 50,424) included AAs (n = 5,029), Latinos (n = 7,910), and Whites (n = 39,485). T2 participants (n = 53,005) included AAs (n = 5,460), Latinos (n = 14,273), and Whites (n = 33,262). LITS increased by a factor of 12.9% to a rate of 79.6% [76.0-83.2] among Latinos, by 19.4% to a rate of 74.4% [70.9-77.9] among AAs, and by 51.7% to a rate of 48.8% [47.5-50.3] among Whites. AAs and Latinos were significantly more likely to be LITS than Whites at both T1 and T2 (p < .0001). In unadjusted analyses at T1, females were more likely to be LITS than males across ethnic groups. At T2, this sex difference was maintained among Whites, but not AAs and Latinos. This suggests less change in LITS among AA and Latino women compared to White women, which may be due to already high T1 LITS base rates among ethnic minority women. It is also possible that the substantial increase in LITS among Whites from T1 to T2 may reflect greater tobacco control effort toward Whites relative to other ethnic groups in CA. Females were significantly more likely to be LITS than males when controlling for demographic variables. Specific factors underlying why women are more likely to be LITS than men are unclear, thus indicating an important research area. The present study found that LITS rates increased over time for male and female AA, Latino, and White adults. There is a need for increased tobacco control attention to LITS across all ethnic groups, but with additional focus on AAs, Latinos, and women who have the highest rates of LITS.

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SYM8B
RACIAL AND ETHNIC DIFFERENCES IN NONDAILY SMOKERS: SMOKING, CESSATION, AND HARM REDUCTION CHARACTERISTICS
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Prevalence of non-daily smoking differs among the three largest ethnic groups in the US with national estimates of 35.7% of Latino (L) smokers, 23.8% of African American (AA) smokers and 16.6% of non-Hispanic White (NHW) smokers smoking on some days of the month. Racial/ethnic differences in NDS remains an understudied area and little is known about cessation and/or harm reduction characteristics for these groups. Data were collected through an online panel survey company. NDS and daily smokers were recruited using stratified sampling to include equal numbers of AAs, Ls, and NHWs. These analyses include 1,201 NDS (n = 578, <10 cpd; n = 400 L, and 400 NHW). Participants completed a survey including demographic, tobacco use characteristics, and quitting behaviors. Chi-square tests and ANOVA were used for comparisons between groups. Pairwise comparison p-values were adjusted by Holm’s method. Despite comparable levels of smoking (total cigarettes/month; AA, 78.9, L, 77.3, NHW, 91.7, p ranged from 0.05 to 0.9), AA NDS were more likely to be cutting down (AA, 81.3% > L, 69.8%, and NHW, 74.3% ps<0.05) and were more likely to set a limit on their cpd to decrease the health risks from smoking (AA, 59.6%, L, 54.0%, p=0.11; AAL > NHW, 45.0%, ps<0.05). A higher proportion of AA NDS had made a quit attempt (> 1 day) in the past year (AA, 61.6%, L, 60.3%, p=0.70; AAL > NHW, 49.0%, ps=0.01) and intended to quit in the next 30 days (AA 15.0% > L 7.8%, NHW 8.5%, ps<0.01). African American and Latino NDS are more likely to report quitting their cigarette consumption, attempting to quit, and intending to quit in the near future than non-Hispanic White NDS. Ethnic differences have potential implications for smoking cessation interventions and future studies should examine whether these differences result in higher quit rates. In addition, future interventions should capitalize on reduction strategies (e.g., actively cutting down) that the majority of African American and Latino NDS engage in to promote cessation.

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SYM8C
RACIAL DIFFERENCES IN PHYSICIAN INITIATED SMOKING CESSION COUNSELING OF DAILY AND NONDAILY SMOKERS
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Background: Nondaily smoking (NDS) has increased in the US in the past decade. We sought to examine how physicians approach smoking cessation among White, African-American (AA) and Latino NDS.

Methods: Participants were NDS (smoked < 24 days in the 30 days) and daily smokers (DS, smoked >25 days in past month) recruited using a panel research company who completed an online survey. The online questionnaire queried their experiences with physicians’ approach to their tobacco use over the last 12 months. Multivariable logistic regressions were performed.

Results: Participants included native NDS (no history of DS > 6 months; n=297), converted NDS (previously DS > 6 months; n=904), light DS (smoked <10 cpd, per day cpd; n=578), and heavy DS (smoked >10 cpd; n=597). Adjusting for smoker type, age, and intention to quit, AA were more likely to be asked if they smoked and advised to quit compared to Whites (OR=1.25, p=0.0463, OR=1.54, p<0.001 respectively) whereas Latinos were similar to whites (OR=1.05, p=0.68, OR=1.23, p=0.054 respectively). AA and Latinos were more likely than whites to be offered cessation assistance by their physicians (OR=1.73, p<0.001; OR=1.65, p<0.001 respectively). Within-race analysis showed that white converted NDS, light DS and heavy DS were more likely to have follow up arranged compared to native NDS [OR=6.43, (non-significant); OR=11.97, p=0.02; OR=8.77, p=0.04, respectively]. Among AA, heavy DS and converted NDS were more likely to have follow up arranged compared to native NDS [OR=3.72, p<0.01; OR=2.47, (non-significant); respectively]. Among Latinos, only converted NDS were more likely to have follow up arranged compared to native NDS (OR=3.25, p<0.01).

Conclusions: Our data demonstrate that AA and Latino smokers are more likely to be advised to quit smoking and are more likely to be offered cessation assistance by their health care professional. Among White, AA and Latino, native NDS were least likely to have cessation-related follow up arranged by their health care professional.

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SYM9
INNOVATIVE STRATEGIES TO INCREASE THE REACH OF QUITLINES
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Tobacco users who make contact with a quitline may be offered a range of services including mailed print materials, recorded messages, counseling, and access to cessation medication. Quitlines have benefited from rigorously tested protocols and are of demonstrated efficacy. Their ease of use and interest from smokers has led to their widespread adoption. Quitlines have grown in the past 25 years from a health plan in Washington and the California state quitline to now all 50 states and national quitlines around the world. They continue to update services to connect with smokers through the web, email, text messages and other new media. Although they are well positioned to serve almost the entire population of smokers, their reach to date is limited, with less than 5% of eligible tobacco users responding to modest marketing and promotion. One potential benefit of quitlines is their ability to reach non-traditional populations who would not otherwise seek treatment services. This symposium will discuss innovative methods to increase the reach and effectiveness of quitline services, including a diverse collection of research projects. David Warner reports on his randomized controlled trial with hospitalized smokers using novel recruitment and a brief quitline facilitation intervention with smokers. His colleague from the Mayo Clinic, Christi Patten, will present the results of a recent randomized controlled trial that employed the support persons of smokers to assist in quitting with training in social support through a quitline. Two researchers will present variations on recruitment methods with low income smokers. Shu-Hong Zhu will detail the results of a randomized controlled trial with Medicaid smokers, which uses monetary incentives. Bruce Christiansen will report on the results of providing a brief motivational intervention to smokers, who were not motivated to quit, recruited from five Wisconsin Salvation Army sites. Scott Leischow will serve as the symposium discussant and will synthesize the multiple perspectives presented and discuss how these studies can advance clinical and research efforts on tobacco control programs.

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SYM9B
USE OF QUITLINES TO PROVIDE PRIMARY TOBACCO INTERVENTIONS IN HOSPITALIZED PATIENTS: A POPULATION-BASED RANDOMIZED TRIAL
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Introduction: Hospitalization is an excellent opportunity for smokers to quit, both to enjoy the long-term health benefits of quitting and likely recover more quickly from their illness. Tobacco interventions targeting hospitalized smokers often require specialized services not available in most hospitals. This study aimed to test the hypothesis that a quitline facilitation intervention would be efficacious in promoting in-hospital quitline counseling and smoking cessation.

Methods: This was a randomized controlled trial of Olmsted County, MN residents who self-reported current smoking, admitted to one of two Mayo Clinic hospitals in Rochester, MN. Patients were recruited regardless of intent to quit. A control group received a brief smoking intervention (and card containing quitline number); an intervention group received a quitline facilitation intervention of similar duration, with warm hand-off of amenable subjects to a national quitline provider for an intake call and potentially an initial coaching call. A 2-week supply of nicotine patches was available to both groups at hospital discharge. Outcomes included number of patients who completed the intake call and/or initial quitline counseling session and biochemically-confirmed 7-day point prevalence abstinence at 6 months after hospitalization.

Results: Of 1,532 eligible patients approached, 600 patients (39.2%) consented and were randomized (299 controls, 301 intervention). Of the control patients, only 2 (0.7%) completed the quitline intake call and 1 (0.3%) completed the first coaching call vs. 196 (65.1%) and 138 (45.8%) of patients receiving a quitline facilitation intervention, respectively. At the time of this abstract submission, the 6-month abstinence endpoint is being collected and will be available at the time of the meeting.

Conclusions: Approximately half of a population-based sample of hospital admissions, many of whom were not intending to quit, were willing to receive quitline counseling services. This approach shows promise in both extending the reach of quitline services and providing a practical means for hospitals to consistently offer tobacco interventions to their patients who smoke.

JUSTIFICATION: This research has the potential to be translated into hospital clinical practice when smokers are admitted to a hospital.

FUNDING: ClearWay Minnesota

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SYM9A
MOTIVATING LOW SES SMOKERS TO TAKE ACTION TO QUIT: A BRIEF INTERVENTION FOR THE COMMUNITY AGENCY SETTING
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Introduction: Individuals with low income/low education and who are underserved (LIEU), smoke at much higher rates than the general population. While most LIEU smokers want to quit, they make fewer and less successful quit attempts than do other smokers. LIEU smokers have specific beliefs about smoking and quitting that may serve as barriers to making quit attempts.

Methods: Subjects were 522 smokers visiting five Wisconsin Salvation Army (SA) sites. Of these, 102 indicated that they were motivated to quit and served as a comparison group. The remaining 420 smokers were not motivated to quit and were randomly assigned to one of three conditions: an intervention group who received an average of 24 minutes of counseling focused on cessation goals and beliefs, an attention-control group, and a low contact control group. The primary outcome was the rate at which smokers made a call to the Wisconsin Telephone Quitline (WTQL) during their SA visit.

Results: Unmotivated participants in the intervention condition called the WTQL at a significantly higher rate (12.2%) than did those in either of the two control conditions (2.2% and 1.4%) (p<0.01) and approached the rate of calling by participants who were initially motivated to quit (15.7%). Intervention condition participants also showed improved motivation to quit and stage of change.

Conclusions: A brief, targeted motivational intervention focusing on cessation goals and beliefs increased use of an evidence-based tobacco cessation treatment by LIEU smokers.

JUSTIFICATION: This study can inform the practice of using brief, targeted motivational intervention.

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FUNDING: ClearWay Minnesota

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SYM9C  
SUPPORT PERSON EFFECTIVENESS STUDY TO PROMOTE SMOKER UTILIZATION OF A QUITLINE

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Background: Quitlines and other evidence-based treatments are greatly underutilized by smokers limiting public health impact. Our prior study found increased quitline utilization among smokers by providing a 3-session phone intervention to family members and friends (i.e., support persons). In the current study, the efficacy of the 3-call intervention was compared with a 1-call intervention and to enhance the potential translatability of the findings to practice, both interventions were delivered by a quitline.

Methods: Recruitment of support persons was conducted statewide in Minnesota. 704 support persons (85% female, 95% Caucasian) were enrolled and all received mailed written materials. Participants were randomly assigned to a control condition (no additional intervention, N=235), the 1-call intervention group (N=233), or a 3-call intervention group (N=236). For both interventions, quitline coaches provided participants with skills training on social support and how to prompt their smoker to use the quitline. Helpline staff documented smoker enrollment in the quitline through 7 month of follow-up.

Results: Smokers linked to support persons in the 1 and 3 call intervention groups had similar rates of quitline enrollment (14.6% and 14.8% respectively) and significantly higher rates than smokers linked to participants in the control group (6.4%), p=0.006.

Conclusion: Findings from this controlled trial indicate that a 1 or 3 call intervention delivered to support people by a quitline is equally effective for increasing treatment engagement among smokers. The reach of quitlines could be enhanced by targeting the social network of smokers.

JUSTIFICATION: The reach of quitlines could be enhanced by targeting the social network of smokers.

FUNDING: ClearWay Minnesota
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SYM10  
NICOTINE AND ALCOHOL CO-ABUSE: FROM MECHANISMS TO TREATMENT

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Smokers who are also heavy alcohol drinkers exhibit greater nicotine dependence, smoke more cigarettes and are less prone to quit smoking than smokers who do not drink heavily. Moreover, while smoking prevalence in the US has steadily declined to about 20%, smoking prevalence amongst heavy drinkers remains high at around 80%. Thus, it is clear that more information on the biological, behavioral and social factors that contribute to smoking among heavy drinkers is needed in order to successfully decrease smoking amongst heavy drinkers. This symposium brings together junior and senior scientists representing both sexes in the areas of animal model and human subject studies. It will provide a series of translational research studies ranging from cellular effects of alcohol-nicotine interaction to the analysis of heavy drinkers perceptions toward smoking and alcohol. How the information from these wide ranging approaches can inform treatment will be discussed. First, Dr. Dani will describe experiments in animals demonstrating that steroid hormones may play a critical role on the combined effect of nicotine and alcohol on the reward pathway and the co-use of the two drugs. Next, Dr. Oliver will follow with a novel approach for assessing the influence of alcohol and smoking cues on human participants’ ability to resist smoking and alcohol consumption during a lapse period. Dr. De Biasi will then describe a series of experiments in mice that assess the effect of alcohol on nicotine withdrawal, identify brain regions important for both nicotine and alcohol withdrawal and evaluate the role of nicotinic receptors in alcohol withdrawal. Finally, Dr. Fucito will share results from a mixed methods study that describes the smoking and psychological attributes of heavy drinkers, their perceptions of smoking and drinking, and their treatment needs and preferences to inform an integrated intervention. Dr. Ehriinger will conclude the symposium with a discussion of the studies and their implications for treatment.

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SYM10A

NICOTINE ACTS VIA STEROID HORMONES TO INCREASE ALCOHOL SELF-ADMINISTRATION

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Alcohol and nicotine (as obtained from tobacco) are the two most abused and costly drugs to society. Epidemiological studies have found a positive correlation between nicotine and alcohol use, with alcoholism approximately 10 times more prevalent in smokers than in non-smokers. In addition to psychosocial and genetic factors, the interaction between nicotine and alcohol also arises from a complex pharmacological interplay. These drugs activate common neural substrates, including the mesolimbic dopamine (DA) reward system and the hypothalamic-pituitary-adrenal (HPA) axis associated with steroid hormone signaling. Furthermore, both the DA and HPA systems are centrally linked to drug use and addiction. Long-term alterations in the steroid hormone systems are implicated in alcohol use disorders. Steroid hormones, such as the glucocorticoids, have a profound influence on neural function and modulate DA transmission. Neuroactive steroids also modify GABA transmission, which may contribute to the pharmacological action of alcohol. To study the complex and multifaceted interaction between nicotine and alcohol, we simplified the interaction by studying how acute nicotine exposure in naïve animals alters subsequent responses to alcohol, including alcohol-induced DA signals and alcohol self-administration. We found that nicotine pretreatment increased alcohol self-administration and decreased alcohol-induced DA responses in the ventral tegmental area (VTA) and in the nucleus accumbens (NAc) [Neuron 79:530-40]. This interaction required an initial activation of high-affinity nicotinic acetylcholine receptors and activation of steroid hormone receptors in the ventral tegmental area. Blocking steroid hormone receptors prior to nicotine exposure prevented the decreased alcohol-induced dopamine response and prevented nicotine from increasing alcohol self-administration. These results indicate a neurophysiological basis for the potent positive correlation between tobacco and alcohol abuse. Supported mainly by NIH NIDA.

JUSTIFICATION: Understanding the neurobiology of nicotine and alcohol co-abuse will be of benefit in designing effective cessation pharmacotherapies.

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SYM10C

NICOTINE WITHDRAWAL SYMPTOMS DURING NICOTINE & ALCOHOL CO-EXPOSURE: BRAIN CIRCUITS AND MOLECULAR MECHANISMS

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Co-occurrence of alcohol and nicotine addiction in humans is well documented, and there is also evidence that common genes may contribute to both disorders. Electrophysiological, pharmacological and neurochemical studies suggest that alcohol influences nAChR function and that some of its effects on the central nervous system might reflect the interaction with the nicotinic cholinergic system. Both nicotine and alcohol activate the mesolimbic dopaminergic reward system but the two drugs might also share common circuits when it comes to withdrawal symptoms. The symptomatology associated with withdrawal is an obstacle during quit attempts and is a major risk factor for drug relapse. Given the high rates of co-abuse of alcohol and tobacco products, the identification and understanding of common neuronal substrates for drug withdrawal would benefit the design of cessation strategies for smokers who also abuse alcohol. We will present data that describe how nicotine withdrawal symptoms are affected by nicotine and alcohol co-abuse. We will also provide evidence that the medial habenula (MHBs) and the interpeduncular nucleus (IPN), areas important for stress, anxiety and nicotine withdrawal, are also involved in the alcohol withdrawal syndrome. Finally, we will describe the influence of α5- and β4-containing nAChRs on anxiety-like behavior, compulsive-like behavior and physical signs of ethanol withdrawal and discuss the implications for smoking cessation therapies.

JUSTIFICATION: Given the high rates of co-abuse of alcohol and tobacco products, the identification and understanding of common neuronal substrates for drug withdrawal would benefit the design of cessation strategies for smokers who also abuse alcohol.

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SYM10D

HEAVY DRINKERS’ SMOKING CESSATION TREATMENT NEEDS AND PREFERENCES: A MIXED-METHODS STUDY

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Heavy drinkers are less able to establish smoking abstinence and cigarette smoking predicts poor alcohol treatment outcomes. The goal of this mixed methods study was to describe the smoking and psychological attributes of heavy drinkers, their perceptions of smoking and drinking, and their treatment needs and preferences to inform an integrated intervention. Heavy drinking smokers (N=26) completed surveys and participated in focus group interviews. Participants were: mostly male (62%), Caucasian (42%) or African-American (46%), 38.7±13.7 years following the cue reactivity task (p = .013), an effect that persisted past the end of the lapse paradigm (p = .017). Although cue reactivity was observed during the in vivo task, the effects of cues on conscious motivation were short-lived, as cues did not influence craving or mood at later time points. Nonetheless, both alcohol and nicotine cues increased the likelihood of drinking during the lapse task, whereas the likelihood of smoking was increased by prior alcohol administration and decreased by prior nicotine administration. Results highlight the complex interplay between the pharmacological effects of alcohol and nicotine, drug cues, motivation and behavior.

JUSTIFICATION: Understanding the combined impact of pharmacology and environment on the co-use of alcohol and tobacco may be informative for more effective treatments.

FUNDING: NIH (AA011157) and American Heart Association (PRE1466076)

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old, and smoking 11.9±4.7 cigarettes daily. Men and women drank 8.9±4.1 and 7.1±3.4 per drinking day, respectively. Most met current alcohol dependence (58%). Higher smoking cravings correlated with higher alcohol craving and anxiety; higher alcohol cravings correlated with higher stress/anxiety/depression and impulsivity scores (p’s<.05). Most saw smoking and drinking as related. Most perceived smoking harder to change but reported higher motivation to change their smoking than drinking. Abstinence from smoking and controlled alcohol use were the most common goals (73%). Most tried quitting smoking in the past year (quit attempt range: 1-12). Prior methods ever used were “cold turkey” (81%), NRT (23%), varenicline (19%), and e-cigarettes (27%). Perceived barriers to quitting smoking were: alcohol use, habit, stress, and low motivation. Perceived barriers to reducing drinking were: social/environmental triggers and low motivation/self-discipline. Many preferred an integrated intervention to change both behaviors simultaneously; others preferred a sequential treatment approach. The most preferred treatment component was personalized feedback about smoking and alcohol use and related health status. They also preferred personalized change strategies focused on: stress, habit replacement, and restructuring social networks/environments to support behavior change. Most were also open to pharmacotherapy. These results suggest heavy drinkers could benefit from smoking cessation treatments that target drinking, negative affect, social factors, and motivation. Integrated treatments for this population warrant further investigation.

JUSTIFICATION: More research on the smoking cessation treatment needs and preferences of heavy drinkers is needed to develop effective, integrated treatments and reduce the significant disease burden and healthcare costs of these combined behaviors.

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SYM11 TOBACCO CESATION INTERVENTIONS FOR LOW-INCOME SMOKERS: REACHING THE FORGOTTEN SMOKERS

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Smoking rates have slowly but steadily declined from a high in the US of about 42% in the 1960s to about 18% in 2012. However, smoking cessation has not been evenly distributed among the general population of smokers, with continuing high rates of smoking among subgroups of smokers such as the mentally ill, substance using, incarcerated, and other disadvantaged groups. These disenfranchised smokers are predominantly poor, uninsured, and lack resources to access smoking cessation services. To date, public health messages and treatment interventions have generally not been designed to reach low-income smokers and they continue to have the highest prevalence of smoking. For example, rates of smoking are highest among individuals with a GED or less education compared to those with at least a high school diploma and smoking rates are highest among those living below the poverty level. Since most of these smokers are uninsured, interventions are needed that reach these disadvantaged groups. We will present data from three interventions that targeted low-income smokers. First, Dr. Augustson will discuss the importance of designing interventions to reach low-income smokers. Next, Dr. Bernstein will discuss an intervention provided in the ED for smokers not presenting for smoking cessation. Dr. Cropsy will present a smoking cessation study conducted with smokers in the community corrections criminal justice system. Finally, Dr. Wetter will present on an outreach study targeting low-income smokers not seeking cessation. Dr. Fiore will discuss the implications of these studies and avenues for moving forward to address smoking cessation in hard-to-reach, low-income populations.

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SYM11A SUCCESSFUL TOBACCO DEPENDENCE TREATMENT ACHIEVED VIA PHARMACOTHERAPY AND MOTIVATIONAL INTERVIEWING IN LOW-INCOME EMERGENCY DEPARTMENT PATIENTS

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Background: Tobacco use is common in patients who visit emergency departments (EDs), many of whom are low-income and have limited access to care. Prior research studying the efficacy of ED-initiated tobacco dependence treatment has shown mixed results. Objective: To study the efficacy of an intervention incorporating motivational interviewing, multimodal nicotine replacement, and active quitline (QL) referral for adult smokers in an ED. Methods: A 2-arm prospective randomized clinical trial of subjects age 21 years or older who smoke was conducted in a busy urban ED in the northeastern United States. Inclusion criteria included self-pay or Medicaid insurance. Intervention arm subjects received a motivational interview delivered by a trained research assistant, 6 weeks of nicotine patches and gum, a referral to the state smokers’ quitline, a booster call 3 days later, and a brochure. Control arm subjects received the brochure. Smoking status was assessed by telephone self-report at 1, 3, and 12 months. The primary outcome was 3 month follow-up, which included in-person confirmation via exhaled carbon monoxide testing for subjects self-reporting tobacco abstinence. Subjects lost to follow-up were considered to be smoking. Results: From October 2010-December 2012, 778 subjects were enrolled, of whom 774 were alive at 3 months. Demographics included 407 (52.2%) female, median age 41 years, 305 (39.1%) White/non-Hispanic, 308 (39.5%) Black/non-Hispanic, 159 (20.2%) Hispanic ethnicity; median daily cigarette use was 11 (IQR 6-20). Treatment arms had comparable baseline characteristics. At 3 months, the prevalence of biochemically confirmed smoking was 47/386 (12.2%) in the intervention arm vs. 19/388 (4.9%) in the control arm (P<0.001). The proportion of subjects using QL services in the intervention and control arms was, respectively, 124 (32.0%) and 73 (18.7%) (P=0.0001). Conclusion: An intensive multicomponent intervention was more efficacious than usual care in treating tobacco dependence in adult ED smokers. Intervention arm subjects were more likely to use nicotine replacement products and engage with a QL.

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SYM11B RACE AND MEDICATION COMPLIANCE MODERATE SMOKING CESATION OUTCOMES IN CRIMINAL JUSTICE SMOKERS: RESULTS OF A RANDOMIZED CLINICAL TRIAL

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Background: Smokers in the criminal justice system have some of the highest rates of smoking (70-80%) and are some of the most disadvantaged smokers in the US. The criminal justice system is also over-represented by racial and ethnic minorities, most of whom are low income and uninsured. Few studies have examined smoking cessation interventions in racially diverse smokers and none have examined these characteristics among individuals on probation, parole or supervised in the community. Purpose: To determine if four sessions of standard behavioral counseling for smoking cessation would differentially aid smoking cessation for African American versus White smokers under community corrections supervision. Methods: Five hundred smokers were randomized from 2009-2013 to either 4 sessions of standard behavioral counseling around their smoking (Counseling) or No Counseling. All participants received 12 weeks of bupropion plus Brief Physician Advice to quit smoking. Generalized Estimating Equations were used to determine factors associated with smoking abstinence across time. Results: The end-of-treatment abstinence rate across groups was 9.4%, with no significant differences between groups. A significant two-way interaction was found such that African American smokers who received No Counseling had higher average cessation rates than African Americans who received Counseling.
whereas White smokers who received No Counseling had lower average cessation rates than Whites who received Counseling. Behavioral counseling appeared to undermine use of pharmacotherapy regardless of race; however, African American smokers who were medication compliant had highest abstinence rates relative to all other smokers. Conclusions: African American smokers who were compliant with medications, regardless of provision of counseling, can achieve and exceed smoking cessation rates of similarly compliant White smokers. These results were achieved without tailoring the intervention to a particular racial/ethnic group and highlight the need for equalizing access to smoking cessation treatment for ethnic/racial minority smokers as the way to reduce disparities in smoking cessation.

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**SYM11C**

**MOTIVATING SMOKERS TO ENGAGE IN QUITLINE TREATMENT: A RANDOMIZED CLINICAL TRIAL**

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Project Health was designed to evaluate the efficacy of “Motivation And Problem Solving” (MAPS), and the provision of proactive nicotine replacement therapy (NRT), for promoting and facilitating Quitline treatment engagement and smoking cessation among low income smokers who are not ready to quit. Participants (N=600) were cigarette smokers with total household incomes <200% of the poverty line. Participants were randomly assigned to one of six conditions in a 2 (NRT: NRT) X 3 (standard treatment [ST]; MAPS-6; MAPS-12) factorial design. Primary outcome variables are receipt of Texas Quitline treatment and smoking abstinence across 6, 12, 18, and 24-month follow-ups. ST consists of referral to the Texas Quitline and standard self-help materials. ST occurs 4 times (Baseline, 6, 12, and 18 months). MAPS-6 and MAPS-12 consist of ST plus up to either 6 or 12 proactive telephone counseling sessions respectively. MAPS is a holistic, dynamic approach to facilitating behavior change and is designed for all smokers regardless of their readiness to quit. MAPS specifically addresses factors of particular relevance to low income smokers (e.g., chronic stressors, family issues, financial resources). Provision of proactive NRT was evaluated because evidence suggests it may increase the likelihood of a quit attempt, and perhaps increase the likelihood of cessation. Complete results are currently available through the 18 month follow-up. There were no significant treatment effects on abstinence. With respect to receipt of Quitline treatment, MAPS-6 and MAPS-12 appeared to have positive effects (p’s from <.05 to <.10); whereas provision of proactive NRT appeared to discourage treatment engagement (p’s from <.05 to <.10). As hypothesized, MAPS resulted in greater Quitline treatment engagement, consistent with Guideline conclusions that interventions for unmotivated smokers increase quit attempts and treatment engagement, but do not impact cessation rates. Proactive NRT resulted in lower treatment engagement. Reasons for this finding remain to be determined. Increasing the reach of evidence based treatments is a promising approach to reducing tobacco use.

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**SYM12**

**NICOTINE METABOLISM AND SMOKING CESSATION: FROM BENCH TO BEDSIDE AND BEYOND**

Presenters: M. Imad Damaj, PhD1, Neal Benowitz, MD2, Caryn Lerman, PhD2, Rachel F. Tyndale, PhD3, 1Virginia Commonwealth University, 2University of California San Francisco, 3University of Pennsylvania, 4University of Toronto

Discussant: Robert Schnoll, PhD, University of Pennsylvania

Inherited differences in nicotine metabolism have been linked with smoking behavior and cessation across multiple investigations. Nicotine is metabolized to inactive metabolites (cotinine and 3’hydroxycotinine) by the polymorphic CYP2A6 enzyme. Faster metabolizers of nicotine tend to experience greater reward from nicotine, smoke more cigarettes, and have greater difficulty quitting compared to slower metabolizers of nicotine. This symposium brings together an interdisciplinary team of scientific leaders to present the latest discoveries in this area, and discuss the translation from research to practice in the form of new methods of outcome prediction, targeted treatment, and development of novel therapeutics. Dr. Damaj will present new preclinical data showing that inhibition of the CYP2A6 enzyme in mice (i.e., mimicking slow metabolizers) enhances bioavailability of nicotine and increases withdrawal. These data suggest that combining CYP2A6 inhibitors with low dose nicotine replacement therapies may be beneficial for smoking cessation. Dr. Benowitz will present a scientific update on the nicotine metabolism ratio (NMR) biomarker, including new data on the reliability and stability of the NMR, and associations with clinical measures of tobacco and alcohol use that are relevant for clinical practice. Dr. Lerman will present the results of the first prospective NMR-stratified placebo-controlled multi-site clinical trial with 1,246 smokers. The results support the clinical utility of treating normal metabolizers of nicotine with varenicline and slow metabolizers with nicotine patch to optimize quit rates while minimizing side-effects. Dr. Tyndale will present new genetic data from this clinical trial, focusing on the lack of associations of CHRNA5-A3-B4 variants with smoking cessation and response to placebo, nicotine patch and varenicline. Dr. Robert Schnoll will then highlight emerging clinical and health policy issues related to translation of this research to practice, emphasizing next steps toward implementation of NMR testing to guide treatment selection, as well as the challenges and potential solutions.

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**SYM12A**

**THE SCIENCE OF THE NICOTINE METABOLITE RATIO**

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Faster metabolizers smoke on average more cigarettes per day (CPD) than slower metabolizers, presumably to obtain desired levels of nicotine in the blood and brain. Nicotine is metabolized primarily by the liver enzyme CYP2A6 to cotinine (COT) which is, in turn, metabolized to trans-3’ hydroxycotinine (3HC). The CYP2A6 gene is highly polymorphic, with strong racial/ethnic differences in allele frequencies. CYP2A6 activity is also affected by environmental factors, including sex hormones and some medications. CYP2A6 genotype is associated with the rate of nicotine metabolism, but there is much variability within specific gene variants, presumably related to environmental factors and unknown genetic modifiers. The ratio of 3HC/COT, termed the nicotine metabolism ratio (NMR), is a biomarker of CYP2A6 metabolic activity that incorporates both genetic and environmental influences, and is therefore a more precise measure of nicotine metabolic rate than genotype. NMR can be measured in blood, saliva and urine, and is highly correlated with the clearance of nicotine (r = 0.90). For an individual, the NMR is stable throughout the day and when measured repeatedly over several months (CV 22%, N=29). Here we present new analyses from the recently completed PNAT2 clinical trial. NMR was 16% higher in women than men and 27% higher in Caucasians than African-Americans (both P < 0.001); and there was a significant association between NMR and the heaviness of smoking index (P < 0.02). Further, NMR was significantly correlated with CPD (r = 0.12) and alcohol use (r = 0.11), and inversely correlated with BMI (r = -0.14). A test-retest analysis in 72 subjects with repeated measurements over 2-3 weeks prior to quitting smoking found excellent reliability both for raw scores (IC = 0.87) and fast vs slow
metabolizer category (kappa = 0.89). The body of research on NMR supports its utility as a biomarker for CYP2A6 activity and nicotine clearance, which may have utility for individualizing pharmacotherapy for smoking cessation.

**JUSTIFICATION:** As evidence accumulates for the potential use of the NMR to tailor treatment selection of individual smokers, findings from this study provide important validation for its possible translation to practice.

**FUNDING:** NIH Pharmacogenomics Research Network grant DA/CA/HH/GM U01020830

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### SYM12C

**A RANDOMIZED PLACEBO-CONTROLLED TRIAL TO TEST A GENETICALLY-INFORMED BIOMARKER FOR PERSONALIZING TREATMENT FOR TOBACCO DEPENDENCE**

Caryn Lerman, PhD*, Robert A. Schnoll, PhD*, Larry W. Hawk, Jr., PhD*, Paul Cinciripini, PhD*, Tony P. George, MD*, E. Paul Wileyto, PhD*, Gary E. Swan, PhD*, Neal L. Benowitz, MD*, Daniel F. Heitjan, PhD*, Rachel F. Tyndale, PhD*, on behalf of the PGRN-PNAT Research Group*, 1University of Pennsylvania, 2State University of New York at Buffalo, 3MD Anderson Cancer Center, 4University of Toronto, 5Stanford University, 6University of California San Francisco

**Background:** There is substantial variability in therapeutic response and adverse effects with pharmacotherapies for tobacco dependence. We tested whether a genetically-informed biomarker of nicotine clearance, the nicotine metabolite ratio (NMR; 3’hydroxycotinine/ cotinine), as measured in plasma, predicts response to nicotine patch vs. varenicline for smoking cessation.

**Methods:** 1,246 smokers were enrolled in an NMR-stratified multicenter, randomized, placebo-controlled clinical trial at 4 academic medical centers. With slow metabolizers oversampled, there were 662 slow and 584 normal metabolizers. Participants received 11 weeks of nicotine patch (active patch/placebo pill), varenicline (active pill/placebo patch), or placebo (placebo pill/patch), plus behavioral counseling. The primary endpoint was biochemically verified 7 day point prevalence abstinence at the end of the treatment (EOT) to estimate the pharmacologic effect of treatment by NMR. Secondary outcomes were side-effects, withdrawal symptoms, and 6-month abstinence rates.

**Results:** A significant NMR-by-treatment interaction at EOT indicated that varenicline was more efficacious than nicotine patch for normal metabolizers, while the efficacy was equivalent for slow metabolizers (p=0.02). The interaction remained significant in the model incorporating both the EOT and 6-month time-points (p=0.02). An NMR-by-treatment interaction showed that slow (vs. normal) metabolizers reported greater overall side-effects severity with varenicline vs. placebo (p=0.04). Among normal metabolizers, nicotine patch yielded a number needed to treat (NNT) of 26, while varenicline yielded an NNT of 4.9. For slow metabolizers, the NNT was 10.3 and 8.1, respectively.

**Conclusions:** Our data support treating normal metabolizers with varenicline and slow metabolizers with nicotine patch to optimize quit rates while minimizing side-effects.

**JUSTIFICATION:** The results of this trial support the potential translation to practice of a novel biomarker for personalizing treatment fornicotine dependence.

**FUNDING:** NIH Pharmacogenomics Research Network grant DA/CA/HH/GM U01020830

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### SYM12D

**A LACK OF ASSOCIATION OF CHRNA5-A3-B4 WITH SMOKING CESSATION RESPONSE IN CAUCASIAN AND AFRICAN AMERICAN SMOKERS**

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**Background:** CHRNA5-A3-B4 variants are associated with smoking level and dependence in Caucasian (rs16969988) and African (rs2056527) Americans. In contrast, the association of these variants with smoking cessation is less consistent. Among multiple studies of Caucasians, associations between rs16969988 and cessation have been variable; in the placebo arm only, with active treatment only, between placebo and active arms, or absent. In two cessation studies in African Americans, rs2056527 and rs988765 were associated with smoking cessation rates while rs16969988, at very low frequencies in African Americans, was not. Question Using the PNAT2 clinical trial we hypothesized
that: 1) among Caucasians rs16969968 is associated with lower cessation rates in the placebo arm, with equivalent rates in active treatment arms (Chen et al., 2012), and 2) among African Americans rs2036527 is associated with lower cessation rates among active treatments, and 3) rs588765 is associated with lower and higher cessation rates in the placebo and active arms, respectively. Results Among Caucasians there was no association of rs16969968 [GA+AA] (or other genotype groupings) with abstinence in any treatment arm (placebo, patch or varenicline, \(P=0.23-0.49\); N=654 Caucasians) or in two-way genotype x treatment interactions, with or without gender, baseline cigarettes per day and/or nicotine metabolic ratio in the model (NMR used to randomize PNAT2, and was associated with varenicline vs patch). There was no association of rs16969968 [GA+AA] +/- bin B (rs588765) and cessation in the placebo arm (N=212) in contrast to Chen et al. 2012 (N=132). There was the expected association of rs16969968 [GA+AA] with baseline cotinine levels \((P<0.0001, N=1026)\), replicating previous studies. Among African Americans (N=533) there were no significant associations of the variants in either rs2056527 or rs588765 with individual treatment arms, or with interactions between treatment arms. Conclusions In the PNAT2 clinical trial we found no association of variants in CHRNA5-A3-B4 with smoking cessation rates; however, as expected, a significant association with baseline cotinine levels was found.

JUSTIFICATION: The study findings provide important data concerning the potential translation of pharmacogenetic treatment approaches in the context of treating nicotine dependence.

FUNDING: Endowed Chair in Addictions for the Department of Psychiatry (RFT), CIHR grants TMH-109787, NIH PGRN grant DA020830, CAMH, the CAMH Foundation, the Canada Foundation for Innovation (#20289 and #16014) and the Ontario Ministry of Research and Innovation.

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SYM14A
LOW-DOSE NICOTINE SELF-ADMINISTRATION IS AFFECTED BY COST OF NICOTINE AND INHIBITION OF MONOAmine OXIDASE

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Rodent models of nicotine (NIC) self-administration (SA) can be used to characterize changes in behavior following a reduction in NIC dose. A recent study showed that a drastic NIC reduction results in a significant decrease in SA behavior, with no sustained compensation, similar to vehicle substitution. Response to nicotine reduction may be moderated by 1) the cost per unit dose of NIC and 2) non-NIC cigarette constituents. A behavioral economics framework suggests that NIC consumption is a function of the cost per unit of NIC. This framework suggests that the threshold NIC dose may vary as a function of cost, and an individual’s response to NIC reduction may be predicted using their response to increases in cost. To evaluate the relationship between cost and NIC dose, rats self-administered NIC, and the behavioral cost (responses required to earn an infusion) per ug of NIC was manipulated across sessions. Rats less sensitive to increases in cost were also less sensitive to reductions in NIC dose, \(r^2 = .749, p <.05\). We also examined how non-NIC constituents may moderate the response to NIC reduction by allowing rats to self-administer NIC in combination with a cocktail of other cigarette constituents. We show that a cocktail of other cigarette constituents (including acetaldehyde, cotinine, myosmine, anatabine, anabasine, normacrine, harmame and norharman), with doses indexed to be proportional to concentrations in cigarette smoke given a standard dose of NIC, does not affect NIC SA. However, unknown constituents cause monoamine oxidase (MAO) to be inhibited in chronic smokers by 30-40%. In a series of experiments, we show that chronic i.p. injections of irreversible MAO inhibitors increase low-dose NIC SA. These data suggest that cost and cigarette constituents that inhibit MAO may be important moderating factors if a NIC reduction policy is implemented. Furthermore, the relationship between increasing cost and decreasing dose suggests that existing information regarding how certain populations respond to tax increases might be used to predict how those populations would respond to a reduction in NIC content.

JUSTIFICATION: Data from rat nicotine self-administration are used to predict the impact of product standards related to nicotine reduction in cigarettes.

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SYM14B
BIOMARKERS OF NICOTINE AND TOXIC EXPOSURE AND OF COMPLIANCE IN CLINICAL TRIALS OF REDUCED NICOTINE CONTENT (RNC) CIGARETTES

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A major concern about reducing the nicotine content of cigarettes to make them less addictive is that smokers would compensate for lower nicotine by smoking more cigarettes or smoking cigarettes more intensively, resulting in greater tobacco toxicant exposure and greater risk to health. In a cross-over study of smokers smoking a single cigarette of various nicotine contents, nicotine intake was highly correlated with nicotine content, with minimal compensation. Two clinical trials of gradual reduction of nicotine content from 12 to 0.5 mg (one trial weekly for 6 weeks, the other months for 6 months) found an average 70% reduction in nicotine intake (assessed by plasma cotinine) with no increase in cigarettes per day, expired CO or urine PAH metabolites. Urine NNAL decreased with RNC as expected because the parent NNK is derived from nicotine. Another trial examined immediate switching from conventional to RNC and found the expected decrease in nicotine intake, with decreased CPD and no increase in biomarkers of smoke
toxicant exposure. Compliance with smoking very low nicotine content cigarettes (0.5 mg) was assessed in one gradual reduction study by comparing within-subject changes in plasma cotinine with what was expected based on changes in nicotine content. Even after considering possible individual metabolic differences and intense compensation, approximately 60% of subjects had biochemical evidence of non-compliance, which was higher than the 21% self-reported non-compliance. Data from a residential study to empirically determine biomarker cut points for compliance will also be presented. Thus, smokers switched from conventional to RNC cigarettes reduce their intake of nicotine substantially without evidence of a compensatory increase in tobacco smoke toxin exposure, but it appears that many smokers are smoking occasional conventional cigarettes to supplement their RNCs. Compliance needs to be assessed and the implications of non-compliance considered in interpreting RNC studies.

JUSTIFICATION: Data related to the compliance in clinical trials and the measurement of exposure are directly relevant to estimating the potential impact of regulated reduction of nicotine in cigarettes.

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SYM14C
A MULTI-SITE, DOUBLE-BLIND, RANDOMIZED TRIAL OF CIGARETTES WITH REDUCED NICOTINE CONTENT

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Regulated reduction of the nicotine content of cigarettes has the potential to reduce cigarette reinforcement, dependence and toxicant exposure. However, few clinical trials of very low nicotine content cigarettes have been conducted. Furthermore, little or no data are available describing the relationship between the level of nicotine in reduced nicotine cigarettes and critical outcome measures such as smoking behavior, biomarkers of exposure, and safety. This presentation will focus on the results of a recently completed 10-site clinical trial of the effects of cigarettes with a wide range of nicotine contents (SPECTRUM cigarettes). Following a baseline period, 840 smokers not seeking treatment were randomized to smoke either their usual brand, one of five cigarettes with tar yields of 7.5-12 mg that varied in nicotine content (~0.4 mg/g to ~18.6 mg/g tobacco), or a low nicotine content (~0.4 mg/g), high tar yield (11-15 mg) cigarette. Nicotine yields (FTC) ranged from ~0.03 to 0.8 mg. More than 92% of randomized participants completed the 6-week period of product use. At the end of 6 weeks, cigarettes with ~2.5 mg/g or less nicotine (regardless of tar yield) resulted in fewer cigarettes smoked per day relative to both usual brand and normal nicotine content cigarettes (<0.01). Urinary total nicotine equivalents (TNEs: analyzed in a subset of 343 participants) were related to the nicotine content. Cigarettes with ~1.3 mg/g or less nicotine significantly reduced TNEs by approximately 60-80% (<0.01). Intermediate nicotine content cigarettes (~5-6 mg/g nicotine) resulted in little change in smoking behavior and more modest decreases in TNEs (<0.05). There was little evidence of compensatory smoking as measured by increases in CO. There were no related or possibly related serious adverse events. The presentation will also address how nicotine content relates to compliance, retention, subjective ratings of cigarettes, withdrawal and dependence. Together, these data provide strong evidence consistent with previous smaller trials that significant reductions in nicotine content are likely to reduce smoking and nicotine exposure amongst current users.

JUSTIFICATION: This study represents the largest clinical trial to date of a potential policy to reduce nicotine content in cigarettes.

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SYM15
NEW INSIGHTS ON NICOTINE AND DEPRESSION: TRANSLATING BASIC SCIENCE INTO MORE EFFECTIVE CLINICAL OUTCOMES

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A substantial knowledge base, derived from molecular, pharmacological, genetic, electrophysiological and behavioral studies of nicotine reinforcement, has provided valuable insights into mechanisms of nicotine dependence. While this work has shown that smoking behavior is strongly motivated by the reinforcing effect of nicotine in the mesolimbic dopamine system, it has also become apparent that factors in addition to primary reinforcement may be critical in promoting smoking behavior and relapse. Nicotine has complex actions on other neuronal systems which may support tobacco use, including activity in circuits which regulate mood. Smokers report that report that tobacco use helps to manage symptoms associated with depression, and the prevalence of smoking among patients with major depression is more than twice that of the general population. New research is rapidly changing our understanding of the relationship between nicotine and depression, including its biological basis as well as the impact of depression on tobacco use and tobacco cessation treatment outcomes. In this session co-chaired by Dr. Rees from Harvard School of Public Health and Dr. Munafò from the University of Bristol, studies from a range of scientific disciplines will report latest insights on nicotine and depression. Dr. Picciotto from Yale University will describe work on the relationship between nicotine’s influence on nACh receptors and depression. Dr. Ashare from the University of Pennsylvania will describe sleep disturbance and short term memory impairment among depressed smokers, and the implications for treatment. Dr. Munafò from the University of Bristol will report research on genetic variants within the CHRNA5-A3-B4 gene cluster associated with heaviness of smoking to explore the causal relationship between smoking and depression. Dr. Evins from Harvard Medical School will highlight work on the influence of varenicline treatment on depressive symptoms among patients with serious mental illness. Finally, Dr. Zawertailo from the Center for Addiction and Mental Health, Toronto, will report on the influence of depression on 6-month tobacco treatment outcomes. Dr. Munafò will be the discussant.

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SYM15A
NICOTINIC MECHANISMS RELATED TO DEPRESSION AND ANXIETY
Marina R. Picciotto, PhD*, Yann S. Mineur, PhD, Yale School of Medicine

The co-morbidity between smoking and mood disorders is striking. Preclinical and clinical studies of nicotinic effects on anxiety, depression, agitation and aggression suggest that smokers may use the nicotine in tobacco products as an attempt to self-medicate symptoms of affective disorders. The role of nicotinic acetylcholine receptors (nAChRs) in circuits regulating mood and anxiety are beginning to be elucidated in animal models. We have found that using antagonists and partial agonists that decrease signaling through nAChRs can be effective in multiple mouse models of antidepressant efficacy, suggesting that the ability of nicotine in tobacco smoke to desensitize nAChRs may be critical for the perceived effects of smoking on mood symptoms. We have also found that depressed non-smokers show decreased availability of nAChRs for binding to an imaging tracer, suggesting that too much signaling through nAChRs may contribute to depression in human subjects. We have modeled this in mice by decreasing break down of ACh in the hippocampus and demonstrating an increase in behaviors related to anxiety and depression. This presentation will highlight translational studies identifying mechanisms through which the nicotine in tobacco affects brain systems involved in mood and anxiety.

JUSTIFICATION: Findings have the potential to inform the neurobiological basis of elevated nicotine use among those with depression

FUNDING: NIH grant DA014241

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SYM15B
COGNITIVE DEFICITS AND SLEEP DISTURBANCE AMONG DEPRESSION-PRONE SMOKERS DURING ABSTINENCE
Rebecca Ashare, PhD*, Andrew A. Strasser, PhD, E. Paul Wileyto, PhD, Jocelyn Cuevas, BA, Janet Audrain-McGovern, PhD, Perelman School of Medicine, University of Pennsylvania

Cigarette smoking is more prevalent among individuals with a history of major depressive disorder (MDD) and elevated depression symptoms and these depression-prone (DP+) smokers have more difficulty quitting smoking. In addition to dysregulated positive affect and reward processing, depression is accompanied by sleep disturbance and cognitive deficits similar to those observed during nicotine withdrawal. However, little research has been conducted to determine the role of smoking in these processes among DP+ smokers. We hypothesized that DP+ smokers (past history and current depression symptoms; n=34) would report more sleep disturbance and exhibit greater abstinence-induced deficits in short-term and working memory, and experience greater attentional bias for affective stimuli, compared with smokers with no history or current symptoms of depression (DP−; n=34). Participants completed two sessions, once following overnight abstinence and once smoking-as-usual (order counterbalanced, abstinence biochemically verified). Smokers completed measures of short-term memory (STM; word recognition task), working memory (N-back task), and attentional bias (Emotional Stroop task). The DP+ group showed declines in STM during abstinence vs. smoking, whereas the DP− group did not (interaction p=0.02). There were small decrements in working memory accuracy during abstinence (p=0.05), but this did not vary by group. During the Emotional Stroop task, the DP+ group showed an attentional bias toward positive vs. neutral stimuli during abstinence vs. smoking (interaction p=0.01). DP+ smokers (vs. DP− smokers) reported significantly more sleep disturbance (ps<0.001), which was associated with worse STM (r=-0.43, p=0.01) and slower reaction times during an emotional Stroop task (rs>0.37, ps<0.03) during abstinence. This study provides initial evidence that DP+ smokers may experience greater abstinence-induced deficits in STM and attentional bias toward emotionally salient stimuli. These cognitive changes may prompt relapse and may help identify novel targets, such as sleep disturbance, for nicotine dependence treatment aimed at attenuating these deficits to improve cessation rates.

JUSTIFICATION: Findings provide evidence to support short-term cognitive changes among depressed patients seeking to quit tobacco use, which will inform tailoring of future clinical approaches.

FUNDING: This study was supported by National Institute on Drug Abuse R21 DA031946 (JAM).

SYM15C
DEPRESSIVE SYMPTOMS DURING EARLY AND SUSTAINED ABSTINENCE IN SMOKERS WITH SERIOUS MENTAL ILLNESS
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Background: Depressive symptoms have been reported with tobacco abstinence and have been associated with lapse and relapse to smoking. The effects of tobacco abstinence and varenicline treatment on depressive symptoms in adults with serious mental illness (SMI) during early or sustained abstinence is largely unknown.

Methods: Adult smokers (n=201) entered a trial of maintenance varenicline treatment in smokers with SMI able to quit smoking during a 12-week open-label trial of varenicline and cognitive behavioral therapy (CBT). Eighty-seven participants attained 14-day point prevalence abstinence at week 12 and were randomly assigned to continue double-blind varenicline or identical placebo and CBT for 40 weeks. Depressive symptoms were assessed with the Calgary Depression Scale for Schizophrenia (CDSS), a validated clinician administered assessment, at every CBT visit from baseline to week 52.

Results: Among those who completed 9 or more weeks of open label varenicline (n=142, n=132 with Sz), CDSS scores decreased from a median of 3 (IQR:2-6) at baseline to 1 (IQR:0-4) at week 12 (p<0.001). There was no effect of abstinence on CDSS scores during the open phase, nor did the time effect differ by abstinence status (14-day point prevalence abstinence at week 12). During the 40-week, maintenance phase (n=87, n=77 with Sz), CDSS scores did not differ between those who demonstrated 21-day point-prevalence abstinence at week 52 vs. those who relapsed to smoking (p=0.94), did not change over time (p=0.70; week 12 Mdn=1, IQR:0-5; week 52 Mdn=2, IQR:0-6), and did not show an abstinence by time interaction (p=.80). There was also no effect of varenicline treatment on depressive symptoms vs. placebo (p=0.37). This pattern of findings was replicated with depressive symptoms as assessed with the Brief Psychiatric Rating Scale depression-anxiety subscale and the Wisconsin smoking withdrawal scale sadness-depression score.

Conclusion: There was no observed effect of abstinence or varenicline treatment on depressive symptoms in stable outpatients with SMI. Reduction in depressive symptoms during open label treatment with varenicline was observed.

JUSTIFICATION: Prospective and controlled trials are improving our understanding of the effect of abstinence and of pharmacotherapeutic cessation aids such as varenicline on depressive symptoms in smokers with serious mental illness and should affect policies restricting smoking cessation treatment in this population.

FUNDING: NIDA R01 DA021245: Smoking Cessation and Smoking Relapse Prevention in Patients with Schizophrenia Investigator Initiated Grant Pfizer Inc.: Extended duration varenicline for prevention of relapse to smoking in patients with schizophrenia NIDA K24 DA030443: Mentoring in Addiction Treatment Research

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INDIVIDUALIZED TREATMENT FOR TOBACCO DEPENDENCE IN PRIMARY CARE SETTINGS: THE ROLE OF BASELINE DEPRESSIVE SYMPTOM SEVERITY ON CESSATION OUTCOMES

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Background: Individuals with tobacco dependence often report symptoms of low mood and depression which has been shown to adversely affect quit outcomes in treatment trials. We hypothesized that individualized treatment for tobacco dependence within a primary care setting may mitigate the effect of current symptoms of depression on quit success.

Methods: Patients in primary care clinics were enrolled in a smoking cessation program which provided up to 26 weeks of brief behavioural counselling and individualized dosing of nicotine replacement therapy at no cost. The baseline assessment included the PHQ9 (a validated 9-item self-completed questionnaire that maps directly on to DSM-IV criteria for depression). Smoking cessation outcomes were measured at 3 and 6 months post enrollment. Bivariate associations between PHQ9 score and cessation outcomes were analyzed.

Results: There were 6473 patients enrolled between January and May 2014 who completed the PHQ9. Moderate to severe depression (score >9) was reported by 12.7% of the sample, another 3.0% reported mild depression (scores between 5 and 9), and 8.8% of the sample met DSM-IV criteria for depression. At 3-month follow-up, those with moderate to severe depression were significantly less likely to be quit compared to those with none to minimal depression, using both complete case analysis (23.3% vs 38.4%, Chisq=30.82, p<0.001) and Intent-to-Treat (ITT) analysis (11.9% vs 20.4%, Chisq=28.49, P<0.001). However, at 6-month follow up, the differences in quit outcomes between the two groups was no longer significant in both complete case analysis (32.6% vs 39.2%, Chisq=1.49, P=0.22) and ITT (20.4% vs 27.6%, Chisq=3.39, P=0.066).

Conclusions: These results indicate that baseline depression severity can hinder cessation success early in treatment. However, longer treatment duration appears to mitigate this effect, indicating that patients provided individualized cessation treatment and counseling support through their primary care provider can successfully quit smoking regardless of current depressive symptoms.

JUSTIFICATION: Findings will support deeper understanding of the role of depression in tobacco cessation treatment outcomes, and will improve clinical practice

FUNDING: Support for this research was provided by the Ontario Ministry of Health and Long-Term Care, Health Promotion Branch

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HOW IS SOVEREIGNTY USED IN COMMERCIAL TOBACCO CONTROL ON TRIBAL LANDS?

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Although the prevalence of commercial tobacco use among American Indians and Alaska Natives (AIAN) varies dramatically by region and tribe, both use rates and tobacco-related health impacts are heavier among AIAN populations than any other racial/ethnic group. Thus profound tobacco-related health disparities exist for AIAN. In this symposium, we aim to outline the extent of these disparities, commencing with new analyses by a team from the CDC led by Linda Neff on AIAN tobacco-related mortality and prevalence. These analyses set the stage for the succeeding papers on the defining role of tribal sovereignty (a key component in the fight for political and economic self-determination of the 500+ Federally Recognized Tribes in the U.S.) in the assertion of local control over health improvements, including reducing exposure to secondhand commercial tobacco smoke and cessation of commercial tobacco use. In the following paper, Matthew Bondaryk, Patricia Nez Henderson (Navajo), et al. will speak on the complex regulation of tribal commercial tobacco products. They will present three lawsuits that highlight unique issues concerning sovereignty and the manufacturing and sales of these products. In the same spirit of illustrating the connections between sovereignty and health, Narinder Dhaliwal and Roland Moore describe a Northern California case study of how one tribe incorporated comprehensive data collection and feedback on its own terms in order to change tobacco control policy in its tribal casino in tandem with culturally-tailored cessation techniques. Rosas-Lee et al. will present findings from a review of tobacco industry documents on strategies used by the tobacco industry to purposefully target American Indians. Finally, the CDC’s Delight Satter (Confederated Tribes of Grand Ronde), Ibrahim Garba, et al. weave findings on economic costs of commercial tobacco use and SHS among American Indians as a frame for talking about sovereignty success stories, highlighting the American Indian Cancer Foundation’s innovative battle against commercial tobacco. Discussant Jeffrey Henderson (Cheyenne River Sioux) will offer critical perspectives on the panel presentation.

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INVESTIGATING THE CAUSAL RELATIONSHIP BETWEEN SMOKING AND DEPRESSION

Marcus R. Munafó, Amy E. Taylor on behalf of the CARTA Consortium MRC Integrative Epidemiology Unit, UK Centre for Tobacco and Alcohol Studies, School of Experimental Psychology, University of Bristol

Cigarette smoking and depression are highly comorbid, but the nature of this relationship remains unclear. High levels of depression may increase smoking (the self-medication hypothesis), or smoking may increase the risk of depression. It is also possible that both causal pathways operate, or that the comorbidity is due to a shared genetic aetiology. We have recently used genetic variants within the CHRNAs-A3-B4 gene cluster associated with heaviness of smoking to explore the causal relationship of smoking with depression, in a Mendelian randomisation analysis. In this, we find no strong evidence to support the position that smoking is a causal risk factor for depression, based on a lack of clear association of genotype (as a proxy for heaviness of smoking) with depression or anxiety in current smokers. However, this analysis also suggested a weak association of genotype with anxiety (but not depression) among never smokers. Although the statistical evidence for this association is modest, it raises the possibility of pleiotropic effects of variants within this gene cluster on both smoking and anxiety. We discuss the implications of these findings in relation to understanding the relationship between smoking, depression and anxiety, and the development of novel treatments.

JUSTIFICATION: In relation to understanding the relationship between smoking, depression and anxiety, these findings have the potential to inform the development of novel treatments.

FUNDING: Medical Research Council

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SYM16A
DIFFERENCES IN SMOKING ATTRIBUTABLE MORTALITY BETWEEN AMERICAN INDIAN/ALASKA NATIVE AND WHITE POPULATIONS LIVING IN IHS CONTRACT HEALTH SERVICE DELIVERY AREA COUNTIES

Linda Neff, PhD1, Paul Mowery, MA, David M. Homa, PhD, Bridgette E. Garrett, PhD, Centers for Disease Control and Prevention Office on Smoking and Health.

Objectives. American Indians/Alaska Natives (AI/ANs) have both high prevalence of cigarette smoking and high rates of smoking-related disease compared to non-Hispanic Whites (Whites), but the comparable burden of smoking in these populations is unknown. To quantify and contrast this burden, we assessed differences in excess mortality attributable to cigarette smoking between AI/ANs and Whites.

Methods. Smoking-attributable fractions (SAFs) and smoking-attributable deaths among AI/AN and White populations were calculated for residents of the 637 Indian Health Service Contract Health Service Delivery Area (CHSDA) counties in the US. We examined five major causes of smoking-related deaths—lung cancer, coronary heart disease (CHD), other heart disease (OHD), stroke, and chronic obstructive pulmonary disease (COPD)—and all-cause deaths for 2001-2009. Deaths by race/ethnicity (AI/ANs vs Whites), age, sex, and underlying cause were obtained from the AI/AN Mortality Database. Due to a lack of AI/AN-specific relative risks for cigarette smokers versus never smokers, SAFs were computed using an indirect method. We also compared smoking prevalence of AI/ANs and Whites aged ≥35 years in the CHSDA counties, using previously published data based on 2005-2009 BRFSS. Results. Both AI/AN men and women had a higher prevalence of smoking than Whites (men: 28% vs. 17%; women, 29% vs. 16%). SAFs were higher for AI/ANs than Whites in both sexes for all-cause mortality and for cardiovascular outcomes, particularly for women. For 2001-2009, in women, smoking caused 18% of CHD, 13% of OHD and 20% of stroke deaths in AI/ANs, compared to 9%, 7% and 10% for Whites. In men, smoking caused 21% of CHD, 15% of OHD, and 17% of stroke deaths in AI/ANs, compared to 15%, 10% and 9% for Whites. SAFs for lung cancer and COPD were comparable in AI/ANs and Whites. Conclusions. Both the higher prevalence of cigarette smoking and higher SAFs observed for AI/ANs indicates that smoking results in a larger health burden for AI/ANs than for Whites. These results underscore the need for comprehensive, culturally appropriate tobacco control programs that effectively reach the AI/AN population.

JUSTIFICATION: Because smoking is shown to contribute to premature AIAN mortality, comprehensive tobacco control and culturally appropriate cessation programs are called for.

FUNDING: This abstract highlights work supported by a Centers for Disease Control and Prevention, Office on Smoking and Health contract #200-2009-28537 for Extramural Research.

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SYM16B
TRIBAL TOBACCO AND SOVEREIGNTY

Matthew Bondaryk, BA1, Hershel W. Clark, BS2, Patricia Nez Henderson, MD, MPH2, Gregg Moor, BA2, Scott J. Leischow, PhD1, 1Mayo Clinic Arizona, 2Black Hills Center for American Indian Health, ’InSource Research Group

Background: A small but considerable number of American Indian/Alaskan Native tribes are manufacturing, marketing and selling commercial tobacco products for sale to tribal and non-tribal tobacco users. Utilizing the unique taxation relationship between the tribes and both state and federal governments, these tribes are able to avoid some of the taxes applied to non-tribal tobacco, thus creating significantly cheaper costs for consumers. While recognizing the sovereignty of tribal nations, members of the public health community nonetheless view these low-cost tobacco products as harmful to the public’s health. The complex web of federal, state, and tribal regulations over the manufacturing, marketing, and sales of tribal commercial tobacco is still being decided through litigation and policy-making. At this point, there is no clarity regarding the way that tribal commercial tobacco will be regulated by the US Food and Drug Administration (FDA) under its new regulatory authority over tobacco. Methods: A review of three case study lawsuits against tribal tobacco manufacturers that highlight the unique issues of tribal immunity and the manufacturing of tobacco products. Results: Issues include nation-to-nation shipment; the origin of the tobacco used in the products; and whether or not the benefits of the tobacco sales are accrued by individuals in a tribe or by the tribe as a whole. Discussion: More research is needed to understand the scope of the tribal tobacco market, tribal tobacco products consumer demographics, and the best regulatory approaches that both respect tribal sovereignty and protect the public’s health.

JUSTIFICATION: Analyses of the complex legal framework surrounding tribal commercial tobacco manufacturing, marketing, and sales point to the need for regulatory approaches that both respect tribal sovereignty and protect the public’s health.

FUNDING: This research is funded by the State & Community Tobacco Control Initiative of the US National Cancer Institute (sctcresearch.org) grant number U61CA154300.

CORRESPONDING AUTHOR: Narinder Dhaliwal, MA1, Roland S. Moore, PhD2, Glen Hayward2, Gary Hayward2, Juliet P. Lee, PhD1, Francisco Buchting, PhD1, 1ETR Associates, 2Pacific Institute for Research and Evaluation (PIRE), 3Redding Rancheria Tribal Clinic, 4WinRiver Casino, 5Horizons Foundation

Background: IHS data indicate that despite regional variation in commercial tobacco use prevalence, tobacco-related mortality and morbidity are high among American Indians. Short-term economic concerns (e.g., fighting restrictions on smoke-free casinos) may impede sovereign tribal decisions to promote the health of tribal members and their employees. In a case study of a Northern California tribe, holistic methods of promoting health are outlined as a way to respect local traditions and honor sustainable economic development.

Methods: A 7 year partnership between a Northern California tribe and public health experts evaluated qualitative and quantitative data collected on multiple health promotion efforts and policy changes by the tribe’s casino and its clinic, serving both tribal members and employees.

Results: In clinic visits since 2012, all patients are subject to screens including questions about commercial tobacco use. Clinicians ask smokers about level of readiness to quit, and invite them to join 8 week courses with other clinic patients who wish to stop smoking. To address culturally salient issues, these courses contrast sacred tobacco use with commercial tobacco use; to overcome the addictive nature of commercial tobacco, patients may be prescribed NRT or medication. The 2013 quit rate was 71% as measured by follow-up consultations. Following a multi-year cooperative program of analyses of air monitoring and staff and patron surveys regarding smoking in the casino, the tribal council recently voted to make the casino and resort 100% smoke-free. Casino staff can attend cessation classes on work time. Additionally, health competitions such as team weight reduction foreground the importance of collective efforts to improve the health of tribal members and employees.

Conclusions: Integrated approaches to health promotion centered on reducing exposure to commercial tobacco across differing institutions of the tribe, especially its businesses and its tribal clinic. This case study highlights how the tribe’s collective wellness efforts are congruent with health-norms supporting public health approaches and are well-received by tribal members and employees.

JUSTIFICATION: This case study illustrates how integrated approaches to strengthening health promotion and tobacco control policy can reduce tribal member and employee exposure to commercial tobacco across differing institutions.

FUNDING: This study was supported by California Tobacco-Related Disease Research Program grant 20CA-0103 and CCAP funding from the California Department of Public Health Grant numbers 05-45720, 10-10208.

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SYM16D
RECLAIMING PUBLIC HEALTH: STORIES OF SELF DETERMINATION FROM INDIAN COUNTRY

Delight Satter, MPH*1, Ibrahim Garba, JD, LLM*1, Doris Cook, PhD2, Kris Rhodes, MPH1, Delores Welch, MSW1, Alex Springer1, Holly Hunt, MA1, Dawn Satterfield, PhD2, Nancy Williams, PhD1, “Centers for Disease Control and Prevention, Office for State, Tribal, Local and Territorial Support, 1Association of American Indian Physicians, 2American Indian Cancer Foundation

Background: Tobacco is one of the greatest preventable health threats to native communities. Native people use commercial tobacco at greater rates than other racial and ethnic populations, and therefore carry a greater burden with tobacco’s health consequences and costs. As a federal agency, CDC recognizes its special obligations to, and unique relationship with, the AI/AN population, and is committed to fulfilling its critical role in assuring that AI/AN communities establish a safer and healthier environment for its members and territory.

Methods: The CDC often requests awardees use resources like The Community Guide as a source of evidence-based program strategies. These resources do not hold many native examples. The CDC’s Tribal Advisory Committee advised the CDC of this gap and requested a collection of success stories from Indian Country. CDC initiated a multifaceted project in partnership with the Association of American Indian Physicians (AAIP) to address this need.

Results: Stories in the collection are focused on public health programs that share their knowledge and experience. Consistently the stories demonstrate the importance of tribal council support, partnerships with other organizations and a holistic and integrated approach. A story from the American Indian Cancer Foundation (AICF) highlights the role it serves in capacity building of tribes’ tobacco prevention and control through community level interventions, and its own native serving organization’s infrastructure development. AICF takes pride in being able to recruit native health professionals with strong science and cultural competency skills, which facilitates the rapid dissemination of evidence based programs.

Conclusions: Indian tribes have an inalienable and inherent right to self-government. Self-government means government in which decisions are made by the people who are most directly affected by the decisions. CDC supports Tribes in their tobacco prevention and control programs in order to protect the public’s health. By helping to disseminate success stories from Indian Country we provide tribal governments access to information for sound and efficient public health decision-making.

JUSTIFICATION: A “sovereignty success story” from the American Indian Cancer Foundation (AICF) highlights the role it serves in capacity building of tribes’ tobacco prevention and control through community level interventions, and its own native serving organization’s infrastructure development. AICF takes pride in being able to recruit native health professionals with strong science and cultural competency skills, which facilitates the rapid dissemination of evidence based programs.

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SYM17
MEASURING EXPOSURE TO TOBACCO MARKETING: APPROACHES, INNOVATIONS, AND LESSONS LEARNED

Chair: Annette R. Kaufman*, Tobacco Control Research Branch, National Cancer Institute
Keryn E. Pasch, PhD, MPH1, Susanne Tanski, MD2, James D. Sargent, MD2, Robert Hornik1, Laura Gibson1, Jiaying Liu1, Sherry Emery1, Rachel Kornfield1, Steven Binns1, Huayi Li1, Jidong Huang1, University of Texas at Austin, Health Behavior and Health Education, 2Department of Pediatrics, Geisel School of Medicine at Dartmouth, Annenberg School for Communication, University of Pennsylvania, “Health Media Collaboratory at the Institute for Health Research and Policy, University of Illinois at Chicago, Discussant: David Portnoy* , Center for Tobacco Products, Food and Drug Administration

The tobacco industry engages in aggressive marketing, advertising, and promotion of their products. Expenditures on tobacco marketing in the United States were nearly $9 billion in recent years. Evidence indicates a causal relationship between tobacco advertising and increased levels of tobacco initiation and continued consumption. Despite the critical role of exposure to tobacco marketing, there is wide variation in measurement methods and the quality of those measures, which hinders the strength of conclusions that can be drawn. The overarching goal of the symposium is to examine and discuss the ongoing work to support the use of specific methods in marketing exposure measurement, justification for use, and importance. Measurement methods have been explored and studied in content areas beyond tobacco and tobacco control researchers can leverage these methodologies. Specifically this symposium will highlight 1) best practices for measurement of exposure to marketing drawn from both within and outside of tobacco control, and 2) innovative methods of measuring marketing exposure, taking into account the increasingly crowded, complicated, and fragmented communication environment. Dr. Pasch will highlight numerous methodological strategies that use objective measures including a study employing photographic evidence of point-of-sale and outdoor marketing and examples using eye-tracking methodology. Dr. Emery will present research that focuses on promotional messages for electronic cigarettes on Twitter. Dr. Tanski will present a longitudinal study of adolescents that utilized cued assessment of television alcohol advertising images to examine their effects on alcohol use outcomes at follow-up. Dr. Hornik will explain the trade-offs of different approaches to measuring exposure to tobacco-related media content and examples from a study of youth and young adults. Dr. Portnoy will serve as discussant, highlighting common themes from these presentations and discuss future directions in applying these measurement practices to tobacco control research.

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SYM16E
TOBACCO INDUSTRY TARGETING OF AMERICAN INDIANS: MISAPPROPRIATING AND EXPLOITING A SACRED MEDICINE


American Indians are disproportionately affected by the burden of commercial tobacco use. A recent study has estimated rates of commercial tobacco use as high as 59%. Multiple historical factors have resulted in increased commercial tobacco use and addiction among American Indians, which in turn have disrupted traditional culture and spiritual practices. The tobacco industry has taken advantage of sovereign American Indian Nations, as state and local smoke-free laws and other tobacco control efforts may not directly impact them. In an effort to assess the scope of tobacco industry marketing towards American Indians, we conducted a study to determine strategies used by the tobacco industry to purposefully target American Indians through marketing and advertising. A keyword search of industry documents from 1991 to 2002 was conducted using tobacco industry document archives from the Legacy Tobacco Documents Library. Public tobacco industry internal documents were organized and analyzed for themes using qualitative analysis software, NVivo 10. Approximately 55 relevant documents were found. Analysis revealed that the tobacco industry developed marketing strategies targeted American Indians by misrepresenting various cultural identity aspects and values of sacred tobacco use. The tobacco industry has manipulated the sacred use of tobacco and asserts cigarette and smokeless tobacco products as retail substitutes as natural, and for sacred and ceremonial use. Evidence also shows that the industry has infiltrated gaming venues to increase sales of tobacco products while masking their true intent by providing scholarships and anti-smoking prevention campaigns and programs for American Indian youth. Public health practitioners must counter tobacco industry strategies as part of a comprehensive approach to addressing commercial tobacco use. A greater understanding of tobacco industry marketing strategies has substantial relevance for addressing tobacco-related health disparities in American Indian communities.

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SYM17A

USING OBJECTIVE MEASUREMENT TECHNIQUES TO DOCUMENT AND DESCRIBE TOBACCO AND NICOTINE PRODUCT MARKETING

Keryn E. Pasch, PhD, MPH, University of Texas at Austin Health Behavior and Health Education

The use of objective measures of data collection to document and describe adolescents’ and young adults’ exposure to tobacco and nicotine product marketing has been limited. This presentation will discuss methodological implications for assessing tobacco and nicotine product marketing within a multi-level context to inform policy and practice. Methodological strategies will be highlighted that use objective measures to provide evidence of adolescents’ and young adults’ exposure to tobacco and nicotine product marketing. The first example uses an objective data collection technique to study the outdoor tobacco and nicotine product marketing environment. While work has documented tobacco point-of-sale and outdoor marketing, little research has used photographic evidence to further characterize this marketing. The methodology that will be presented uses an electronic data collection tool to document and photograph outdoor tobacco and nicotine marketing allowing for expedited data collection and increased opportunities for detailed coding and description of product marketing. Examples from a study using observations of all outdoor tobacco and nicotine marketing within one half mile of middle and high schools will be presented. The second set of examples use eye-tracking, a computer-based technology that provides an unobstructive, real time descriptive analysis of an individual’s point of gazes, sequence of gaze, and length of attention for tobacco and nicotine advertisements. Two applications of eye-tracking technology will be presented. The first application highlights the use of eye-tracking technology to better understand attention given to print advertising for several tobacco products including traditional cigarette, cigar, smokeless, and e-cigarette products. The second eye-tracking example presents issues on real-time analysis of television commercials for e-cigarette products. Objective data collection methods, such as those described in this presentation, can provide needed descriptive information beyond what can be obtained by traditional self-reported measures and much needed information how tobacco and nicotine marketing may influence behavior.

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SYM17B

ALTERNATIVE APPROACHES TO MEASURING EXPOSURE TO TOBACCO-RELATED MEDIA CONTENT IN THE CONTEXT OF ESTIMATING ITS EFFECTS

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Measuring exposure to mediated tobacco-related content to assess effects of exposure on outcomes has a long history. Assignment of individuals to exposure levels may require experimental assignment, time (e.g. before/after), exogenous measures across time or across geography (e.g. Gross Ratings Points), self-reports of specific exposures, or self-reports of media usage linked to content analysis of media sources. All of these measures involve trade-offs. The authors present a study of the effects of mediated information about tobacco and e-cigarettes (pro and anti) on youth and young adults’ tobacco usage and beliefs. The study includes a 36-month nationally representative rolling telephone survey with an eventual 10,780 13-25 year olds and follow up interviews with half of them 6 months after the first interview. Over the same period we are using intensive machine-based content analysis procedures to describe content related to tobacco in nine media sources (broadcast entertainment TV, TV news, print newspapers, Associated Press, TV ads, Twitter, Facebook posts, YouTube video comments, and Google searches.) The authors present measurement findings for exploring exposure effects in the following ways: (1) does variation in exogenously-measured content, aggregated by month, associate with simultaneous and lagged variation in similarly aggregated youth survey responses; (2) do survey-measured individual differences in media use, multiplied by variation in exposure to exogenously-measured content, predict individual survey respondent outcomes; (3) do individual survey claims of specific exposure, aggregated by month, predict individual (lagged) survey responses, and 4) do individual survey claims of specific exposure predict lagged individual survey responses? Each of these approaches has strengths and weaknesses (e.g., sensitivity to individual variation in exposure; threat of unmeasured confounders; clarity of causal order among variables; statistical power; match between exposure measure and outcome). We will explore these alternative approaches, outline their expected strengths and weaknesses, and seek advice from fellow presenters and attendees in this symposium.

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SYM17C

A CUE-BASED ASSESSMENT OF RECEPTIVITY TO TELEVISION ALCOHOL ADVERTISING, ITS LONGITUDINAL RELATION TO DRINKING OUTCOMES, AND ITS POTENTIAL TO INFORM FDA ABOUT TOBACCO ADVERTISING

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Unhealthy corporate products (tobacco, alcohol, energy dense foods) are common causes of premature mortality and their use is promoted through multibillion marketing campaigns. We describe the use of a novel method to assess exposure to marketing imagery to alcohol advertising, a method that could easily be adapted to tobacco. Longitudinal study of 2541 U.S. adolescents 15-23 years old at baseline, with 1596 follow-up assessing the relation between television alcohol advertising and drinking outcomes. Cued assessment of television advertising images for top beer and distilled spirits brands that aired nationally in 2010-11 (n=351). Images were digitally edited to remove branding and respondents queried ~ 20 randomly selected images. An alcohol advertising receptivity (AAR) score was derived (1 point each for having seen and liking the ad, and 2 for correct brand identification). Fast food ads from 2010-11 (n = 535) were queried to evaluate message specificity. Longitudinal outcomes: baseline underage never drinkers, drinking onset; baseline underage never binge drinkers, binge drinking onset; baseline AUDIT-C<4, hazardous drinking onset. Multivariate regressions predicting each outcome controlling for covariates, weighting to the US and employing multiple imputation to address loss to follow-up. Underage participants were slightly (but significantly) less likely to have seen alcohol ads compared to legal-age participants. Hazardous drinking was present among 39%, 54%, and 63% of 15-17, 18-20 and 21-23 year olds respectively. Underage baseline participants, AAR score independently predicted onset of drinking (AOR 1.63 [95% CI 1.15, 2.29]), binge drinking (AOR 1.40 [1.08, 1.80]) and hazardous drinking (1.46 [1.14, 1.87]). Food advertising receptivity was not associated with drinking outcomes. Receptivity to television alcohol marketing was independently associated with drinking outcomes and the association specific to television alcohol imagery, consistent with the idea that it reaches and affects drinking in underage persons. Similar assessment of tobacco imagery has the potential to advise FDA on penetration and effect of marketing for tobacco products.

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SYM17D
MEASURING ELECTRONIC CIGARETTE PROMOTION ON TWITTER: QUANTITY AND CONTENT
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Background: Little is known about marketing practices on social media. This project explores the extent and nature of promotional messages for electronic cigarettes on Twitter. Methods: Through GNIP we obtained access to Twitter’s complete dataset. We matched e-cigarette keyword rules between October 1, 2012 and September 30, 2013. We coded a random sample of 5,000 tweets as “commercial” or “organic,” then used this set to train a machine classifier to classify the entire corpus. Keyword rules were used to further characterize themes in tweet content, including: health, safety, smoking cessation, and pricing or discounts. To better understand cross-platform e-cigarette promotion and discussion, we mapped relationships between Twitter accounts and websites they mentioned. Results: Nearly 5 million e-cigarette tweets were collected, posted by over 1.2 million accounts. Monthly tweet volume increased from 87,000 tweets in October 2012 to >1 million by March 2013, then declined to 307,000 by September 2013. Of the accounts that tweeted e-cigarette messages, 58% were coded as commercial. The fraction of commercial content declined over the study period, to a fraction that was smaller than that of organic content by August 2013. Commercial and organic accounts linked to largely distinct sets of websites. Conclusion: Twitter represents an important platform for tobacco promotion. Social media data can provide insights into the amount and character of tobacco promotions, which reach millions of people yet are largely unregulated to date.
FUNDING: CA154254
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SYM18
CONTINGENCY MANAGEMENT CESSATION TREATMENT APPLIED TO SPECIAL POPULATIONS
Sandra Japuntich, PhD*, Andrew C. Meyer, PhD, Benjamin Toll, PhD, Suchitra Krishnan-Sarin, PhD, Stephen T. Higgins, PhD*, 1VA Boston Healthcare System and Boston University School of Medicine, 2University of Vermont, 3Yale University School of Medicine, 4Yale University School of Medicine
The use of contingency management (CM) or financial incentives for smoking cessation has gained popularity in recent years because of its effectiveness in inducing cessation in difficult to treat populations. CM has three components: objective verification of drug abstinence, tangible reinforcement for abstinence (e.g., payment), and withholding of reinforcement if abstinence is not verified. CM shows special promise in a number of research and clinical scenarios including when use of pharmacotherapy is contraindicated (e.g., in light smokers, or surgery candidates) and in treatment refractory smokers. This symposium will provide examples of contingency management treatments applied to four different difficult to treat special populations of smokers. Dr. Japuntich will present on a pilot study using CM in trauma exposed smoker with and without PTSD, with a focus on feasibility, preliminary efficacy results and abstinence induced PTSD symptom change. Dr. Meyer will present on a feasibility study using CM in patients with COPD. Dr. Toll will present results of a pilot study using CM for cancer patients awaiting surgery. Dr. Krishnan-Sarin will present results of two trials using CM in adolescent smokers. The first trial examined the independent and combined efficacy of CM and cognitive behavioral therapy. The second trial examined the independent and combined efficacy of CM and active (vs. placebo) nicotine patch. The discussant, Dr. Higgins will provide a summary of the current state of knowledge regarding CM treatments and applications and lead a discussion on future directions of CM research.
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SYM18A
PILOT STUDY OF CONTINGENCY MANAGEMENT TOBACCO TREATMENT FOR TRAUMA EXPOSED SMOKERS
Sandra J. Japuntich, PhD*,2, Suzanne Pineles, PhD,2 Kristin Gregor, PhD,2 Suchitra Krishnan-Sarin, PhD,2 Celina Jocs, BA,1 Samantha Patton, BS,1 Ann Rasmussen, MD,1, Women’s Health Sciences Division, National Center for PTSD, VA Boston Healthcare System, 1Department of Psychiatry, Boston University School of Medicine, 2Department of Psychiatry, Yale University School of Medicine
Introduction: Individuals with posttraumatic stress disorder (PTSD) have a high prevalence of tobacco use and low quit rates. Providers often report concerns about cessation-induced increases in PTSD symptoms. Contingency management (CM: payment for abstinence) has been shown to be effective for difficult to treat smokers including smokers with serious mental illness.
Method: This pilot study evaluated CM for trauma exposed smokers with and without PTSD (N=50; 52% male, 48% White, 42% Black; M age 44.16 [SD=12.05]; 36% current PTSD). The treatment included 5 weeks (2 sessions pre-quit, 11 post) of cessation focused cognitive behavioral therapy and 8 days of CM (up to $300); abstinence was verified with CO and cotinine.
Results: 88% (n=44/50; 83% PTSD; 91% control) attended at least 1 CM visit; 64% (n=32/50; 72% PTSD, 56% control) completed CM. 52% (26/50) completed the 5-week study (67% PTSD; 44% control). The PTDS group reported greater cessation induced increases in Minnesota Withdrawal Scale scores (p<.04). There was an interaction between PTSD group and cessation such that those with PTSD who maintained abstinence during CM had greater increases in one week CESD depression symptoms than those who lapsed. Despite these differences, there was no difference in 7-day cotinine confirmed point prevalence abstinence rates by group (p=.05; dropout rates as coded: 1 week PTSD 53%, Control 41%; 2 weeks PTSD 40%, Control 31%; 3 weeks PTSD 27%, Control 21%; 4 weeks PTSD 20%, Control 10%). In addition, there was no increase in Clinician Administered PTSD scores in those with PTSD, CM abstainers: pre-quit: M=66.75 (SD= 24.89), 1 week post-quit: M=63.00 (SD= 22.65; p pre to post >.05); CM lapsers: pre-quit: M=62.14 (SD= 17.39), 1 week post-quit: M=64.75 (SD= 27.28; p pre to post >.05).
Conclusions: Despite greater increases in depression and withdrawal, CM produced high abstinence rates in individuals with PTSD with no increase in PTSD symptoms. Relapse was common when contingencies were removed and attrition was common in non-abstinent participants. CM appears to support initial tobacco cessation in this typically refractory population.
JUSTIFICATION: This study demonstrates the use of a novel cessation treatment in a typically refractory treatment population and addresses concerns that individuals with mental illness may experience a debilitating increase in symptoms upon cessation.
FUNDING: This research was supported by VA CSR&D MERIT award 1-I01-CX-00298-01 and by VA CSR&D Career Development Award (Japuntich) #IK2CX000918-01A1
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SYM18B
USING CONTINGENCY MANAGEMENT TO PROMOTE SMOKING ABSTINENCE AMONG PATIENTS WITH PULMONARY DISEASE
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Background: Chronic obstructive pulmonary disease (COPD) is a leading cause of morbidity and mortality, with an estimated 90% of all COPD deaths in the U.S. attributable to smoking. Smoking cessation is identified as the most effective intervention to reduce COPD-related consequences. However, patients with COPD show poorer outcomes across a range of smoking-cessation interventions than those without COPD. Taken together, smokers with COPD represent a challenging and costly population for whom more efficacious interventions are needed.
Method: A pilot study evaluated the effectiveness of a multifaceted CM intervention to reduce COPD-related consequences. The intervention was delivered remotely and included: a 2-week pre-quit period (intensity of reinforcement increased over sessions); a 1-week pre-quit period, during which reinforcement was provided contingent on 7-day cotinine confirmed cigarette abstinence; and 3 weeks of 1-4 sessions per week of CM, with reinforcement for abstinence and treatment adherence. The study was completed by 20 COPD patients (M age 55.76 [SD=8.75]).
Results: CM participants demonstrated significantly greater increases in one week CESD depression symptoms than those who lapsed. Despite these differences, there was no difference in pre-quit to post-quit one week CESD depression scores (CM: M=24.89, SD=23.89; p=.05 vs. Control: M=18.14, SD=25.32).
Conclusions: This pilot study demonstrated the feasibility of a targeted multifaceted CM intervention to reduce COPD-related consequences. The intervention was well received and demonstrated preliminary efficacy. Further study is needed to determine the optimal CM intervention for COPD patients.
SYM18C

NOVEL TREATMENT TO PROMOTE SMOKING CESSATION BEFORE CANCER SURGERY

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Cancer patients exhibit a high prevalence of tobacco use. Many of these smokers continue to smoke before cancer surgery, which increases perioperative risk and often leads to a complication. Contingency management, an incentive-based intervention, is an effective treatment for smoking. We developed a contingency management protocol for pre-operative cancer patients based on data from 10 individual semi-structured interviews with former patients. Patients were unanimous in indicating that they would be interested in participating in the proposed program, and the majority of participants rated monetary rewards as providing the highest degree of motivation to quit smoking. The feedback from interviews informed the design of the pilot intervention. We conducted a pre-operative smoking cessation pilot study in which patients were randomized to receive either: a) standard care (SC; 3-6 counseling sessions and nicotine replacement therapy [NRT]), or b) a contingency management intervention for promoting initial smoking abstinence, is an effective treatment for smoking. We developed a contingency management intervention, an incentive-based intervention, is an effective treatment for smoking. We developed a contingency management intervention, an incentive-based intervention, is an effective treatment for smoking. We developed a contingency management intervention, an incentive-based intervention, is an effective treatment for smoking. We developed a contingency management intervention, an incentive-based intervention, is an effective treatment for smoking. We developed a contingency management intervention, an incentive-based intervention, is an effective treatment for smoking. 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expand our knowledge base of ENDS effects in both users and the secondhand effects in observers. He will also provide insights on the implications of these data for tobacco control regulatory policy and decision-making.

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SYM19A
ELECTRONIC CIGARETTES: PREDICTING AEROSOL NICOTINE CONTENT AND USER NICOTINE EXPOSURE AND EFFECTS

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Electronic cigarettes (ECIGs) heat a nicotine-containing liquid to produce an aerosol. The aerosol and the effects it produces may be influenced by device, user behavior (i.e., puff topography), and liquid nicotine concentration. Using data from the engineering and clinical laboratories, we explore how device voltage and puff topography influence aerosol nicotine yield and how nicotine concentration influences user nicotine delivery and subjective effects. In the engineering lab, aerosols were machine-generated with an ECIG cartridge using 5 distinct puff profiles. Output voltage and e-liquid nicotine concentration were varied. In the clinical lab, 10 current nicotine users used an ECIG that was loaded with 1 ml of a 70% propylene glycol / 30%vegetable glycerin liquid in four independent sessions that differed by nicotine concentration (0, 8, 18, or 36 mg/ml). Blood was sampled regularly for plasma nicotine concentration and subjective effects were assessed. Engineering lab results reveal that nicotine yields from 15 puffs varied by more than 50-fold across conditions. Greater voltages, longer puffs, and higher nicotine concentrations resulted in higher nicotine yield. Clinical lab results reveal that ECIG puffs are longer than those taken by cigarette smokers. In addition, increasing liquid nicotine concentration increases plasma nicotine concentration and withdrawal suppression. With some device/liquid combinations, nicotine yield and plasma nicotine concentration are much greater than those seen for cigarettes under similar conditions. We present a framework for evaluating and regulating the nicotine emitted from ECIGs that uses “nicotine flux”: the nicotine emitted per puff second by a given ECIG design under given use conditions. We speculate that, if the flux is too low, users likely will abandon the device or, if the flux is too high, the side effect and/or abuse liability profile will make it unacceptable. By considering ECIG design, liquid composition, and puff behavior variables in combination, ECIG specifications can be mandated to result in a target flux range.

JUSTIFICATION: For regulatory and policy considerations, this study provides important information on ENDS use in terms of secondhand effects for the passively exposed observer.

FUNDING: This research was supported in part by the Medical University of Poland KNW-1-031/N/3/0.

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SYM19B
SECONDHAND EXPOSURE TO NICOTINE AND TOXICANTS FROM ELECTRONIC VS. TOBACCO CIGARETTES

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E-cigarettes are designed to generate inhalable nicotine aerosol (vapor). Analysis of global e-cigarette marketing indicates that these products are promoted to circumvent smoke-free policies and to reduce exposure to secondhand smoke. Although no sidestream vapor is generated between puffs, some of the vapor is exhaled by e-cigarette user. As the popularity of e-cigarettes increases, it is becoming important to further investigate patterns and levels of passive exposure to nicotine and other toxicants from e-cigarettes. Selected airborne markers of secondhand exposure were measured in exhaled e-cigarette vapors in controlled laboratory settings. These markers included nicotine, aerosol particles (PM2.5), carbon monoxide, and volatile organic compounds (VOCs). Secondhand exposure to nicotine from e-cigarette vapors was also compared with exposure from environmental tobacco smoke. It has been shown that ultrafine particles, some volatile organic compounds (VOCs), and nicotine are released with exhaled vapor. Studies showed that e-cigarettes are a significant source of secondhand exposure to nicotine but not to combustion toxicants. The air concentrations of nicotine emitted by e-cigarettes vary across brands and types of the devices. It has been estimated that average concentration of nicotine resulting from smoking tobacco cigarettes is significantly higher than from e-cigarettes, however one study showed that 1-hr exposure to secondhand cigarette smoke and to exhaled e-cigarette vapors generated similar effects on serum cotinine levels. Using an e-cigarette in indoor environments may involuntarily expose nonusers to nicotine but not to toxic tobacco-specific combustion products. More research is needed to evaluate health consequences of secondhand exposure to nicotine, especially among vulnerable populations, including children, pregnant women, and people with cardiovascular conditions. Solid scientific data are needed to inform regulators whether e-cigarettes should be included under smoke-free policies to protect nonusers from inhaling nicotine and toxicants.

JUSTIFICATION: For regulatory and policy considerations, this study provides important information on ENDS use in terms of secondhand effects for the passively exposed observer.

FUNDING: This research was supported in part by the National Institutes of Health grant R01CA170115 and the Center for Tobacco Products, Virginia Commonwealth University, 2Aerosol Research Laboratory, American University of Beirut.

SYM19C
EFFECTS OF IN-VIVO AND ADVERT OBSERVATION OF E-CIGARETTE VAPING ON SMOKING DESIRE AND URGE IN YOUNG ADULT SMOKERS

Andrea King*, Lia Smith†, Daniel Fridberg‡, Dingcai Cao‡, Patrick McNamara‡, Hannah Resnick†, Norvel Brown†, Alicia Matthews†, University of Chicago, Department of Psychiatry & Behavioral Neuroscience, †University of Illinois at Chicago, Department of Ophthalmology and Visual Sciences, ‡University of Illinois at Chicago, Department of Health Systems Science.

Electronic cigarette (e-cigarette) use is forecasted to increase sharply in the coming years, particularly in young adults, and as a result, observations of e-cigarette vapor may become more common. Studies examining direct observer effects of e-cigarette use are lacking. Thus, we conducted two controlled investigations testing the impact of observing e-cigarette use on smoking desire in young adult smokers. The main outcomes were visual analogue scale ratings of desire to smoke a regular cigarette and scores on the Brief Questionnaire of Smoking Urges (B-QSU). In Study 1, subjective assessments were conducted before and after 60 young adult participants (mean age=24.7, smoke 8.9 cig/day) engaged in conversation with a study confederate who drank bottled water and then either smoked a regular combustible cigarette or vapor an e-cigarette. Study 2 assessed smoking urge and desire in an independent sample of 78 young adult smokers (mean age=26.3, smoke 9.1 cig/day) after being randomized to view advertisements for either bottled water or e-cigarettes. Results from Study 1 showed that observing water drinking did not affect participants’ smoking desire or urge ratings. However, observing both e-cigarette vapor and regular cigarette smoking significantly increased combustible smoking desire and urge (p<0.05) with observation of e-cigarette vapor also increasing e-cigarette desire (p<0.01). In Study 2, viewing the e-cigarette advert increased ratings of desire and urge to use a combustible cigarette and an e-cigarette (p<0.05) but this was not the case for the water advert. Further, these increases in smoking urge were significant for both positive and negative reinforcement effects. In sum, this research is the first to use controlled designs to examine direct observer effects of e-cigarette use which may act as a cue to increase desire for both combustible and e-cigarettes. The results...
may have implications for product regulation and marketing. Results expand the debate about e-cigarettes to include effects on persons exposed either in person or by advertisement to product use.

JUSTIFICATION: For regulatory and policy considerations, this study provides important information on ENDS use in terms of secondhand subjective effects for the passively exposed observer.

FUNDING: This research was supported in part by National Institutes of Health grants R01-AA013746 and P30-CA14599 and the University of Chicago Department of Psychiatry Research Fund and University of Illinois at Chicago Health Systems Science Faculty Fund

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SYM20
CHARACTERIZING NEURAL RESPONSES TO NONDRUG REWARDS IN SMOKERS: SHEDDING LIGHT ON RELAPSE AND IDENTIFYING POTENTIAL AVENUES FOR IMPROVING TREATMENT

Chair: Stephen Wilson, PhD*, The Pennsylvania State University

Presenters: Stephen Wilson, PhD1, Maggie Sweitzer, PhD2, Francesco Versace, PhD3, James MacKillop, PhD4, The Pennsylvania State University, 5Duke University Medical Center, 6The University of Texas MD Anderson Cancer Center, 7McMaster University

Discussant: Joseph McClernon*, PhD, Duke University Medical Center

Quitting smoking is associated with numerous desirable outcomes or rewards. Smokers often cite these potential benefits as a key source of motivation for quitting. In addition, quitting smokers are routinely advised to use nondrug rewards to help sustain the drive to remain abstinent. Thus, nondrug rewards play a vital role in both the initial decision to give up smoking and the effort to stay cigarette free. Conceptually, the use of nondrug rewards to facilitate smoking cessation is grounded in well-established behavioral principles. Why, then, do the nondrug rewards that frequently serve as a key source of motivation for quitting smoking often fail to promote long-term abstinence? This symposium will provide an overview of emerging neuroscience research that is beginning to address this important question and generate information that is crucial for using nondrug rewards more effectively in the context of smoking cessation.

Dr. Wilson will present data from a functional magnetic resonance imaging (fMRI) study examining the association between neural responses to monetary rewards and the subsequent willingness to resist smoking during a laboratory task modeling lapse behavior. Dr. Sweitzer will present data from an fMRI study examining the extent to which (a) neural responses to smoking and monetary rewards and (b) patterns of functional connectivity (covariation) among reward-related brain areas at rest predicted lapse during a quit attempt supported by contingency management. Dr. Versace will present data from a series of studies in which event-related potentials to pleasant, unpleasant, neutral, and cigarette-related stimuli were measured to examine (a) differences in reward sensitivity between smokers and nonsmokers, (b) individual differences in reward sensitivity among smokers in relation to cessation outcomes, and (c) individual differences in vulnerability to developing dependence among young adult smokers. Dr. MacKillop will present data from an fMRI study that used a neuroeconomic approach to examine the relative valuation of tobacco-related and monetary rewards. Finally, Dr. McClernon will comment on each of the presentations and lead discussion.

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SYM20A
BRAIN RESPONSES TO NON-DRUG (MONETARY) REWARDS PREDICT CLINICALLY-RELEVANT SMOKING BEHAVIOR IN THE LABORATORY

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As a group, individuals who smoke cigarettes exhibit blunted subjective, behavioral, and neurobiological responses to nondrug incentives and rewards (e.g., money) relative to nonsmokers. Findings from recent studies suggest, however, that there are large individual differences in the devaluation of nondrug rewards among smokers. Moreover, this variability appears to have significant clinical implications, as reduced sensitivity to nondrug rewards is associated with poorer smoking cessation outcomes. Currently, little is known about the neurobiological mechanisms that underlie these individual differences in the responsivity to nondrug rewards. Here, we tested the hypothesis that individual variability in reward devaluation among smokers is linked to the functioning of a brain region called the ventral striatum (a key part of the so-called reward system).

Specifically, functional magnetic resonance imaging was used to examine variability in the neural response to winning money in nicotine-deprived smokers (n = 44). We focused in particular on neural responses to monetary gains during the anticipation of an opportunity to smoke, as the expectation of imminent access to cigarettes has been found to heighten the devaluation of nondrug rewards by smokers in prior work. Our primary goal was to investigate whether individual differences in reward-related brain activity in those expecting to have access to cigarettes were associated with the degree to which the same individuals subsequently were willing to resist smoking in order to earn additional money. Our key finding was that smokers who exhibited the weakest response to rewards (i.e., monetary gains) in the ventral striatum were least willing to refrain from smoking for monetary reinforcement. These results suggest that outcome-related signals in the ventral striatum serve as a marker for clinically-meaningful individual differences in reward-motivated behavior among nicotine-deprived smokers. Further investigation of this individual variability may provide important insight into the mechanisms underlying the development and maintenance of addiction to cigarettes and other substances.

FUNDING: Provided by NIDA Grant R03DA029675.

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SYM20B
ABSTINENCE-INDUCED CHANGES IN STRIATAL RESPONSE TO REWARD AND FUNCTIONAL CONNECTIVITY PREDICT LAPSE DURING A QUIT ATTEMPT

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Deficits in reward processing during smoking withdrawal may be an important mechanism contributing to relapse. We recently reported that 24-h abstinence altered reward sensitivity in the ventral striatum (VS), contributing to heightened activation to smoking reward and attenuated activation to monetary reward. Here we examined whether abstinence-induced changes in VS BOLD response to each reward type predicted lapse during a quit attempt supported by contingency management (CM). We further examined whether changes in resting-state functional connectivity (rsFC) among reward-related brain regions explained changes in VS reward sensitivity and predicted lapse. Smokers (n=36) completed 2 fMRI sessions, one after 24-h abstinence and one after smoking as usual. Each scan included a guessing task in which they could earn smoking and monetary rewards, followed by a resting state scan. Smokers then engaged in a 3-week quit attempt, with monetary reinforcement for abstinence. Individuals exhibiting attenuated right VS activation to monetary reward during abstinence were more likely to lapse during CM (p<.05), even after controlling for behavioral predictors.
of craving and dependence. When examining rsFC, abstinence was associated with decreased connectivity between a VS seed and dorsomedial prefrontal cortex (dmPFC, p<.001); change in VS-dmPFC connectivity correlated with task-related changes in VS. Furthermore, a significant lapse x abstinence interaction was observed for VS connectivity with mid-cingulate and bilateral insula, such that smokers maintaining continuous abstinence exhibited greater connectivity between these regions during abstinence compared with non-abstinence (p<.001). In a logistic regression model, increased VS-cingulate and VS-insula connectivity during abstinence mediated the relationship between craving and lapse, while VS sensitivity to monetary reward remained an independent predictor. These results highlight the importance of deficits in non-drug reward processing in maintaining smoking behavior and suggest that enhanced connectivity within the salience network during abstinence may help regulate reward processing and protect against relapse.

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SYM20C
ASSESSING REWARD SENSITIVITY USING EVENT-RELATED POTENTIALS: IMPLICATIONS FOR SMOKING CESSATION AND SMOKING PREVENTION

Francesco Versace*, Jason D. Robinson, Jeffrey M. Engelmann, Jennifer A. Minnix, Maher A. Karam-Hage, Cho Y. Lam, David W. Wetter, Paul M. Cinciripini, University of Texas MD Anderson Cancer Center

Neurobiological models of drug addiction emphasize how drug use might alter brain mechanisms involved in the processing of natural rewards and suggest that the short-term, drug-induced amelioration of reward deficits might contribute to addictive disorders and substance abuse. To investigate the extent to which smokers show decreased sensitivity to natural rewards, we conducted three studies in which we recorded event-related potentials (ERPs, a direct measure of brain activity) to pleasant, unpleasant, neutral, and cigarette-related pictures. To estimate reward sensitivity, we used the amplitude of the late positive potential (LPP, an index of motivational significance) evoked by the images. The first study examined reward sensitivity in smokers (N=81) who showed lower pretreatment brain responses to pleasant than to cigarette-related pictures. The results indicated that, relative to never smokers, smokers did not show blunted brain responses to pleasant stimuli. The second study evaluated whether individual differences in reward sensitivity influence the ability to quit smoking. We collected ERPs to emotional, neutral, and cigarette-related pictures from 180 treatment-seeking smokers. Individuals (N=81) who showed lower pretreatment brain responses to pleasant than to cigarette-related pictures were significantly less likely to achieve long-term smoking abstinence than smokers showing the opposite brain reactivity pattern. To evaluate whether this biomarker could be used to identify individuals at higher risk of developing dependence, we conducted a third study where we investigated whether individual differences in reward sensitivity were observable among young smokers (age 18 to 25). The results showed that 25 of the 45 smokers recruited in the study were characterized by lower brain responses to pleasant than to cigarette-related stimuli. Overall, these findings support the hypothesis that low reward sensitivity is associated with higher vulnerability to nicotine dependence in both adults and youths. In a clinical setting, ERPs could be used to identify individuals with reduced reward and offer them appropriate interventions to enhance reward functions.

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SYM20D
CLARIFYING THE NEURAL BASIS FOR THE REWARD VALUE OF TOBACCO USING NEUROECONOMICS

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The field of neuroeconomics integrates perspectives and methods from psychology, economics, and neuroscience. It is inherently multidisciplinary and leverages these different vantage points to more completely understand the processes that underlie people's preferences, values, and, ultimately, the choices they make. This includes generally adaptive decision making but maladaptive decision making, such as in the case of nicotine dependence. A common strategy in neuroeconomics research is to use money as a widely understood commodity of value in experimental paradigms and the current study. This is particularly relevant to brain imaging studies on smoking cue reactivity to date, which have reported effects relative to neutral control stimuli with no incentive properties, making it unclear whether the observed activation pertains to value in general or the value of cigarettes in particular. The current study sought to use a neuroeconomic approach to tease out the neural activation specifically related to the value of tobacco. Specifically, using functional magnetic resonance imaging (fMRI), the study sought to clarify the neural activity reflecting tobacco-specific incentive value by examining smokers' responses to neutral cues, and a third set of cues, monetary cues, which served as an active control condition reflecting domain-general value. Participants were 42 male daily non-deprived smokers. In a priori analyses, significantly greater activation was found in the left ventral striatum in response to tobacco and money cues relative to neutral cues. Monetary cues also elicited significantly increased activation in the right inferior frontal gyrus and cuneus compared to the other two cue types. Overall, the results did not reveal discrete tobacco-specific regions of activation. Rather, the findings suggest that the salience of monetary cues was the highest and, as a result, might have reduced the incentive salience of tobacco cues. Implications for incentive-based interventions, such as contingency management, will be discussed.

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SYM21
PROMOTING ADOPTION OF TOBACCO USE TREATMENT IN DENTAL SETTINGS

Donna Shelley, MD, MPH*, Sayone Thihalolipavan, MD, MPH, CTTs, Judith S. Gordon, PhD, David A. Albert, DDS, MPH, Nancy A. Rigotti, MD, New York University School of Medicine, 2New York City Department of Health and Mental Hygiene, 3University of Arizona, 4Columbia University, School of Dental Medicine, 5Harvard Medical School and Massachusetts General Hospital

Dental providers have a central role in providing tobacco cessation services, with over 68% of dental professionals reporting that treating tobacco use is an important professional responsibility. More than half of smokers see a dentist annually and tobacco use is a known risk factor for oral disease. Research has also demonstrated the effectiveness of dental office-based cessation interventions. Yet dental care settings remain a relatively untapped venue for the treatment of tobacco dependence. This symposium will bring together population and practice level data to inform our understanding of current practice patterns, organizational and provider level factors that influence adoption of tobacco use treatment (TUT) in dental settings, and will provide data on systems-level interventions that may address barriers to implementing TUT into routine dental care. Dr. Shelley, the session Chair, will provide a brief overview of the current science on implementing TUT in health care settings and the significant role of dental care settings. This will be followed by presentations from Dr. Thihalolipavan, New York City Department of Health, who will present epidemiological data from the 2013 NYC Community Health Survey on frequency of dental visits among adult smokers and correlates of receiving advice to quit. Dr. Gordon, University of Arizona, will share qualitative findings on barriers and facilitators of implementing TUT in post-graduate training and specialty dental settings. Dr. Albert, Columbia University College of Dental Medicine, will share data from a NIDCR-funded study that tested an iPad-delivered
BARRIERS AND FACILITATORS FOR INCORPORATING TOBACCO CESSATION INTERVENTIONS IN POST-DOCTORAL DENTAL SETTINGS

Judith S. Gordon, PhD; David A. Albert, DDS, MPH; Emilie Bruzelius, MPH; Angela Ward, RDH, MA; 1University of Arizona, Department of Family and Community Medicine; 2Columbia University, School of Dental Medicine, Section of Population Oral Health

Introduction: Tobacco use is a significant factor in the development of many oral diseases, and dentists are in a unique position to provide effective tobacco cessation counseling utilizing the 5 A's. Yet, many dental schools are not providing sufficient didactic and clinical education to establish tobacco cessation as a routine part of practice. Moreover, there have been few attempts to reinforce tobacco cessation knowledge and skills at the post-doctoral level, where dental trainees develop the foundation for their future clinical practice.

Methods: We assessed the barriers and facilitators to conducting tobacco cessation interventions in postdoctoral dental settings using surveys and focus groups in three New York City institutions. Quantitative and qualitative analyses examined barriers and facilitators regarding implementation and maintenance of tobacco cessation activities into clinical practice, and whether tobacco intervention behaviors varied by participants’ demographic or institutional setting.

Results: 50 individuals completed surveys and participated in 12 focus groups. Half of the groups were conducted with residents and half with dental faculty. There was a statistically significant difference in the amount of tobacco cessation intervention across the 6 dental specialties. Pediatric and orthodontic dentists recorded lower mean 5 A’s scores than the other groups. Focus group discussions explored the specific issues that impede and facilitate tobacco counseling with participants describing three broad categories of factors, (1) clinician, (2) organizational, (3) structural and contextual. Several important differences emerged by specialty including the relative priority of cessation counseling versus other duties and the importance of organizational and contextual factors.

Conclusions: Results suggest that more organizational support is needed for implementation of clinical interventions, and underscored the fact that training alone is not sufficient to influence residents to incorporate tobacco cessation into clinical practice.

FUNDING: Pfizer

PERCEIVED ORGANIZATIONAL PRIORITY AND PROVIDER PRACTICE PATTERNS FOR TREATING TOBACCO USE IN DENTAL CARE SETTINGS

Jamie Ostroff, PhD; Sarah Borderud, MPH; Bharat Narang, MPH; Alena Campo, Mirelis Gonzalez, MS; Yuelin Li, PhD; Donna Shelley, MD, MPH; ‘Memorial Sloan Kettering Cancer Center,’ New York University School of Medicine, ‘Multiple Principal Investigators’

Background: Dentists have a central role in treating tobacco use. Yet, implementation of tobacco use treatment (TUT) guidelines remains inadequate in dental care settings.

Methods: This analysis is part of a larger NCI-funded cluster randomized clinical trial evaluating systems-level strategies (clinical reminder systems, performance feedback, pay-for-performance) for implementing TUT guidelines in dental clinics. We hypothesized that perceived organizational priority (POP) measured on a scale from 1 to 5 (not true=true) for treating tobacco use would positively influence providers’ TUT practice patterns. We conducted surveys of dental care providers at baseline (BL), 5 months (5FU), and 9 months (9FU) post-intervention to assess perceived importance of TUT guideline implementation within their dental clinic (POP), using a measure adapted from Klein et al. (Cronbach’s alpha of 0.88). Providers were also asked what percentage of their patients they assisted to quit smoking (i.e., provided brief counseling, referred to the New York State Quitline or other smoking cessation program, and/or discussed or prescribed cessation medications). Responses were aggregated into mean summary scores. Spearman’s correlation coefficients were used to test associations between POP and provider TUT behaviors.

Results: At BL, providers reported that the organizational priority of TUT guidelines implementation in their clinic was “somewhat true” (mean = 3.0), compared with ‘mostly true’ at 4.5FU (mean = 3.85; p < .01). At baseline, POP was not significantly associated with the TUT (Assist) summary score, but at 5FU POP and the TUT assist behavior summary score were significantly associated (r = .31, p < .01). At 5FU, POP was significantly specifically associated with providing brief counseling (r = .42, p < .01) and offering a referral to the Quitline (r = .26, p = .04). POP was also significantly associated with providing brief counseling at the 5FU (r = .31, p < .02).

Routine Dental Visits and Advice to Quit Smoking Among Adult New York City Smokers, 2013

Sayone Thihalolipavan, MD, MPH, CTTS; John Jasek, MPA, NYC Department of Health and Mental Hygiene

Background: In 2014, New York State Medicaid expanded reimbursement of tobacco cessation counseling to dental professionals as routine dental visits (RDV) for cleaning are opportune times for dental professionals to screen and intervene with tobacco users. We assessed the frequency of receipt of advice to quit (one component of comprehensive counseling) from a dentist or a hygienist among all New York City past year smokers (NYC PYS) in 2013, regardless of insurance status, as a baseline for comparison post-expansion. Methods: Data are from the 2013 Community Health Survey, a population-based survey of adults (n=8698). We assessed past-year RDV, primary care provider visits (PCPV), and receipt of advice to quit from dental professionals by smoking status and medical insurance type. Additionally we categorized current smokers as heavy daily (>=11 cigarettes per day (CPD)), light daily (<11 CPD) or nondaily to assess differences in advice by smoking frequency. Prevalences and t-tests were conducted in SUDAAN to account for the complex survey design. Results: PYS were less likely to report a RDV in the last year than nonsmokers (49% vs. 62%, p < .001), and this was consistent among Medicaid recipients (48% vs. 60%, p = .003), privately insured (57% vs. 74%, p < .001), and uninsured (32% vs. 45%, p = .005). Thirteen percent of PYS had an RDV with no PCPV; 37% had both an RDV and a PCPV. Uninsured PYS were more likely (23%) to have only an RDV compared to those with private insurance (11%) or Medicaid (8%). Among PYS who had a RDV in the past year, 42% received advice to quit from a dental professional. Heavy (>=11 CPD) daily smokers were more likely than nondaily smokers to receive advice to quit (59% vs 36%, P = .001). Conclusion: In NYC, RDVs are missed cessation opportunities for PYS. RDVs are more commonly received by smokers (57% vs. 74%, p < .001), and uninsured (32% vs. 45%, p = .005). Thirteen percent of PYS had an RDV in the last year than nonsmokers (49% vs. 62%, p < .001), and this was consistent among Medicaid recipients (48% vs. 60%, p = .003), privately insured (57% vs. 74%, p < .001), and uninsured (32% vs. 45%, p = .005). Thirteen percent of PYS had an RDV with no PCPV; 37% had both an RDV and a PCPV. Uninsured PYS were more likely (23%) to have only an RDV compared to those with private insurance (11%) or Medicaid (8%). Among PYS who had a RDV in the past year, 42% received advice to quit from a dental professional. Heavy (>=11 CPD) daily smokers were more likely than nondaily smokers to receive advice to quit (59% vs 36%, P = .001). Conclusion: In NYC, RDVs are missed cessation opportunities for PYS. RDVs are more commonly received by smokers (57% vs. 74%, p < .001), and uninsured (32% vs. 45%, p = .005). 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SYM21D
DEVELOPING AND EVALUATING A DENTAL OFFICE-BASED TOBACCO CESSION DECISION SUPPORT SYSTEM

David A. Albert, DDS, MPH; Judith S. Gordon, PhD; Emille Bruzelius, MPH; Judy A. Andrews; Angela Ward, RDH, MA; Catherine Gifford, MS; University of Washington, Seattle, WA 98109, USA, 206-667-7314, jheffner@fhcrc.org

Introduction: The primary aim of this study was to pilot-test an iPad-delivered clinical decision support system, the Tobacco Decision Control Support System (TC-DSS), to assist dental clinicians in providing brief tobacco cessation to patients in general practice dental offices. We theorized that a decision support system specifically designed for the dental office has the potential to reduce barriers to tobacco intervention and increase dentists' adoption and implementation of evidence-based tobacco cessation guidelines (5 A's: Ask, Advise Assess, Assist, Arrange).

Methods: Dental Offices were identified using the Aetna Insurance network of providers with five offices ultimately selected for participation. Within each office, patients presenting for non-emergent care received an iPad containing the study Informed Consent Document and an initial Tobacco Use Survey in the waiting room. Items included current tobacco use, previous quit attempts, and medical contraindications. Survey results were used to generate a tailored treatment recommendation for each patient using the TC-DSS algorithm. The treatment recommendation was then available to the dental clinician during the patient encounter. After each encounter the dental clinician documented the tobacco cessation activities occurring during the visit. Follow-up email and phone assessments were conducted with all patients who received a TC-DSS-generated recommendation.

Results: In total, 492 participants agreed to take part in the study. Of those, 99 (20.12%) were deemed eligible (i.e., reported any tobacco use within the past week and were at least 18 years old), and completed the initial survey. Recommendations were made to 72 patients (72.7%); 52 (52.5%) received a prescription for tobacco cessation medication, 62 (62.6%) received printed materials, and 29 (29.3%) were referred to the quit line.

Conclusions: Results suggest that a decision support system designed for dental practice is a viable means for increasing dentists' tobacco cessation behaviors. The TC-DSS appears to be a promising tool for promoting evidence-based tobacco cessation interventions, and delivering them with fidelity in the dental setting.

SYM22
ADDRESSING A GROWING HEALTH DISPARITY: NEW TREATMENTS FOR SMOKERS WITH PSYCHIATRIC SYMPTOMS

Chair: Jaimee L. Heffner, PhD, Fred Hutchinson Cancer Research Center
Presenters: Robert M. Anthenelli, MD1; Jonathan B. Bricker, PhD2; Michael J. Zvolensky, PhD3; Jaimee L. Heffner, PhD4; University of California at San Diego, 1Fred Hutchinson Cancer Research Center and University of Washington, Seattle, 2University of Houston, 3Fred Hutchinson Cancer Research Center

Smokers with psychiatric disorders represent over 40% of current smokers, consume 45% of cigarettes sold in the US, and quit at rates up to 50% lower than smokers in the general population. Despite overall declines in the population-level prevalence of smoking over the past several decades, there has been little change in smoking prevalence among those with psychiatric disorders. To address this growing health disparity, research on new treatment approaches to address poor smoking cessation outcomes for these smokers is much-needed. This symposium will illustrate the successes and challenges of novel pharmacotherapy and behavioral interventions at different stages of treatment development—ranging from early feasibility evaluations to large randomized, controlled trials. It will also assess clinic variation in smoking intervention and increase dental clinicians' adoption and implementation of evidence-based tobacco cessation guidelines.

Conclusions: POP is a strong predictor of provider delivery of tobacco treatment assistance. Further analysis will be conducted to assess clinic variation in POP and whether changes in POP improve provider adherence to TUT guidelines.

JUSTIFICATION: The study provides critical new knowledge to facilitate the widespread implementation, dissemination and sustained utilization of evidence-based tobacco use treatment strategies in dental practices across the U.S.

FUNDING: National Cancer Institute (R01CA162035)

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SYM22A
ACCEPTANCE AND COMMITMENT THERAPY FOR SMOKERS SCREENING POSITIVE FOR CURRENT DEPRESSION: RESULTS FROM A TELEPHONE-DELIVERED RANDOMIZED PILOT TRIAL

Jonathan B. Bricker, PhD1,2; Kristin E. Mull, MS2; Jaimee L. Heffner, PhD3; 1Fred Hutchinson Cancer Research Center, 2University of Washington, Seattle, WA 98109, USA, 206-667-7314, jheffner@fhcrc.org

Objective: Adults with current depression have over two times higher smoking rates than those without depression. Depressed smokers are 40% less likely to quit smoking than non-depressed smokers. To date, few behavioral interventions for current depressed smokers have shown significant effectiveness relative to control groups (van der Meer et al., 2013, Figure 3). To address this gap, the current study explored whether a novel behavioral intervention using Acceptance and Commitment Therapy (ACT), developed for a general population of smokers, shows promise for the subgroup of depressed smokers. Methods: Selected all smokers who screened positive for depression (n=47; from depression scale in the Anxiety & Depression Detector; Means-Christensen et al., 2006) from a telephone-delivered randomized pilot trial (N=121). The trial compared ACT with a standard skills intervention following the US Clinical Practice Guidelines (USCPG). Both arms followed a five-call protocol (30 min for Call 1; 15 min for Calls 2-5). Results: At end of treatment, ACT participants had completed 1 more call (95% CI: 0.1-2.0) than USCPG participants (3.4 vs. 2.4 calls) and had higher levels of acceptance of cravings to smoke (2.41 vs. 2.13; p<.05) than USCPG participants. At six-month follow-up, cessation and depression outcomes were the following: (1) thirty-day point prevalence quit rates were 33% for ACT vs. 13% for the USCPG comparison arm (OR = 1.22; CI: 96.1-56.6); (2) controlling for baseline scores, mean depression scores were 27% lower for ACT than for USCPG (Mean = 4.9

SYM22B
REASSESSMENT OF A GROWING HEALTH DISPARITY: NEW TREATMENTS FOR SMOKERS WITH PSYCHIATRIC SYMPTOMS

Chair: Jaimee L. Heffner, PhD, Fred Hutchinson Cancer Research Center
Presenters: Robert M. Anthenelli, MD1; Jonathan B. Bricker, PhD2; Michael J. Zvolensky, PhD3; Jaimee L. Heffner, PhD4; University of California at San Diego, 1Fred Hutchinson Cancer Research Center and University of Washington, Seattle, 2University of Houston, 3Fred Hutchinson Cancer Research Center

Smokers with psychiatric disorders represent over 40% of current smokers, consume 45% of cigarettes sold in the US, and quit at rates up to 50% lower than smokers in the general population. Despite overall declines in the population-level prevalence of smoking over the past several decades, there has been little change in smoking prevalence among those with psychiatric disorders. To address this growing health disparity, research on new treatment approaches to address poor smoking cessation outcomes for these smokers is much-needed. This symposium will illustrate the successes and challenges of novel pharmacotherapy and behavioral interventions at different stages of treatment development—ranging from early feasibility evaluations to large randomized, controlled trials.
SYM22B  
ANXIETY SENSITIVITY REDUCTION FOR SMOKING CESSATION: A RANDOMIZED CLINICAL TRIAL

Michael J. Zvolensky, PhD*, Norman B. Schmidt, PhD, Samantha G. Farris, MA, Nicholas P. Allan, MA, University of Houston, Department of Psychology, *Florida State University, Department of Psychology

Anxiety sensitivity (fear of aversive internal anxiety states) is a cognitive individual difference factor related to the development and maintenance of anxiety symptoms and disorders and various smoking processes. The present study reports on a randomized clinical trial involving a 4-session anxiety sensitivity reduction smoking intervention compared to a 4-session standard smoking cessation treatment involving relapse prevention counseling. Conditions were matched for contact time and both involved the administration of nicotine replacement therapy. Adult daily smokers were recruited from the community (via flyers, newspaper ads, radio announcements). Participants (n = 466) were on average 38.2 (SD = 13.56) years old, 49.4% female, 85.7% reported high school education or higher, and the majority identified was white (75.6%). The participants had a moderate level of nicotine dependence (mean FTND = 5.2; SD = 2.27) and used an average of 16.6 cigarettes each day (SD = 9.53), started daily smoking at age 17.5 (SD = 3.80), and made 3.5 previous quit attempts lasting 24 hours or longer (range: 0–15). Of the sample, 44.4% met criteria for at least one current (past year) psychological disorder. Generalized Estimation Equations Analyses were employed to predict smoking abstinence assessed via self-report and Carbon Monoxide (CO) Readings from Quit Week to Year 1 after adjusting for nicotine dependence, gender, age, and depression. Results indicated that the odds of relapsing are significantly lower for participants in the anxiety sensitivity reduction smoking condition compared to standard care at 3, 6, and 12-month follow-up (OR = 3.1, 4.7, and 13.1, respectively). The present findings suggest an integrated anxiety sensitivity reduction program for smoking cessation holds promise for facilitating abstinence compared to standard smoking cessation treatment.

JUSTIFICATION: This study demonstrates the potential of a novel approach to smoking cessation counseling to improve long-term smoking cessation outcomes.

FUNDING: This study was funded by a grant from NIMH (#MH076629, to MJZ and NBS).

SYM22C  
FEASIBILITY STUDY OF ACCEPTANCE AND COMMITMENT THERAPY AND NICOTINE PATCH FOR SMOKERS WITH BIPOLAR DISORDER

Jaimee L. Heffner, PhD*, Jennifer B. McClure, PhD, Kristin E. Mull, MS, Robert M. Atheneidelli, MD, Jonathan B. Bricker, PhD*, 1Fred Hutchinson Cancer Research Center, Division of Public Health Sciences, 2Group Health Research Institute, *University of California at San Diego, 1University of Washington, Seattle

Background: Quit rates for smokers with bipolar disorder are approximately half that of the general population. To address this disparity, we previously conducted the first pilot test of a targeted behavioral intervention for smokers with bipolar disorder. The intervention’s focus on mood management was not uniformly acceptable to participants. Consequently, in the present study, we pilot-tested a more flexible targeted treatment approach using Acceptance and Commitment Therapy (ACT).

Method: Ten adult smokers with stable bipolar disorder were enrolled in the feasibility study. The sample was predominantly female (80%), Caucasian (90%), and heavy, dependent smokers (90% met DSM-IV nicotine dependence criteria, M cigs/day=20.9). The targeted ACT treatment was delivered as individual therapy in ten weekly 30-minute sessions. Participants also received open-label nicotine patch on a standard, 8-week tapered dosing schedule.

Results: Most participants reported that the intervention was helpful (90%) and that they would recommend it to a friend (90%). The treatment completion rate was 80%. CO-verified quit rates at end of treatment were 40% for 7-day point-prevalence abstinence and 30% for 4-week prolonged abstinence. Consistent with ACT’s theorized mechanism of change, acceptance of smoking triggers increased by 54% from baseline to end-of-treatment. On average, mood symptom measures remained stable or decreased slightly from baseline to end-of-treatment (e.g., 0.1-point mean decrease in Young Mania Rating Scale score; 1.3-point mean decrease in Montgomery-Asberg Depression Rating Scale score).

Conclusions: Targeted ACT plus nicotine patch for smokers with bipolar disorder was feasible to implement, acceptable to participants, and facilitated short-term cessation. Consistent with its theory-based mechanism of change, acceptance of smoking triggers was enhanced. There was no evidence of a substantial impact on mood symptoms. A randomized, controlled trial is now needed to continue developing this promising new intervention.

JUSTIFICATION: This study will inform a subsequent controlled trial evaluating the efficacy of the intervention compared with standard care treatment.

FUNDING: NIDA grant #K23DA026517 (JLH) and Fred Hutchinson Cancer Research Center.

SYM22D  
TOPIRAMATE AS AN AID TO SMOKING CESSATION IN RECOVERING DUALY-DIAGNOSED MEN

Robert M. Atheneidelli, Jaimee L. Heffner, Nicole M. Bekman, Amanda E. Higley, Elizabeth Dinh, Esther Wong, Jessie Tibbs, Christopher P. Wehrle, Gina K. Erbacci, Katie Russell, Scott Franz, Katie Carlson, Thomas J. Blom, Neal M. Doran, Pacific Treatment and Research Center, VA San Diego Healthcare System, 1Fred Hutchinson Cancer Research Center, 2University of Cincinnati College of Medicine

Background: Cigarette smoking and alcohol dependence are a lethal combination, and recovering alcohol dependent smokers have more difficulty quitting smoking than non-alcoholic smokers. Topiramate is an antiepileptic medication with well-documented effects on reducing heavy drinking. We and others have found that the medication might promote smoking cessation especially among men. The purpose of the present study was to determine the extent to which topiramate aids smoking cessation in dually-diagnosed alcoholic smokers motivated to quit.
SYM23A

SELF-REPORTED QUIT RATES FROM THE SMOKEFREETXT PROGRAM

H. Cole-Lewis*, A. Sanders, M. Schwarz, Y. Hunt, E. Augustson

Nationally, the annual quit rate among adult smokers is approximately 6% (CDC MMWR 2011). As mobile technology adoption continues to skyrocket in the US, we must capitalize on this shift to further engage American smokers who want to quit smoking. To this end, the National Cancer Institute (NCI) launched SmokefreeTXT in 2011, an evidence-informed, text message based cessation program leveraging the high usage rates of text messaging across various populations. In this presentation, we will report findings from an observational study to assess the efficacy of the SmokefreeTXT program using self-reported outcome data from adults who voluntarily enrolled in the intervention. The study discussed encompasses 18,080 subscribers in the real world implementation during September 20, 2011 to May 22, 2014. Quit rates are calculated based on the amount of exposure a subscriber had to the intervention. Outcomes for the study are point prevalence abstinence at 7 days, 42 days (end of program), 72 days, 132 days, and 222 days post quit date. Additionally, sustained abstinence is reported for 72 days, 132 days and 222 days post quit date. Descriptive analyses indicate the mean self-reported age of subscribers was 34.89 and the majority of the sample was female, smoked every day at baseline, had a web enabled phone, and lived in the South. Subscribers who received any dose of treatment (1+ Days) had the following quit rates at 7 days, 42 day, 72 day, 132 day, and 222 day post quit date: 20.3%, 7.2%, 6.7%, 4% and 2%. Half Dose of treatment (21-day to 41-day) achieved: 24.8%, 11.3%, 10.6%, 6.3% and 3.2%. Full Dose (42 days or more) achieved: 23.7%, 12.9%, 12.2%, 7.3% and 3.7%. Nearly half (46%) of those who opted out of the intervention before the end (n=8831), do so in the first week of the intervention and the number of opt-outs decreased as the intervention continued. Overall, this observational study shows great promise for the efficacy of the SmokefreeTXT program to increase smoking cessation success in an immediate, pervasive manner. Abstinence rates for this real world implementation are higher than the 6% that has been observed previously by other cessation methods (HHS 2010).

FUNDING: National Institutes of Health, National Cancer Institute

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SYM23B

VETERAN ENGAGEMENT IN A TEXT MESSAGING PROGRAM FOR SMOKING CESSATION

Dana E. Christofferson, PhD*, Jeffery S. Hertzberg, BA, Jean C. Beckham, PhD, Paul A. Dennis, PhD, Kim Hamlett-Berry, PhD, Erik M. Augustson, PhD, MPH

Mobile health technologies are attractive to health care systems for the potential to reach and engage users who might not otherwise utilize available smoking cessation treatments. This technology also provides the ability to supplement ongoing clinical care with daily, evidence-based prompts and support. The U.S. Department of Veterans Affairs, Veterans Health Administration (VHA) implemented SmokefreeVET, a text message based smoking cessation intervention in May 2013 throughout the VHA national health care system. VHA serves a population of Veterans that is predominantly older and male, with higher rates of mental and physical health compared to the general adult population. Approximately 85% of VHA enrollees are 45 years old or older and 90% of enrollees are male. Overall, 19.5% of VHA enrollees are current smokers. An analysis of SmokefreeVET users was conducted to determine the user demographics and patterns of use of a smoking cessation text messaging program used within a large health care system. Growth mixture modeling was used to identify discrete groups of Veterans based on patterns of engagement, defined by the number of texts sent to the program per week. Four distinct groups were identified, corresponding to low engagement, high engagement, increasing engagement, and decreasing engagement. Group differences in baseline characteristics, particularly demographic and smoking-related, were examined. Analyses were also conducted to explore group differences in self-reported abstinence over the course of the six-week observation period. Results suggested greatest engagement by the lightest smokers as well as correspondence between program engagement and abstinence. The experience of SmokefreeVET is unique in describing the use
of mobile technology in a population of users that is older than typically described and begins to define characteristics of mHealth use by VA health care system enrollees. Identification of user engagement patterns can inform the development of mHealth interventions targeted to the Veteran population, as well as suggest strategies to test to increase engagement with text messaging and other mHealth interventions.

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SYM23C
SMOKEFREE MOMS: A NOVEL TEXTING PROGRAM TO HELP PREGNANT WOMEN QUIT SMOKING


Texting interventions for smoking cessation offer a novel approach to reach a variety of populations. SmokefreeMom was recently developed, as an offshoot of NCI’s SmokefreeTXT, to meet the cessation needs of pregnant women. SmokefreeMom allows pregnant women to receive tailored texts with information about quitting, help with craving, support and encouragement. As part of the development process, qualitative interviews were conducted with pregnant women (n=23) at Medstar Washington Hospital Center in Washington, DC. Participants indicated that the text messages were helpful, informative, supportive and provided actionable step-by-step guidance to encourage smokers to quit. Participants indicated which messages were easiest to understand, most motivating and those that would benefit from improvement. On a scale of 1 to 5 (best), participants rated the average helpfulness of the prototype messages to be a 4.2; the support of someone caring about their quitting at 4.7, and their enthusiasm for recommending it to a friend to be 4.5. Feedback informed the further development of SmokefreeMom program which launched in May 2014. Based on subscriber self-reported data, 173 pregnant women have enrolled in the SmokefreeMOM texting program. They represent a diverse group of women from 36 states across the U.S. and the District of Columbia, with a mean age of 29. On their quit date, 54 participants replied via text with their smoking status and of those, 25 reported quitting. At the end of the first week post-quit date, 32 replied, and 22 reported being smokefree. One month after their quit date, 22 replied and 6 reported being smokefree. A randomized trial of SmokefreeMom is also on-going within a healthcare delivery system, and preliminary results will be presented.

FUNDING: National Institutes of Health, National Cancer Institute

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SYM23D
CHALLENGES AND OPPORTUNITIES FOR MHEALTH BEHAVIORAL INTERVENTIONS


Emerging evidence supports the efficacy of mHealth interventions for promoting behavior change across a variety of health behavior domains. However, process data that would help guide the design and implementation of mHealth interventions are lacking. This presentation will attempt to address this gap, by using participant engagement data from a national text messaging smoking cessation intervention to examine challenges and opportunities associated with the real-world implementation of a large-scale mHealth intervention. The National Cancer Institute’s SmokefreeTXT program has reached nearly 70,000 smokers since its inception in July 2011. The program provides encouragement, advice, and tips to help smokers quit. Users receive cessation support messaging for up to two weeks before and six weeks after their quit date. We conducted a retrospective records analysis of individual-level SmokefreeTXT system data of program users from 2011-2014. A combination of qualitative and quantitative methods were used to describe patterns of participant engagement with the SmokefreeTXT intervention. Of the 18,080 program users included in the analysis, 48.8% (n=8,831) opted out of the program before the end of treatment. The majority of treatment opt-out occurred within the first 7 days post quit date (45.9%); opt-outs declined as the intervention continued. In-depth interviews with program users suggest that opting-out was associated with relapse to smoking. Program users provided qualitative feedback about program features and design elements: users wanted to be able to reset their quit date or pause the program; to select the number of text messages they receive; to be offered options to receive information on other topics; to minimize mentions of cigarettes; and to make the program more interactive. Results highlight the need for a flexible, data-driven approach to mHealth program development, with an emphasis on design elements that facilitate a tailored user experience. Future research is needed in order to determine how best to optimize treatment engagement, especially early on when users are more likely to opt-out.

FUNDING: National Institutes of Health, National Cancer Institute

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PA12-1
ARE PEOPLE WITH SCHIZOPHRENIA RESPONSIVE TO REGULATORY EFFORTS?
Mary F. Brunette¹, Delbert G. Robinson, Daniel J. Coletti, Molly E. Patrick, Jennifer W. Tidey*  

As the prevalence of smoking has declined in the U.S., there has been increasing concern about vulnerable sub-populations who continue to smoke. People with mental illness use 40% of cigarettes sold in this country, and within this group, people with schizophrenia are most likely to smoke and have high rates of health consequences, including preventable death due to cancers and cardiovascular diseases. While prevalence research to date implies that people with schizophrenia are less responsive to regulatory efforts than others, very little research has directly explored this group’s response to regulatory approaches, thus schizophrenia is an excellent example of an understudied vulnerable population. This symposium will explore new evidence related to the potential impact of various regulatory approaches on people with schizophrenia. Dr. Robinson will present data on tobacco product and e-cigarette use among youth and young adults with schizophrenia, demonstrating higher rates and unique patterns of use when compared to young people without mental illness. Dr. Coletti will describe exposure and response to tobacco marketing and health messages among young people with schizophrenia as compared to people without mental illness, showing that this group reports high exposure but difficulty applying the information in health messages to themselves. Dr. Brunette will describe frequent use of low cost tobacco products in a sample of smokers with schizophrenia and other severe mental illnesses, and will demonstrate the associations between price minimizing behavior, cessation treatment utilization and cessation outcomes, suggesting that taxation to increase price of cigar products and loose tobacco could reduce smoking in this population. Dr. Patrick will discuss the acute effects of very low nicotine cigarettes among people with schizophrenia in a laboratory setting, suggesting that this regulatory approach could be tool to reduce smoking. The discussant, Dr. Tidey, will engage the audience and speakers in a discussion about the impact of regulatory approaches on vulnerable populations such as people with schizophrenia.

JUSTIFICATION: This symposia will provide preliminary data regarding the impact of various regulatory approaches on people with schizophrenia that may inform regulatory policy.

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PA12-2
RANDOMIZED, DOUBLE-BLIND, PLACEBO CONTROLLED TRIAL OF NICOTINE NASAL SPRAY FOR SMOKING CESSATION IN SCHIZOPHRENIA
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Background: Smokers with schizophrenia have high levels of nicotine dependence and reduced success in quitting. Several aspects of the nicotine nasal spray (NNS), including its rapid onset of action, its intermittent dosing, its effective craving relief and reinforcing properties make it an appealing treatment for smokers with schizophrenia.

Methods: In this randomized, double-blind, placebo-controlled trial, subjects were clinically stable adult outpatients, with SCID confirmed schizophrenia who smoked ≥ 10 cigarettes/day and were motivated to try to quit. Subjects were randomized to receive either active nicotine or piperine placebo nasal spray placebo for 20 weeks, with post-treatment follow-up up to 1 year. Both groups received behavioral intervention designed for schizophrenia delivered as 15 sessions over 26 weeks. Self-reported abstinence was verified by expired carbon monoxide at all visits.

Results: A total of 66 patients were consented to participate in the study with 55 randomized as the intent to treat group. Subjects in each treatment group did not differ with regard to baseline cigarettes per day smoked, expired carbon monoxide level, serum cotinine level or number of past quit attempts. Overall study retention (80%) was not different between groups although drop out due to adverse events was higher in the active NNS group. Quit rates were low overall and not different between treatment groups in this small sample. At the 4-week end of treatment assessment, the 7-day point prevalence abstinence was 15% (4/27) in the NNS compared with 8% (2/25) for placebo.

Conclusions: This is the first placebo controlled trial of a nicotine replacement product in schizophrenia. Nicotine medication plus counseling produces modest quit rates in schizophrenia and alternate strategies should be investigated.

JUSTIFICATION: This study can inform treatment decisions in helping smokers with schizophrenia.

FUNDING: This work was supported by a grant from the National Institute on Drug Abuse (R01- DA024640-01A1 to JMW). Pfizer, Inc provided product support.

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PA12-3
EFFECTS OF TREADMILL WALKING ON CIGARETTE CRAVING, WITHDRAWAL SYMPTOMS, AND SMOKING BEHAVIOR IN PEOPLE WITH SCHIZOPHRENIA
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Background: The mortality rate of people with schizophrenia is 2-3 times that of the general population, primarily due to high rates of cigarette smoking, physical inactivity, obesity, hypertension and diabetes mellitus. Several studies have found that walking acutely reduces cigarette craving among smokers without psychiatric illness, but little is known about the effects of such interventions in people with serious mental illness.

Methods: In this laboratory study, we are using a within-subjects design to examine whether treadmill walking reduces cue-elicited cigarette craving, nicotine withdrawal symptoms and smoking behavior among smokers with schizophrenia (SWS). After a baseline session in which SWS (n = 18, 78% male, 40.4 +/- 9.0 years, 22.2 +/- 8.5 CPD, 50% want to quit someday) habituate to walking on the treadmill, they undergo study sessions in which they are exposed to smoking cues and then either complete a 1-mile treadmill walk or sit passively for the same length of time. Participants complete the Questionnaire on Smoking Urges (QSU) and Minnesota Nicotine Withdrawal Scale (MNWS) before and after the activity periods, followed by a smoking assessment in which they can receive $0.25 for every 5 min that they delay smoking.

Results: Relative to the passive control condition, walking significantly reduced QSU and MNWS scores (p’s < .05 for the Activity x Pre-post interactions). Walking tended to delay smoking among those not interested in quitting (Passive: 33.2 +/- 21.6 min, Walk: 26.9 +/- 23.0 min); however, this interaction was not statistically significant. These results suggest that walking may be an effective rescue strategy for reducing cue-elicited cigarette craving and withdrawal symptoms among SWS. Future studies should examine whether walking, in combination with other strategies, helps to reduce smoking among those not interested in quitting.

JUSTIFICATION: These findings suggest that walking may be an effective strategy for reducing cigarette craving in smokers with schizophrenia.

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PA12-4
WEIGHT GAIN AND CARDIOVASCULAR RISK REDUCTION ASSOCIATED WITH TOBACCO ABSTINENCE IN SMOKERS WITH SERIOUS MENTAL ILLNESS

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Background: Heavy smoking and obesity-related risk factors contribute to high rates of cardiovascular disease and premature mortality in individuals with serious mental illness (SMI). Smoking cessation reduces risk of CVD but is also associated with weight gain in the general population. Patients with SMI have a higher prevalence of both smoking and obesity, and the impact of smoking cessation on weight gain and overall CVD risk in this population is unknown.

Methods: We enrolled 201 smokers in a smoking cessation trial to test the long-term effectiveness of varenicline in patients with SMI. At the end of a 12-week open-label course of varenicline and cognitive behavioral therapy (CBT), eighty-seven attained 14-day point prevalence abstinence and were randomized to continue either varenicline or placebo and CBT for 40 weeks. Weight, body mass index (BMI), and Framingham 10-year CVD risk were assessed over the 52-week trial and modeled with repeated measures analyses of variance (PROC MIXED in SAS).

Results: The mean BMI at baseline was 32. Participants who demonstrated 21-day point-prevalence abstinence at the end of treatment (week 52), gained more weight than subjects who relapsed to smoking (4.8 (6.6) kg vs. 1.2 (6.5) kg gain, baseline to week 52 respectively, time*abstinence interaction F1, 336 = 7.2, p<0.01). Despite a significant increase in weight, those who were abstinent reduced their 10-year risk of developing CVD from 14.2% (IQR: 9.1 – 26.6%, n=30) at baseline to 9.3% at week 52 (IQR: 6.8 – 14.3%, n=29), and those who relapsed did not have any change in their CVD risk (10.8% at baseline, IQR: 6.0-19.2%, n=49; 9.3% at week 52, IQR: 6.9-13.6%, n=28). The beneficial effect of point prevalence abstinence at week 52 on CVD risk was significant (time*abstinence interaction F1,50 = 20.21, p<0.0001) adjusting for sex, site, varenicline use and concurrent weight gain.

Conclusion: Despite the high prevalence of obesity at baseline and substantial weight gain associated with long term abstinence, smoking cessation significantly reduced the Framingham estimated 10-year CVD risk among patients with serious mental illness.

JUSTIFICATION: The reduction in CVD risk with sustained abstinence in this population with high prevalence of premature mortality from CVD should inform policies that would increase availability of smoking cessation treatment for those with serious mental illness.

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PA12-5
ASSOCIATION BETWEEN TOBACCO SMOKING AND DEATH BY SUICIDE: A COMPETING RISKS HAZARD MODEL IN A LARGE COHORT WITH 35-YEAR FOLLOW UP

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Importance: Studies have shown that tobacco smoking is associated with an increased risk for suicide, but have had conflicting findings as to the magnitude and degree to which the association is independent of co-morbid psychiatric illness and have not addressed whether smoking is a marker for a suicide risk factor or whether tobacco smoking has a causal role in the association.

Objectives: To estimate the association between smoking and suicide, and the degree to which it is influenced by dose, cessation, psychiatric and somatic morbidity, genetic, and environmental factors.

Design: 16,282 twin pairs alive and aged over 18 years in 1974 were queried with detailed health and smoking questionnaires in 1975 and 1981, with response rates of 89% and 84% respectively. Smoking status and dose, marital, employment, and socioeconomic status, and psychiatric and somatic co-morbidity were assessed at both time points. Participants were then followed for 35 years for vital status. The association between tobacco smoking and suicide over the follow-up period was determined in a competing risks hazard model.

Results: Current smokers had a higher cumulative suicide incidence than former or never smokers at every age. Heavy current smokers had higher suicide risk (hazard ratio (HR) = 3.47; 95% CI, 2.31-5.22) than current smokers who smoked less (HR = 2.3; 95% CI, 1.61-3.23). Former smokers did not show increased suicide risk. Current smokers had increased risk for suicide (HR = 2.84; 95% CI 1.58-5.10) adjusting for depressive symptoms, alcohol or sedative hypnotic use, excluding those with serious medical or psychiatric illness. In the 28 twin pairs discordant for both smoking and suicide, 24 of the suicides were in smokers and 4 in non-smokers, (OR = 6; 95% CI 2.06-23.8).

Conclusions: Tobacco smoking is associated with suicide in a dose dependent fashion, independent of age, sex, depressive symptoms, heavy alcohol use, and major psychiatric or medical illness. The results are consistent with an interpretation that genetic factors do not significantly modify the relationship between smoking and suicide and that exposure to tobacco smoke may have a causal role in relation to suicide.

JUSTIFICATION: The demonstrated independent dose-dependent relationship between smoking and suicide justifies further research on the effect of tobacco use on neurobiology underlying suicide and may call into question claims that novel nicotine delivery devices are safe, as exposure to nicotine may be the causal factor in this association.

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PA12-6
INITIAL NICOTINE NASAL SPRAY EXPERIENCE AMONG SMOKERS WITH AND WITHOUT SCHIZOPHRENIA
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Background: Use of nicotine nasal spray (NNS) has been limited due to its aversive side effects although its rapid onset may be reinforcing in some individuals. Smokers with schizophrenia (SS) have reduced smell function that may result in fewer side effects and better clinical response to NNS. Positive response to a test dose of NNS was associated with better abstinence in a general population study.

Methods: This is a secondary data analysis from a NNS vs placebo cessation study in 55 outpatient smokers with schizophrenia (SS) and 59 control smokers (CON) without mental illness who did not participate in the cessation trial but underwent the same baseline procedures. Subjects completed the University of Pennsylvania Smell Identification Test (Doty 1984; UPSIT). Subjects were randomized to a single test dose of NNS or matched placebo. At baseline and 2 minutes following nasal spray administration subjects completed the Initial Spray Experience survey (ISE; Kaufmann 2004).

Results: No differences were found between SS versus CON smokers on baseline demographic characteristics including gender, age, race/ethnicity, and measures of nicotine dependence including cigarettes smoked per day. SS were more impaired in overall smell function compared to controls (moderate vs mild microsmia). SS were significantly impaired in all subscale scores of smell valence (lower detection of neutral, pleasant and unpleasant smells vs. controls). SS had a mean increase in the ISE positive subscale score while CON had a decrease (compared to baseline) although this was not significant in this small sample. SS had a lower increase in the ISE negative subscale score compared to CON, suggesting they had fewer negative side effects to the active nasal spray (p=0.082). SS who received the active NS had a greater change in ISE positive subscale scores compared to those who received the placebo NS (0.26 vs -0.04; NSS).

Conclusions: Reduced smell function in schizophrenia may increase the tolerability of nicotine nasal spray. Smokers with schizophrenia may experience more positive reinforcing effects from nicotine nasal spray that could contribute to better clinical outcomes.

JUSTIFICATION: This is a study to better understand tolerability and use of nicotine nasal spray in smokers with schizophrenia.

FUNDING: This work was supported by a grant from the National Institute on Drug Abuse (R01- DA024640-01A1 to JMW). Pfizer, Inc provided product support.

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PA13-1
E-CIGARETTE USE AMONG ADULTS IN THE UNITED STATES: FINDINGS FROM A NATIONALLY REPRESENTATIVE COHORT
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Introduction: Use of e-cigarettes, has increased rapidly, but little is known about patterns of use and associations with age, conventional cigarette smoking history, and type of device.

Methods: We recruited a nationally representative online sample of 10,181 smokers and 3,123 nonsmokers using probability U.S. address-based sampling. Wave 1 data were collected between April 7, 2014 and June 30, 2014. The survey included demographic characteristics, e-cigarette use, most commonly used device type (tank, cartridge, disposable), and main reasons for use. Data were weighted to yield weighted demographic distributions of smokers and nonsmokers that match those of the nationally representative 2012 National Adult Tobacco Survey. Descriptive statistics were generated with significance testing conducted between relevant groups.

Results: Ever and current use of e-cigarettes were 53.6% and 21.5% among current smokers, 14.9% and 5.2% among former smokers, and 6.4% and 1.6% among never smokers, respectively. Among current smokers who currently use e-cigarettes, 33.4% most commonly used tanks, 39.6% cartridges and 27.0% disposables. Overall, 17.1% of tank users cited “can help me quit” as their main reason for using e-cigarettes compared with 11.8% of disposable/cartridge users (p<0.10). Compared with disposable/cartridge users, tank users were more likely to cite “they cost less” (14.7% vs. 4.0%, p<0.01) and less likely to cite “can be used where smoking isn’t allowed” (9.9% vs. 18.5%, p<0.01) as main reasons for use. Young adults aged 18-24 were more likely than users aged 25+ to cite “they come in flavors I like” (9.1% vs 1.3%, p<0.01) and less likely to say “they can help me quit smoking” (6.9% vs. 15.1%, p=0.01) as their main reason for using e-cigarettes.

Conclusion: Reasons for and patterns of use vary by smoking history, device type, and age. Flavors and reasons other than cessation are reported as main reasons for using e-cigarettes in young adults compared to adults age 25+. Cohort follow-up data may illuminate whether different patterns of use are associated with smoking cessation among e-cigarette users over time.

JUSTIFICATION: Our findings on patterns of and reasons for e-cigarette use, including that young adults aged 18-24 were more likely to cite “they come in flavors I like” and less likely to say “they can help me quit smoking” as a main reason for use can inform public health prevention efforts.
FUNDING: No Funding.

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PA13-2
TOXICANT EMISSIONS FROM ELECTRONIC CIGARETTE “DIRECT DRIP ATOMIZERS”

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Introduction: Electronic cigarettes (ECIGs) electrically heat and vaporize a liquid solution to produce an inhalable aerosol. Normally the electrical heater is automatically fed the liquid via a reservoir-wick system. Some ECIG users, however, elect to directly drip liquid onto the heater coil, reportedly for greater vapor production and throat hit. Use of such “direct drip atomizers” (DDAs) may involve greater exposure to non-nicotine toxicants due to the potentially higher temperatures attained by the coil. In this study we examine nicotine and volatile aldehyde emissions from one type of DDA under a variety of use scenarios.

Methods: Aerosols were machine-generated from an NHALER 510 Atomizer (2.5 Ohms) powered by an eGo-T battery (3.4V, Joyetech), using a common PG-based liquid. The machine was programe to draw an 8 s puff at 19 mL/s puff velocity, once every 10 s. Reflecting common practice by DDA users, inter-drip interval, the number of puffs drawn between dripping additional liquid onto the coil, was varied from 2-4 puffs/drip. Total particulate matter, nicotine, and volatile aldehyde yields were quantified. In addition, instantaneous heater coil temperature was recorded during puffing using an infrared thermographic camera.

Results: Formaldehydes, acetaldehyde, acetone, propionaldehyde, and valeraldehyde were present in the ECIG aerosol at levels that far exceed typical values reported for conventional ECIGs and combustible products, both per puff and per unit of nicotine yield. Increasing the inter-drip interval resulted in greater toxicant emissions, in addition to lower TPM and nicotine yield delivery at each subsequent puff. Maximum heater coil temperature was observed to increase with increasing inter-drip interval.

Conclusions: Unorthodox ECIG use methods may result in significantly elevated toxicant exposure. Regulations mandating design restrictions to limit unorthodox use may be necessary to protect public health.

JUSTIFICATION: Regulations addressing ECIG safety should account for possible unorthodox use methods such as dripping.

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PA13-3
CHANGES IN LUNG FUNCTION OVER TIME AFTER INITIATION OF E-CIGARETTE USE

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Background: Electronic cigarettes (e-cigarettes) are relatively new in the global tobacco market with the first e-cigarette introduced in 2003. A paucity of literature exists regarding the short- and long-term health effects of e-cigarettes. The current study uses data from new e-cigarette users to model how lung function changes over time.

Methods: This observational study enrolled 46 participants within the 7 days following their first purchase of an e-cigarette. Visits occurred at baseline, 1, 3, and 6 months after purchase. Lung function was a primary outcome measured by handheld spirometry using percent of predicted Forced Expiratory Volume in 1 second (FEV1) and percent of predicted Forced Vital Capacity (FVC). Because no smoking restrictions were placed participants, we adjusted for participants self-reported average cigarettes smoked per day at each visit. Linear mixed-effects models were employed for each outcome separately—polynomial effects were evaluated and person-mean centering was used to partition the between- and within-participant effects of the time-varying cigarettes smoked predictor.

Results: Non-daily smoking was reported by 10 participants at month 3. No participant ceased using both smoking and e-cigarettes. Linear fixed effects were indicated for both outcomes; no individual differences in this effect were observed. Lung function improved over time with average increases of 1.67 percent and 1.06 percent per month for FEV1 and FVC, respectively (both p less than 0.05). The average number of cigarettes smoked was not significantly related to FEV1; however, a one-cigarette increase compared to a participant’s usual level of smoking at a given visit decreased FVC by an average of 0.15percent at that visit (p less than 0.05).

Conclusion: Lung function, assessed by spirometry, improved significantly from baseline despite the majority of users continuing to smoke cigarettes. E-cigarettes may result in an improvement in lung function with long-term use and reduction of cigarette intake. The safety of long-term use of e-cigarettes has yet to be established. We will continue to collect data on participants up to one year from enrollment.

JUSTIFICATION: This project provides information on potential health consequences of e-cigarette use.

FUNDING: State of Nebraska Cancer and Smoking Disease Research Program

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PA13-4
ADOPTION OF E-CIGARETTES DURING TOBACCO DEPENDENCE TREATMENT IS ASSOCIATED WITH POORER QUIT OUTCOMES

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Anecdotal evidence suggests that electronic cigarettes (e-cigs) are being used as a cessation aid by many smokers even though their safety and efficacy in this regard has yet to be sufficiently empirically determined. Other reports indicate that e-cigs are primarily used concurrently with traditional cigarettes. We examined baseline characteristics and 3-month outcomes of smokers who reported adopting e-cigs while enrolled in a smoking cessation program in their primary care clinic that provides up to 26 weeks of brief behavioural counseling and individualized dosing of nicotine replacement therapy at no cost. We hypothesized that concurrent e-cig use would interfere with the cessation treatment offered and result in poorer quit outcomes. Participants completed assessments and were asked about e-cig use at baseline and again at 3-months post-enrollment. Bivariate analysis was used to examine the association between e-cig adoption and baseline sample characteristics. Univariate logistic regression was used to examine the association between e-cig adoption and 3-month quit outcomes, as well as reduction in cigarettes smoked. The study included 3073 participants.
of whom 363 (11.8%) began using e-cigs in the first 3 months of treatment (but were not using at baseline). E-cig adopters were more likely to be younger and female, with no significant differences in baseline HSI scores, cigarettes per day, education level, employment status, income, quit confidence, and motivation to quit between e-cig adopters and non-adopters. At a 3-month follow-up, 50.8% of e-cig adopters were using NRT. E-cig adopters were less likely to report being quit 3 months post enrollment (OR= 0.682, p=0.002, 95%CI=0.536-0.867), and had no significant effect in smoking reduction (OR=1.033, p=0.785, 95%CI=0.820-1.290). E-cig adoption seems to negatively affect cessation outcomes and provides no benefit as a harm reduction tool for clients receiving a combination of pharmacological and behavioural smoking cessation treatment in primary care settings. Many patients appear to be using e-cigs, NRT and traditional cigarettes concurrently, which may increase the risk of nicotine toxicity.

JUSTIFICATION: Clinicians treating patients for tobacco dependence using NRT may want to ask about concurrent use of e-cigarettes

FUNDING: Support for this research was provided by the Ontario Ministry of Health and Long-Term Care, Health Promotion Branch

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PA13-5
HOW HAS THE AVAILABILITY OF SNUS INFLUENCED CIGARETTE SMOKING IN NORWAY? IS THERE A TRANSFER VALUE FROM SNUS TO E-CIGARETTES?
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Background: In Norway, low-nitrosamine smokeless tobacco (snus) is allowed to compete with cigarettes in the nicotine market. This happened when alternative nicotine products—such as e-cigarettes—are allowed to be used. This delay is due to the Registration Act, which requires new nicotine products to be approved before they can be marketed. In Norway, snus is one of the nicotine products that are registered.

Methods: We analysed consumption data from registered and unregistered supply sources of tobacco. We calculated quit-smoking ratios across snus use status in nine datasets comprising a total of 19,269 ever-smokers. Trends in snus use and smoking were derived from time-series of annual, cross-sectional, nationally representative surveys for the period 1985–2013.

Results: The market share for snus increased from 4% in 1985 to 28% in 2012, but overall tobacco consumption decreased by 20.3% over this period. Snus was the most common method for smoking cessation. Compared with smokers with no experience of using snus, the quit ratio for smoking was significantly higher for daily snus users in seven of the nine datasets analysed. Among young male adults, the prevalence of smoking (daily + occasional) was reduced from 50% in 1985 to 21% in 2013. Over the same period, use of snus increased from 9% to 21%. We found a positive correlation between snus use and smoking reduction (OR=1.033, p=0.785, 95%CI=0.820-1.290). E-cig adoption seems to negatively affect cessation outcomes and provides no benefit as a harm reduction tool for clients receiving a combination of pharmacological and behavioural smoking cessation treatment in primary care settings. Many patients appear to be using e-cigs, NRT and traditional cigarettes concurrently, which may increase the risk of nicotine toxicity.

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PA14-1
TIMING OF NICOTINE LOZENGE ADMINISTRATION TO MINIMIZE TRIGGER INDUCED CRAVING AND WITHDRAWAL SYMPTOMS
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Nicotine lozenge is often recommended to be used on an as needed basis with smokers generally told to use this product when craving or withdrawal symptoms occur. There is a delay however between lozenge use and when substantial nicotine concentrations are reached. For smokers experiencing acute symptoms of craving or withdrawal, this delay may be too long to prevent relapse. The purpose of this study was to determine if nicotine lozenge use prior to a common smoking trigger (i.e. a stressful task) can decrease craving and withdrawal symptoms observed subsequent to the task. In this study, 84 subjects completed two laboratory sessions. At one session, nicotine lozenge was given immediately after a stressor (to approximate current recommended use i.e., after craving and withdrawal symptoms occur) and at the other session subjects were randomized to receive nicotine lozenge either a) immediately prior to: b) 10 minutes; c) 20 minutes; or d) 30 minutes prior to the stressor. Craving and withdrawal symptom severity were measured via the Minnesota Nicotine Withdrawal Scale and the Questionnaire of Smoking Urges (QUIS). Relative to post stressor lozenge use, the increase in withdrawal symptoms from immediately prior to the stressor to post-stressor was smaller when lozenge was used immediately prior to (p=0.03) and 10 minutes prior to (p=0.044) the stressor. Results were similar for QSU when subjects used the lozenge immediately prior to the stressor (p=0.03) and for factor 1 of the QSU when lozenge was used 10 minutes prior to the stressor (p=0.028). Relative to post-stressor lozenge use, increases in scores from 30 minutes prior to the stressor (i.e. baseline) to post stressor were smaller for the QSU in all experimental conditions (all p values <0.01 for QSU factor 1 and <0.04 for QSU factor 2) and for withdrawal symptoms for all experimental conditions except for lozenge immediately prior to the stressor (all p values <0.03). Administering the nicotine lozenge prior to a smoking trigger can decrease trigger induced craving and withdrawal symptoms. Future studies are needed to determine if such use would increase cessation rates.

JUSTIFICATION: Data from this can lead to development of methods by which medicinal nicotine can be used more effectively.

FUNDING: This research was supported by Grant R21DA029689 to the first author from the National Institute on Drug Abuse and Grant M01-RR00400 from the General Clinical Research Centers program of the National Center for Research Resources.

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PA14-2
CORRELATES OF ADHERENCE TO VARENICLINE AMONG HIV+ SMOKERS: A PATH ANALYSIS
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Introduction: Few studies have evaluated the delivery of smoking cessation interventions among people living with HIV/AIDS. We conducted a NIDA-funded three arm pilot RCT to assess the effect of cell phone-delivered counseling and/or a text message intervention on varenicline adherence and smoking cessation among a HIV+ clinic-based population. The three arms were: 1) usual care (UC), 2) UC + text messages (TM), and 3) UC+TM+ 7 sessions of motivational interviewing-focused telephone counseling on adherence to varenicline at end of

FUNDING: Supported by the National Institute on Drug Abuse, National Institute on Aging, and the National Institute of Mental Health.

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2015 Paper Sessions
The tobacco cessation field faces a serious challenge: to increase the quit rate at the population level. This study examined data from two nationally representative U.S. Current Population Surveys—Tobacco Use Supplements (CPS-TUS 2003 and 2010-2011) to examine whether adding varenicline to the growing list of smoking cessation aids increased the population cessation rate. Survey respondents were adults (18+ years) who were smoking 12 months prior to the survey (N=34,869 in 2003, N=27,751 in 2010-2011). The main outcome was the use of cessation pharmacotherapies among smokers who tried to quit smoking in the previous year. Pharmacotherapies included varenicline, bupropion and nicotine replacement therapies (such as the patch, gum, spray, inhaler, and lozenge). Annual cessation rates were calculated for 2003 and 2010-2011 by determining the percentage of those who successfully quit smoking for at least 3 months among those who were smoking 12 months before the interview. Varenicline use increased significantly from 0% in 2003 to 10.9% in 2010-2011. During that same time, use of nicotine patches and nicotine spray and inhaler decreased significantly. The use of any pharmacotherapy increased only by 2.4 percentage points. Users of varenicline were more likely to have received physician advice than users of other pharmacotherapies, 75.6% vs. 62.2% (P <0.01). Those who used varenicline also had a longer relapse in the first three months of a quit attempt, but the difference dissipated after that. The change in the annual cessation rate from 2003 to 2010-2011 was negligible, from 4.5% [95% CI 4.2-4.8] in 2003 to 4.7% [95% CI 4.4-5.0] in 2010-2011. In summary: despite a dramatic increase in the use of varenicline, there was no meaningful change in the population cessation rate. The addition of varenicline to the list of approved cessation aids has mainly led to the displacement of other established therapies. This demonstrates that the population impact of a new therapy is a function of more than the efficacy or the reach of the therapy.

JUSTIFICATION: This study will help develop policy that has population-level impact on smoking cessation.

FUNDING: This study was supported by the National Cancer Institute of the National Institutes of Health under the State and Community Tobacco Control Initiative, Award Number U01CA154280. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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PA14-4 VARENICLINE AS A CAUSE OF SUICIDAL OUTCOMES: A SYSTEMATIC REVIEW

John R Hughes*, University of Vermont

Post-marketing analyses and case reports have associated varenicline use with suicidal behaviors. This article reviews post-marketing analyses, case reports, clinical trials, uncontrolled observational studies, controlled observational studies, and studies in smokers with psychiatric problems that have tested this association. The author searched the literature for relevant reports via computer and other searches. The heterogeneity of methods and outcomes prevented a meta-analysis; instead a qualitative, systematic review was undertaken. Two pooled analyses of 10 and 17 placebo-controlled trials failed to find more suicidal outcomes in the varenicline condition. Seven large uncontrolled observational studies reported low rates of suicide outcomes in varenicline users (< 0.1%), and one study reported a higher rate (6%). Five large controlled observational studies did not find more suicide outcomes in varenicline users than in those using prescribed bupropion or over-the-counter nicotine medications. Small placebo-controlled trials and observational studies of smokers with current psychiatric problems did not find varenicline was associated with suicidal outcomes. Among the more valid study designs (pooled analyses of placebo controlled trials or large controlled observational studies), there is consistent evidence that varenicline either does not cause increased suicide outcomes, or if it does, the effect is very small. Warnings to consumers and clinicians should reflect, not just the results of post-marketing studies, but the results of the more valid research designs.

JUSTIFICATION: These data suggest the warning on labeling of varenicline should be changed.

FUNDING: No Funding

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PA14-3 POPULATION IMPACT OF ADDING VARENICLINE TO APPROVED PHARMACOTHERAPY FOR SMOKING CESSION

Shu-Hong Zhu, PhD,* Sharon E. Cummins, PhD, Anthony C. Gamst, PhD, Shiushing Wong, PhD, Tyson Ikeda, MD, Department of Family and Preventive Medicine, University of California, San Diego

The smoking cessation field faces a serious challenge: to increase the quit rate at the population level. This study examined data from two nationally representative U.S. Current Population Surveys—Tobacco Use Supplements (CPS-TUS 2003 and 2010-2011) to examine whether adding varenicline to the growing list of smoking cessation aids increased the population cessation rate. Survey respondents were adults (18+ years) who were smoking 12 months prior to the survey (N=34,869 in 2003, N=27,751 in 2010-2011). The main outcome was the use of cessation pharmacotherapies among smokers who tried to quit smoking in the previous year. Pharmacotherapies included varenicline, bupropion and nicotine replacement therapies (such as the patch, gum, spray, inhaler, and lozenge). Annual cessation rates were calculated for 2003 and 2010-2011 by determining the percentage of those who successfully quit smoking for at least 3 months among those who were smoking 12 months before the interview. Varenicline use increased significantly from 0% in 2003 to 10.9% in 2010-2011. During that same time, use of nicotine patches and nicotine spray and inhaler decreased significantly. The use of any pharmacotherapy increased only by 2.4 percentage points. Users of varenicline were more likely to have received physician advice than users of other pharmacotherapies, 75.6% vs. 62.2% (P <0.01). Those who used varenicline also had a longer relapse in the first three months of a quit attempt, but the difference dissipated after that. The change in the annual cessation rate from 2003 to 2010-2011 was negligible, from 4.5% [95% CI 4.2-4.8] in 2003 to 4.7% [95% CI 4.4-5.0] in 2010-2011. In summary: despite a dramatic increase in the use of varenicline, there was no meaningful change in the population cessation rate. The addition of varenicline to the list of approved pharmacotherapies has mainly led to the displacement of other established therapies. This demonstrates that the population impact of a new therapy is a function of more than the efficacy or the reach of the therapy.

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2014 found widespread misuse of NRT patches. The most common method for misuse was shredding patches and rolling the strips with tea leaves, or soaking patches with water and tea leaves then using tea leaves in place of tobacco. We investigated the methods of misuse to evaluate if nicotine was effectively liberated and provide a comparison with normal tobacco combustion. We found that nicotine was liberated when shredded patches were included in a makeshift cigarette. Soaking or boiling patches in water was ineffective; however if boiled with coffee, the nicotine was liberated and absorbed by tea leaves. Both nicotine and caffeine were then available in inhalable form. These findings suggest that programs or interventions which provide subsidised or free NRT patches to populations who have no/restricted access to tobacco and other nicotine products should include appropriate strategies to minimise the potential for misuse.

JUSTIFICATION: This research will inform guidelines and policies for providing free or subsidised nicotine replacement therapy for people who are incarcerated or near the home (OR: 0.96; 95% CI:0.93,0.99).

Methods: A cross-sectional design was used to assess home smoking ban, smoking status, cigarettes smoked in the home, and barriers and benefits to attaining a smoke-free home among N=154 caregivers who either were current smokers or who reported friends/family smoking inside or near their home. We dichotomized home smoking rules as: complete ban (n=73) vs. partial or no ban (n=81).

Results: Home smoking ban status did not vary by gender (Female: 86%), age (Mean: 32 yrs), number of children at home (2.2), race/ethnicity (Black: 40%, Hispanic: 23%, White: 16%, Asian: 11%, mixed race/other: 8%), education level (High school or less: 62%), or smoking status (current smokers: 87%). Those with a full ban had longer quit attempts (p=0.02), smoked fewer cigarettes around the home (p=0.003), had more knowledge on SHS, and did not smoke in the car (p=0.012). Those with a partial/no ban were more concerned about SHS and child health (p=0.014), and had less confidence in preventing children’s exposure to SHS (p=0.001). Logistic regression used to predict complete ban status found that 24% of the model variance was explained by: confidence in quitting (OR: 0.82; 95% CI: 0.67,1.02), concern about SHS and child health (OR: 0.44; 95% CI:0.26,0.74), e-cigarette use (OR: 3.3; 95% CI:0.92,11.63), and number of cigarettes smoked in or near the home (OR: 0.98; 95% CI:0.93,0.99).

Conclusions: Less than half of parents from low income communities reported a complete home smoking ban. Observed correlates—including confidence in quitting, concerns about children’s health, smoking outside the home—provide useful opportunities to engage parents on adopting a home smoking ban, via interventions delivered through Head Start.

JUSTIFICATION: Findings from this work will facilitate the implementation of tobacco interventions in Head Start sites, to increase engagement among smokers from disadvantaged communities

FUNDING: American Legacy Foundation

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PODIUM PRESENTATION 1: SECONDHAND SMOKE

PA15-1
FACTORS ASSOCIATED WITH ADOPTION OF HOME SMOKING BANS AMONG PARENTS FROM HEAD START PROGRAMS


Background: Despite decades of tobacco control efforts, low-income communities continue to share a disproportionate burden of high smoking prevalence and poorer health outcomes, including SHS exposure among children. National programs such as Head Start offer a setting through which tobacco interventions can be delivered. Survey data from Head Start Boston families were examined to understand factors associated with adoption of a home smoking ban.

Methods: The methods of misuse to evaluate if nicotine was effectively liberated and provide a comparison with normal tobacco combustion. We found that nicotine was liberated when shredded patches were included in a makeshift cigarette. Soaking or boiling patches in water was ineffective; however, if boiled with coffee, the nicotine was liberated and absorbed by tea leaves. Both nicotine and caffeine were then available in inhalable form. These findings suggest that programs or interventions which provide subsidised or free NRT patches to populations who have no/restricted access to tobacco and other nicotine products should include appropriate strategies to minimise the potential for misuse.

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JUSTIFICATION: Findings from this work will facilitate the implementation of tobacco interventions in Head Start sites, to increase engagement among smokers from disadvantaged communities

FUNDING: American Legacy Foundation

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PODIUM PRESENTATION 1: SECONDHAND SMOKE

PA15-2
SMOKE-FREE SCHOOL POLICY AND EXPOSURE TO TOBACCO SMOKE POLLUTION: A QUASI-EXPERIMENTAL ANALYSIS

Sunday Azagba1, Ryan David Kennedy2, Neil Bruce Baskerville1, Propel Centre for Population Health Impact, University of Waterloo School of Public Health and Health Systems, 1Propel Centre for Population Health Impact, University of Waterloo, Johns Hopkins Bloomberg School of Public Health, Institute for Global Tobacco Control, Department of Health, Behavior & Society

Background: Tobacco control prevention efforts are important to protect people from exposure to dangerous tobacco smoke, support cessation and reduce tobacco-use initiation. While smoke-free laws have been a widespread tobacco control strategy, little work has been done to understand or evaluate the impact of smoke-free school ground policies. The objective of the current study is to evaluate the impact of provincial smoke-free school ground policies on youth-reported exposure to tobacco smoke on school property.

Methods: This study used a nationally representative sample of 16,693 youth aged 15-18 from the 2005-2012 Canada Tobacco Use Monitoring Survey. A quasi-experimental design was used to evaluate the impact of smoke-free school ground policies on exposure to tobacco smoke.

Results: Approximately half (49%) of respondents reported TSP exposure on a school property in the past month. Smoke-free school policy had a statistically significant effect on TSP exposure. In particular, the adoption of smoke-free school reduced the probability of TSP exposure by about 8 percentage points. Respondents who were smokers were more likely to be report being exposed to TSP than non-smokers. Likewise, those living in urban areas had higher probability of being exposed to TSP than those living in rural parts of Canada.

Conclusions: Reported exposure to tobacco smoke did decrease after the introduction of smoke-free ground policies; however, almost half of high-school aged youth report exposure in the last month. Across Canada, provincial health authorities as well as school administrators may need to assess the implementation of these smoke-free policies and improve enforcement strategies to further reduce exposure to dangerous TSP.

JUSTIFICATION: Health authorities as well as school administrators may need to assess the implementation of smoke-free school policies and improve enforcement strategies.

FUNDING: SA & NBB–financial support to work on this manuscript was provided from a Major Program grant from the Canadian Cancer Society Research Initiative (CCSRI grant #701019). RDK–financial support to work on this manuscript was provided from the Propel Centre for Population Health Impact at the University of Waterloo. The study sponsors did not play any role in the study design, collection, analysis or interpretation of the data, or contribute in any way to the writing of the report or the decision to submit this publication.

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PA15-3
EXPLORING CHILD WELFARE WORKERS’ RECEPTIVENESS TO ADDRESSING ETS AND TOBACCO USE IN THEIR CLIENTS

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In-home service providers, such as child welfare workers, nurses, social workers, hospice workers, care managers and other health care professionals, face many occupational safety concerns on each occasion that they enter a client’s residence. Exposure to environmental tobacco smoke (ETS) is becoming one of the more prominent occupational safety concerns among the risks that in-home workers may encounter. This cross-sectional study administered questions to child welfare workers (N= 87) employed in a mid-western child welfare agency to assess knowledge, attitudes, and receptiveness to provide cessation services (Delucchi, Tajima & Guydish, 2009) and the knowledge of the hazards of smoking and ETS. Eighty-five percent of participants did not feel they had the required skills to help their clients quit smoking. Fifty three percent of participants knew resources available in the community to help clients quit smoking. Participants reported approximately ½ of the children and ½ of the families on their caseloads live with someone who smokes. Further, 93% reported their clients are not concerned about smoking and 89% reported that those clients who do smoke do not want to quit smoking. Seventy two percent of participants reported that if they counseled all of their clients who smoke, only 10% would try to quit smoking for more than six months. Seventeen percent of respondents were “very confident” in their ability to treat nicotine dependence if they were given training. The majority of participants (79%) agreed that the hazards of second-hand smoke have been clearly demonstrated. However, if clients smoke around the child welfare worker, 71% of the workers never or occasionally asked the client not to smoke around them. If clients smoke in their house, only 23% of the respondents attempted to have a meeting with clients elsewhere. The majority of participants did not address smoking with their clients and did not make efforts to reduce their exposure to ETS. Determining effective methods to reduce ETS exposure among child welfare workers is critical to the health and well-being of this group of professionals.

JUSTIFICATION: Child Welfare workers could be trained to address smoking cessation and ETS in their families and children that they serve and in turn reduce their occupational ETS exposure.

FUNDING: National Institute for Occupational Safety and Health Pilot Research Project Training Program of the University of Cincinnati Education and Research Center Grant #T42/CH088432-08 and the School of Social Work, College of Allied Health, University of Cincinnati.

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PA15-4
SMOKE EXPOSURE AND ATTITUDES REGARDING SMOKE EXPOSURE IN SUPPORTIVE HOUSING

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Background: Smoking prevalence among the unhoused is 68-80% with serious health consequences. Housing-first communities do not require abstinence from drugs/alcohol for lodging, including cigarettes. Little is known about second- and third-hand smoke (SHS/THS) exposure and attitudes toward smoking in these communities.

Methods: In a Bay Area housing first community with 58 apartments and a drop-in service for day clients, we surveyed residents, day clients, and staff; measured urinary cotinine and NNAL levels in nonsmoking adult and child residents and staff, and collected air and dust samples from private and common areas (assays in process, will be available for presentation).

Results: Surveyed residents were 20 nonsmoking adults (10 parents, age M=44 sd=16 years) and 10 children (age M=10 sd=4, range 5-17 years) living at the facility for 4 sd=3 years. Most adults did not allow smoking in their home (16/20) and stated homes were free of smoke (15/20). All adults were aware of what SHS was and 15/20 (75%) believed there was no safe level of exposure; 14/20 (70%) favored a law to prohibit smoking in supportive housing, one opposed and 5 had no opinion. All staff were aware of SHS harms; 5/6 (83%) favored a residential smoking ban, 1 opposed and 2 had no opinion. Nearly all (97%) nonsmoking adult/child residents and staff had detectable urine cotinine (>0.05 ng/ml) indicating recent SHS exposure: values averaged 1.79 sd=3.24 ng/ml (adults), 2.3 sd=4.8 ng/ml (children) and 0.93 sd=1.26 (staff). NNAL (an known carcinogen) was detected (>25 pg/mL) in 86% of samples. Among 50 surveyed day clients, 80% of whom smoked (70% male, age M=51 sd=9 years), 12% had never heard of SHS, 39% felt there are safe levels of SHS exposure; 21% opposed a smokefree policy in supportive housing, 23% had no opinion, and 56% supported such a policy.

Discussion: Nonsmoking residents and staff in a housing first community had high levels of SHS exposure and favored smokefree policies. While most day clients smoked, a majority expressed support for a smoking ban. Best practices to reduce SHS/THS exposure and treat tobacco dependence in multiply addicted residents and visitors are needed.

JUSTIFICATION: Results inform smoking policies, especially in supportive housing with the socioeconomically disadvantaged.

FUNDING: Miller Foundation Award from Psychiatry and Behavioral Sciences, Stanford University School of Medicine; California Consortium on Thirdhand Smoke, TRDRP 20PT-0184; NIH P30 DA012393.

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PA15-5
IMPACT OF U.S. SMOKE-FREE LAWS ON RESTAURANT AND BAR EMPLOYMENT, 1990-2012

Paul R. Shafer, MA*, Public Health Policy Research Program, RTI International

Hospitality and tobacco industry lobbyists have fought indoor smoke-free air laws in restaurants and bars at state and local levels based on claims that enactment of such laws would yield significant losses in revenue for these establishments. Several studies at the state and local levels have provided evidence that smoke-free air laws have not adversely impacted restaurants and bars; however, there are currently no estimates of the impact of these laws nationally. This study estimates the relationship between restaurant and bar employment and percentage of U.S. population covered by smoke-free air laws using a dynamic instrumental variables panel model. Employment data were obtained from the Quarterly Census of Employment and Wages. Restaurant employment was not related to...
percent of population covered by restaurant smoke-free laws. Bar employment was negatively related to percent of population covered by bar smoke-free laws (b=-0.00015, p=0.014), indicating a 0.015% decline in bar employment for each additional 1% of the population covered by a bar smoke-free law. However, these separate models do not account for possible spillover effects in areas with a law covering only restaurants or bars. Combined restaurant and bar employment is positively related to percent of population covered by restaurant smoke-free laws (b=0.000177, p=0.003) and negatively related to percent covered by bar smoke-free laws (b=-0.00010, p=0.003). These results predict a 0.2% increase in restaurant employment and a 0.4% decline in bar employment, if the US were to go completely smoke-free, based on restaurant (76.5%) and bar smoke-free law coverage (64.5%) in 2012. Restaurant employment in fourth quarter 2012 (4.7 million) was more than ten times that of bar employment (348 thousand), indicating that the projected increase in restaurant employment would more than offset the projected decrease in bar employment. Based on these findings, there is no evidence to suggest that smoke-free air laws have had a meaningful adverse impact on overall restaurant and bar employment in the United States or that one would materialize if the US were to go smoke-free nationally.

**JUSTIFICATION:** This research provides policymakers with further evidence that smoke-free air laws do not have a meaningful effect on restaurant or bar employment, allowing them to protect employees and patrons from the dangers of secondhand smoke without sacrificing jobs.

**FUNDING:** No funding to declare for this study.

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**PODIUM PRESENTATION 1: BIOMARKERS OF EXPOSURE AND TOBACCO USE**

**PA16-1**

**COTININE CONFIRMED DIFFERENCES IN CIGARETTE SMOKING BETWEEN NON-HISPANIC WHITES AND NON-HISPANIC BLACKS BY GENDER AND AGE GROUP, UNITED STATES, 2001-2010**

Saida Sharapova, MD, MPH**, Ralph S. Caraballo, PhD†, Katherine J. Asman, MSPH, †Office on Smoking and Health, Centers for Disease Control and Prevention, ‡Statistics and Epidemiology Unit, RTI International

**Objective:** When compared to non-Hispanic (NH) whites, NH blacks have lower prevalence of cigarette smoking among youth, but higher among adults. Using self-reported and biomarker data, we examined whether disparities in smoking prevalence between NH blacks and NH whites persisted after accounting for non-disclosure.

**Methods:** We used NHANES 2001-2010 data to assess cotinine-confirmed cigarette smoking status (self-reported smoking on at least 1 day in the past month and serum cotinine (ng/mL) above the following established thresholds: 12-19 year old NH white males (8.78) and females (2.95), NH black males (6.01) and females (2.81); ≥20 years: NH white males (6.79) and females (4.73), NH black males (13.3) and females (5.92). Weighted prevalence estimates were calculated for NH blacks and NH whites by gender and three age groups (12-17, 18-25, and 26+ years). Subgroup differences were tested at 5% significance level.

**Results:** Smoking prevalence among 12-17 years old NH white boys (18.0%) and NH black boys (14.6%) was statistically similar ([p=0.05]); among girls, NH white girls had a higher smoking prevalence (20.7%) than NH black girls (10.2%), ([p<0.001]). In the 18-25 years age group, smoking prevalence in NH black men (47.4%) and NH white men (53.8%) were statistically similar ([p=0.10], and again, NH white young adult women had higher smoking prevalence (39.3%) than NH black women (32.1%) ([p=0.0253]). In adults 26 years or older, NH black men had higher smoking prevalence (43.6%) than NH white men (33.8%) ([p<0.0001]), and NH black women had higher smoking prevalence (30.2%) than NH white women (22.1%), ([p<0.0001]).

**Conclusion:** The higher smoking prevalence among NH white compared to NH black adolescents and young adults and higher prevalence in NH black adults compared to NH white adults is not the result of non-disclosure.
Tiffany H. Seyler*, Elizabeth A. Cowan, Jenny G. Kim, Roy de Castro, Benjamin C. Blount, Lancing Wang, Tobacco and Volatiles Branch, National Center for Environmental Health, Centers for Disease Control and Prevention

Cigarette smoking is a significant risk factor for cancer and cardiovascular disease. Additionally, exposure of nonsmokers to secondhand tobacco smoke has been linked to increased risk of cancer and respiratory illnesses. The aromatic amine 2-aminonaphthalene (2-AMN) is a human bladder carcinogen that is found in tobacco smoke; urinary 2-AMN is an effective biomarker of 2-AMN exposure. We measured 2-AMN in urine from 1,988 participants (≥12 years-old) in the Centers for Disease Control and Prevention’s National Health and Nutrition Examination Survey 2005–2006. The measurements of 1,276 participants (who had both serum cotinine and cigarette per day for data regression analysis) were used in univariate analysis and regression models to determine 2-AMN exposure by demographic groups and by tobacco smoking status. In univariate analysis, urinary 2-AMN was significantly higher in smokers (serum cotinine >10 ng/mL) than in non-smokers (serum cotinine ≤10 ng/mL): geometric mean (GSE) 4.53 (0.36) vs. 1.09 (0.04) ng/g creatinine (p-value <0.0001). We ran linear regression models stratified by smoking status and containing predictors for sex, age, race/ethnicity, urinary creatinine, and either serum cotinine (non-smokers) or self-reported cigarettes-per-day (CPD) smoked in the five days preceding the NHANES physical examination (smokers). In the non-smoker regression model, non-Hispanic blacks and Mexican-American had significantly higher urinary 2-AMN than non-Hispanic whites. In the smoker regression model, urinary 2-AMN was significantly higher among participants smoking more cigarettes (11–20 CPD (1 pack), 21–30 CPD (1.5 packs), and more than 30 CPD (>1.5 packs)) as compared to those smoking fewer cigarettes (1–10 CPD (0.5 pack)). 2-AMN is also a good biomarker for cigarette users, with the concentration of 2-AMN significantly higher in cigarette users than in non-users or smokeless tobacco product users.

JUSTIFICATION: These results are the first characterization of urinary 2-AMN in a representative sampling of the U.S. population, and they may be used as a baseline for future evaluation of trends in 2-AMN exposure from tobacco smoke in the US population.

FUNDING: No Funding

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PA16-5
USING NASAL GENE EXPRESSION TO CAPTURE THE PHYSIOLOGIC RESPONSE TO SECONDHAND SMOKE IN CHILDREN AND ADULTS

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Background: Airway epithelial gene expression is altered in active smokers and can serve as a biologic indicator of tobacco smoke exposure. Here we sought to examine whether nasal gene-expression profiling might be used to monitor the host response to secondhand smoke (SHS) inhalation.

Methods: At Boston University, nasal epithelial brushings were collected from healthy non-exposed, passively exposed, and actively exposed adults (n=52) whose smoking statuses were obtained through self-report and confirmed via serum cotinine. A similar protocol was implemented at Columbia University and Johns Hopkins University, where enrolled subjects included children with and without household SHS-exposure (n=104). In addition to saliva cotinine levels, objective levels of exposure (e.g. UVPM, PM2.5) were measured using residential and personal monitoring devices. RNA was isolated and processed for hybridization onto Affymetrix microarrays. Linear modeling was employed for differential expression analysis and the functional annotation of genes with SHS-associated expression profiles was conducted using Enrichr. The comparison of profiles across independent cohorts as well as previously published smoking-related profiles was performed using Gene Set Enrichment Analysis (GSEA).
Results: We have identified 325 and 275 genes as differentially expressed with SHS exposure in adults and children, respectively (p<0.01). These independently derived signatures are significantly concordant with each other, as well as with previously published profiles of active smoking (GSEA FDR<0.05). Genes whose expression is higher in children exposed to SHS are enriched for pro-apoptotic genes, and genes involved in alkaloid biosynthesis or limonene and pinene degradation.

Conclusion: Our results suggest that like mainstream tobacco smoke, the inhalation of SHS induces changes throughout the airway that can be assessed via nasal gene-expression profiling. We intend to connect this novel exposure assessment approach with population-based studies to identify factors that contribute to variation in the biologic response to to SHS, and to monitor the physiologic benefits of exposure minimization efforts.

JUSTIFICATION: As nasal gene-expression profiling can capture the physiologic response to inhaled exposures including low levels of secondhand smoke, this non-invasive tool may have substantial utility in population-based studies for assessing the biologic consequences of interventions that seek to modify exposure to inhaled pollutants.

FUNDING: NIH/NIEHS: 3U01ES016035-04S1, 1R01ES020425-01
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PA17-2
RACIAL AND ETHNIC DIFFERENCES IN SMOKING-RELATED BELIEFS AND SMOKING SUSCEPTIBILITY AMONG US YOUTH NONSMOKERS

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Background: Smoking prevalence among youth varies by race/ethnicity. Little is known about whether smoking-related beliefs, which are known predictors of youth smoking, vary by race/ethnicity, and if so, what may explain the variation.

Methods: We examined smoking susceptibility and smoking-related beliefs among a nationally representative sample of nonsmoking middle and high school students (N = 21,931) and its variation by race/ethnicity using weighted regression models.

Results: Hispanic youth were more susceptible to smoking compared to White youth (adjusted odds ratio [AOR] 1.56, p< 0.05) after adjusting for age, gender, and living with tobacco user. No differences in smoking susceptibility were detected between White youth and other races/ethnicities. Compared to White youth, Hispanic youth were less likely to deny that smoking makes someone looks cool (AOR 0.84); to deny that smokers have more friends (AOR 0.70); and to strongly agree that all tobacco products are dangerous (AOR 0.86) (ps< 0.05). These beliefs were associated with smoking susceptibility (ps< 0.05). Hispanics were less likely to see tobacco advertising and promotions on internet, in magazines and newspapers, and at point-of –sale, and more likely to receive parental guidance against tobacco use (ps< 0.05). They were more likely to receive promotional materials from tobacco companies and had higher perceived norms of smoking prevalence among grade-level students (ps< 0.05). Differences in smoking susceptibility and smoking-related beliefs remained significant between Hispanic and White youth (ps< 0.05) after adjusting for these factors, implying that they only explained part of racial/ethnic disparities. This suggests other unmeasured variables may explain Hispanic’s positive smoking-related beliefs and high smoking susceptibility.

Conclusions: Smoking-related beliefs vary by race among US youth nonsmokers. Addressing these beliefs in minority populations may reduce tobacco-use disparities. Future studies should explore factors that drive differences in smoking-related beliefs.

JUSTIFICATION: This will inform public health research and policies to address smoking-related beliefs in minority populations, which may reduce tobacco-use disparities.

FUNDING: This research was supported by the Division of Intramural Research of the NIH, National Institute on Minority Health and Health Disparities.

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PA17-1
HARDCORE SMOKING IN A MIDWESTERN U.S. COMMUNITY SAMPLE, 1993 TO 2011

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Introduction: One explanation for the recent lack of progress in reducing U.S. adult smoking rates is that the smoking population has become hardened so that individuals who continue to smoke despite increasing pressures to quit are resistant to quitting or less able to stop smoking. Previous studies testing the hardening hypothesis were cross-sectional and used different definitions of hardcore smoking. The current study analyzed longitudinal trends in hardcore smoking from 1993 to 2011 and tested socio-demographic predictors of hardcore smoking.

Methods: Participants were adults who reported smoking at four waves of data collection from 1993 to 2011. Six definitions of hardcore smoking were created: smoking more than 15 cigarettes per day (definition 1), no quit attempt in the past year (definition 2), no plan to quit within the next year (definition 3), smoke within the first 30 minutes of waking up (definition 4), a combination of definitions 3 and 4 (definition 5), and a combination of definitions 1, 2, and 3 (definition 6). Generalized linear mixed models were used to test age, sex, educational attainment, and survey wave as predictors of the six hardcore smoking variables.

Results: After controlling for socio-demographic factors, the odds of hardcore smoking decreased over time for definition 3 (p <.001), definition 5 (p <.001), and definition 6 (p = .002) but increased over time for definition 4 (p = .031). Smokers with lower educational attainment had greater odds of meeting all definitions of hardcore smoking (all p-values ≤ .006).

Conclusions: The proportion of hardcore smokers defined by low motivation to quit decreased over time, but the proportion defined by nicotine dependence increased over time, suggesting that how hardcore smoking is defined is an important consideration. Smokers with lower educational attainment are at increased risk for hardcore smoking.

JUSTIFICATION: Because hardcore smoking is more likely among smokers with lower educational attainment, further progress in reducing morbidity and mortality associated with cigarette smoking will require targeted interventions that reduce smoking among low socioeconomic status groups.

FUNDING: This work was supported by the National Institute on Drug Abuse at the National Institutes of Health (DA013555).

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PODIUM PRESENTATION 1: TRENDS IN SMOKING BEHAVIOR
Consulting, Inc. contractor to: Office on Smoking and Health, Centers for Disease Control and Prevention, Emory University, 3RTI International, 4
HEALTH INTERVIEW SURVEY, 1997-2012
IN QUITTING AND QUIT ATTEMPTS BY AGE: THE NATIONAL HEALTH INTERVIEW SURVEY, 1997-2012

PA17-3

Gillian L. Schauer1,2, Cerie James3, Kat Asman4, Ann M. Malarcher5, Carter Consulting, Inc. contractor to: Office on Smoking and Health, Centers for Disease Control and Prevention, 1Department of Behavioral Sciences & Health Education, Emory University, 2RTI International, 3Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention

Quitting smoking at any age confers health benefits. However, studies have suggested that quitting by age 35 leads to mortality rates similar to never smokers. Accordingly, we aimed to determine how the average and median ages of quitting have changed over time. We used data from the 2012 National Health Interview Surveys, annual, cross-sectional, household interview surveys. We computed the average and median age of quitting for two Healthy People 2020 cessation measures—quit attempts and successful recent quitting. Data came from 113,599 adult cigarette smokers participating in the 1997-2012 National Health Interview Surveys, annual, cross-sectional, household interview surveys. We computed the mean and median age of quitting by two-year period, defining recent successful quitting as being quit between 6-12 months. Trends in quit attempts and successful quitting by age were computed using orthogonal polynomial logistic regression models to test for linearity and significance. In the most recent two years of surveillance, people ages 45-64 years comprised the largest proportion of smokers (38.6%) and people ≥65 years comprised the smallest (7.9%). No significant time trends were found in the average age of quitting (40.0 years in 1997-1998, and 40.7 years in 2011-2012, \( p = 0.80 \)), or in the median age of quitting (35.9 years in 1997-1998, 36.9 years in 2011-2012, \( p = 0.64 \)). The percentage of smokers making a past year quit attempt increased significantly over time among those ages 25-34, 35-44, and 45-64 years, and the percentage of smokers quitting successfully each year increased among those ages 25-34 and 35-44 years. In all years, there was an inverse relationship between age and quit attempts. Although the average age of quitting has not changed over time, increases in quit attempts and quitting are occurring among those in the middle age ranges (25-44 years). More research is needed on why quit rates among those age 45-64 are not increasing, despite increased quit attempts. Quitting appears to be increasing among middle-aged adults; population level interventions that increase quitting, particularly among younger age groups, should be continued, including price increases, mass media campaigns, and tobacco-free policies.

FUNDING: There are no funding sources to declare for this work. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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PA17-4
CIGARETTE SMOKING TRAJECTORIES DURING YOUNG ADULTHOOD IN A NATIONALLY REPRESENTATIVE Sample

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Young adulthood represents a time of transition in the life cycle, with higher rates of experimentation across several risk-related behaviors. While the rates of cigarette smoking initiation among adolescents have decreased, current evidence suggests an increase in initiation among young adults. This study examines the trajectories of cigarette use over time in a nationally representative sample of young adults, aged 18-24. Six waves of data from the Legacy Young Adult Cohort Study were used to model cigarette smoking over time (n=2756). The Latent Class Growth Mixture Modeling (LCGM) function in Mplus was used to create developmental trajectories for those with at least 3 data points and allowed for a slope and a quadratic function. The trajectory analyses used an ordinal variable ranging from 1-6 indicating smoking status (never, non-current, non-daily 1-5 days, non-daily 6-24 days, daily 25-30 days, daily users 11+ cigarettes per day). We tested the fit of the 3-5- and 6-class solutions. Our analyses found that a 5-class solution fit the best (\( \text{Entropy} = 0.97; \text{Lo Mendell Rubin (LMR) Adjusted LRT test: 4 vs. 5 classes value} = 1072.9, p = 0.0009 \)) by the 5-class solution better than the 3- or 4-class solutions). The 5-class solution fit the best (\( \text{Entropy} = 0.97; \text{Lo Mendell Rubin (LMR) Adjusted LRT test: 4 vs. 5 classes value} = 1072.9, p = 0.0009 \)) by the 5-class solution better than the 3- or 4-class solutions). The 5-class solution included: Class 1—stable users (67.5%); Class 2—escalators (31.1%); Class 3—quitters (3.2%); Class 4—relapsers (2.7%); Class 5—never smokers (6.3%). The profiles of smoking trajectories differed by socio-demographic characteristics. Compared to non-smokers, stable users and escalators are more likely to be white, have a HS degree or less, and reside in lower SES households. Quitters and relapsers are more likely to be Hispanic, have a HS degree or less, and reside in lower SES households as compared to their non-smoking counterparts. There were no differences based on age. Understanding the patterns of smoking trajectories during young adulthood (18-24) is a critical opportunity that can help optimize interventions to reduce initiation during this developmental period.

JUSTIFICATION: Understanding the patterns of smoking trajectories during young adulthood (18-24) is a critical opportunity that can help optimize interventions to reduce initiation during this developmental period.

FUNDING: Funded by Legacy

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PA17-5
CIGARETTE SMOKING AMONG METROPOLITAN AND RURAL ADOLESCENTS

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Introduction: Individuals living in rural areas suffer disproportionately from tobacco use and tobacco-related illness. The purpose of the present is to examine differences in cigarette smoking behavior, and the social environment that can affect tobacco use behavior, among metropolitan and rural adolescents to gain a better understanding of factors that lead to tobacco-related disparities among rural youth.

Methods: Data from the 2012 Florida Youth Tobacco Survey were analyzed. Participants between 14 and 17 years of age at the time of survey were included in the present study (unweighted n=39814). Participants were categorized as living in a metropolitan or rural area using 2003 Rural-Urban Continuum Codes (RUCC). Geographic differences (metropolitan vs. rural) in cigarette smoking behavior and the social environment were analyzed using survey procedures in SAS 9.4. Analyses accounted for the complex sampling procedures utilized, clustering by county, and demographic differences (age, sex, and race/ethnicity). Data were weighted to reflect the demographic characteristics of Florida.

Results: Rural youth between the ages of 14 and 17 were more likely to report having ever smoked cigarettes, reporting initiating smoking at younger ages (8-14 vs. 15-17), and having smoked 100+ cigarettes in their lifetime compared to youth from metropolitan areas. In terms of the social environment, rural youth were more likely to report that adult smoking was acceptable among their friends, they had been in a room with a smoker 5 or more days (in the past 7 days), that they lived with a smoker, that they had been offered a cigarette from a parent, and that cigarette smoking was allowed in their home.

Conclusions: The present study shows important differences in initiation and progression of tobacco use among metropolitan and rural adolescents, as well as the social environment that can affect tobacco use behavior. The results of this study suggest important factors that need to be targeted in interventions to reduce tobacco-related disparities in rural communities.

JUSTIFICATION: The results of this study suggest important factors that need to be targeted in interventions to reduce tobacco-related disparities in rural communities.

FUNDING: Dr. Bernat’s effort is supported with a grant from the National Cancer Institute (RO3 CA168411; D. Bernat, Principal Investigator). Dr. Choi’s effort on this abstract is supported by the Division of Intramural Research, National Institute on Minority Health and Health Disparities, National Institutes of Health.

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PA17-6
ASSOCIATION BETWEEN PARENTAL AND CHILD SMOKING AND DEPENDENCE IN THE US POPULATION

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Objective: Of the models developed to account for the etiology of tobacco use and nicotine dependence, familial influences represent an important class, especially since risk for onset of tobacco begins and ends in adolescence. Taking advantage of newly accessible national data, we investigate the association of different patterns of parental smoking with child smoking and nicotine dependence in a national sample of parent-child dyads.

Methods: The data are from nine aggregated surveys (2004-2012) from the National Household Survey on Drug Use and Health and include 35,000 parent-child (12-17 year old) dyads; 10,500 mother-daughter, 10,700 mother-son, 6,600 father-daughter, and 7,200 father-son pairs. Multiple logistic regressions estimated the unique effect of parental lifetime smoking pattern (never smoked; former smoker; smoked past year, not dependent; smoked past year, dependent), controlling for other predictors, on child lifetime smoking among all youths and nicotine dependence among lifetime smokers.

Results: Twice as many children ever smoked when parents smoked lifetime; three times as many did so when parents were dependent on nicotine. Controlling for other factors, the strongest predictor of child lifetime smoking was parental smoking, especially when the parent was dependent. Next in importance were child perceived risk of smoking, with ethnicity, older age, delinquency, depression, and child reported quality of parenting. The same factors, except depression and parent-child conflict and lack of support, predicted child nicotine dependence. For smoking, the association between parent and child did not vary by gender or race/ethnicity. For dependence, for daughters only, the association with parental dependence was stronger for mothers than fathers.

Conclusion: Parental effects reported in this study include not only socialization effects of parents on their children, but unmeasured genetic and community effects. Rates of smoking among adults have remained fairly stable in the last decade. Reducing these rates would have a beneficial effect in lowering even further the rates of smoking among young people, who become the next generation of smokers.

JUSTIFICATION: Take parental smoking into account when developing smoking prevention programs and treatment interventions, and policies targeted toward reducing smoking in young people.

FUNDING: Supported by grant 6032 from Legacy (Dr. Kandel).

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PA24-1
ATTITUDES TOWARD RAISING THE MINIMUM PURCHASE AGE FOR TOBACCO AMONG U.S. ADULTS, 2014

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Approximately 95% of adult cigarette smokers first experiment with smoking before age 21, and ages 18 to 21 are a critical period when many smokers transition from experimental to established use. The minimum age for tobacco purchase is 18 in most states; however, some localities have recently increased the minimum age to 21. This study used data from the 2014 Summer Styles survey, a consumer-based web survey of U.S. adults aged ≥18 (n=4,219). Respondents were asked, ‘Do you favor or oppose raising the legal minimum age to purchase all tobacco products from 18 to 21?’; response options included: ‘strongly favor’, ‘somewhat favor’, ‘somewhat oppose’, and ‘strongly oppose’. Descriptive statistics were calculated overall and by sex, age, race/ethnicity, education, income, U.S. region, and cigarette smoking status. Logistic regression was used to determine adjusted odds ratios (OR) and 95% confidence intervals (CI). The findings indicate that 75.0% of adults favor raising the legal minimum purchase age to 21, including 50.4% who reported ‘strongly favor’ and 24.6% who reported ‘somewhat favor’; in contrast 14.0% reported ‘somewhat oppose’, and 11.0% reported ‘strongly oppose’. By cigarette smoking status, 77.5% of never smokers ‘strongly’ or ‘somewhat’ favored the idea, compared to 74.6% of former and 69.9% of current smokers. Following adjustment, the odds of ‘strongly’ or ‘somewhat’ favoring raising the legal minimum purchase age to 21 were higher among adults aged 25-44 (OR: 1.8; CI: 1.3-2.5), 45-64 (OR: 2.3; CI: 1.7-3.2), and ≥65 (OR: 3.1; CI: 2.2-4.5) than those aged 18-24; odds were lower among former (OR: 0.7; CI: 0.6-0.9) and current (OR: 0.7; CI: 0.5-0.8) cigarette smokers compared to never smokers. Overall, three-quarters of U.S. adults favor raising the minimum legal purchase age for tobacco products to 21, including 7 in 10 smokers. The Surgeon General suggests that greater restrictions on tobacco sales are a promising tobacco end-game strategy. Raising the minimum purchase age for tobacco products to 21 would have a beneficial effect in lowering even further the rates of smoking among young people, who become the next generation of smokers.
PA24-2
THE IMPACT OF TOBACCO POLICY ON SMOKING RELAPSE AND INTERVENTION EFFICACY IN A NATIONAL SAMPLE
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Though millions of Americans attempt to quit smoking each year, >90% relapse within 12 months. Interventions increase success, but even with the most effective interventions, more than two-thirds of attempts fail. Even modest reductions in relapse rates could yield significant public health benefits. This study explored the role of geographic and contextual factors in relapse after controlling for individual characteristics. A secondary analysis was carried out on data from the Technology Enhanced Quitline study, a test of the impact of automated telephone calls as a supplement to traditional tobacco quitline services. High-intensity and low-intensity interventions were compared with standard treatment. Data from this nationally representative sample of 1785 U.S. smokers trying to quit were geocoded and linked with publically available data. Non-linear mixed-effects models, estimated with the SAS GLMMIX procedure, were used to simultaneously examine individual (demographic and smoking characteristics), neighborhood (unemployment, clean indoor air laws, and tobacco tax rates), county (crime level, tobacco production and smoking prevalence), and regional-level factors (tobacco control funding) while accounting for within-cluster correlations between subjects. Among study participants, the presence of a comprehensive clean indoor air law (p=0.012) and higher tobacco tax rates (p=0.003) were found to be significant independent predictors of 7-day relapse risk at 6 months post-intervention controlling for treatment and individual level factors. There was a significant interaction between presence of a comprehensive clean indoor air law and intervention group for 7-day abstinence at 6 months (p=0.004) and 30-day abstinence at 6 (p=0.007) and 12 months (p=0.031). For all outcome measures, the high-intensity intervention produced modest to moderate reductions in risk of relapse in areas with comprehensive smoking policies (ORs between 0.62-0.85), but was associated with an increased risk of relapse (ORs between 1.80-2.20) in areas without smoking policies. Contextual factors may influence smoking relapse and impact the effectiveness of cessation interventions.

JUSTIFICATION: This study demonstrates that tobacco policy may influence tobacco relapse risk, and indicates that the passage of comprehensive clean indoor air laws may increase the efficacy of smoking cessation interventions.

FUNDING: This study was supported by Grant Numbers R03CA171831, R01CA138936, and R25CA117865 from the National Cancer Institute.

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PA24-3
BEYOND EXCISE TAXES: A SYSTEMATIC REVIEW OF LITERATURE ON NON-TAX POLICY APPROACHES TO RAISING TOBACCO PRICES
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Objective: Raising the price of tobacco is considered one of the most effective ways to control tobacco use. In addition to excise taxes, governments are exploring other policies to raise tobacco prices, e.g., setting price levels or banning price-related marketing strategies. We conducted a systematic review to determine how non-tax tobacco policy prices are described, recommended and evaluated in the literature.

Data Sources: We systematically searched six databases and the California Tobacco Control library for English language papers, indexed on or before December 18, 2013, that included a tobacco keyword (e.g., cigarette), policy keyword (e.g., legislation) and a price keyword (e.g., promotion). Through this process we identified 3,067 articles. Study Selection: Two coders independently reviewed all abstracts or full text, and identified 61 articles that explicitly described a public policy likely to impact the retail price of tobacco products through non-tax means.

Data Extraction: Two coders independently identified: types, locations and products targeted by policies described; recommendations for implementing policies, including legal and political issues; and empirical assessments of policy impacts.

Data Synthesis: The most prevalent non-tax price policies in the literature were price promotion restrictions and minimum price laws. Independent promotion bans and minimum price laws were discussed more in the U.S. context, whereas promotion bans as a component of comprehensive marketing policies received significant global attention. Few studies empirically assessed the impact of non-tax price policies, but the literature includes several suggestions for how to strengthen each policy and prepare for legal challenges or tobacco industry opposition.

JUSTIFICATION: This study provides information to practitioners seeking to work with policymakers to increase tobacco prices, and identifies gaps in current research on non-tax price policies.

FUNDING: Research reported in this presentation was supported by grant number CA154281 from the National Cancer Institute at the National Institutes of Health as part of the ASPiRE study (Advancing Science and Policy in the Retail Environment), and by grant number 1P50CA180907-01 from the National Cancer Institute and FDA Center for Tobacco Products (CTP). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH or the Food and Drug Administration.

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PA24-4
A SIMSMOKE MODEL OF COMPREHENSIVE TOBACCO CONTROL IN NEW YORK CITY, 2002-2012
Michael Johns*, John Jasek, David Levy

Background: In 2002 New York City (NYC) implemented a comprehensive tobacco control plan consisting of increased cigarette taxes, legislation to make bars and restaurants smoke-free, recurring hard-hitting anti-tobacco media campaigns, and large-scale giveaways of smoking cessation aids. Following implementation of these policies, adult smoking decreased 28%, from 21.5% in 2002 to 15.5% in 2012. We developed a SimSmoke model to estimate the contribution of these policies to the decline in smoking seen in NYC over this period.
Methods: SimSmoke is a dynamic simulation model used extensively at state and national levels to estimate the impact of tobacco control policies on smoking and deaths averted. The NYC model begins in 1999 and tracks the smoking prevalence until 2012. Programmed policy levels impact the smoking rate by affecting the number of people who initiate, quit and relapse over time. The model was calibrated and validated against sex and age stratified prevalence estimates from the Behavioral Risk Factor Surveillance Survey (1999-2010) and the NYC Community Health Survey (CHS; 2002-2012). The base model was then compared to a counterfactual condition created by removing the NYC-specific policy inputs from the model in order to estimate policy effects.

Results: The model estimated that smoking declined 29% between 2002 and 2012, which closely matches estimates from the CHS. This decline in adult smoking was 24% greater than what would have been expected without comprehensive tobacco control; about 6,000 premature deaths were prevented as a result. Taxes made the greatest contribution to the decline (36%), followed by smoke-free air legislation (24%), access to smoking cessation services (22%) and media (14%). This comprehensive policy package is estimated to avert approximately 136,000 deaths by 2060.

Conclusions: This is the first SimSmoke model built to estimate the impact of tobacco control policies implemented at the city level. It suggests that NYC’s tobacco control efforts produced a substantial decline in smoking between 2002 and 2012 that will prevent more than 100,000 premature deaths over the next 50 years.

FUNDING: No funding
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PA24-5
A SYSTEMATIC REVIEW AND RESEARCH AGENDA FOR IMPROVING THE IMPLEMENTATION OF SMOKE-FREE LAWS

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Globally, exposure to secondhand tobacco smoke leads to 603,000 deaths and 10.9 million disability-adjusted life years lost annually. As part of their obligations under the WHO Framework Convention on Tobacco Control, low- and middle-income countries (LMIC) are increasingly legislating smoke-free laws covering public spaces. These policies have proven effective in high-income countries, but some LMIC have struggled to implement them and attain compliance. We present a research agenda for improving implementation of smoke-free laws in LMIC. The agenda is informed by a systematic review of the current state of the science. A search of 10 databases yielded 3,894 unique articles, which reduced to 1,409 after title screening, 236 after abstract screening, and 66 after full text review. We also reviewed reports from WHO and tobacco control NGOs and citations in sources. Of these additional 174 publications, 65 met the inclusion criteria, bringing the total number of sources used to 131. We analyzed these materials for common themes. We found that many of the health and economic aspects of smoke-free laws in high-income countries carry over to LMIC, the tobacco industry aggressively opposes smoke-free laws, there are commonalities in lessons learned in implementing laws across various LMIC, and a number of obstacles to successful implementation are faced in LMIC, especially in terms of resources and political will. Based on these findings and our own experience in the field, we suggest four central topics on which research is urgently needed (1) learning how to effectively work with limited resources, (2) determining how to increase political will among political leaders and enforcement officers; (3) finding methods for increasing public compliance in settings where laws have already been passed but not achieved success; and; (4) understanding the social and behavioral processes underlying smoke-free laws. We suggest that investigation into these topics can improve both the effectiveness of smoke-free laws in practice and the academic study of policy implementation.

JUSTIFICATION: The research agenda presented will assist in improving the design and implementation of smoke-free laws in low- and middle-income countries, increasing the effectiveness and public health benefit of such policies.
FUNDING: Supported by a grant from the Institute for Global Tobacco Control at the Johns Hopkins Bloomberg School of Public Health funded by the Bloomberg Initiative to Reduce Tobacco Use.
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PODUM PRESENTATION 2: EMERGING TREATMENTS FOR TOBACCO ADDICTION

PA2-1
PILOT STUDY OF THE 5-HT2AR AGONIST PSILOCYBIN IN THE TREATMENT OF TOBACCO ADDICTION

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Despite suggestive early findings on the therapeutic use of hallucinogens in the treatment of substance use disorders, rigorous follow up has not been conducted. To determine the safety and feasibility of psilocybin as an adjunct to tobacco smoking cessation treatment we conducted an open-label pilot study administering moderate (20mg/70kg) and high (30mg/70kg) doses of psilocybin within a structured 15-week smoking cessation treatment protocol. Participants were 15 psychologically healthy nicotine-dependent smokers (10 males; mean age of 51 years), with a mean of 6 previous lifetime quit attempts, and smoking a mean of 19 cigarettes per day for a mean of 31 years at intake. Biomarkers assessing smoking status, and self-report measures of smoking behavior demonstrated that 12 of 15 participants (80%) showed seven-day point prevalence abstinence at 6-month follow-up. The observed smoking cessation rate substantially exceeds rates commonly reported for other behavioral and/or pharmaceutical therapies (typically <35%). Although the open-label design does not allow for definitive conclusions regarding the efficacy of psilocybin, these findings suggest psilocybin may be a potentially efficacious adjunct to current smoking cessation treatment models.

JUSTIFICATION: The present study investigates an entirely novel approach to smoking cessation pharmacotherapy which may hold promise for clinical application.
FUNDING: The Beckley Foundation provided initial funding for this research, with continued funding provided by Heffter Research Institute. Support for Dr. Garcia-Romeu was provided by National Institute on Drug Abuse Grant T32DA07209.
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PA2-2
A CLUSTER RANDOMIZED TRIAL OF A BRIEF TOBACCO CESSION INTERVENTION IN LOW-INCOME COMMUNITIES IN INDIA

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Background: Tobacco use causes 5.4 million deaths globally and one million deaths in India every year. There is an urgent need to identify and assess the effectiveness of low cost, scalable tobacco cessation interventions especially for low and middle income countries like India.

Trial Design: A community based, pragmatic, cluster randomized controlled trial.

Methods: Settings and participants: 32 urban low income communities (slums) in Delhi, India and participants were 1214 adult current tobacco users Objective and intervention: To assess the effectiveness of a brief intervention of quit advice including a single session of training in yogenic breathing exercises (QA-YBE) in comparison to control condition of very brief advice (VBA) delivered pro-actively by community outreach in achieving salivary cotinine validated abstinence after 7 months.

Randomization: Out of total 32 clusters, 16 clusters were randomly allocated to the intervention arm and 16 were allocated to control arm with the help of a computer generated random sequence. The participant follow-up rate at 7 months was 95.1% and similar in both arms.

Primary outcome: Followed Russell standards (RS6) of self-reported abstinence on follow up after 7 months of intervention delivery validated by salivary cotinine estimation. Analysis: The primary analysis was by logistic regression adjusting for clustering. An intention to treat analysis was used for computing quit rates in both arms.

Results: All the 32 clusters, were delivered the intervention, assessed for outcome and analyzed. The quit rate by the primary outcome measure was 2.6 percent in intervention group versus 0.5 percent in the control group (OR 5.36 CI 1.13-25.45, P=0.02) which was statistically significant. The effect size was similar to that found in the Cochrane review of physician brief advice for smoking cessation.

Conclusion: The findings of this study provides a low cost, non-physician based, scalable, effective intervention option to support low income tobacco users in India to quit tobacco use as well as in other LMICs where tobacco users have less access to physicians and medications.

PA2-3
INTEREST OF REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION COMBINED WITH NICOTINE REPLACEMENT THERAPY IN REDUCING CIGARETTE RELAPSE IN OVERNIGHT ABSTINENT SMOKERS: RESULTS FROM A RANDOMIZED CONTROLLED TRIAL

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Introduction: The DorsoLateral PreFrontal cortex (DLPFC) plays a major role in the craving associated with tobacco use disorders. Further evidence suggests that stimulation of the DLPFC using repetitive Transcranial Magnetic Stimulation (rTMS) might be an efficacious method to reduce craving among smokers. Hypothesis: In smokers who quit smoking, Nicotine replacement therapy (NRT) is known to attenuate withdrawal symptoms and rTMS to reduce craving. Thus, the combination of these two treatments could reduce relapse. This hypothesis may be of interest because relapse is common after short durations of abstinence in smokers despite the use of NRT.

Method: Patients with severe nicotine dependence were randomly assigned to two treatment groups to receive either active or placebo rTMS sessions applied on the DLPFC. The day after quitting smoking, each patient of the two groups underwent 10 sessions of 1 Hz active or placebo rTMS for two weeks (360 pulses/session; 120% of motor threshold) and used 21-mg nicotine patches. The rate of abstinence, the brief French version the Tobacco Craving Questionnaire (FTCQ), and the Questionnaire of Smoking Urge (QSU) were used to assess the therapeutic results after the 2-week stimulation period.

Results: Thirty-seven patients were included in the study (active=18; placebo=19). At the end of the 2-week treatment, they were significantly more abstinent patients in the active group (n=16) than in the placebo groups (n=9) (Ficher’s exact test: p=0.027; 1 missing data). The FTCQ analysis revealed a significant decrease in the compulsion factor of tobacco craving from baseline in the active rTMS group (Wilcoxon test: p=0.011) but not in the placebo group (p=0.115). There was no difference between the two groups for the other factors of the FTCQ (emotionality, expectancy, and purposefulness) and for those of the QSU (anticipation of pleasure and relief).

Conclusion: During tobacco secession, rTMS combined with NRT improved the success rate of abstinence in patients with severe nicotine dependence, probably by reducing compulsivity.

FUNDING: Granted by University Hospital of Dijon
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PA2-4
THE EFFECTS OF N-ACETYL-CYSTEINE ON CORTICOSTRIATAL CIRCUITRY FUNCTION MAY HELP SMOKERS TO REMAIN SMOKE FREE

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Chronic administration of drugs of abuse, including nicotine, produces an imbalance in corticostriatal glutamate transmission that mediates reinstatement to drug seeking. In animal models, N-acetylcysteine (NAC) restores the balance in corticostriatal glutamate transmission and attenuates reinstatement of drug seeking. However, the effects of NAC on corticostriatal circuitry function and smoking-related behavior in humans remains unknown. The present study examined the effects of NAC on corticostriatal circuitry function, smoking withdrawal symptoms and self-administration of cigarette smoke in a sample of adult nicotine-dependent smokers. Participants (N=20; mean age 35.9±13.5; cigs/day 15.3±5.9; years smoking 15.7±6.0) were randomized to receive a double-blind
course of NAC (1200 mg in the morning and 1200 mg in the evening) or matched placebo over the course of 3 ½ days of monetary-incentivized smoking abstinence. Participants attended daily lab visits on each of 3 consecutive abstinence days in order to biochemically monitor smoking (i.e., CO/ppm). On day 4, participants were fMRI scanned and performed a laboratory-based smoking relapse analog task. Study findings reveal that, as compared to the PBO group (n=11), smokers in the NAC group (n=9) significantly reduced smoking (p<.01), reported less craving (p<.05) and had stronger rsFC in the corticostratal network (between nucleus accumbens seed and dACC and dlPFC [ρ<.005; k>100]). Moreover, the strength of rsFC between nucleus accumbens and dACC was negatively correlated with NAC effects of rsFC between nucleus accumbens and dACC was negatively correlated with NAC effects of nicotine withdrawal (r =-.59, p<.01) and self-reported craving (r =-.42, p=.06). Findings suggest that NAC may help treat the pathophysiology of nicotine addiction and reduce vulnerability to relapse during a quit attempt.

FUNDING: This research was supported by R01DA033459B (BF) & P50DA015369 (PWK).

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PA2-6
ZONISAMIDE DOES NOT ENHANCE VARENICLINE-INDUCED SMOKING CESSION

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Varenicline is the current gold-standard pharmacotherapy for smoking cessation, yet >55% of smokers attempting to quit with varenicline fail to respond. This pilot study evaluated whether zonisamide (Zonegran; ZON), an FDA-approved anti-epileptic medication, would enhance varenicline-induced smoking cessation outcomes, by potentially reducing some nicotine withdrawal symptoms (e.g., weight gain) that are not attenuated by varenicline alone. Treatment-seeking smokers (N=74) were enrolled into a randomized, double-blind, placebo-controlled clinical trial for a 10-week period. All participants received a 10-day induction and recommended varenicline maintenance for smoking cessation and were randomized to receive either ZON (300mg; N=34) or placebo (N=40) as an adjunct agent. Participants attended the clinic once weekly, received 3 sessions of structured behavioral smoking cessation counseling (Clearing the Air™), and provided self-report of smoking and urine cotinine samples to verify abstinence. The primary outcome was self-reported and cotinine-verified abstinence during the final 4 weeks of treatment; secondary outcomes included nicotine withdrawal symptoms and craving. Participants were 71% male, 45±6 years old, 32% Caucasian, smoked 19±7 cigarettes/day, and had a mean FTND score of 5.4. Results showed that varenicline produced the expected rates of abstinence during treatment, though only 15% of ITT participants met our rigorous primary outcome criteria. ZON did not significantly increase smoking cessation outcomes, with 14.7% vs. 13.3% of participants in the ZON vs. placebo groups meeting the primary outcome criteria, respectively. ZON also did not produce changes in secondary outcome measures, though trends suggest reductions in withdrawal. Overall, we did achieve the expected effect of varenicline on cessation, however ZON did not enhance varenicline-induced smoking cessation, which may be explained by lack of significant effect on nicotine withdrawal symptoms. Ultimately, this study attempted to augment the therapeutic effects of varenicline on smoking cessation and develops a model by which additional medications can be evaluated for this indication.

JUSTIFICATION: Augmenting varenicline for smoking cessation would increase smoking cessation outcomes beyond what is achievable with the current gold-standard pharmacotherapy.

FUNDING: NIDA grant: R21DA034164

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PA3-1
50 STATE LAW APPROACHES TO REDUCING CIGARETTE TAX AVOIDANCE AND TAXING OTP'S, 2005-2014

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Background: Some states have responded to the loss of cigarette tax revenue due to tax avoidance by enacting laws that seek to reduce the incentives for tax avoidance, while also seeking to tax to a greater extent emerging and increasingly popular other tobacco products (OTP's).

Objective: This presentation had two primary objectives: First, to examine states’ specific strategies to minimize cigarette tax avoidance through: (1) anti-counterfeit cigarette stamp encryption technology; (2) additional, distinctive stamps, particularly for tribal entities; (3) assessing different cigarette tax rates near
PA3-2
TOBACCO ADVERTISING AND PRESS COVERAGE OF SMOKING AND HEALTH DURING 19 YEARS OF ARGENTINEAN NEWSPAPERS

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Argentina is the unique Latin America country without ratifying the Framework Convention on Tobacco Control (FCTC). National newspapers are the main way to depict pro and against tobacco related messages and sources of other media. Thus, it is key to know the extent and content of these messages to develop an adequate advocacy response. Media advocacy can increase news coverage of tobacco issues and can play a central role in ratifying of the FCTC. Objective: to describe and compare the extent and content of tobacco related images (ads or not) and articles published in the largest Argentinean newspapers. Methods: We developed a cross sectional study, by choosing systematically all issues of newspapers we collected the section and if a cigarette brand appeared. For ads, we recorded the cigarette brand. Results: There were identified 3804 images and articles from 6148 issues. Non-ads were the most frequent: 72.81%, followed by articles, 20.19% and ads 7.57%. All were published mainly on Sunday, the largest circulation day. There were 1027 articles (31%) and 2787 images (69%) classified by price (i.e., premium; discount) and flavor (i.e., regular; flavored). Articles and images were classified by cigarette (i.e., Marriott; Marlboro). Objective: to describe and compare the extent and content of tobacco related images (ads or not) and articles published in the largest Argentinean newspapers. Methods: We developed a cross sectional study, by choosing systematically all issues of newspapers we collected the section and if a cigarette brand appeared. For ads, we recorded the cigarette brand. Results: There were identified 3804 images and articles from 6148 issues. Non-ads were the most frequent: 72.81%, followed by articles, 20.19% and ads 7.57%. All were published mainly on Sunday, the largest circulation day. There were 1027 articles (31%) and 2787 images (69%) classified by price (i.e., premium; discount) and flavor (i.e., regular; flavored). Articles and images were classified by cigarette (i.e., Marriott; Marlboro). objective: to describe and compare the extent and content of tobacco related images (ads or not) and articles published in the largest Argentinean newspapers. Methods: We developed a cross sectional study, by choosing systematically all issues of newspapers we collected the section and if a cigarette brand appeared. For ads, we recorded the cigarette brand. Results: There were identified 3804 images and articles from 6148 issues. Non-ads were the most frequent: 72.81%, followed by articles, 20.19% and ads 7.57%. All were published mainly on Sunday, the largest circulation day. There were 1027 articles (31%) and 2787 images (69%) classified by price (i.e., premium; discount) and flavor (i.e., regular; flavored). Articles and images were classified by cigarette (i.e., Marriott; Marlboro). objective: to describe and compare the extent and content of tobacco related images (ads or not) and articles published in the largest Argentinean newspapers. Methods: We developed a cross sectional study, by choosing systematically all issues of newspapers we collected the section and if a cigarette brand appeared. For ads, we recorded the cigarette brand. Results: There were identified 3804 images and articles from 6148 issues. Non-ads were the most frequent: 72.81%, followed by articles, 20.19% and ads 7.57%. All were published mainly on Sunday, the largest circulation day. There were 1027 articles (31%) and 2787 images (69%) classified by price (i.e., premium; discount) and flavor (i.e., regular; flavored). Articles and images were classified by cigarette (i.e., Marriott; Marlboro).

PA3-3
CIGARETTE BRANDS WITH FLAVOR CAPSULES IN THE FILTER: TRENDS IN USE AND BRAND PERCEPTIONS AMONG SMOKERS IN MEXICO, ARGENTINA, AND THE UNITED STATES, 2012-2014

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Objective: To describe trends, correlates of use, and consumer perceptions related to the product design innovation of flavor capsules in cigarette filters. Methods: Quarterly surveys from 2012 to 2014 were analyzed from an online consumer panel of adult smokers aged 18-64, living in the US (n=6865 observations; 3366 individuals), Mexico (n=5723 observations; 3366 individuals), and Australia (n=5864 observations; 2710 individuals). Preferred brand varieties were classified by price (i.e., premium; discount) and flavor (i.e., regular; flavored without capsule; flavored with capsule). Participants reported their preferred brand variety’s appeal (i.e., satisfaction; stylishness), taste (i.e., smoothness, intensity), and harm relative to other brands and varieties. GEE models were used to determine time trends and correlates of flavor capsule use, as well as associations between preferred brand characteristics (price X flavor) on perceptions of relative appeal, taste, and harm.

Results: Preference for flavor capsules increased significantly in Mexico (6% to 14%) and Australia (1% to 3%), but not in the US (4%). 18-24 year olds were most likely to prefer capsules in the US (10%) and Australia (4%), but not Mexico. Smokers who preferred capsules viewed them having more positive appeal (all countries), taste (all countries), and lesser risk (Mexico, US) than smokers who preferred regular brands.

Conclusions: Results are consistent with industry reports on the importance of flavor capsule innovations for industry growth. Flavor capsules appear more attractive to youth, although both youth and more-established smokers in Mexico preferred discount capsule varieties. This design innovation appears to differentiate brands in ways that justify regulatory action.
PA3-4
UPTAKE OF SNUS AMONG SMOKERS GIVEN A FREE SAMPLE
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Low nitrosamine smokeless tobacco (aka snus) is arguably safer than conventional cigarette smoking. While uptake within the U.S. has been minimal, snus may be a palatable alternative or complement to cigarette smoking for certain groups of smokers. In a nationwide, prospective naturalistic trial, we randomized smokers unmotivated to quit to receive a 6-week free supply of Camel Snus to use ad libitum (including not at all), or not. We report data for 529 smokers within the snus group with complete uptake data during the sampling period, categorized as: 1) Rejecters: never used snus (n=100; 19%); 2) Droppers: tried but discontinued use (n=104; 20%); 3) Late Samplers: initially declined but later reported use (n=29; 5%); and 4) Consistent Samplers: tried and persisted in use, at least once over repeated sampling weeks (n=296; 56%). We herein focus on predictors of Consistent Sampling vs. Rejection; other pairwise comparisons will be available for conference presentation. Among the entire sample, unadjusted predictors of consistent sampling were: a) being male (OR=3.13; p<.001), b) absence of home smoking restrictions (OR=1.67; p=.03), c) medical comorbidity (OR=1.75; p=.03), d) baseline smoking level (within bins of 5cpd: OR=1.19; p=.02), and d) nicotine dependence (1 unit increase in HSI: OR=1.25; p=.02). Multivariable, adjusted predictors of consistent sampling were male gender (OR=3.22; p<.001) and level of dependence (OR=1.28; p=.02). Given gender differences in consistent sampling (males: 69% vs. females: 50%), we stratified results. Among women, adjusted predictors of consistent sampling were: absence of smoking restrictions in the home (OR=1.49; p=.09), and medical comorbidity (OR=1.65; p=.06). Among males, only nicotine dependence predicted consistent sampling (OR=1.26; p=.03).

With upcoming close of trial, we can report on more substantive measures of sampling and adoption, including amount of use and downstream purchase, as well effects on cigarette smoking. We conclude that a) a moderately high number of smokers, including both men and women, will use snus under conditions of free sampling, and b) predictors of snus sample use vary across gender.

JUSTIFICATION: This nationwide, naturalistic RCT examines the short and long term impact of providing smokers free samples of low-nitrosamine smokeless tobacco (aka snus), offering implications for public health harm reduction.

FUNDING: Funding through NCI R01CA154992 (PI: Carpenter).

CORRESPONDING AUTHOR: Matthew Carpenter, PhD, Associate Professor, FUNDING: Funding through NCI R01CA154992 (PI: Carpenter).tobacco (aka snus), offering implications for public health harm reduction. JUSTIFICATION: This nationwide, naturalistic RCT examines the short and long term impact of providing smokers free samples of low-nitrosamine smokeless tobacco (aka snus), offering implications for public health harm reduction.}

PA3-5
NON-CIGARETTE TOBACCO PRODUCT (NCTP) ADVERTISING: A CONTENT ANALYSIS OF RHETORICAL AND PERSUASIVE THEMES
Smrita C. Banerjee1,2, Elyse Shuk1, Kathryn Greene1, Jamie S. Ostroff1, Memorial Sloan Kettering Cancer Center, Rutgers University

Tobacco control efforts have resulted in significant reduction in cigarette smoking among U.S. adults over the past five decades, but has slowed in recent years. Print advertisements for non-cigarette tobacco products (NCTP) coupled with other marketing approaches such as appealing packaging, point-of-purchase marketing, flooding of ads in magazines, and increased availability are likely to expand the market for tobacco usage and renormalize smoking and tobacco use. Whereas prior research has identified persuasive themes in tobacco product ads, little research has comparatively examined the use of persuasive themes across tobacco product marketing. We conducted a content analysis of NCTP print advertisements in consumer magazines for persuasive and rhetorical themes. The sample consisted of distinct NCTPs ads (for cigars/cigarillos/little cigars, moist snuff, snus, e-cigarettes) that appeared in consumer magazines from August 2012-August 2013, obtained from Kantar Media. The results demonstrated that the largest number of unique ads were found for moist snuff (n=44, with an ad expenditure of $27.14 million) followed by ads for e-cigarettes (n=27, $39.83 million), cigars (n=21, $8.96 million), and snus (n=8, $8.14 million). The most frequently used rhetorical themes were pathos (ads designed to elicit an emotional response) for cigar (57%) and moist snuff (80%) ads, and logos (use of logic or facts as evidence for ad claims) for e-cigarette (85%) and snus (50%) ads. Similarly, the most frequent persuasive themes were ads that extol a high quality product, available at a good economic deal, with high consumer satisfaction for cigar and moist snuff ads. For e-cigarette and snus ads, the most frequent themes conveyed comparative claims portraying the advertised product as different, better, and/or less risky than conventional cigarettes or smokeless tobacco. These findings provide practical implications for development of media literacy based counter-advertising interventions that aim at helping youth/young adults (a) become more adept at identifying marketing strategies for snus and e-cigarettes, and (b) make more critical decisions about tobacco product use.

JUSTIFICATION: The findings of this study not only present a comparative analysis of persuasive strategies used in NCTP advertising, but also provide implications for media literacy based interventions that aim at helping youth and young adults become more adept at identifying strategies used by tobacco advertisers in order to become critical decision makers who discourage tobacco product use.

FUNDING: Research reported in this abstract was supported by National Institute of Drug Abuse (1R03DA035242-01) FDA Center for Tobacco Products (CTP). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH or the Food and Drug Administration.

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PA3-6
PRICE-RELATED PROMOTIONS FOR TOBACCO PRODUCTS OVER TWITTER
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Objectives: This cross-sectional study examined price-related promotions for tobacco products over Twitter.

Methods: Through the Twitter firehose, we obtained access to all public tweets and metadata posted between December 6, 2012 and June 20, 2013 that contained at least one keyword related to a tobacco-related product or behavior (e.g., smoking, cigarette, vaping) and at least one keyword related to a price (e.g., “Get 5% Off with coupon: disc5”) focused on e-cigarettes. Tweets offering free samples comprised less than 1% of the sample; most of these tweets mentioned e-cigarettes (81.5%). About 99% of tweets that included a discount code (e.g., “Get 5% Off with coupon: disc5”) focused on e-cigarettes. Tweets offering free samples comprised less than 1% of the sample; most of these tweets mentioned e-cigarettes (81.5%).

Results: The majority of tweets (97%) mentioned tobacco products (including e-cigarettes) while 3% mentioned tobacco cessation products. E-cigarettes were the most frequently mentioned tobacco product (92.9%), followed by cigarettes (5.5%). About 54% of tweets about cessation products involved FDA-approved cessation products (e.g., nicotine replacement patch or gum) while 31.4% mentioned non-FDA approved cessation methods (e.g., hypnotherapy). The most common type of price promotion across all products was a discount (70.9%). About 99% of tweets that included a discount code (e.g., “Get 5% Off with coupon: disc5”) focused on e-cigarettes. Tweets offering free samples comprised less than 1% of the sample; most of these tweets mentioned e-cigarettes (81.5%).

Conclusions: The vast majority of tweets offering price promotions focused on e-cigarettes. Some of the promotions (e.g., free samples) are banned by the Family Smoking Prevention and Tobacco Control Act for regulated tobacco products and may soon be banned for e-cigarettes and other currently unregulated products. Although this study focused on tobacco products, our analysis identified a number of cessation-related tweets, about a third of which promoted non-FDA approved cessation methods. Future studies should investigate the extent to which non-evidence-based cessation methods are promoted through Twitter.
PA1-1
SMOKERS’ PERCEPTIONS OF THE HEALTH RISKS OF E-CIGARETTES AND OTHER TOBACCO PRODUCTS: IMPLICATIONS FOR TOBACCO CONTROL

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Introduction: Although traditional cigarettes are the most popular tobacco product among U.S. adults, rates of use of other nicotine and tobacco products are increasing. Beliefs that other nicotine and tobacco products are less harmful than cigarettes may be one driver of their increasing popularity. We sought to understand smokers’ perceived likelihood of developing health problems from using cigarettes and four non-cigarette tobacco products (NCTPs: e-cigarettes, snus, dissolvable tobacco, and smokeless tobacco).

Methods: A U.S. national sample of 6,607 adult smokers completed an online survey in March 2013 assessing their beliefs about the likelihood that use of cigarettes and NCTPs would cause them to develop lung cancer, oral cancer, and heart disease.

Results: Smokers viewed e-cigarettes as less likely to cause lung cancer, oral cancer, and heart disease compared to regular cigarettes (all p<.001). Past use of e-cigarettes and intention to quit smoking were not related to beliefs about the riskiness of e-cigarettes. Participants viewed NCTPs other than e-cigarettes as more likely to cause oral cancer than cigarettes but less likely to cause lung cancer. In between-group comparisons, smokers rated e-cigarettes as less harmful than the other NCTPs for all three health conditions.

Conclusions: The consistent perception that e-cigarettes were less harmful than cigarettes could be one factor driving the dramatic increase in their use, which has not been matched by that of snus, dissolvable tobacco, or smokeless tobacco. Understanding smokers’ beliefs about the health risks from different nicotine and tobacco products can inform policy (e.g., developing warning labels that clarify or correct inaccurate harm perceptions) and programs (e.g., designing smoking cessation interventions that build on existing beliefs about different health outcomes).

JUSTIFICATION: Understanding smokers’ beliefs about the health risks from different nicotine and tobacco products can inform policy (e.g., developing warning labels that clarify or correct inaccurate harm perceptions) and programs (e.g., designing smoking cessation interventions that build on existing beliefs about different health outcomes).

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PA1-2
SMOKERS’ E-CIGARETTE INFORMATION SOURCES, RISK PERCEPTIONS, POLICY ATTITUDES, AND USE INTENTIONS

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Background: Electronic cigarettes (“e-cigarettes”) are innovations targeted at smokers as cigarette alternatives with the potential to impact public health if widely adopted. This study aims to describe smokers’ e-cigarette risk perceptions, valued information sources, policy attitudes, context of first e-cigarette use and future use intentions.

Methods: Results are based on a 2014 e-cigarette focused survey of 500 current smokers recruited from GfK’s Knowledge Networks nationally representative research panel.

Results: Smokers most frequently reported seeing e-cigarettes in stores (84%) or used by people around them (81%). Half of ever users first tried an e-cigarette from a known person while 43% initially purchased an e-cigarette. The majority (61%) believed e-cigarettes are less harmful than regular cigarettes, a belief largely attributed to intuition or “common sense” (82%) but also to news and advertisement sources. However, 33.1% rated e-cigarettes at 5 or above on a scale of perceived harmfulness (1=not at all, to 7=extremely harmful), and 80% agreed e-cigarette safety information was important to them. Approximately one-third stated they would turn to a doctor first for information on e-cigarette safety, though an almost equal percent said they would turn to the Internet (25.5%) or product packaging first (24.2%). While most (62.5%) did not know that e-cigarettes are unregulated, 83-88% agreed that e-cigarettes should be regulated by the FDA for safety and quality. Carry warning labels, and have the same legal age of sale as other tobacco. Over half (53.5%) of former e-cigarette users and 18.5% of never users indicated that they think they would smoke an e-cigarette in the next year, and 20% were more interested in using an e-cigarette made by a tobacco company.

Conclusions: Though most smokers believe e-cigarettes are less harmful than tobacco cigarettes, they do not necessarily believe that e-cigarettes are harmless, and think that safety/risk information about e-cigarettes is important and that e-cigarettes should be regulated. E-cigarette use will likely grow and product regulation is warranted.

JUSTIFICATION: This presentation can inform policy, communication and educational activities related to electronic cigarettes.

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PA1-3
ATTITUDES TOWARD E-CIGARETTES AMONG SMOKERS WHO HAVE NEVER TRIED E-CIGARETTES

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Most e-cigarettes users are smokers, and the majority of smokers have already experimented with e-cigarettes. A 2014 population survey showed that 53.7% of U.S. smokers have tried e-cigarettes. This study focused on the rest of the smokers: those who have never tried e-cigarettes. It examined their attitude toward e-cigarettes and their intention to use e-cigarettes in the future. The study is based on a national probability sample (N=1625) in the United States in 2014. The result shows that 58.0% of smokers who have never tried e-cigarettes would actually try e-cigarettes if offered one by a friend. The majority of these smokers, 86.2%, did not agree that e-cigarettes should be banned, and 89.6% of them believed e-cigarettes would be helpful for quitting smoking. In contrast to smokers who would not try e-cigarettes when offered one by a friend, these potential e-cigarette users held more positive attitudes toward e-cigarettes. In particular, they were less likely to agree that e-cigarettes should be taxed like regular cigarettes (36.9% vs. 62.5%), less likely to agree that e-cigarettes advertising
should be banned as regular cigarettes advertising (40.6% vs. 60.9%), more likely to expect that e-cigarettes could help them quit smoking (69.8% vs. 49.2%), and more likely to believe that e-cigarettes are less harmful (49.8% vs. 35.4%). These results suggest that an even greater proportion of smokers than those who have already tried e-cigarettes (>53.7%) will experiment with e-cigarette in the future, likely increasing the overall e-cigarette uptake rate in the next few years. Future longitudinal studies can also examine how well the attitude measures described here predict the experimentation and the regular use of e-cigarettes among adults.

JUSTIFICATION: This study enhances the understanding of the epidemiology of e-cigarette use.

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PA1-4
EXAMINING SMOKING AND VAPING BEHAVIORS OF VAPOSTORE CUSTOMERS
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The prevalence of e-cigarette (EC) stores has increased dramatically in recent years, as has the use of tank systems. The available literature explores online vapor forums to profile the EC community, yet there is little research investigating the vaping behaviors and preferences of EC store customers. The purpose of the present study is to begin to address this gap in the literature. A convenience sample of 100 vapor store customers (51% male; 76% White; Mage = 37.6, SD = 15.1) from four Midwestern, metropolitan vapor stores completed a short survey assessing their vaping/smoking history, current vaping/smoking behaviors, and vaping attitudes and preferences. All participants completed exhaled carbon monoxide testing to biochemically confirm self-reported smoking status (CO<11ppm). Participants had been vaping for a little over a year (Mmonth=14.6, SD=9.7), with 63.4% of EC users biochemically-verified smoking abstinence. The majority of customers (91%) reported enjoying vaping more than smoking, with 80% preferring non-tobacco EC flavors. However, 60% reported that they would still vape if the only flavor available was tobacco. On a scale from 1 (not important) to 10 (very important), participants reported that the most important EC features were “battery life” (M=8.5, SD=2.6), “tastes good” (M=8.4, SD=2.6), and “curbs cravings” (M=7.5, SD=3.3); the least important feature was “feels/ looks like traditional cigarette” (M=2.9, SD=3.2). A majority ‘agreed’ or ‘strongly agreed’ that they preferred to buy EC supplies at vapor stores because of “access to staff who can help troubleshoot EC problems” (85%), “enjoy the atmosphere” (74%), and “because the e-liquid is fresher” (86%). No significant differences were found between EC-only users and dual (EC & cigarette) users in terms of number of cigarettes smoked per day prior or nicotine dependence prior to initiation, length of EC use, and use of tobacco vs. non-tobacco EC flavors. Overall, vapor store customers demonstrated high rate of smoking abstinence and overwhelmingly preferred vaping to smoking; however, no differences were seen between EC-only users and dual users in terms of smoking history or vaping behaviors.

JUSTIFICATION: This study provides information that is useful in determining public policy regarding electronic cigarette use.

FUNDING: This research was funded by the Oklahoma Tobacco Research Center who is provided funding through the Oklahoma Tobacco Settlement Endowment Trust.

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PA1-5
THE NATURAL HISTORY OF E-CIGARETTE USE FOR SMOKING CESSATION AFTER HOSPITALIZATION
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Despite prohibition on marketing e-cigarettes for smoking cessation, they are often perceived as a quit aid, with smokers most often citing smoking cessation or reduction as their reason for use. Studies exploring e-cigarettes have been found they reduce cravings and assist with smoking reduction, suggesting help with smoking cessation; however, they have not been found superior to NRT. This 6-month follow-up study examines the use and impact on quitting of e-cigarettes and recommended quit aids after a hospitalization, an event that often motivates a quit attempt. 740 hospitalized smokers were recruited and assigned to the control condition of a smoking cessation intervention. Participants were provided bedside smoking cessation advice. Patients were over age 19, smoked in the previous month, cognitively and physically able to participate, and had access to email and the internet, but were not required to want to quit smoking. Demographics, smoking history, use of e-cigarettes, motivation to quit, and quit attempts in the previous year were assessed at baseline. Use of quit aids (varenicline, bupropion, or NRT), e-cigarettes and 30-day point prevalence smoking status were assessed at 6-months follow-up. 630 (85%) provided data at 6-months post-hospitalization. Most participants reported planning to stay quit (26%) or try to quit (57%) with the remaining unsure of plans (14%) or planning to not quit (3%). 42% of participants reported using quit aids and/or e-cigarettes after hospitalization with 83% of them having planned to stay quit or try to quit. Plans for quitting were predictive of 30-day point prevalence smoking abstinence 6-months later (p<0.0001). The majority of patients chose “cold turkey” (57.8%) which had the highest quit rate (36%). More participants opted to use e-cigarettes (20%) than a quit aid (13.2%) or a combination of the two (8.6%) but had lower quit rates than either (20.6% vs. 31.3% and 25.9%, respectively). These results suggest that electronic cigarettes, while more popular than quit aids in this sample, were not as effective for smoking cessation than were either as effective as “cold turkey,” the most common method for quitting.

JUSTIFICATION: This presentation has implications for understanding quitting methods and the effectiveness of e-cigarettes for quitting smoking among hospitalized smokers.

FUNDING: NIDA –U01DA031515

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PA1-6
E-CIGARETTE SUBSTITUTION FOR SMOKERS WITH SCHIZOPHRENIA OR BIPOLAR DISORDER WHO PREVIOUSLY FAILED TO QUIT
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Introduction: People with schizophrenia and bipolar disorders are more likely to smoke, less likely to quit, and suffer disparate morbidity and early tobacco-related mortality. Although many of these smokers want to quit, most are unable to do so for more than a few weeks, even with evidence-based cessation treatment combinations. We conducted a pilot study to assess the short-term effect of e-cigarette substitution on smoking among smokers with mental illness who had previously failed to quit with treatment.

Methods: We consented 22 daily smokers in outpatient treatment for mental illness (54.5% schizophrenia; 45.5% bipolar disorder) who were not currently trying to quit, and provided them with a supply of e-cigarettes (2nd generation NJOY) and instructions on use. We followed participants with four weekly assessments
of breath CO, use of e-cigarettes, use of combustible tobacco, and satisfaction measures. Mean age was 43±14 years. Paired t-tests assessed changes in outcomes.

Results: Two participants completed a baseline evaluation only. Among the remaining 20, baseline mean weekly combustible tobacco use was 192±159 cigarettes. Use decreased to 67±76 cigarettes/week at study end (t=3.62, df=17, p=0.005). Decrease in smoking was confirmed by a reduction in breath CO level from a baseline mean 27ppm±17 to 15ppm±8 at study end (t=3.26, df=18, p=0.004). Two participants (10%) switched completely to e-cigarettes. Satisfaction with e-cigarettes was high (mean satisfaction and enjoyment ratings were 4.1 and 3.8 on a scale of 1-5). No serious adverse events were reported.

Conclusions: During one month of e-cigarette access, smokers with schizophrenia and bipolar disorder greatly reduced combustible tobacco use, coinciding with a 50% decrease in CO level. These pilot data suggest that a safety-tested e-cigarette product could reduce harm in these vulnerable smokers while they are unable to quit. Further research is needed to explore the safety, addiction liability, and health impact of e-cigarette combination use and switching among people with severe mental illnesses and other vulnerable populations of smokers who are unable to quit.

JUSTIFICATION: Outcomes of this pilot study of switching from combustible tobacco to e-cigarettes in people with serious mental illness has potential public health implications for other vulnerable populations of smokers who struggle to quit.

FUNDING: No Funding.

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PA1-7
IS EXPOSURE TO E-CIGARETTE COMMUNICATIONS ASSOCIATED WITH PERCEIVED HARM OF E-CIGARETTE VAPORS? RESULTS FROM A NATIONAL SURVEY OF U.S. ADULTS

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Background: Most U.S. adults have been exposed to information about e-cigarettes through another person, advertising, or news stories. Yet, the link between exposure to e-cigarette communications and public attitudes toward benefits and harms of e-cigarettes is not well understood. Prior content analyses reported that e-cigarette ads and media coverage frequently mention a lack of harm, while documentary film and public service announcements portray e-cigarette vapor as harmless.

Methods: We analyzed survey data from 1449 U.S. adults who were members of KnowledgePanel, a nationally representative online research panel, from October-December 2013. Perceived harm outcomes were: (1) harmfulness of SHV to one’s health, (2) concern about health impact of breathing SHV, and (3) whether SHV was considered more/less harmful than secondhand smoke. Predictor variables included frequency of exposure in the past 30 days to: (1) advertising, (2) concern about health impact of breathing SHV, and (3) whether SHV was considered more/less harmful than secondhand smoke.

Results: Exposure to advertising perceived as positive was associated with lower concerns about the health impact of breathing SHV (B=-0.051, 95% CI=-0.098, -0.005) and perceiving SHS as less harmful than SHS (B=0.029, 95% CI=0.050, 0.008). Exposure to interpersonal discussion perceived as positive was negatively associated with all three perceived harm outcomes. Non-advertising media exposure was not a significant predictor of any of the three outcomes.

Conclusions: Exposure to information about e-cigarettes perceived as positive through advertising and interpersonal discussion could have a role in shaping public perceptions of the harmfulness of SHV.

JUSTIFICATION: These findings may play a role in guiding public education efforts to increase public understanding of constituents in SHV and policies to restrict potentially misleading claims in marketing materials.

FUNDING: Data for this research was provided by the Annenberg National Health Communication Survey, supported by the Annenberg School at the University of Pennsylvania and the University of Southern California. Andy Tan conducted this work while a postdoctoral fellow at the Center of Excellence in Cancer Communication Research at the University of Pennsylvania (supported by NIH grant P20CA095856). Cabral Bigman conducted this work while an assistant professor at the University of Illinois at Urbana-Champaign. Susan Mello conducted this work while an assistant professor at Northeastern University. Ashley Sanders-Jackson conducted this work while a postdoctoral fellow at Stanford Prevention Research Center (supported by NIH grant T32 CA848167). No financial disclosures were reported by the authors of this paper.

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PA1-8
A CONTENT ANALYSIS OF ELECTRONIC CIGARETTE PORTRAYAL IN NEWSPAPERS

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Background: Since their introduction into United States markets in 2007, electronic cigarettes (e-cigarettes) have become increasingly popular. A corresponding increase can be found in news coverage of e-cigarettes. According to a Newsbank search, in 2008 there were only three newspaper articles published in the United States with “electronic cigarettes” in the headline, whereas in 2013 there were 189 such articles.

Objective: The objective of this study was to determine how e-cigarettes are being portrayed in newspapers and how the public is responding. Methods: A content analysis was conducted on 450 articles obtained from a Newsbank search for newspaper articles published in the United States that contained “electronic cigarette” in the headline. This search was then narrowed by removing pieces that were less than 50 words as well as articles that only mentioned e-cigarettes in passing. The articles were coded for overall frame, type of article and the main topics addressed. Two coders were used to demonstrate reliability and reproducibility. Descriptive statistics and Fisher’s Exact Test were utilized to characterize the changes in newspaper articles over time and the differences between informative and opinion pieces.

Results: In addition to depicting the changes in newspaper articles over time, the analysis revealed significant differences between news articles and opinion pieces published in newspapers throughout the United States. The main topics addressed in informative articles were the description and regulation of e-cigarettes. Editorial and opinion pieces placed more emphasis on the increasing popularity of e-cigarettes and the perceived health benefits.

Conclusions: This content analysis indicated that there has been, and there currently remains, much confusion surrounding the long term health effects of e-cigarettes and their use as a smoking cessation tool. More research needs to be conducted on e-cigarettes and the findings must be clearly communicated via news media to the public, to support knowledgeable consumer decisions, and to policymakers, so that informed regulations may be implemented.

JUSTIFICATION: Recognizing the information available to readers, allows for a better understanding of their thoughts about and feelings towards e-cigarettes.

FUNDING: The Ohio State University, Center of Excellence for Regulatory Tobacco Science (OSU-CERTS), is supported by grant number P50CA180908
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PA1-9
EXPLORING TWITTER DATA FOR KEY CONVERSATIONS, TRENDS, AND PATTERNS RELATED TO E-CIGARETTES


Background: E-cigarette use has gained momentum in the United States. The use prevalence among youths is of particular concern. There are an increasing number of public dialogues about e-cigarettes, especially on social media – an outlet particularly popular among youth. It is important that we attempt to discern the core voices, message frames, and sentiment surrounding e-cigarettes. The objective of this analysis was to explore Twitter data during a critical time in the e-cigarette evolution by conducting a content analysis to identify key conversations, trends, and patterns.

Methods: 3.7 M tweets were supplied by the Twitter Firehose. They represented all public tweets sent between May 1, 2013 and May 1, 2014 that were matching strategic keywords. Metrics utilized for the purposes of this study were time, date, geolocation, user profile link, tweet content, and tweet link. Two-stage content analysis was performed: 1) randomly sampling tweets from the full dataset and classifying content for e-cigarette relevance until a manageable sample of at least 10,000 relevant tweets was achieved and 2) classifying content of each relevant tweet for sentiment, user description, genre, and theme. Bivariate associations and correlation analysis were performed as well.

Results: Findings show that 71% of the sample tweets were classified as positive sentiments, while negative and neutral tweets made 12% and 17% of the sample. Most tweets containing images (92%) were positive. The top two categories of users who tweeted about e-cigarettes were everyday people (65%) and E-cig community movement (16%). Personal opinion (28%) and marketing (21%) were the two largest genres of tweets, where advertising (26%) and policy/government (20%) were the two largest themes.

Conclusion: Analyzing social media trends is a meaningful way to inform public health practitioners of the current sentiments in regards to e-cigarettes, including who is engaged in the dialogue, what they are saying, and what they are doing. This study also provides a replicable methodology, as well as insights for how this method can be automated using computational methods such as supervised machine learning.

FUNDING: National Institutes of Health, National Cancer Institute
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PA1-10
EFFECT OF VAPING POWER ON AEROSOL SIZE DISTRIBUTION AND E-JUICE VAPORIZED IN A TYPICAL E-CIGARETTE

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E-cigarette technology has rapidly evolved toward higher powered devices that produce more concentrated aerosol and, presumably, a more satisfying vaping experience. This research characterizes the effect of vaping power on mass of e-juice vaporized as well as particle size and particle mass distributions. Vaping aerosol was produced with a tank-style e-cigarette equipped with an adjustable voltage battery set to 3.3 and 11.2 Watts. Aerosol particle size distributions were measured simultaneously with a Scanning Mobility Particle Sizer (SMPS) and an Aerodynamic Particle Sizer (APS), providing a combined size measurement range of 16 nanometers (nm) to 19.8 micrometers (µm). This instrument ensemble was also used to characterize conventional cigarette smoke aerosol for direct comparison. Additionally, e-juice vaporization mass was measured at 9 points between 3.0–11.9 watts. Consistent with prior studies, vaping aerosol size distributions were bimodal in the ultrafine region; however, a previously unreported third mode was observed around 900 nm comprising approximately 95% of aerosol mass. Particle mass distribution shifted toward larger particle sizes at the higher vaping power, likely due to increased kinematic coagulation. Increasing power from 3.0 and 11.9 watts resulted in an 86-fold increase in e-fluid consumption. Vaping device power has a dramatic effect on vaping aerosol concentration and mass distribution across particle sizes. Vaping aerosol mass spans a much wider particle size range than previously reported, although the major portion of the mass is still well within the respirable size range. Because e-cigarette technology continues to evolve toward high power/ high output devices, these results demonstrate need for further research to inform the design and regulation of e-cigarette products.

JUSTIFICATION: Realizing that small differences in vaping power can result in large differences in e-juice vaporized as well as shifts in aerosol size distribution should inform public health and clinical research seeking to compare e-cigarette devices against each other; studies should be standardized on vaping Power.

FUNDING: This study was conducted at the University of Oklahoma, College of Public Health and was supported by Oklahoma Tobacco Research Center grant # C1081507.

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PA1-11
A RANDOMIZED, CONTROLLED, CROSSOVER, RELATIVE BIOAVAILABILITY STUDY OF NICOTINE DELIVERED BY AN ELECTRONIC VAPOUR PRODUCT, A NICOTINE INHALATOR, AND A CONVENTIONAL CIGARETTE

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Introduction: This randomized, controlled clinical trial was designed to investigate the pharmacokinetic (PK) profile of nicotine delivered by an electronic vapour product (EVP) prototype in comparison with conventional cigarettes (CC) and an inhalator used in nicotine replacement therapy (NRT).

Methods: This is a randomized controlled study in two parts using a four-way crossover study design. The first part compared an EVP device with flavoured (COOL2.0%) and unflavoured (BL2.0%) capsules, with conventional cigarettes (JPS Silver, King Size, 0.5mg nicotine) and a 15-milligram nicotine inhalator (Nic15). The second part compared the non-flavoured EVP containing different nicotine concentrations (BL0%, BL0.4%, BL0.9%, or BL2.0%). A total of 24 healthy male subjects were included, 12 assigned to Part 1, and 12 assigned to Part 2. The study was performed according to good clinical practice (GCP) standards and registered in clinicaltrials.gov.

Results: Part 1: The maximum plasma level of nicotine after the fourth product (Cmax) was similar for the 2 EVP prototypes (3.83 ng/ml for BL2.0% and 2.76 ng/ml for COOL2.0%) and for the Nic15 product (2.71 ng/ml). These levels were significantly lower compared to CC (23.03 ng/ml). The time to reach this level (Tmax) was longer for the EVPs (8.8 min for BL2.0%, 12.7 min for COOL2.0%) and the Nic 15 (11.4 min), than for the CC (3.2 min). Part 2: Dose proportionality was seen for the different nicotine levels of the EVP prototype. The Cmax was 3.69 ng/ml for BL2.0%, 2.02 ng/ml for BL0.9%, 0.97 ng/ml for BL0.4% and 0.05 ng/ml for BL0%. The mean Tmax ranged from 7.7 to 13.2 min.

Conclusions: At the maximum nicotine concentration of 2% as prescribed by the EU Tobacco Products Directive, EVPs such as the prototypes tested in this study have the potential to deliver nicotine with a similar PK profile as for inhalators used in NRTs. The Cmax of all products tested was approximately one tenth of that of the tested CC and the Tmax approximately three times longer.

JUSTIFICATION: This study provides interesting insights about where EVPs are situated in terms of their ability as nicotine delivery devices in comparison to conventional cigarettes and NRTs.

FUNDING: This study was funded by Fontem Ventures.
PA1-12
NICOTINE RESIDUES IN HOUSES OF ELECTRONIC CIGARETTE USERS, TOBACCO SMOKERS, AND NON-SMOKERS IN WESTERN NEW YORK, USA

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Purpose: Thirdhand smoke is the residue of tobacco toxicants that can persist on surfaces after smoking has ceased. The nicotine deposited on the surfaces can react with airborne chemicals to create carcinogens. While prior studies have shown that there is nicotine residue in tobacco smokers’ homes, none have examined the nicotine deposition on surfaces in electronic cigarette users’ homes.

Methods: We measured nicotine on surfaces in three groups of homes: 8 electronic cigarette users, 6 cigarette smokers, and 8 nonsmokers. The wipe samples were taken from the homes of individuals residing in the Buffalo, NY area. The residents needed to have smoked or vaped in their home on a regular basis. Tobacco cigarettes had not been smoked in the homes of electronic cigarette users for over a year. Three surface wipe samples were taken in each room from the floor, wall and window. Nicotine was extracted from the wipes and analyzed using gas chromatography. A Kruskal-Wallis test was performed to determine statistical differences in the nicotine levels between the groups of homes.

Results: Half of the electronic cigarette users’ homes had detectable levels of nicotine on surfaces whereas nicotine was found in all of the tobacco cigarette smokers’ homes. Trace amounts of nicotine were also detected in half of the non-smokers homes. There was no significant difference in the levels of nicotine found upon the different surfaces in the homes (p > 0.05). Nicotine levels in electronic cigarette users homes was significantly lower than that found in cigarette smokers homes (average concentration 8±17 vs. 1,303±2,676 micrograms/m2; p<0.05). There was no significant difference in the amount of nicotine in electronic cigarette users’ and non-smokers’ homes (p>0.05).

Conclusions: Nicotine is a common contaminant found on indoor surfaces even in non-smokers homes. Using electronic cigarettes indoors significantly reduces thirdhand exposure to nicotine compared to smoking tobacco cigarettes. JUSTIFICATION: This is a preliminary study showing reduction in thirdhand exposure to nicotine in houses of electronic cigarette users compared to tobacco smoking. FUNDING: This work was supported by Roswell Park Cancer Institute, National Cancer Institute (NCI) (P30 CA016056), and National Cancer Institute CURE Supplement. CORRESPONDING AUTHOR: Maciej Goniewicz, PharmD, PhD, Assistant Professor, Roswell Park Cancer Institute, Department of Health Behavior, Elm and Carlton Streets, Buffalo, NY 14201, USA, 716-845-8541, Fax: 716-845-1265, maciej.goniewicz@roswellpark.org

PA7-1
THE CHRNA5 D398N POLYMORPHISM: EFFECTS OF THE POLYMORPHISM ON DRUG RESPONSE AND BRAIN FUNCTION IN A MOUSE MODEL

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The human polymorphism designated rs16969968 leads to an aspartic acid (D) to asparagine (N) amino acid change at position 398 in CHRNA5, the gene that encodes the nicotinic acetylcholine receptor (nAChR) alpha5 subunit. This polymorphism repeatedly has been associated with risk for nicotine dependence and other smoking-related behaviors. To appreciate the neurobiological basis for how this genetic variant alters risk for nicotine dependence, we have generated a knock-in mouse that possesses the “risk” variant of Chrna5 (N397). Consistent with human data, the N397 mouse exhibited significantly elevated nicotine intake relative to animals possessing the non-risk variant (D397). The N397 variant also increased sensitivity to the rewarding effects of nicotine but did not alter sensitivity to the aversive effects of nicotine. Functionally, the risk variant decreased nicotine-stimulated dopamine release from synaptosomes prepared from the nucleus accumbens. Other experiments indicated that there are few genotype-dependent effects on neurotransmitter content in the nucleus accumbens (NA) and ventral tegmental area (VTA) under baseline conditions. However, the N397 risk-variant mouse exhibited a reduction in dopamine, glutamate, taurine and glycine content in the NA following nicotine exposure as compared to the D397 mouse. In contrast, the N397 mouse exhibited elevated levels of serotonin, glutamate, taurine and glycine in the VTA relative to the D397 mouse after nicotine exposure. Nicotine treatment also led to an increase in serotonin turnover in the VTA of D397 mice but not N397 mice. These data indicate that the CHRNA5 D398N variant may make an individual more prone to nicotine dependence due to unique alterations in brain chemistry in response to nicotine exposure. Understanding how these gene x nicotine exposure dependent alterations in brain chemistry influence continued nicotine use may provide insight into the mechanism through which the CHRNA5 D398N is associated with nicotine dependence in humans.

JUSTIFICATION: Understanding the biological basis of how an genetic variant alters risk for nicotine dependence will be informative for developing improved, or minimally, targeted treatment strategies for smoking cessation. FUNDING: Funding support from NIH. CA089392, DA015663, DA026918 AA007464 CORRESPONDING AUTHOR: Jerry Sitzel, University of Colorado Boulder, Institute for Behavioral Genetics, UC8447, Boulder, CO 80309, USA, 303-735-6173, stitzel@colorado.edu

PA7-2
POLYGENE BY ENVIRONMENT INTERACTION AND ADOLESCENT SMOKING RISK


Given that more than 80% of adult smokers initiate before the age of 18, adolescence represents an important developmental period for studies of smoking behavior (SB). While genetic factors have consistently been demonstrated to influence individual differences in SB, heritability estimates from twin and family studies of smoking initiation (SI) are typically higher for adults than adolescents. Previously, we conducted genome-wide association studies (GWAS) of adolescent smoking behavior in three longitudinal cohorts (n=2541), including a twin sample (Virginia Twin Study of Adolescent Behavior Development, ABD), and two epidemiological samples, (Great Smoky Mountain Study, and Christchurch Health...
and Development Study). Despite failing to detect any single-marker associations attaining genome-wide significance, we estimated by the GCTA approach that genome-wide common variation in aggregate accounted for 50.3, 0.8, 0.1 and 0.1% of the variance in SB (p<1.0x10^-8). Here, we extend our previous work by examining environmental effects on adolescent smoking using three complimentary approaches: (1) incorporating environmental main effects, (2) assessing polygene score by environment interaction, and (3) estimating the proportion of trait variance due to gene by environment interactions (GxE). Preliminary analyses yielded significant environmental main effects for socioeconomic status (OR = 1.4-2.1) and mother smoking during pregnancy (OR = 1.5-1.9) on adolescent smoking behavior. A genetic score comprised of 25 adult-smoking associated SNPs was not associated with SB nor were there significant genetic score by environmental interactions. However, the GCTA estimated proportion of variance due to genetic by environment interaction for SB ranged 18-26% for SES and maternal smoking during pregnancy. Future research will apply these methods to additional smoking behaviors and compare polygene scores by alternative methods (i.e., BLUP, p-value threshold). Albeit preliminary, these results suggest that GxE may play an important role in adolescent smoking risk.

JUSTIFICATION: Identify gene and environmental effects contributing to smoking behavior in adolescence.

FUNDING: Grant support by NIH (M01RR00067, MH68085, P01MH093731 and K23MH080230), NIDA (DA0111301, DA24413, DA025109), NARSAD, and William T. Grant Foundation.

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PA7-3
SMOKING BEHAVIOR AND PEER NETWORKS: SENSATION SEEKING PHENOTYPES AND GENOTYPES
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Smoking initiation, a sensation seeking behavior, occurs within a social context, among networked peers, and peer influence on smoking behavior is assumed to predominantly reflect an environmental influence. Yet, sensation seeking tendencies have both genetic and non-genetic underpinnings. For example, single nucleotide polymorphisms (SNPs) in the dopamine transporter gene (SLC6A3) are associated with self-reported sensation seeking tendencies and behaviors, including smoking initiation. Here we investigate whether peer network structures might relate to genotypic (SLC6A3) and phenotypic measures of sensation seeking (self-reported tendencies), and thereby influence smoking behavior. Participants (n=1,132 of whom 573 were girls and all of Mexican origin) in the current analysis are members of a cohort established to examine genetic and non-genetic determinants of smoking initiation. Participants provided a saliva sample, which was genotyped for SNPs identified from the literature as associated with sensation seeking behaviors, including SLC6A3. Self-report data on sensation seeking tendencies, cigarette use, and number of friends who smoke were collected in 2008-09 when participants were between the ages of 12 and 17 (mean=14.3; SD=1.04). Using analysis of variance, we examined mean differences in a) cigarette use, b) sensation seeking tendencies, and c) minor allele frequency (MAF) of SLC6A3 by number of peers who smoke (none, one, or more than one). Among youth who reported no friends who smoke, 16% reported cigarette use, compared to 41% among youth who reported one friend smokes, and 64% among youth who reported more than one friend smokes (p<0.001). We observed a positive linear relationship between number of friends who smoke and sensation seeking tendencies (p<0.001 for all), as well as the MAF of SLC6A3 (p=0.061). Our results suggest that with respect to smoking behavior, peer groups share similar genotypic and phenotypic sensation seeking tendencies. Targeting smoking interventions to peer groups based on smoking status to address sensation seeking tendencies could increase prevention efforts and intervention efficacy.

Our results suggest that peer groups could share similar sensation seeking tendencies, thereby increasing individual group members’ risks to engage in sensation seeking behavior. Targeting smoking interventions to peer groups based on smoking status could increase intervention efficacy.

JUSTIFICATION: Our results suggest that peer groups could share similar sensation seeking tendencies, thereby increasing individual group members’ risks to engage in sensation seeking behavior.

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PA7-4
SMOKING INITIATION AND QUANTITY: SAME OR DIFFERENT GENETIC AND/OR ENVIRONMENTAL RISK FACTORS?
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Previous studies have suggested a changing role for the contributions of genetic and shared environmental factors to liability of smoking initiation from early adolescence to young adulthood. Measures of smoking quantity typically show a larger contribution of genetic factors. However, estimates of the overlap in risk factors to smoking initiation and quantity have been less consistent, especially in adolescence. Furthermore, individual studies were often underpowered to estimate these factors reliably, especially in early adolescence partly because of the rapidly increasing prevalence of ever smoking. The current study combines data from the major twin registries in the US (Virginia, Colorado, Minnesota) and around the world (Europe & Australia) to jointly estimate the mean level of smoking initiation and quantity and the causes of individual differences in smoking initiation and progression. Sample sizes ranged from 3000 to over 10,000 individuals at any given age between ages 12 and 19. Structural Equation Modeling was used to fit alternative genetic models in OpenMx and test whether the liabilities to smoking initiation and quantity are independent or correlated and whether sex differences exist in the causes of variation. Cross-sectional twin correlations suggested that both additive genetic and shared environmental factors influenced the liability of smoking initiation and quantity across the adolescent and young adult age range with their roles shifting throughout adolescence such that genetic factors gradually explain a larger proportion of the variance. In early and middle adolescence, the liabilities to smoking initiation and quantity were primarily independent while in later adolescence and young adulthood, a correlated liability model fitted the data better. Thus different factors appear to influence whether someone starts to smoke and how much they smoke in early adolescence where at least partly the same factors contribute to whether and how much one smokes in late adolescence/young adulthood. These results may have important implications for prevention/ intervention efforts to decrease the consequences of smoking.

JUSTIFICATION: Knowledge of overlap between risk factors for smoking initiation and quantity has implications for where prevention/intervention efforts should be focused.

FUNDING: R01DA025109, R37DA018673

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Background: Recent meta-analyses show strong evidence of associations between genetic variants in CHRNA5 on chromosome 15q25, smoking quantity, and lung cancer. This meta-analysis tests whether the CHRNA5 variant rs1696968 predicts age of smoking cessation and age of lung cancer diagnosis.

Methods: Meta-analyses examined associations between rs1696968, age of quitting smoking, and age of lung cancer diagnosis in 24 studies of European ancestry (N=29,072).

Results: The rs1696968 allele (A) is associated with a lower likelihood of smoking cessation (HR=0.95, 95% CI=0.92-0.98, p=0.0043), and the AA genotype is associated with a 4-year delay in median age of quitting compared with the GG genotype. Among smokers with lung cancer diagnoses, the rs1696968 genotype (AA) is associated with 4 years earlier median age of diagnosis compared with the low-risk genotype (GG) (HR=1.08, 95% CI=1.04–1.12, p=1.105).

Conclusion: These data support the clinical significance of the CHRNA5 variant rs1696968. It predicts delayed smoking cessation and an earlier age of lung cancer diagnosis in this meta-analysis. Given the existing evidence that this CHRNA5 variant predicts favorable response to cessation pharmacotherapy, these findings underscore the importance of public health efforts to identify smokers carrying the rs1696968 in CHRNA5 in relation to smoking cessation success and lung cancer risk.

JUSTIFICATION: These findings inform both clinical research and public health by suggesting a genetic marker can be used to predict age of smoking cessation and lung cancer diagnosis, both of which are important health problems.

FUNDING: International Lung Cancer Consortium (ILCCO): The data management of ILCCO is supported by Cancer Care Ontario Research Chair awarded to R. Hung, and NIH U19 CA148127 Transdisciplinary Research in Cancer of the Lung (TRICL). The study was also supported by a grant from the National Institute of Health (U19CA148127). The Toronto study was also supported by Canadian Cancer Society Research Institute (no.020214), Ontario Institute of Cancer and Cancer Care Ontario Chair Award to RH. Sample collection for the Heidelberg lung cancer study was in part supported by grant 70-2919 from the German Federal Ministry of Education and Research.

PA7-6
CYP2A6 GENOTYPE DIFFERENTIALLY SHAPES STRIATAL-CORTICAL BRAIN CIRCUITS IN SMOKERS VS. NONSMokers

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Genetic variations in CYP2A6 determine the rate of nicotine metabolism and are associated with smoking behaviors. A functional brain imaging study showed that genetic variation in CYP2A6 modulates neural reactivity to smoking cues. However, whether the CYP2A6 genotype directly shapes the intrinsic functional connectivity of brain circuits and how such genotype effects, if any, interact with smoking remains unknown. We addressed these issues using resting-state fMRI and network analysis. 48 smokers (Normal: Slow = 25:23) and 71 non-smokers (Normal: Slow = 28:43) were included in the analysis. Subjects underwent a 6
PA18-1  TOBACCO RETAILER DENSITY NEAR HOME AND SCHOOL: ASSOCIATIONS WITH TEEN SMOKING IN U.S. HOUSEHOLDS

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Background: Socioecological explanations for adolescent tobacco use emphasize the retail availability of products and marketing near schools. Less is known about the impact of living in neighborhoods with a high concentration of tobacco retailers and the relative influence of home and school environments on smoking uptake.

Methods: Baseline survey data from 2,771 adolescents (age 13-16) were drawn from a web panel that uses address-based sampling to construct a representative sample of U.S. households. Participants answered questions about cigarette smoking, peer and parent use, and other risk factors. Using ArcGIS, we created 800-foot road network buffers around each participant’s home and school. Address data for likely tobacco retailers were purchased from two different sources, and tobacco retailer density measured the number of retailers per square mile for each buffer. Neighborhood demographics (percent African American, Hispanic, and below poverty) were obtained from intercensal estimates. Logistic regressions modeled ever smoking as a function of home and school density separately, adding individual characteristics (age, gender, race, ethnicity, and self-reported grades), followed by social influences and neighborhood demographics. Presence of a tobacco retailer within 1,000 feet of schools was examined for relevance to potential regulation of tobacco sales.

Results: Prevalence of ever smoking was 18.7 percent. Tobacco retailer density was skewed for home (median=0.0; IQR=4.7) and for school buffers (median=8.7; IQR=14.5). Nearly half of adolescents attended a school within 1,000 feet of a tobacco retailer. Each increase of one tobacco retailer per square mile in the home buffer was associated with higher odds of ever smoking (OR=1.01; CI=1.01, 1.02), adjusting for both individual and neighborhood demographics. Neither tobacco retailer density near schools nor the presence of a tobacco retailer within 1,000 feet was associated with ever smoking.

Conclusions: Place-based policies that restrict where tobacco can be sold should not focus exclusively on proximity to schools. Additional policies are needed to reduce tobacco retailer density everywhere.

JUSTIFICATION: More is known about retail availability of tobacco near schools than homes, and this is the first studies to examine both in the US population.

FUNDING: Supported by the National Cancer Institute, grants R01-CA67850 and U01-154821.

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PA18-2  IS THERE A RELATIONSHIP BETWEEN THE CONCENTRATION OF SAME-SEX COUPLES AND TOBACCO RETAILER DENSITY?

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Background: Tobacco use is markedly higher among lesbian, gay, and bisexual (LGB) populations than among heterosexuals. While this disparity historically has been explained as the result of coping with stress from discrimination and structural stigma, environmental exposure to tobacco retailers is known to contribute to tobacco use behaviors. Thus, we aimed to assess the association between the rate of same-sex couple households and tobacco retailer density and to examine potential explanations of the relationship.

Methods: 97 U.S. counties in the lower 48 states were selected with probability proportionate to population. Two 2012 commercial databases of tobacco retailers were merged to create a frame of all tobacco retailers (N=91,910). Retailers were geocoded, and we calculated the number of tobacco retailers per 1,000 residents in each census tract (N=17,941). We calculated same-sex couple rates per 1,000 households from Census 2010. We then built sex-stratified spatial regression models to assessing relationship, adding demographic and neighborhood environment variables to examine confounding.

Results: For same-sex couples, by sex, and tobacco retailer density there was a small but significant positive relationship, as hypothesized. Controlling for area-level racial/ethnic composition and median income explained this relationship for female same-sex couples. Controlling for neighborhood racial/ethnic composition, median income, the presence of interstate highways, and urbanicity level did not fully explain the relationship between male same-sex couples and tobacco retailer density.

Discussion: There is a small, but potentially meaningful at the population level, relationship between the concentration of same-sex couple households and the density of tobacco retailers. This relationship can be explained by other physical and demographic neighborhood characteristics for female same-sex couples; however, the relationship for male same-sex couples remains. The significant, positive relationship between rates of same-sex couple households and tobacco retailer density in census tracts suggests the possibility that disparities in tobacco use for LGB populations may have an environmental component.

JUSTIFICATION: Little is known about tobacco use disparities for LGBT populations, and the existing literature focuses largely on the role of stress/discrimination and targeted marketing. This research suggests that a greater density of tobacco retailers in LGB neighborhoods may help contribute to disparities in LGB tobacco use.

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Objective: Estimate the degree that tobacco outlet density affects nondaily smoking (NDS) prevalence by examining the link between the spatial distribution of US tobacco outlets and patterns of NDS within a national triethnic sample.

Participants: N=1,201 nondaily smokers, N=904 (75%) converted NDS (cNDS) who had previously smoked every day, and N=297 (25%) native NDS (nNDS) who have only smoked non-daily, drawn from a national online panel.

Main Outcome Measures: Kernel density estimation (KDE) was used to generate a nationwide probability surface of tobacco outlets that was then linked to the residential zip-code tabulation area (ZCTA) of each participant. Hierarchically nested log-linear models were then compared to evaluate the association between outlet density, nondaily use patterns, price sensitivity and intentions to quit.

Results: cNDS were much more likely than nNDS to reside in areas with higher outlet density (likelihood ratio test statistic G2=421.9, p<0.001). This was especially apparent among cNDS who tried and failed to quit completely the previous year (G2=20.1, p<0.001), and among those with no intentions to quit in the next 30 days (G2=50.6, p<0.001). cNDS living in high-density areas were more likely to report that price had influenced their decision to reduce the amount they smoke (G2=39.9, p<0.001). Those in high-density areas were also more likely to shop around for better prices (G2=27.5, p<0.001), although neither cNDS nor nNDS reported that the price of cigarettes affected their choice of brand.

Conclusions: Findings suggest that nondaily conversion may be a more viable and attractive alternative to cessation for smokers residing in areas with higher outlet density and associated lower prices. Particularly in dense urban areas, tobacco control efforts that encourage cessation may inadvertently increase NDS rates by driving up nondaily conversion rather than cessation among current daily smokers.

JUSTIFICATION: This work could help guide efforts to craft tobacco control policies that counteract rising nondaily smoking rates, especially in urban areas.

FUNDING: This work was funded by Pfizer’s Global Research Awards for Nicotine Dependence (JSA). JSA is also supported by the National Institute for Minority Health Disparities (NCMHD/NIH-1P60MD003422). TRK is supported by the National Institute on Drug Abuse, National Cancer Institute and Office of Behavioral and Social Science Research (NIH-R01DA034734).

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Objective: Tobacco industry documents show systematic targeting of minority and low-income consumers at the point of sale (POS). We sought to systematically review and meta-analyze extant evidence of disparities in tobacco marketing at tobacco retailers by socio-demographic neighborhood characteristics.

Methods: We identified 43 relevant papers from 893 unique results of a systematic search in 10 databases on May 28, 2014. We found 126 effect sizes for associations of price, placement, promotion, or product availability with a neighborhood demographic of interest (socioeconomic disadvantage, race, ethnicity, and urbanicity). We conducted a narrative review and random-effects meta-analysis, stratified by neighborhood characteristics and randomly sampling for one outcome per study to address dependence among effect sizes. We used correlations as our measure of effect size. Funnel plots were examined for evidence of asymmetry.

Results: There are disparities in the marketing of tobacco products by neighborhood demographics. Disparities in menthol marketing are starkly present, with targeting toward urban and more African-American neighborhoods. Smokeless tobacco products are targeted toward low income and more white communities. Differences in store type partially but not fully explain these disparities. Meta-analysis was possible for neighborhood socioeconomic disadvantage and provides marginally significant evidence of more tobacco marketing at retail stores in more disadvantaged areas, rz=0.08 (95% CI: -0.02 to 0.17).

CONCLUSIONS: Geodemographic market segmentation and targeting, a standard marketing practice across industries, represents an issue of social and environmental injustice for youth exposure to tobacco marketing and for smokers whose quit attempts may be stymied by disproportionate marketing in low-income and African-American neighborhoods.

JUSTIFICATION: Persistent tobacco-related disparities are influenced by tobacco industry marketing. The literature regarding disparities in point-of-sale marketing remains un-synthesized and spread across several disciplines. Systematic review and meta-analysis could inform research on disparities and regulatory action.

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Background: The Institute of Medicine recommends that public health agencies restrict the number and regulate the location of tobacco retailers as a means of reducing tobacco use. However, the best policy strategy for tobacco retailer reduction is unknown.

Purpose: The purpose of this study is to test the percent reduction in the number and density of tobacco retailers resulting from three potential policies: (1) prohibiting sales of tobacco products in pharmacies and stores with pharmacy counters, (2) restricting sales of tobacco products within 1000 feet of schools, and (3) regulating to 500 feet the minimum allowable distance between tobacco retail
outlets. Methods. This study uses data from two lists of tobacco retailers in North Carolina, one at the statewide level, and another “gold standard” list from three counties. Retailers near schools were identified using point and parcel boundaries in ArcMap. Python programming language generated a random lottery system to remove retailers within 500 feet of each other.

Results: Data from both lists indicate that a minimum allowable distance policy has the greatest impact if implemented singly. Further, using the gold standard list, implementation of both a pharmacy and near-schools ban would, on average, reduce retailer density by 29.7% (range 26.3 to 35.6%).

Conclusions: The implementation of policies restricting tobacco sales in pharmacies, near schools or in close proximity to another tobacco retailer would substantially reduce the number and density of tobacco retail outlets.

JUSTIFICATION: This study aims to quantify and compare the reduction in the number and density of tobacco retailers resulting from three potential policy solutions; tobacco control practitioners and policy makers would benefit from an analysis of the potential impact of these three unique policy solutions.

FUNDING: Funding for this study was provided by the University Cancer Research Fund to UNC Lineberger Comprehensive Cancer Center at UNC Chapel Hill. Funding was also provided by a grant from the National Cancer Institute to Dr. Ribi (Multi-Pi)—“Maximizing state & local policies to restrict tobacco marketing at point of sale,” 1U01CA154281.

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PA18-6 THE VIEW FROM THE OTHER SIDE OF THE COUNTER: INTERVIEWS WITH VAPOR STORE OWNERS

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Electronic cigarette use is becoming increasingly popular but little is known about the role of the vapor store in promoting vaping behaviors and user beliefs about vaping. Customers consider vapor store staff experts and rely on their information in making decisions about vaping. Thirty-three vapor store owners and managers were interviewed regarding their beliefs and knowledge about e-cigarettes, marketing practices, motivations for selling e-cigarettes, how they explained the safety of vaping to customers, views about teen vaping, and types of customers who come to their store. Interviews were conducted in the vapor store and digitally recorded. The recordings were transcribed and analyzed for themes using NVivo software. Most owners interviewed felt that they were performing an important health service to their customers by helping them stop smoking but regrettable the majority were often misinformed about their products and passed misinformation along to customers. Owners described how they explained the safety of nicotine and vaping products to customers, such as equating nicotine and caffeine, as well as their beliefs about the health impacts of vaping. Owners shared their “dosing” practices for deciding how much nicotine customers should get in their e-liquid. The majority of owners reported getting most of their knowledge about e-cigarettes from Google and YouTube, including how to mix juices and the safety of their products. Owners described how they marketed their product to different user segments, and discussed their conflicting views about teen vaping and their beliefs about whether vaping promoted smoking. Owners also discussed reactions from the community and local businesses to their store and their involvement with advocacy groups. Finally, most store owners discussed their support of some types of regulation within the industry to protect consumers. Vapor stores are the focal point of vaping culture and increasingly are seen as a resource for quitting smoking. Almost all store owners had a sincere interest in helping customers quit smoking but had little access to accurate information or training.

JUSTIFICATION: These results can be used to develop effective policies concerning the growing electronic cigarette industry as well as inform public health practitioners and researchers of areas of immediate needs for education for the general public and education and training for vapor store owners and staff.

FUNDING: This project was funded by the Oklahoma Tobacco Research Center

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PA5-1 SEX DIFFERENCES REVEALED IN THE DOPAMINERGIC SIGNATURE OF TOBACCO SMOKING

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Background: Women have more difficulty quitting smoking than men. The neurobiological basis for this difference is unknown. Dopamine (DA) is a critical neurotransmitter that is implicated in nicotine reinforcement and smoking cessation treatment success, with evidence supporting stronger associations for men compared to women. A recent methodological innovation allows us to probe the DA response to smoking in highly localized striatal regions. This is the first investigation to examine sex differences in anatomical and temporal signatures of smoking-induced DA release.

Methods: Sixteen healthy smokers (8M, 8F) abstinent overnight, participated in one [11C]raclopride positron emission tomography (PET) scan. Subjects smoked their preferred brand of cigarette while being imaged. Brief DA responses (lasting only minutes) were extracted from the dynamic PET data. Voxel-wise analyses produced spatio-temporal patterns of DA release, visualized as “DA movies”. Parametric images of magnitude and timing of DA release were compared between groups.

Results: Men were significantly more likely than women to release DA in some fraction of the right ventral striatum in response to smoking. The male activation pattern in right ventral striatum in response to cigarettes was characterized by a faster and greater peak response to cigarettes than the female pattern. Additionally, women responded faster than men in a discrete sub-region of the dorsal putamen.

Conclusions: This is the first demonstration of sex differences in the DA response to tobacco smoking in the living human brain. We demonstrated that the magnitude and the timing of the DA response differs between men and women. Our finding, that men activate more ventrally than women, is consistent with the established notion that men smoke for the reinforcing, drug effect of cigarettes. Women smoke for other reasons, such as mood regulation and cue reactivity, which may be more habit driven, and dorsally localized. The DA-ergic signature of smoking may represent an important multi-dimensional biomarker of smoking dependence and a tool for the development of new gender-sensitive medications for smoking cessation.

JUSTIFICATION: To provide a novel methodology for testing gender-sensitive treatments.

FUNDING: Supported by NIDA (R21DA032791, K02DA031750), and the Office of Research on Women’s Health (P50DA033945).

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**PA5-2**
INCREASED CIRCULATING PEPTIDE YY AND GHERLIN ARE ASSOCIATED WITH EARLY SMOKING RELAPSE

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Accumulating evidence suggests the involvement of appetite hormones in regulating reward and craving for drugs. We recently found that increased peptide YY (PYY) and ghrelin were associated with decreased reported craving and increased positive affect, and higher ghrelin levels predicted increased risk of smoking relapse. This study assessed PYY and ghrelin during ad libitum smoking (session 1) and after the initial 48 hours of a smoking cessation attempt (session 2), and how changes in these hormones across sessions were associated with smoking relapse. Data were compared smokers who were able to abstain for the first four weeks (n=37), smokers who relapsed within this period (n=54), and a nonsmoking comparison group (n=37). Plasma samples for the measurement of PYY and ghrelin and subjective measures assessing craving and mood were collected at the beginning of each session. Smoking status was verified via self-report and biochemical measures in the two sessions and a follow-up visit conducted four weeks after the quit day. Smoking relapse was defined as smoking seven consecutive days. Repeated measure analyses were conducted including smoking groups (abstainers, relapsers, nonsmokers), sex, and sessions as predictors. Results showed that relapsers experienced greater levels of distress than nonsmokers and abstainers (ps < .01). Across groups, women had higher ghrelin levels than men. Relative to nonsmokers, smokers who relapsed had higher circulating ghrelin levels, especially during the ad libitum session (p<01). Relapsers also exhibited higher PYY than nonsmokers particularly in the second (abstinent) session (p<05). These results suggest that PYY and ghrelin may be useful markers of smoking relapse. Future work will examine actual changes in appetite and weight after cessation and determine the extent to which these hormones contribute to post-cessation changes in appetite and weight among smokers.

JUSTIFICATION: PYY and ghrelin may be useful markers of smoking relapse and appetite changes after cessation.

FUNDING: This research was supported in part by National Institute of Health grants R01DA016351 and R01DA027232 (PI: al’Absi)

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**PA5-3**
ABNORMAL INTEROCEPTIVE INSULA ACTIVITY ASSOCIATED WITH NICOTINE CRAVING IN LONG-TERM SMOKERS

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Interception constitutes the perception of metabolic and visceral signals that collectively contribute to the subjective sense of the body’s internal state. The physiological dysregulation associated with nicotine withdrawal promotes an aversive interception state that motivates drug-seeking behaviors aimed at reestablishing homeostasis. The insular cortex is a cortical destination for interception signals from the body, with demonstrated involvement in neuroimaging studies of interception and nicotine cue-reactivity. Lesions of the insula are also associated with the dramatic cessation of cigarette craving. This evidence points to a direct role for the insula in manifesting the subjective interception experience of nicotine craving. However, to date there is no human neuroscience evidence demonstrating that nicotine craving is associated with activity in the specific regions of the insula supporting interception. We therefore recruited long-term cigarette smokers as well as healthy non-smokers to undergo fMRI while performing a task requiring interception attention to visceral sensations or exteroceptive attention in a visual target detection control task. The cigarette smokers were scanned twice, once while nicotine-sated, and once while nicotine-craving. In healthy non-smokers we observed greater activity within both the left and right dorsal mid-insula during attention to visceral sensations compared with the exteroceptive control task. Both regions have previously been shown to underlie interception, paradoxically with less stimulus-evoked activity when subjects are under states of increased visceral input. We next used the bilateral dorsal mid-insula clusters in region of interest analyses to compare activity in smokers during nicotine craving compared to their sated state. Importantly, in line with prior findings, we found that nicotine craving was associated with less stimulus-evoked activity in both regions when compared to the nicotine-sated state. These findings constitute the first evidence in humans that nicotine craving is associated with altered activity specifically within regions of the insula supporting interception.

FUNDING: The Oklahoma Tobacco Research Center (OTRC), The National Institute of Mental Health, and The William K. Warren Foundation

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**PA5-4**
THAT’S WHERE I SMOKE: INSULA REACTIVITY PREDICTS SMOKING BEHAVIOR IN RESPONSE TO PERSONAL SMOKING ENVIRONMENTS

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Environmental contexts associated with prior smoking increase craving and provoke smoking behavior. Whereas the neural basis of context-induced drug seeking has been evaluated in animal models, the neural basis of context effects has not been sufficiently explored in humans. In the current analysis, we examined whether brain activation in response to viewing personal smoking environments (PSEs) is correlated with craving and smoking behavior in response to viewing these same cues outside the scanner. Participants in the study were 40 adult smokers (58% female; 65% non-white; mean age = 35±11.1; cigs/day = 14.6±5.5). Using methods validated in prior research (Conklin et al., 2010) each participant took pictures of places in which they reliably smoke (PSEs) or abstain from smoking (PAEs). Participants then underwent fMRI scanning following 24 h abstinence during which they viewed personal environments (PSEs and PAEs), standard smoking/nonsmoking environments, and smoking/nonsmoking objects. BOLD signal associated with viewing smoking (minus nonsmoking) cues was extracted for reward and motivation brain regions. Later, in two separate lab sessions, participants viewed either PSEs or PAEs while self-reported craving, ad lib smoking behavior and breath CO were assessed. Compared to PAEs, viewing PSEs in the lab resulted in greater craving (F=37.3, p<001), # of puffs taken (F=5.5, p=.024) and CO boost (F=7.0, p=013). Right insula reactivity to PSEs was correlated (r<.05, 2-tailed) with lab-based PSE effects on # of cigarettes smoked (r=.45), latency to smoke (r=.58) and number of puffs taken (r=.46). Right insula reactivity to smoking objects and standard environments were not correlated with lab-based measures. These data provide novel evidence of associations between brain and behavioral responses to environmental cues associated with smoking. Our data broadens conceptualization of the insula in nicotine dependence to include conditioned-context processes. Finally, our findings highlight the importance of taking individuals’ personal smoking environments into consideration when developing smoking cessation interventions.

FUNDING: This research was supported by R21 DA033083 (FJM).

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PA5-6
BUPROPION-VARENCLINE INTERACTIONS ON NICOTINE SELF-ADMINISTRATION IN RATS

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There has been increased interest in recent years in the strategy of employing varencline and bupropion together as a combination drug therapy for the treatment of tobacco addiction in humans. However, this treatment strategy has not been evaluated in preclinical animal models of nicotine addiction. In this study, we examined the effect of combining varencline and bupropion in a rat model of nicotine self-administration. Young adult female Sprague-Dawley rats were allowed to self-administer nicotine in 1.0 hr sessions under an FR1 schedule of reinforcement. Drugs were administered 15 min before each session, both individually and in combination. The doses for each compound (varencline: 0.3, 1.0, 3.0 mg/kg; bupropion: 8.33, 25.0, 75.0 mg/kg) were chosen based on current knowledge of their individual effects on nicotine self-administration. Higher doses of each drug reduced nicotine self-administration compared to control treatment when given individually, with reductions of 62% and 75% with 3.0 mg/kg varencline and 75.0 mg/kg bupropion, respectively. However, lower doses of each drug were shown to augment the effects of the higher doses when given in combination. The 0.3 mg/kg dose of varencline combined with the 25.0 and 75.0 mg/kg doses of bupropion resulted in greater reductions of nicotine self-administration than either dose of bupropion when given alone. Likewise, a combination of 1.0 mg/kg varencline with 75.0 mg/kg bupropion reduced self-administration to a greater extent than either dose alone. These results mirror human studies showing that combination therapy with varencline and bupropion may be more beneficial than monotherapy with either drug, and may produce positive smoking cessation outcomes with lower doses.

JUSTIFICATION: Developing combination treatments for smoking cessation
FUNDING: This research was supported by P50 grant DA027840 from NIDA.
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PA6-2
EXPOSURE TO ADVERTISING FOR E-CIGARETTES AND PRODUCT TRIAL AMONG U.S. ADOLESCENTS

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Background: Adolescents’ exposure to e-cigarette advertising on television increased more than 250% between 2011-2013, but less is known about their exposure to advertising in other channels. This cross-sectional survey measured adolescents’ self-reported exposure to e-cigarette advertising on television/internet and at the point of sale to examine its association with product trial as well as future intentions among never users.

Methods: Data were gathered in a follow-up wave of a longitudinal survey of adolescents (age 13-20, n=1,386) from a web panel that is representative of US households. Multiple logistic regressions modeled product trial and intention to use e-cigarettes in the future (susceptibility) as a function of advertising exposure, adjusting for prior smoking, household income, sensation seeking and other socio-demographics.

Results: The prevalence of trying e-cigarettes was 7.6%, and 34% of those who tried them had never smoked combustible cigarettes. Among adolescents who reported never trying either combustible cigarettes or e-cigarettes (n=1,002), more were susceptible to using e-cigarettes (30.1%) than to smoking (22.0%), and 17.9% were susceptible to both. Approximately half of adolescents reported seeing e-cigarette advertisements on TV/Internet in the past month – 30.8% saw them occasionally and 19.4% saw them frequently or almost always. At point of sale, 27.3% of adolescents reported seeing e-cigarette advertisements occasionally and 12.5% saw them frequently or almost always. In adjusted models, frequent exposure to point-of-sale advertising was associated with higher odds of trying e-cigarettes (OR=2.05, 95% CI=1.06, 3.97), and frequent exposure to TV/Internet advertising was associated with higher odds of intention to use e-cigarettes among never users (OR=1.52, 95% CI=1.05, 2.20).

Conclusions: Adolescents are exposed to unregulated advertising for e-cigarettes in multiple channels, and approximately half had tried e-cigarettes or intend to try them in the future. Achieving parity in regulations that govern advertising for combustible cigarettes and e-cigarettes could be necessary to deter adolescents’ use of these products.

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PA6-3
FLAVORED OTHER TOBACCO USE AMONG YOUNG ADULT “NON-SMOKERS” IN THE U.S.

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Studies have shown that self-report of cigarette use under reports actual use when compared with cotinine samples. Self-identification measures can also produce inaccurate results because respondents may not include use of other tobacco products. Additionally, flavors, such as candy and fruit, are featured in non-cigarette other tobacco products including large cigars, little cigars or cigarillos, pipes, hookah, chew, dip or snuff, snus, dissolvables and e-cigarettes. This study examined the use of flavored and non-flavored other tobacco products among young adults who identify as non-smokers, yet report past 30 day use of these products. Data is used from wave 6 of the Legacy Young Adult Cohort Study, a nationally representative sample of young adults (n=4,301). Other tobacco product users were categorized as flavored (n=107, 44%) or non-flavored other tobacco only users (n=134, 56%). Bivariate analysis compared self-reported smoking status and past 30-day use of other tobacco products. Overall, 26% of other tobacco product users self-identified as non-smokers. Among the non-smokers, past 30-day use of flavored products (vs. non-flavored products) was higher for little cigars or cigarillos (10.5% vs 2.3%), hookah (42.1% vs 7.0%) and e-cigarettes (36.8% vs 16.3%). Additionally, nearly 20% of respondents who reported using only non-flavored tobacco products and self-identified as a smoker reported past 30 day use of cigars. Among these non-smokers who have used flavored products in the past month, almost half report using hookah and nearly 40% report using e-cigarettes. The discordance in self-identified smoking status and actual product use highlights the need to collect data using self-identification items as well as actual tobacco use behavior to help ensure accurate categorization of tobacco use behavior.

JUSTIFICATION: The discordance in self-identified smoking status and actual product use highlights the need to collect data using self-identification items as well as actual tobacco use behavior to help ensure accurate categorization of tobacco use behavior.

FUNDING: Funded by Legacy.

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PA6-4
ELECTRONIC-CIGARETTE USE AND RESPIRATORY SYMPTOMS IN ADOLESCENTS

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Background: A widely held opinion is that electronic cigarettes (e-cigs) and other electronic nicotine delivery devices (ENDS) are likely to be less harmful to users than combustible tobacco products. However, there has been very limited study of either the toxicity or epidemiology of ENDS, although flavors in ENDS have known pulmonary toxicity. We examined the association e-cig use with chronic bronchitic symptoms among adolescents.

Methods: Questionnaire data were obtained for 2100 grade 11-12 adolescents participating in the Children’s Health Study in schools in 12 Southern California communities. The risk of chronic cough and phlegm associated with e-cig use was assessed in models adjusted for gender, ethnicity, community, and current or ever cigarette smoking.

Results: 502 participants (24.1%) reported ever having used an e-cig, and 196 (9.4%) reported having used an e-cig during the last 30 days (current users). Among ever and current e-cig users, 212 (42.2%) and 78 (39.8%), respectively, reported no history of combustible cigarette use. Risk of bronchitic symptoms was increased by 2-fold among ever e-cig users (odds ratio (OR) 2.0 [95% CI 1.6,2.6]) among current users. Risk increased with frequency of current e-cig use (OR 1.5 [95% CI 0.91,2.5]) for 1-2 days and 2.0 [95% CI 2.5,3.4]) for 3 or more days in previous month) compared with never users. This frequency-response relationship was attenuated by adjustment for lifetime or current cigarette smoking dose. However, risk of bronchitic symptoms among e-cig users was also increased in analyses restricted to never smokers (OR 1.6 [95% CI 1.2,2.2]).

Conclusions: Adolescent e-cig users had increased rates of bronchitic symptoms. Further investigation is needed to determine the long-term effects of ENDS on lung health.

FUNDING: The study was conducted while the first author was at the University of Southern California. This research was supported by grant number P50CA180905 from the National Cancer Institute and FDA Center for Tobacco Products (CTP).

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PA6-5
RESEARCH INFORMING THE REGULATION OF E-CIGARETTES TO RESTRICT ACCESS TO YOUTH
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The Food and Drug Administration (FDA) proposes to regulate e-cigarettes, with a specific focus on protecting vulnerable populations, such as youth. To better inform the regulatory authority, understanding how adolescents obtain e-cigarettes, where they use e-cigarettes, and how they view e-cigarettes, is imperative. Thus, we conducted a school-wide survey in five high schools and two middle schools in CT (N = 5152) in Spring 2014 to assess these important issues. The sample was 50.5% females and 15.3 (SD=1.9) years old. Among adolescent lifetime-cigarette users (23.3%, 46.8% females, 15.9 [SD=1.7] years old) top sources for obtaining e-cigarettes were friends (36.6%), tobacco shops (12.8%), gas stations (8.7%), and online stores (6.9%). Among adolescents <18 years old who tried to purchase an e-cigarette from a store (n=429) or an online store (n=367), 76.5% and 88.6%, respectively, reported that they were not denied from purchasing e-cigarettes. Among lifetime e-cigarette users, top locations in which they used e-cigarettes were in their homes (50.5%), schools (24.8%), and public places where smoking is not allowed (24.1%). Among the total sample (N=5152), the availability of different flavors (17.1%), ability to do smoke tricks (13.9%), and the ability to customize flavors (8.5%) were the top appealing components of e-cigarettes. Logistic regression analyses showed that lifetime e-cigarette users were more likely than never-users to view the availability of different flavors (OR=94.07), the ability to do smoke tricks (OR=218.74), and the availability of odorless vapors (OR=4.25) as appealing; whereas, never-users were more likely than lifetime users to view external features of e-cigarettes, such as its shape (OR=5.11) and the ability to “light up” (OR=4.38) as appealing. The findings underscore the need to regulate e-cigarette sales to minors, including online purchases, and prohibit e-cigarette use indoors at schools and public locations where cigarette smoking is prohibited. Furthermore, restricting various flavors, eliminating visible vapors, and reducing the appeal of the e-cigarette design may lessen youth interest.

JUSTIFICATION: This research examines adolescent e-cigarette use behaviors and provides specific regulation recommendations to reduce access of e-cigarettes to youth.

FUNDING: P50DA009241; P50DA036151
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PA6-6
ARE E-CIGARETTES AND OTHER MODIFIED RISK TOBACCO PRODUCTS GATEWAYS TO HARMFUL TOBACCO USE?
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Debate continues as to whether modified risk tobacco products (MRTPs) like e-cigarettes (EC) will serve as gateways to more harmful tobacco use (i.e., cigarettes). Previous research from our lab suggests that very few students who first tried ECs transitioned to daily tobacco use (1.7%), compared to 10% and 21% of those who first tried cigarettes and traditional smokeless tobacco (SLT), respectively. The present study examines the gateway hypothesis with a second wave of college students. Undergraduate students (N = 792; Mage = 19.6; 75.5% = Caucasian) completed an online survey of past/current use of cigarettes, SLT, hookah, dissolvables, snus, ECs, and nicotine replacement therapy (NRT), between October 2013 and May 2014. Descriptive statistics and multinomial regressions were used to determine whether first tobacco product tried predicted current use. Given the small number of participants who first tried ECs (2.9%), only those who first tried ECs, snus, and ECs, these three tobacco products were summed into a MRTP category for inferential analyses. Overall, 51.5% of participants reported trying a tobacco product with an average age of first use of 16.6 years (SD = 8.23). Hookah was the most frequently tried tobacco product (39.4%), but cigarettes were most often the first product tried (21.2%), followed by Hookah (13.9%), SLT (10.0%), ECs (3.9%), Snus (1.6%) and dissolvables (0.1%). Participants who first tried cigarettes or SLT were significantly more likely to be a current user (cigarettes: OR = 3.46, p = .012; SLT: OR = 3.29, p = .026) and/or poly user (cigarettes only: OR = 2.49; p = .051) compared to those who first tried a MRTP. Of those who first tried cigarettes, 7.1% (12 of 168) became daily smokers and 23.2% (39 of 168) non-daily smokers; no student who first tried ECs reported being a daily smoker, but 6.5% (2 of 31) did report non-daily smoking. MTRP experimentation continues to increase, but the likelihood of these products serving as a gateway product continues to appear minimal. However, continued surveillance, especially in longitudinal designs, is warranted in light of the rapid technological advancements with these products.

JUSTIFICATION: The present investigation helps to identify the gateway potential of various tobacco products in a rapidly expanding tobacco market.

FUNDING: This research was supported in part by the Oklahoma Tobacco Research Center.

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PA8-1
WATERPIPE USE AMONG CANADIAN YOUTH: INCREASING PREVALENCE, PATTERNS OF USE, AND PERCEPTIONS
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Few national surveys currently assess waterpipe smoking among youth. This is an important gap in tobacco use surveillance systems, given that waterpipe tobacco smoking is associated with lung cancer and respiratory disease. This study relies on data from the 2012/2013 cycle of the Youth Smoking Survey (YSS) cycle, which was administered to 47,203 Canadian youths in grades 6 through 12 attending schools from 9 (of 10) Canadian provinces. Relevant dichotomous outcomes included “ever use”, “use in the last 30 days”, and students’ reporting the belief that hookah use is less harmful than cigarette smoking. Covariates included sex, grade, province of residence, race/ethnicity, and amount of weekly spending money. Differences in prevalence rates between YSS 2010/2011 and YSS 2012/2013 were also assessed. Logistic regression models were fitted to examine covariance related to the odds of ever and last-30-day waterpipe use; whether beliefs about harms associated with waterpipe smoking were associated with odds of waterpipe use; whether survey year was associated with waterpipe use. We found that in Canada, 5.3% of students in grades 9-12 currently use hookah, Waterpipe use among grades 9 to 12 students increased since 2010, with students at 36% higher odds of current waterpipe use in 2012/2013 than in 2010/2011 (OR=1.36, 95%CI:1.07, 1.73). There is significant provincial variation in waterpipe use, ranging from 11.7% of students in British Columbia to 17.7% of students in Alberta ever trying waterpipe. Students who believed that waterpipe use was less harmful than cigarette smoking had higher odds of using waterpipe in the last 30 days (OR=2.6, 95% CI: 1.9, 3.5). Compared to non-smokers, current smokers had higher odds of ever use (OR=6.1, 95% CI: 6.1, 10.7), last-30-day use (OR=7.6, 95% CI: 5.8, 9.9), and believing that waterpipe use is less harmful than cigarette smoking (OR=1.5, 95% CI: 1.2, 1.8). This study suggests that waterpipe use among youth is of growing concern in Canada. Provincial legislation to ban waterpipe smoking in public places has been enacted in Alberta and is being considered by other Canadian provinces. This study can be used to inform public health surveillance efforts to monitor the prevalence of use of other tobacco products, including hookah.

JUSTIFICATION: Decreasing cigarette smoking prevalence among youth requires public health surveillance efforts to monitor the prevalence of use of other tobacco products, including hookah.

FUNDING: The Youth Smoking Survey is a product of the pan-Canadian capacity building project funded through a contract between Health Canada and the Propel Centre for Population Health Impact from 2008 through 2011. The YSS consortium includes Canadian tobacco control researchers from all provinces and provided

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training opportunities for university students at all levels. The views expressed herein do not necessarily represent the views of Health Canada.

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PA8-2
HOOKED ON HOOKAH: NICOTINE LEVELS IN SHISHA
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Purpose: Hookah is a water pipe used to smoke shisha or ma’assel: a mixture of tobacco, sweetener (e.g. molasses), glycerol (humectant), and flavorings. Hookah’s have been a traditional part of the Middle East for centuries and have recently emerged in the United States culture among the younger population. Currently there is little regulation of this product in the U.S. in terms of the labeling or content of the shisha. The aim of our study is to determine the accuracy of the marketed nicotine content in shisha.

Materials/Methods: Twenty-one shisha packages, from 6 brands, with varying advertised levels of nicotine were purchased from both online and local vendors. Packages were examined and cataloged for health warning and content labeling. The shisha was diluted in solvents (NaOH and MTBE) and then spiked with an internal standard (quinoine). We then used gas chromatographic analysis to determine the nicotine content of the various shishas (modified CORESTA method 62).

Results: The determined nicotine results ranged from untraceable amounts to 3.0 mg/g. The samples labeled tobacco free were found to have no detectable nicotine. Packages had misleading, vague, or nonexistent health warnings and half had labeled nicotine concentrations. For samples marketed as 0.05% nicotine, we found a mean nicotine concentration of 0.12% (SD=.06), 143% higher than the label. The samples marketed 0.5% nicotine had a mean nicotine concentration of 0.16% (SD=.07), 69 % lower than the labeled amount. Of the products containing tobacco, labeled nicotine content did not predict the actual nicotine content. Shisha brand was a significant predictor of nicotine content however, with Tangiers having the highest nicotine content followed by Starbuzz, Al Fakher, Nakhla and Fumari respectively.

Conclusion: Erroneous shisha labeling poses a problem to consumers who are unaware of the actual nicotine content of the product. In light of the rapid increase in waterpipe smoking among youth in the U.S. there is a dire need for regulation of this product to provide accurate content labeling and health warnings.

JUSTIFICATION: This study demonstrates the need for regulation of the constituent labeling of shisha products.

FUNDING: Funding for study materials was provided by JP Morgan Chase contributions to the Roswell Park Cancer Institute Summer Internship Program.

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PA8-3
PARTICULATE MATTER MEASUREMENTS IN TEN HOOKAH BARS: AN OCCUPATIONAL HAZARD
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Background: Hookah smoking has been highlighted as a public health problem. Many of the harmful constituents of hookah smoke are formed primarily from the incomplete combustion of the burning charcoal. The greatest concern is the fine particulate matter less than 2.5 micrometers in diameter, which permeates to the level of the lung alveoli and could potentially result in respiratory dysfunction.

Methods: Indoor air quality of environmental tobacco smoke (ETS) was assessed within ten hookah bars. Fine particulate matter was measured by a TSI SidePak AMS10 Aerosol Monitor and converted into micrograms per cubic meter. The sampling time among the ten bars consisted of a mean (standard deviation) of 4.2 (0.7) hours. Characteristics of the bars that were recorded included the number of ventilation sources, presence of cigarette smoking inside the bar, amount of time that entry doors remained open, and occupancy of patron who were active hookah smokers.

Results: Over the duration of air sampling in all of the bars, the mean (standard deviation) was 1,636 (1,945) micrograms per cubic meter and the median (interquartile range) was 2078 (2727, 350) micrograms per cubic meter. There were four venues that had a mean particulate matter value higher than the cumulative mean ranging between 1,900 – 4,052 micrograms per cubic meter. The highest recorded measurement for the mean (standard deviation) particulate matter was 4,052 (1790) micrograms per cubic meter and median (interquartile range) was 2,631 (2,687-5,498) micrograms per cubic meter.

Conclusion: Fine particulate matter can contribute to respiratory inflammation and irritation for the patrons and workers within the hookah bars. The Environmental Protection Agency has set acceptable levels for particulate matter as a 24-hour standard and 3-year average of 35 micrograms per cubic meter. High levels of particulate matter pollute the air within hookah bars and perpetuate the need for protective measures for workers within these occupations.

JUSTIFICATION: This study will inform occupational safety standards for hookah bars.

FUNDING: This study was funded by the American Lung Association.

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PA8-4
UNDERSTANDING LITTLE CIGAR/CIGARILLO RISK PERCEPTIONS AMONG YOUNG ADULT SMOKERS
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Little cigar/cigarillo (LCC) smoking is increasingly prevalent among young adults. Early indicators suggest that these smokers endorse low perceived risks (i.e. LCCs are less harmful than cigarettes) of LCC smoking. Very little is known about how young adults form LCC risk perceptions, which researchers believe are determinants to smoking behavior and key to understanding how to inform regulatory policy and prevention methods. This study used focus groups to explore young adult smokers’ LCC smoking knowledge and comprehension of risks associated with LCCs. A convenience sample (n=97) of African American, Hispanic, and white young adults who self-identified as dual (smoked ≥1 LCC and cigarette in past 30 days) and cigarette-only (≥1 cigarette in past 30 days) smokers participated in 13 audiotaped focus groups conducted in the Southeastern United States. Topics discussed included experiences smoking LCCs, affect for LCCs, and perceived health risks of smoking LCCs relative to smoking cigarettes. A brief survey, used to characterize participants, was administered prior to the focus groups. The participants had a mean age of 25.1 years (SD=4.5), were majority male (53.1%), and 60.0% identified as African American, 29.5% as white, and 17.5% as Hispanic. Though self-identified at enrollment as dual or cigarette-only
smokers, 59.8% of participants reported LCC-only smoking, 25.8% reported dual smoking, and 7.2% reported cigarette-only smoking in the past 30 days prior to the focus groups. The participants viewed LCCs along a continuum of risks, comparing its risks to cigarette, premium cigar, and blunt (tobacco + marijuana) smoking. Perceptions of risk were shaped by many factors, including participants’ personal experiences with the product (i.e. experiencing adverse health effects); intended use of the product (smoke LCCs with tobacco or smoke them as blunts); LCC smoking practices (amount smoked, duration smoked, and inhalation); presence of warning labels; quality of tobacco inside the LCC; flavor of the LCC; and brand of LCC smoked. Health communication messages that accurately convey the risks of LCCs to targeted groups of young adults need to address factors that shape reasoning about risk perceptions.

FUNDING: This study was conducted by the first author at Georgia State University. Supported by FDA/NIH/NCI 1R21CA180934-01 (PI: Sterling)

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PA8-5

RACIAL/ETHNIC DISPARITIES IN FREQUENCY OF CIGAR SMOKING AMONG U.S. HIGH SCHOOL STUDENTS

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Background: Several sources have documented a rising prevalence of current cigar/little cigar/cigarillo use among Black high school students. According to estimates from the National Youth Tobacco Survey (NYTS), in 2012, 16.7% had used cigars in the past 30 days, a rate that has doubled since 2009. Few studies, however, have previously examined demographic differences in frequency of cigar use, that is, the number of days during the past 30 days that cigars were used, among high school students. The current study examines racial and ethnic differences in frequency of cigar use, and is the first to do so using a nationally representative sample of U.S. high school students.

Methods: This study uses weighted survey data from CDC’s 2013 Youth Risk Behavior Surveillance System (YRBSS) with a sample of 13,035 students. We examined the relationship between cigar/little cigar/cigarillo use and four race/ethnicity groups (White, Black, Hispanic and Other). Cigar use was modeled as count data, and the mean number of days for each response category was assigned. Zero-inflated negative binomial regression, which is appropriate for overdispersed count data with excess zeros, was used.

Results: Findings revealed racial disparities in frequency of cigar use. As compared to White students, Black students had an almost twofold increase in risk of smoking cigars on more days in the past 30 days (IRR=1.90, 95% CI, 1.49-2.41, p-value<0.00). No differences were found for Hispanic and Other groups as compared to White students.

Discussion: This study found that Black students are significantly more likely to smoke cigars on more days than their White counterparts. There are a number of factors that may contribute to disparities in frequency of cigar use. For example, there exists a price disparity between cigarettes and cigar products, and cigars are available in a variety of flavors, unlike conventional cigarettes. Future research should explore cultural factors behind reasons for cigar smoking among diverse populations, especially in terms of occasional or “celebratory” use versus daily use to inform youth tobacco prevention programs.

JUSTIFICATION: The findings of this study highlight the need to understand differences in patterns of use of tobacco products among vulnerable populations in order to inform culturally-appropriate public health messaging and prevention programs.

FUNDING: No Funding.

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PA8-6

COMPREHENSIVE CHEMICAL ANALYSIS OF SNUS PRODUCTS FROM THE U.S. AND WESTERN EUROPE

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Native to northern Scandinavia, snus are oral tobacco products, similar to moist snuff, that are placed between the gum and upper lip. These loose or portioned (pouch) products are sometimes marketed for smoking cessation or as an alternative to cigarettes. They have been touted as a less harmful form of oral tobacco. Although sold in various countries, it is not known whether the composition of snus is consistent across manufacturers. This study examined moisture, pH and concentrations of nicotine, flavors, alkaloids, and tobacco-specific N-nitrosamines (TSNAs) in 64 snus products from four different countries (Sweden, Norway, Denmark and the United States). Total moisture content varied from 27.6% to 59.5% and pH ranged from 5.9 to 9.0. Total nicotine levels, which determines the strength of the snus (e.g., strong, extra strong) ranged from 6.8 to 20.6 mg/g, wet. Based on the pH measurements, the corresponding percentage of nicotine in the unprotonated form ranged from 0.74-91.4% which results in unprotonated nicotine concentrations from 0.09 to 15.4 mg/g. The levels of 4-(methylxynitrosamine)-1-(3-pyridyl)-1-butane (NNK) and N-nitrosonornicotine (NNN) (NNN+NNK) from the U.S. are approximately 2.1 times higher than those made in the Western European countries. Menthol was the most abundant flavor compound detected, in 43% of the European products, followed by camphor (38%), eucalyptol (25%) and pulegone (23%). Five tobacco alkaloids (nicotine, myosmine, anabasine, anatabine and isonicotine) were also tested in this study. Our findings will aid public health professionals and policymakers in understanding exposure levels and negative health effects associated with snus.

FUNDING: All research was supported by internal funds of the Centers for Disease Control and Prevention (CDC).

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PODIUM PRESENTATION 4: TOBACCO, MARIJUANA, AND OTHER DRUGS

PA9-1

ASSOCIATIONS OF CANNABIS AND CIGARETTE USE WITH DEPRESSION: FINDINGS FROM AVON LONGLITUDE STUDY OF PARENTS AND CHILDREN

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Introduction: Substance use is associated with common mental health disorders, but the causal effect of specific substances is uncertain. We investigate whether adolescent cannabis and cigarette use is associated with incident depression and anxiety, while attempting to account for effects of confounding and reverse causation.

Methods: We used data from ALSPAC, a UK birth cohort study, to investigate associations between cannabis or cigarettes (measured at age 16) and depression or anxiety (measured at age 18), before and after adjustment for pre-birth, childhood and adolescent confounders. Our imputed sample size was 4561 participants.

Results: Both cannabis (unadjusted OR 1.50, 95% CI 1.26, 1.80) and cigarette use (OR 1.37, 95% CI 1.16, 1.61) increased the odds of developing depression. Adjustment for pre-birth and childhood confounders partly attenuated these relationships though strong evidence of association persisted for cannabis use. There was weak evidence of association for cannabis (fully adjusted OR 1.30, 95% CI 0.98, 1.72) and insufficient evidence for association for cigarette use (fully adjusted OR 1.26, 95% CI 0.97, 1.63).
adjusted OR = 0.97, 95% CI 0.75, 1.24) after mutually adjusting for each other, or for alcohol or other substance use. Neither cannabis nor cigarette use were associated with anxiety after adjustment for pre-birth and childhood confounders.

Conclusions: Whilst evidence of association between cannabis use and depression persisted after adjusting for pre-term and childhood confounders, our results highlight the difficulties in trying to estimate and interpret independent effects of cannabis and tobacco on psychopathology. Complementary methods are required to robustly examine effects of cannabis and tobacco on psychopathology.

JUSTIFICATION: Understanding the effect of substance use on mental health is of vital importance as cigarette use is much higher in these groups than the general population.

FUNDING: MRC PhD studentship. ALSPAC is funded by MRC and Wellcome Trust

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PA9-2

"SMOKE WHAT?": THE COMPLEXITIES OF SMOKING IDENTITY AND SMOKING BEHAVIOR AMONG YOUTH

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Tobacco control investigators often rely on established categories (e.g., never, current, and ex-smoker) to categorize young people's smoking behavior. These categories may fail to accurately reflect their smoking self-identity or actual smoking behavior, despite evidence acknowledging discrepancies between these two pertinent factors. The preponderance of this work has mainly focused on cigarette use; less studied are tobacco products such as little cigars and cigarillos. As a result, investigators often misclassify or exclude youth from research who may be most at risk of the deleterious effects of smoking, specifically dependence. In an effort to better understand factors that shape "smoking identities," this mixed methods study explored the smoking experiences of urban youth. Employing surveys and focus groups, we assessed factors such as: smoking patterns; life stressors; and peer social dynamics. A convenience sample (N=58) of young adults was recruited using flyers, street outreach, and collaboration with a community-based organization. The 53-item survey contained questions about smoking identity, physical activity, and tobacco and other drug use. Additionally, five focus groups were conducted to examine the roles smoking played in young people's lives. The age range was 13-20 years with a mean age of 17.3 years. The sample was 43.1% female and the majority identified as African American/black (81%). Most respondents lived with a smoker (62.1%) and had close friends who smoked (63.8%). More than half had their first smoking experience with blunts/marijuana (51.2%), cigarettes (33.3%) or both (12.1%). The qualitative data further explicated our quantitative findings. Many youth who used tobacco or marijuana in the past 30 days did not self-identify as a smoker. Notably, participants discussed marijuana use as a precursor to cigarette use, with the belief that smoking a cigarette after a blunt "boosts the high." This work provides a basis for future research to address the increased risks of young tobacco users who do not identify as "smokers" and the development of effective interventions for this often misunderstood and unaddressed subgroup.

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PA9-3

ASSESSING THE OVERLAP BETWEEN TOBACCO AND MARIJUANA: TRENDS IN PATTERNS OF DUAL TOBACCO AND MARIJUANA USE IN ADULTS FROM 2003-2012

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Recently, a number of states have enacted policies making marijuana legal for recreational or medicinal use; these policies are expected to increase in the coming years. Previous research suggests that tobacco use and use of other substances, including marijuana, go hand in hand. Assessing how trends in dual marijuana and tobacco use have changed over the past decade, overall and by sex, age and race, is vital to understanding how marijuana legalization may impact tobacco use. Data were obtained from 560,500 adults who participated in the 2003-2012 National Survey on Drug Use and Health, a cross-sectional, household interview survey conducted annually. Data from the three most recent years (2010-2012) were used to characterize dual marijuana and tobacco users vs. marijuana-only and tobacco-only users. Data from all years were used to compare trends in dual use. By age, race, and sex. Orthogonal polynomials were used to assess linearity and trend significance. From 2010-2012, 23.8% of the sample were past month tobacco-only users, 2.2% were marijuana-only users, and 5.0% were dual marijuana and tobacco users. Compared to marijuana-only and tobacco only users, a significantly higher percentage of dual users were male, ages 18-24 or 25-34 years, of lower education and income, and with past month heavy drinking or other illicit substance use. From 2003 to 2012, the percent of dual use increased among both males and females (p<.001, p<.05), those ages 35-49 years (p<.001), and whites (p<.01), blacks (p<.05), and Hispanics (p<.01); dual use decreased among those ages 18-24 years (p<.0001). Dual use was higher at each time increment among blacks (vs. whites), males (vs. females), and those ages 25-35 years (vs. ages 18-24). Dual use of tobacco and marijuana has increased over the past decade, with increases occurring disproportionately among individuals who are middle-aged and non-White. Increased surveillance of tobacco use patterns is needed as marijuana legalization policies expand.

JUSTIFICATION: As marijuana legalization policies increase, increased surveillance of dual use of tobacco and marijuana is needed, particularly among specific sex, age, and racial/ethnic groups.

FUNDING: No funding

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PA9-4

PILOT STUDY EVALUATING AN INTERVENTION FOR TOBACCO USE DURING TREATMENT FOR CANNABIS USE DISORDER

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Background: Cannabis users frequently report concurrent tobacco use, and tobacco smoking is a predictor of poor outcomes during treatment for cannabis use disorders (CUD). Interventions targeting tobacco during treatment for other substances are effective at decreasing tobacco use while not adversely impacting outcomes for the other substance; this combined approach may be effective for targeting tobacco and cannabis use. This study evaluated an intervention simultaneously targeting tobacco and cannabis to determine whether targeting tobacco would engender tobacco quit attempts or reductions while maintaining positive cannabis outcomes.

Method: Twenty-eight participants meeting diagnostic criteria for CUD and reporting regular tobacco use with some interest in quitting in the next six months (i.e., >2 on a 5-point scale; M=4.8) were enrolled in an ongoing 12-week treatment for CUD that includes computer-assisted delivery of motivational enhancement therapy, cognitive-behavioral therapy, and abstinence-based contingency management. Participants are also encouraged to complete an optional tobacco
intervention consisting of a behavioral treatment tailored for tobacco and cannabis users and nicotine-replacement therapy (NRT). Cannabis abstinence and tobacco quit attempts were biologically verified during clinic visits.

Results: Cannabis outcomes were similar to those achieved in previous studies using this CUD intervention, with a mean of 4.1 weeks of cannabis abstinence. 22 out of 28 participants engaged in the tobacco intervention; 22 completed at least one tobacco computer module and 15 initiated NRT. Four participants set a tobacco quit date, 16 made >1 quit attempt lasting > 24 hrs, 8 made >1 quit attempt lasting > 2 wks, and 3 achieved sustained abstinence during the last 2 wks of treatment. Reductions in cigarettes per day were observed (baseline: M=10.9, SD=6.9; last week of treatment: M=5.8, SD=5.2).

Summary: Results indicate that targeting tobacco during treatment for CUD engenders increased tobacco quit and reduction attempts without adversely impacting cannabis outcomes and supports the safety and feasibility of targeting tobacco during treatment for CUD.

JUSTIFICATION: This study provides preliminary evidence that supports the safety and feasibility of targeting tobacco use during treatment for CUD, which may improve clinical research and practice aimed at treating tobacco and cannabis co-users.

FUNDING: Funding for this study was provided by NIH/NIDA grants: R01-DA032243 and T32-DA037202.

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PA9-5 CHARACTERIZING NICOTINE WITHDRAWAL AMONG OPIOID-MAINTAINED SMOKERS

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Aim: Withdrawal is a central component of nicotine dependence and its severity may influence risk of relapse. While withdrawal typically peaks within the first two days following a quit attempt and gradually diminishes thereafter, less is known about its pattern in vulnerable groups of smokers with disproportionate rates of smoking. One such group is opioid-dependent individuals, in whom smoking rates are high and treatment response notoriously poor. We have developed an intervention which produces initial abstinence among opioid-maintained smokers (Dunn et al., 2008, 2010; Sigmom et al., in prep). Here we characterize nicotine withdrawal in these participants and contrast it with withdrawal seen previously in a general population of smokers (Hughes, 1992).

Methods: Fifty-three opioid-maintained patients completed a 2-week smoking intervention and were biochemically-verfied to be abstinent. Withdrawal was assessed daily using the Minnesota Nicotine Withdrawal Subscale (Hughes & Hatsukami, 1996).

Results: At intake, participants smoked on average 18 cigs/day, had cotinine levels of 1208 ng/ml and moderate nicotine dependence. Nicotine withdrawal was mild at intake (M=1.86 out of a possible range of 0-4), comparable to scores seen in non-substance abusing smokers. Withdrawal then steadily decreased over the 14-day study, which stands in contrast to the peak typically seen at Day 2 in prior studies. Specifically, at Day 2 participants' withdrawal had declined to 73% of baseline levels (M=1.36), compared to 142% of baseline (M=2.33) in a general population of smokers. By Day 14, participants withdrawal reached 47% of baseline (M=.87), compared to 104% (M=1.71) in the general population.

Conclusion: The pattern of nicotine withdrawal in opioid-dependent patients may depart from that typically seen among the general population of smokers. How this pattern may influence patients' success with quitting smoking remains unclear. The mechanism underlying this difference, such as a unique pharmacological interaction whereby opioids may attenuate nicotine withdrawal, also warrants further study.

PA9-6 CRAVING, WITHDRAWAL, AND SUBSTANCE USE AS MEDIATORS OF TREATMENT EFFECT ON SMOKING CESSATION IN COCAINE- AND METHAMPHETAMINE-DEPENDENT PATIENTS

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Background: Smoking cessation treatment (SCT) is effective among illicit stimulant users, with substance use disorder (SUD) treatment being unaffected or even aided by smoking cessation. However, the mechanisms underlying successful smoking cessation among stimulant users are not well established. Research has found that nicotine craving mediates successful smoking cessation in smokers with co-occurring disorders; this study predicted that nicotine craving would mediate smoking cessation in stimulant users, unlike other possible mediators such as nicotine withdrawal symptoms and non-nicotine substance use.

Methods: Secondary analysis of a randomized, 10-week trial conducted at 12 SUD treatment programs. Five hundred and thirty eight adults meeting DSM-IV-TR criteria for cocaine and/or methamphetamine-dependence and interested in quitting smoking were randomized to SUD treatment as usual (TAU) or to TAU plus SCT, consisting of counseling, bupropion, nicotine inhaler, and contingency management. Smoking abstinence was assessed via self-report and carbon monoxide levels. Possible mediators were assessed in week 4, immediately after the TAU+SCT group began a uniform attempt to quit smoking. Nicotine craving was assessed by a single item from the 8-item Minnesota Nicotine Withdrawal Scale, “desire to smoke”. Withdrawal was assessed by the other 7 scale items, and substance use was assessed by self-reported number of stimulant-free and drug-free days during week 4.

Results: Bootstrapped regressions indicated that, as expected, nicotine craving significantly mediated the relationship between SCT and cigarette point prevalence abstinence at the end of treatment (mediation effect=.09, 95% CI=.05-.15, p<.05). Withdrawal symptoms (mediation effect=.007, 95% CI=.008-.07, p>.05), stimulant free days (mediation effect=.000, 95% CI=.001-.001, p>.05), and drug free days (mediation effect=.000, 95% CI=.002-.003, p>.05) were not significant mediators.

Conclusions: These results highlight craving as a critical factor for understanding smoking cessation among stimulant users, and suggest further examinations of the factors related to nicotine craving in polysubstance users.

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JUSTIFICATION: These results may have implications for quit smoking interventions among opioid-maintained smokers and a potential unique pharmacological interaction between nicotine and opioids.
DO FEAR APPEALS WORK? USING TWITTER TO EVALUATE EMOTION IN CDC'S TIPS FROM FORMER SMOKERS CAMPAIGN—2013

Glen Szczypka*, Sherry Emery

Theoretical Background and Research Question: The CDC began a national media campaign “Tips from Former Smokers” (Tips) that used real-life stories from smokers suffering from the long-term health consequences of smoking, including amputation, tracheotomy, paralysis, and heart surgery. The campaign’s graphic and emotional approach was based on evidence that anti-tobacco ads with negative emotional appeals are associated with higher recall, and are more effective at promoting cessation than humorous or non-emotive ads. The combination of graphic images, fear appeals, and personal testimony in the Tips ads was expected to elicit a negative reaction to smoking or to the thought of smoking. This study presents an analysis of the emotional content of Twitter messages collected from the CDC Tips 2013 campaign. The main objective is to determine whether the Twitter conversation contained messages that reflect negative emotion such as fear and disgust and if so which ad characteristics elicited a negative emotional response.

Methods: Data were obtained from a vendor, GNIP, licensed to provide access to the entire corpus of Twitter data, using a data streaming process referred to as the “Firehose.” Concept clusters for emotions such as fear, disgust, sadness and humor were derived using SPSS Text Analytics.

Results: Of the 80,733 tweets categorized with an emotional response, the largest categories were fear, disapproval, and disgust. 29,564 tweets (36.6%) contained a fear response; 19,433 tweets (24.1%) contained a disapproval response; and 16,472 tweets (20.4%) contained a disgust response. Of the 51,580 tweets categorized as specific CDC Tips ads, Terrie ads contained the most references with 41,597 tweets (79.7%). General reference to the CDC Tips campaign was the second most frequent category with 7,304 tweets (14%).

Discussion: Our qualitative analysis offers insight into the intermediate thought processes by which the audience interpreted and reacted to the ads in a natural setting via Twitter. These results, in addition to the increase in call volume to 1-800-QUIT-NOW during the campaign, offer support for Tips’ hard-hitting graphic messaging approach.

JUSTIFICATION: This qualitative evaluation of how people naturally-processed and reacted to CDC Tips messages provides additional evidence supporting the use of graphic, hard-hitting and emotionally evocative messaging strategies for public health campaigns; given the controversy surrounding such graphic imagery.

FUNDING: Funded by the National Institutes of Health (NIH), Part of the NCI State and Community Tobacco Control Research Initiative. See more at: http://www.healthmediaicollaboratory.org/who-we-are/ visionary#YUEpf0.dpdf

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PA21-2
RANDOMIZED CONTROLLED TRIAL OF TWEET2QUIT FOR SMOKING CESSATION

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Background: Smoking cessation interventions to bolster social support from family, friends, and co-workers outside of treatment programs (i.e., extra-treatment) have been largely ineffective at enhancing abstinence. Social media like Twitter, which can provide social support beyond one’s personal networks, have not been examined for quitting smoking.

Purpose: We evaluated the efficacy of a Twitter-based quit-smoking intervention, Tweet2Quit and examined predictors of tweeting and how tweeting affected abstinence.

Design: 2-group RCT Conditions: Control participants received 8-weeks of nicotine patch, referral to a web-based quit guide (www.smokefree.gov), and instruction to set a quit date within a week of study start. Treatment added participation in a 20-person Tweet2Quit private support group that ran for 100 days with two daily auto-messages: (1) a group discussion topic, and (2) individualized feedback on prior day tweeting.

Participants: N=160 smokers, all intending to quit, recruited on Google when searching for cessation information. The sample was 73% female, 36% partnered, 81% Caucasian, 21% college-degree, and averaged 36 years of age, 16 cigarettes/day, and 17 years smoking.

Main Outcome: Self-reported sustained abstinence at 7-, 30-, and 60-days post-quit-date

Results: Sustained abstinence out to 60-days was 20% for control and 40% for Twitter participants, p=0.012. Tweeting volume related positively and significantly to abstinence (r =.15, p=0.003). The 4 groups, with 20 participants each, averaged 1,143 tweets per group, with 73% of members tweeting, and averaging 57 tweets over an average of 47 days. Participants’ tweet volume positively related to: need (more withdrawal symptoms), chronicity of smoking (years), convenience (tweeted using mobile texting), personalization (photo ID on their Twitter account), and reported willingness to use quit-smoking aids (all p<.05).

Conclusions: Tweet2Quit appears to be a feasible, largely automated, efficacious and inexpensive intervention for smoking cessation. Engagement was high and related to abstinence. Future research aims include longer-term follow-up with biological confirmation of abstinence.

JUSTIFICATION: This RCT evaluates the use of social media combined with NRT for treating tobacco addiction. Highly automated and scalable, the treatment has great potential for broad scale dissemination.

FUNDING: NIH R34 DA030538

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PA21-3
PROACTIVE TEXT MESSAGING FOR SMOKERS IN PRIMARY CARE

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Background: Few smokers receive evidence-based cessation services during primary care visits. Federal initiatives to promote smoking status documentation in electronic health records (EHR) now enable health systems to offer population health interventions to smokers outside an office visit. We pilot-tested a proactive method for connecting primary care patients who smoke with smoking cessation intervention delivered by text message.

Methods: We used the EHR to identify smokers who were seen at 2 Massachusetts community health centers in the 12 months prior to 2/1/2014 and had a mobile phone number listed. Primary care providers reviewed and allowed us to contact their patients. These patients were sent a proactive text message inviting them to enroll by texting back. The program included messages from the QuitNow text library and newly-developed motivational advice messages for smokers who were not ready to quit. We calculate program uptake as proportion of smokers who opt-in after proactive recruitment and program engagement as number of text messages sent and received by smokers.

Results: Uptake: 28 of 284 (10%) smokers sent the proactive text enrolled. Enrollees were 91% (n=26) white, 61% (n=17) female, mean age was 45 yrs (range 25-69), 39% (n=11) had ≥1 comorbid illness (diabetes, coronary artery disease, depression, hypertension or chronic kidney disease), 71% (n=20) had private insurance, 18% (n=5) had Medicaid, and 11% (n=3) had Medicare. We assessed readiness to quit: 9 (32%) reported a plan to quit in ≤ 30 days, 6 (21%) planned to quit > 30 days, 2 (7%) dis-enrolled, 2 (7%) already quit, and 9 (32%) did not reply. The mean no. of cigarettes was 17/day and 42% smoked within 5 min. of waking engagement. On average, enrollees received 14 messages and sent 5 messages to the program in answer to program queries or to request help for cravings or slips.

Conclusions: One in 10 smokers enrolled in a text messaging program for cessation after proactive text recruitment, and 20% of these were smokers not ready to quit. A proactively delivered text messaging program deserves testing as a way to deliver services to motivated and unmotivated smokers in primary care.

JUSTIFICATION: Text messaging is a promising method for increasing the reach of tobacco treatment services in primary care populations.

FUNDING: This study was supported by Partners HealthCare Systems, Inc. and the Center for Connected Health at Massachusetts General Hospital. Dr. Kruse was supported by a post-doctoral fellowship from funded by the National Cancer Institute 5R25 CA057711-20.

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PA21-4
USE OF AUTOMATED TECHNOLOGY TO PREVENT SMOKING RELAPSE AMONG RECENTLY QUIT SMOKERS ENROLLED IN EMPLOYER AND HEALTH PLAN SPONSORED QUITLINES

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Background: Although many cost-effective smoking cessation options exist, little is known about how to best intervene with smokers during the time of greatest risk for relapse after quitting. This study tested an automated risk assessment and transfer protocol to reduce relapse rates compared to a standard quitline protocol.

Methods: We randomized 1,785 smokers who were enrolled in the Quit For Life® program through one of 19 employers or health plans and who reported being quit for at least 24 hours into one of three groups: standard quitline; Technology Enhanced Quitline, with 10 assessments (TEQ-10); Technology Enhanced Quitline, with 20 assessments (TEQ-20). The standard quitline included 5 calls, medications, a quit guide, and an online program. The TEQ interventions added interactive voice recognition (IVR) delivered relapse risk assessments over the first 8 weeks post-quit with automated transfer to a Quit Coach for those exceeding risk thresholds. We assessed self-reported quit rates at 6- and 12-months post-enrollment. Missing outcome data were imputed. Logistic regression models were used to analyze quit outcomes.

Results: There were no significant differences in imputed 30-day quit rates between the three study groups at 6 months (59% for standard, 62% for TEQ-10, 59% for TEQ-20) or 12 months (61% for standard, 61% for TEQ-10, 55% for TEQ-20). Nearly three quarters (73.3%) of TEQ-10 or TEQ-20 participants were identified as at risk by the IVR assessments and this resulted in 0.41 IVR-transferred counseling calls in addition to the average of 3.7 completed program calls. Participants without a positive screen were more likely to be quit at 6-months (OR=1.8, p<.001).

Conclusions: Although the TEQ protocol successfully identified quitters at risk for relapse, adding IVR relapse prevention calls did not lead to higher quit rates. This is likely due to the highly effective standard quitline program (61% were still quit at 1 year) and that few counseling calls after a positive screen were completed. Future research should explore alternative intervention protocols different timing of IVR assessments.

JUSTIFICATION: IVR-delivered assessments can be used identify quitters more likely to return to smoking, suggesting a relapse reduction protocol involving IVR assessments holds promise if future research can identify the best way to intervene with callers at the time of need.

FUNDING: This study was supported by Award Number R01CA138936 from the National Cancer Institute, Technology-Enhanced Quitline Services to Prevent Smoking Relapse. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Cancer Institute or the National Institutes of Health.

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**PA21-5**

A SMARTPHONE GAME FOR TOBACCO ADDICTION TARGETING ROUTINE AND MANUAL WORKERS; A NOVEL ADDITION TO SMOKING CESSATION SERVICES

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Background: Smoking prevalence in routine and manual workers (RM) is double that of professional and managerial groups in both the UK and US. RM workers smoke more heavily, initiate smoking at a younger age, and are less likely to quit compared to other occupational groups. Both UK and US Governments have made this group a priority for smoking cessation to reduce health inequality. RM workers require quick and easy access to stop smoking services at times and locations that suit them. Smoking cessation health apps on smartphones could offer an effective platform for health promotion in this group. Over 400 smoking cessation apps are currently available, however most are not developed in collaboration with public health practitioners or with users and few incorporate validated behaviour change techniques. ‘Gamification’ is effective in promoting healthy behaviour and delivering health promotion advice however, there is as yet no dedicated smartphone game for smoking cessation. Aims: To use gamification techniques to develop a novel smoking cessation game implementing validated behaviour change methods to target heavy smokers in RM occupational groups.

Methods: The app has been developed iteratively and collaboratively with public health practitioners, game designers and health psychologists. Smokers were invited through patient participation groups to try the game. The fourth iteration of the game has been tested in RM workers. Qualitative analysis of feedback used a framework approach.

Results: Players found the game engaging and motivating and it provided effective distraction from smoking. Those with higher tobacco dependence were more engaged. Over 70% of RM workers would recommend this app to a friend and play again.

Conclusions: A dedicated game to promote smoking cessation has the potential to distract smokers during cravings and to deliver effective smoking cessation advice. Large-scale uptake of this app could have an enormous public health impact and by targeting RM workers could reduce health inequalities. We plan to conduct further beta testing in RM workers and evaluate the game formally in a multi-centre randomized controlled trial.

JUSTIFICATION: If the App developed for this study proves to be successful upon trial, the app could be made commercially available and could change how smoking cessation services are provided.

FUNDING: National Institute For Health Research Programme grant

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**PA21-6**

EVALUATION OF NICOTINE LOZENGES AS AN ADJUNCT FOR WEB-BASED SMOKELESS TOBACCO CESSTATION

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Introduction: Promising Web-based interventions for smokeless tobacco (ST) cessation have emerged and recent studies have reported on the efficacy of nicotine lozenges for smokeless tobacco cessation. We describe our Randomized Controlled Trial (RCT) that tested the relative benefits of adding Nicotine Lozenges as adjuncts to our fully-automated, MyLastDip Web-based ST cessation intervention.

Methods: 407 adult daily ST users who wanted to quit were recruited and screened online and then randomly assigned to one of two conditions: (a) the Web-only (N= 202), or (b) the Web+Lozenges (N= 205).

Results: Assessment completion rates at 3 months, 6 months, and for both 3 and 6 months were 71.4%, 72.9%, and 65.0%, respectively. No significant differences were found between conditions. Using complete case analysis for repeated point prevalence (3 and 6 month assessments), all tobacco abstinence was 52.8% for participants in the Web Only Condition and 66.4% in the Web+Lozenge Condition. Results were obtained for ST abstinence. Participants reported being satisfied with their programs and participants in the Web+Lozenges condition were relatively more engaged with the web program. Program engagement was positively related to tobacco abstinence at 6 months.

Conclusions: Both Web-based ST cessation programs encouraged important long-term levels of absolute tobacco and ST abstinence. We will present data on the relationship between reported lozenge use and cessation as well as other predictors of cessation. The absence of between-group differences is discussed in terms of composition of the control condition and implications for policies of distributing lozenges to ST cessation participants.

JUSTIFICATION: The results of this study can guide policy for providing free nicotine lozenges for ST users that use web based programs for cessation.

FUNDING: This work was supported by the National Cancer Institute of the National Institutes of Health (R01-CA142952).

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**PODIUM PRESENTATION 5: LOW-INCOME SMOKERS AND CESSTATION**

**PA4-1**

SNIPING AND OTHER HIGH-RISK SMOKING PRACTICES AMONG HOMELESS YOUTH

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Background: Approximately 70% of homeless youth are current cigarette smokers. However, little is known about their engagement in high-risk smoking practices that may increase their exposure to toxins and susceptibility to infectious diseases, such as sniping (i.e., smoking discarded butts or filters), sharing the same cigarette with others, and blocking filter vents while smoking. This is the first study to examine the prevalence of different high-risk smoking practices among homeless youth smokers, and includes a mixed-methods investigation of sniping behavior in particular.

Methods: A structured survey was administered to a probability sample of 292 homeless youth who had smoked in the past 30 days and at least 100 cigarettes in lifetime to examine the prevalence and correlates of high-risk smoking practices. In
addition, four focus groups were conducted with a total of 27 homeless youth who had a history of smoking to obtain narratives on the context of sniping behavior and the cognitions of homeless youth regarding this high-risk smoking practice.

Results: Nearly all youth engaged in at least one high-risk smoking practice, with 72% having sniped cigarettes in the past 30 days. Results from multivariable linear regression analyses found that sniping behavior was significantly more frequent among homeless youth with less negative smoking attitudes, greater nicotine dependence, lower income, and more severe drug abuse (p<.05). Focus group data identified specific sniping strategies used by homeless youth, including those to mitigate the perceived health risks of sniping.

Conclusions: High-risk smoking practices are widespread among homeless youth smokers. Sniping behavior in particular appears to be more common among those homeless youth who may already be facing greater health threats due to their nicotine dependence, lower income, and drug abuse. Evidence-based programs are urgently needed to reduce tobacco use among homeless youth. Such programs should include a focus on non-conventional smoking practices that can exacerbate the health risks associated with smoking.

JUSTIFICATION: Findings from this study can inform efforts to reduce high-risk smoking practices among homeless youth.

FUNDING: This research was supported by funds from the California Tobacco-Related Disease Research Grants Program Office of the University of California, Grant Number 21RT-0118 (PI: Tucker).

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PA4-2 USE OF TOBACCO CESSATION TREATMENT AMONG YOUNGER AND OLDER LOW-INCOME ADULT SMOKERS: THE ROLE OF ATTITUDES, INTENTIONS, AND SOCIAL ENVIRONMENT

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Background: Smoking rates in low-income populations are unacceptably high. Low rates of cessation treatment use may contribute to high rates of smoking in these populations. We assessed whether individual attitudes and intentions as well as social environment characteristics predict cessation treatment use in a low-income population of smokers and whether the influence of these factors differs by age. Our objective was to help inform interventions aimed at increasing cessation treatment use in demographically diverse populations.

Methods: We analyzed baseline survey data from 2406 participants enrolled in a randomized controlled trial evaluating the effectiveness of proactive care in a population-based sample of smokers enrolled in two publicly-subsidized health care assistance programs: Medicaid and MinnesotaCare. Stepwise multivariate logistic regression models identified predictors of past year treatment utilization at baseline among younger smokers (18-34) and older smokers (35-64). Income, employment, education, social environment, attitudes toward cessation, and attitudes toward Nicotine Replacement Therapy (NRT) were included in the models depending on significance.

Results: Past year quit attempts were high in both younger (59%) and older smokers (49%), however, younger smokers were less likely to use treatment than older smokers (27% vs 36%). In both groups, quitting self-efficacy, readiness to quit, and intent to use NRT were associated with treatment use. In the younger group, employment, presence of another smoker in the home, presence of a child in the home, and perceived drawbacks of NRT were also associated with treatment use. In the older group, income and education were associated with treatment use.

Conclusion: Interest in quitting is high among low-income smokers, although rates of treatment use are lower in younger smokers than older smokers. Our results suggest that attitudes and intentions may help predict treatment use in low-income smokers. Furthermore, social environment characteristics may be useful in predicting treatment use among young low-income smokers. These results help inform future cessation treatment interventions for low-income smokers.

JUSTIFICATION: The present study helps inform future strategies aimed at increasing smoking cessation treatment utilization among demographically diverse populations of smokers.

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PA4-3 MINORITY STRESS, SMOKING, AND CESSATION ATTEMPTS: FINDINGS FROM A COMMUNITY SAMPLE OF TRANSGENDER WOMEN IN THE SAN FRANCISCO BAY AREA

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High rates of smoking have been observed in samples of LGBT populations. Research has demonstrated associations between reports of minority stressors and smoking behaviors among lesbian, gay, and bisexual populations. An emerging body of research has shown a high prevalence of stressful life conditions, including high prevalence of trauma, among transgender women. Critical questions remain unanswered in regards to how minority stressors are related to smoking behaviors and cessation attempts among transgender women. The purpose of this study was two-fold: 1) to examine associations between minority stressors and heavy smoking (i.e., 20 or more cigarettes per day); and 2) to examine the association between minority stressors and unsuccessful cessation attempts. A community sample of 241 transgender women completed a one-time survey. Participants' mean age was 35 years; 51% identified as a racial/ethnic minority, and 63% earned <1000 per month. Logistic regression models examined associations between minority stressors and smoking behaviors; and unsuccessful cessation attempts. Both models adjusted for age, income, education, race/ethnicity, HIV status, depression, alcohol use, and current hormone use. Overall, 83% of participants indicating that they had smoked a cigarette in the last month. Of these women, 40% indicated that they smoked 20 or more cigarettes per day and 60% had unsuccessfully attempted to quit. Physical assault (AOR = 3.30, 95% CI: 1.57, 6.94) and discrimination (AOR = 1.04, 95% CI: 1.00, 1.08) were each independently associated with heavy smoking. Physical assault (AOR = 3.10, 95% CI: 1.47, 6.50) and discrimination (AOR = 1.11, 95% CI: 1.04, 1.18) were each independently associated with unsuccessful cessation attempts. Heavy smoking and unsuccessful cessation attempts may be driven by traumatic early life and adult experiences. Future research is warranted to address unique stigmatizing contexts in understanding and providing tailored intervention to address smoking among transgender women.

JUSTIFICATION: This project illustrates the importance of intervening upon minority stressors to guide future public health research, policy, and practice among transgender women to alleviate high rates of smoking.

FUNDING: This study was supported by the NIH grant # U24AA022000-03; PI: Operario.

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PA4-4
PHONE-BASED POSTPARTUM CONTINUING CARE: COMPARISON OF POSTPARTUM OUTCOMES AMONG PREGNANT SMOKERS

Victoria H. Coleman-Cowger, PhD,* Battelle

Tobacco use among pregnant and postpartum women is the leading preventable cause of poor pregnancy outcomes and a major public health issue. Women who have low income and who are African American are more likely to smoke during and after childbirth and, after initial cessation, more likely to relapse. This pilot study compares the 3-month postpartum smoking, mental health, and birth outcomes of women who were recruited from a low-income, primarily African-American obstetrics clinic at their first prenatal visit and randomly assigned to a control group (standard in-clinic care) or Intervention group (standard in-clinic care + Phone-based Postpartum Continuing Care) in week 26 of their pregnancy. One hundred thirty women were enrolled into the study at their first prenatal visit (i.e., first or early second trimester). The large majority of participants were African-American, never married, with a mean age of 26 years. Upon enrollment, 68.5% were current smokers and 31.5% had recently quit smoking. The current smokers reported smoking on 90% of the past 90 days and 11 times per day. Scores on the Edinburgh Postnatal Depression Scale (EPDS) and Perceived Stress Scale (PSS) were 8.9 and 17.3, respectively, for the full sample. At week 26, participants were randomized to either the Control or Intervention group using urn randomization balanced on presenting self-reported tobacco use, mental health symptoms, and race. As expected, birth weight of babies whose mothers were assigned to the Control group (3000g) was not statistically different than birth weight of Intervention group babies (2997g) since the Intervention did not begin until postpartum. At 3 months postpartum, with a 76% follow-up rate, the Intervention group reported lower EPDS (6.8 v 8) and PSS (13.2 v 14.9) scores, fewer days of smoking of the past 90 (40.7 v 53), and slightly fewer times smoked per day (5.6 v 5.8) when compared with the Control group but none of these differences were statistically significant. A possible reason for these findings was low compliance with PPCC protocol. Fewer than 20% of Intervention participants completed all calls at the time of 3 month postpartum assessment.

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PA4-5
THREE-MONTH EFFECTS OF A COMMUNITY HEALTH ADVOCATE-LED SMOKING CESSATION INTERVENTION IN PUBLIC HOUSING

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Background: We conducted a cluster randomized trial among Boston public housing residents, a group that is low-income, ethnically diverse, and which has high smoking rates. We hypothesized that an intervention based on Motivational Interviewing (MI) delivered by a tobacco treatment advocate (TTA-MI) would be more effective MI Interventions. Future analyses will investigate quit rates at 7-month and 12-month follow-up.

Methods: The intervention group received brief advice and motivational interviewing during 15 minute counselling sessions (both face to face and via telephone) once per week for a period of eight weeks, free Nicotine Replacement Therapy, telephone quitline referrals and peer buddy support. The control group received advice to quit smoking and the NSW Quitline phone number. All participants were followed up at one and six months post baseline. Primary outcome was expired CO-confirmed continuous abstinence at six months.

Results: Participants followed-up at 3-months (n=295) were mostly female (71.0%) and Black (57.1%). Quit rates were 13.8% for 7-day PPA and 12.9% for 30-day PPA in the TTA-MI group and 9.1% for 7-day PPA and 6.3% for 30-day PPA. The TTA-MI group was significantly more likely to achieve 7-day (OR=1.93, 95%CI: 1.01–3.69) and 30-day PPA (OR=2.73, 95%CI: 1.20–6.21) than the TTA-SC group. When stratified by number of TTA visits, TTA-MI participants who had one TTA visit were not more likely than TTA-SC participants to have higher quit rates. However, TTA-MI participants with two or more visits were significantly more likely to have 7-day (OR=2.62, 95%CI: 1.27–5.41) and 30-day PPA (OR=3.67, 95%CI: 1.47–9.16).

Conclusion: More intensive intervention was associated with higher quit rates among our low-income, ethnically-diverse population. The study provides evidence that lay providers from the target community can be trained to deliver effective MI interventions. Future analyses will investigate quit rates at 7-month and 12-month follow-up.

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PA4-6
EFFECTIVENESS OF A CLIENT-CENTRED CASE-WORKER DELIVERED SMOKING CESSATION INTERVENTION FOR SOCIALLY DISADVANTAGED SMOKERS: A RANDOMIZED CONTROLLED TRIAL

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Introduction: The prevalence of smoking within disadvantaged groups remains higher than the prevalence of smoking in the general population. However, few RCTs examining the effectiveness of smoking cessation programs have been carried out in disadvantaged groups. This RCT aimed to evaluate the effectiveness of a case-worker delivered smoking cessation intervention at increasing smoking cessation rates amongst socially disadvantaged smokers.

Methods: The intervention group received brief advice and motivational interviewing during 15 minute counselling sessions (both face to face and via telephone) once per week for a period of eight weeks, free Nicotine Replacement Therapy, telephone quitline referrals and peer buddy support. The control group received advice to quit smoking and the NSW Quitline phone number. All participants were followed up at one and six months post baseline. Primary outcome was expired CO-confirmed continuous abstinence at six months.

Results: 919 people were screened, 435 people consented and were randomised into intervention (n = 193) and control groups (n = 242) with a 60% follow up rate at six months. Demographic and smoking related variables were similar across the intervention and control group. Based on complete case analysis, in the intervention and control groups, no statistically significant differences were detected in expired CO-confirmed continuous abstinence (3.2% versus 2.1%, OR = 1.07, 95% CI = 0.18, 6.51), or seven day point prevalence (2.1% versus 3.5%, OR = 0.39, 95% CI = 0.04, 3.57) based on complete case analysis. Adjusted analyses found a statistically significant difference between prevalent abstinance (PPA) at 3-month follow-up. We conducted intent-to-treat and as-treated analyses using logistic GEE models to account for the cluster randomization by public housing site.

Conclusion: More intensive intervention was associated with higher quit rates among our low-income, ethnically-diverse population. The study provides evidence that lay providers from the target community can be trained to deliver effective MI interventions. Future analyses will investigate quit rates at 7-month and 12-month follow-up.

FUNDING: National Institutes of Health, National Cancer Institute, 1RO1CA141587-05 and 3RO1CA141587-04S2

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intervention and control groups in number of cigarettes smoked per day (8 versus 13, p<0.001). Process measures including intervention compliance and NRT use will be presented.

Conclusions: This RCT was not effective at increasing smoking cessation rates amongst a sample of socially disadvantaged individuals, although a statistically significant reduction in the number of cigarettes smoked was observed.

JUSTIFICATION: The results of this study have the potential to influence future smoking cessation trials targeted at highly disadvantaged individuals, from recruitment and retention methods, to intervention components, and assumptions used when assessing primary outcome measures.

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PA10-1

CIGARETTE SMOKING CESSATION AMONG U.S. SMOKERS WHO ALSO USE SMOKELESS TOBACCO

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Introduction: Concurrent use of cigarettes and smokeless tobacco, or dual use, is common. It is unknown whether dual use is associated with increased cigarette smoking cessation. Cigarette consumption level may also play a role.

Methods: The 2010-2011 Tobacco Use Supplement to the Current Population Survey included 26,760 current smokers, with 675 dual users. We compared rates of attempted smoking cessation, relapse, and 30-day abstinence between dual users and exclusive smokers, using multivariate regression models.

Results: More dual users (45%) than exclusive smokers (37%) attempted to quit smoking during the previous year (p<0.01), and this difference remained significant in a logistic regression model adjusted for demographic and cigarette dependence measures (ORadj 1.33, 95% CI 1.15-1.53). 48% of dual users who made a quit attempt reported “trying to quit smoking by switching to smokeless tobacco”. However, once in a quit attempt, dual users showed a 13% higher adjusted hazard of relapse to smoking, as compared to exclusive smokers in a Cox regression model (HRadj 1.13, 95% CI 1.02-1.26). There was no difference between dual users and exclusive smokers in attainment of 30-day abstinence on the most recent quit attempt (ORadj 1.09, 95% CI 0.88-1.37). The pattern of more quit attempts but faster relapse among dual users was more pronounced at higher cigarette dependence levels.

Conclusion: Prospective studies at the population level are needed. Cigarette smokers who also use smokeless tobacco are more likely to try to quit, but relapse more quickly than exclusive smokers, and have no apparent cessation advantage.

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PA10-2

DOES CULTURAL SPECIFICITY LEAD TO GREATER SMOKING CESSATION AMONG AFRICAN AMERICANS? A RANDOMIZED TRIAL

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African Americans experience greater difficulty quitting smoking compared to Whites. Targeted interventions addressing the unique concerns of ethnic groups (i.e., culturally specific) may potentially reduce health disparities; however, the evidence for cultural specificity is equivocal. This study tested the efficacy of a culturally specific smoking cessation intervention. We hypothesized that the culturally specific condition would produce greater cessation compared to the control condition. A 2-arm randomized controlled trial compared culturally specific group cognitive behavioral therapy (CS-CBT) to standard group CBT.
in a community sample. Participants in both conditions received 8 sessions and transdermal nicotine patches (TNP) for 8 weeks. Evidence-based smoking cessation and relapse prevention models guided CBT in both conditions. The difference between conditions was the inclusion of culturally specific components (e.g., race and smoking, race-matched clinicians, emphasis on religion/spirituality). The primary outcome variable was cotinine-verified 7-day point prevalence abstinence (7-day ppa), at the end-of-counseling (ECC), and 3, 6, and 12-month follow-ups. Participants (N=542) were mostly middle aged (49.5 years, male (57%), single (64%), at least high school educated (82%), with annual household incomes under $10k. They averaged 18 daily cigarettes for 26 years, and were moderately nicotine dependent. Within-time analyses demonstrated that 7-day ppa was significantly greater in the CS-CBT condition compared to standard CBT at the EOC (72% vs. 61%, p = .046), and at the 3-month (36% vs. 26%, p = .024) follow-up. The differences were not significant at 6 (28% vs. 25%) or 12-months (26% vs. 24%). Secondary analyses revealed significant condition by attendance and condition by time interaction effects, indicating benefits of greater intervention adherence in the CS-CBT condition on 7-day ppa at 6-months. Culturally specific group CBT led to short-term efficacy over an established CBT. The longer-term effect of CS-CBT was evident among those with better adherence. This study has implications for interventions to prevent relapse among African Americans.

JUSTIFICATION: Findings from this study have the potential to inform smoking cessation intervention approaches among African Americans.

FUNDING: National Cancer Institute, 1R01CA151614-01A1

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PA10-4
THE RELATIONSHIPS OF ABSTINENCE-RELATED EXPECTANCIES TO SMOKING CESSATION TREATMENT OUTCOME

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Introduction: Smokers’ abstinence-related expectancies demonstrate robust relations with several smoking-related constructs including dependence, mediate the associations of race and gender with motivation to quit and abstinence self-efficacy, and prospectively predict abstinence-induced withdrawal symptoms. The associations of abstinence-related expectancies with smoking cessation treatment outcome, however, have not been investigated.

Methods: Smokers enrolled in a clinical trial of smoking cessation treatment (N = 216) received a standard 12-week intervention including behavioral counseling and pharmacotherapy. The Smoking Abstinence Questionnaire (Hendricks et al., 2011), a measure of smokers’ abstinence-related expectancies, was administered at pre-treatment baseline and Week 12.

Results: Controlling for a range of covariates (e.g., cigarette dependence, motivation to quit, abstinence self-efficacy, demographic characteristics), greater baseline expectancies for smoking-specific social support (OR = 1.64, p = .04) and weaker expectancies that one’s experience with coffee would be altered upon quitting (OR = .81, p = .04) were associated with a greater likelihood of abstinence at Week 12. Expectancies for withdrawal effects (mean change = -.38, p = .006) and smoking-specific social support (mean change = -.29, p = .002) decreased from pre-treatment baseline to Week 12. Greater decreases in expectancies for withdrawal (OR = 2.5, p = .003) and adverse effects (OR = 3.17, p = .002) from pre-treatment baseline to Week 12 were independently associated with a greater likelihood of abstinence at Week 12.

Conclusion: Smoking cessation treatment outcome is predicted, and may be mediated, by abstinence-related expectancies. These findings highlight the importance of the abstinence-related expectancy construct and suggest unique targets for boosting the efficacy of tobacco dependence interventions.

JUSTIFICATION: This study presents novel targets for augmenting the effectiveness of smoking cessation treatments.

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ATTACHMENT ANXIETY AS A TARGET FOR SMOKING CESSATION IN WOMEN

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Background: Smoking cessation is especially difficult for women. Women have more trouble quitting and are more likely to relapse than men. Also, the relationship between childhood adversity and substance use is stronger in women than in men. Smoking has been linked to both childhood adversity and attachment insecurity. Adult attachment describes biological and psychological processes in close relationships.

Hypothesis: We hypothesized that attachment insecurity mediates the relationships between childhood adversity and starting and continuing to smoke in both men and women.

Methods: Primary care patients aged 25-65 were surveyed in a cross-sectional study using validated measures of smoking behaviour, attachment anxiety, attachment avoidance, and childhood adversity. Regression analyses and the Sobel test were used to determine the significance of the indirect effect of childhood adversity on starting smoking or continuing to smoke through attachment anxiety or attachment avoidance.

Results: Among 356 subjects, 60% had experienced childhood abuse, neglect or adversity, 49% started smoking and 20% were current smokers. Gender, education and self-rated health were not related to the main variables. In women, childhood adversity was associated with quitting smoking (beta=1.52, p<.01). The relationship between childhood adversity and attachment anxiety was significant (beta =.65, p=.046). Lower attachment anxiety was associated with quitting smoking (beta=.33, p=.04). The Sobel test indicated that attachment anxiety was not a mediator between childhood adversity and quitting smoking in women (z=1.45, p=.15). In men, neither childhood adversity nor attachment insecurity was associated with starting or continuing to smoke.

Conclusion: Neither attachment anxiety or attachment avoidance were mediators between childhood adversity and smoking in either men or women. However, attachment anxiety was associated with continuing to smoke in women. These findings suggest that women with high insecurity may benefit from strategies that focus on decreasing attachment insecurity through psychotherapy and supplementing treatments to complement insecure attachment patterns.

JUSTIFICATION: Identifying gendered determinants of relapse may lead to new therapies to help women quit smoking

FUNDING: No Funding

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LONG-TERM PROJECTIONS OF SMOKING-ATTRIBUTABLE LUNG CANCER BY GENDER

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Trends in lung cancer reflect past prevalences of cigarette smoking, which have been historically higher among males than females. Projecting smoking-attributable (SA) lung cancer rates can aid in understanding the impact of anti-tobacco efforts and identifying potentially disparate populations. The purpose of this research was to project SA lung cancer incidence rates in the US by gender and to explore differences in projections based on a 5 or 10-year period of case selection. Data on incident cases of lung and bronchus cancer (2001-2010) for adults 35 years or older were obtained from CDC WONDER. To calculate the SA fraction, sex- and age-specific cigarette smoking prevalence estimates were obtained from the 2013 BRFSS. SA lung cancer incidence rates were calculated by multiplying age-adjusted rates by the SA risk percentage from SAMMIEC. Annual percent change (APC) was estimated using Poisson linear regression to project rates of lung cancer incidence from 2011 to 2050 and were calculated by gender based on a 5 (2006-2010) and 10-year (2001-2010) period of case selection. Statistical significance was considered at alpha <0.05. SA lung cancer incidence rates were higher among US males (125.4 per 100,000) than females (74.9 per 100,000) in 2010. In 2050, predicted SA lung cancer incidence rates are 64.3 per 100,000 females and 57.7 per 100,000 males. These estimates are based on a 10-year period of case selection, and represent a 2.0% (p<0.0001) and 0.3% (p=0.1965) annual decline among males and females, respectively. Based on a 5-year period of case selection, predicted SA lung cancer incidence rates are at 35.3 per 100,000 females and 33.9 per 100,000 males in 2050. These estimates represent an annual decline of 3.3% (p<0.0094) among males and 1.8% (p=0.0420) among females. Projected SA lung cancer incidence rates declined more rapidly among males than in women. Smoking has been linked to both childhood adversity and attachment anxiety, attachment avoidance and attachment insecurity. Adult attachment describes biological and psychological processes in close relationships.

JUSTIFICATION: This validated cessation intervention is low cost and easy to disseminate via multiple modalities.

FUNDING: This research was funded by National Cancer Institute grants R01CA134347, P30CA076292, and R25CA090314.

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A RANDOMIZED CONTROLLED TRIAL OF A SELF-HELP INTERVENTION FOR TOBACCO DEPENDENCE

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Self-help has several advantages over more intensive counseling, including greater acceptability, lower cost, and greater reach; however, efficacy to date has been poor. In contrast to cessation, self-help booklets have shown efficacy for preventing smoking relapse. This study developed and assessed the efficacy of a series of smoking cessation booklets adapted from the successful “Forever Free” relapse-prevention series (Brandon et al., 2000, 2004, 2012). Daily smokers (N=1874), recruited nationally via multimedia advertisements, were randomized to one of three conditions. The Usual Care (UC) group received the National Cancer Institute booklet, “Clearing the Air: Quit Smoking Today.” The Standard Repeated Mailings (SRM) group received eight “Quit Smoking for Good” booklets mailed over 12 months. The Intensive Repeated Mailings (IRM) group received 10 booklets and additional supplemental written materials designed to enhance perceived social support, mailed monthly over 18 months (greater frequency and duration of intervention). Groups were comparable on baseline measures. Follow-up assessments were completed at 6, 12, 18, and 24 months. The primary outcome was self-reported 7-day point-prevalence abstinence. Multiple imputation was used to manage missing data. The IRM condition was significantly superior to UC at every follow-up, with increasing abstinence rates over time. At 24 months, abstinence rates were 30.0% and 18.9%, respectively (p <.0001). Abstinence rates for the SRM group fell between the others at all follow-ups. In summary, extended self-help booklets delivered over time increased abstinence rates through at least 24 months, with much greater effect sizes than typically associated with self-help. These initial findings provide renewed support for the efficacy of intensive, multi-contact self-help interventions for smoking cessation. Such interventions can be extremely cost-effective, widely disseminated, and amenable to a variety of delivery modalities.

JUSTIFICATION: This validated cessation intervention is low cost and easy to disseminate via multiple modalities.

FUNDING: This research was funded by National Cancer Institute grants R01CA134347, P30CA076292, and R25CA090314.
PA22-2

DOES A RECENT CANCER DIAGNOSIS PREDICT SMOKING CESSATION? AN ANALYSIS FROM A LARGE PROSPECTIVE U.S. COHORT

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Purpose: Quitting smoking provides important health benefits to cancer patients. A cancer diagnosis may motivate quitting—potentially providing a “teachable moment” for oncologists and other health care providers to encourage and assist quitting—but little is known about whether individuals recently diagnosed with cancer quit at higher rates than those without cancer.

Methods: This analysis included 13,198 smokers who enrolled in the Cancer Prevention Study-II Nutrition Cohort in 1992 or 1993 and reported smoking status biennially through 2009. Quit rates of smokers first diagnosed with cancer during two- and four-year intervals were compared to quit rates of smokers not diagnosed with cancer. Cancer diagnoses likely to cause physical limitations or symptoms that could influence smoking behavior (cancers of the lung, head and neck, esophagus, or any metastatic cancer) were excluded. Logistic regressions calculated quit rates controlling for age, sex, survey year, cardiovascular disease, and chronic obstructive pulmonary disease.

Results: The two-year quit rate was higher among the 772 smokers diagnosed with cancer [31.3%; 95% confidence interval (CI) 28.0%-34.5%] than among smokers not diagnosed with cancer (19.5%; 95% CI, 19.0%-19.9%). A similar difference was observed in four-year quit rates (43.0% vs. 33.4%). Results were similar by cancer site and stage.

Conclusion: A cancer diagnosis, even one with a relatively good prognosis that is not strongly related to smoking, may be associated with increased quitting that can be capitalized on to promote cessation.

JUSTIFICATION: Results suggest that a cancer diagnosis is a “teachable moment” that can be capitalized on to promote cessation.

FUNDING: No funding.

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PA22-3

LONG-TERM FOLLOW-UP OF TOBACCO USE AMONG A POPULATION-BASED COHORT OF LUNG AND COLORECTAL CANCER SURVIVORS

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Background: Cigarette use is the main risk factor for lung cancer (LC) and a risk factor for colorectal cancer (CRC). Continued smoking after diagnosis may adversely affect treatment effectiveness, risks of subsequent cancers, survival, and quality of life. Research conducted with 2455 LC and 3047 CRC patients from the Cancer Care Outcomes Research and Surveillance (CanCORS) found that 14% of LC patients and 9% of CRC patients reported smoking at enrollment (5 months post-diagnosis). We explored tobacco use among CanCORS survivors who were disease free at long-term follow-up.

Methods: In 2011-2012, we surveyed survivors of the CanCORS cohort (enrollment in 2005-2007) who had not recurred with advanced disease (n=198 LC; n=558 CRC). The cohort was 52.8% male, median age=65.6 yrs; 76.3% white non-Hispanic and 12.3% black; and 70.6% Stage I/II at diagnosis. We assessed past 12 month tobacco use and used logistic regression to identify factors associated with tobacco use.

Results: Six to eight years following diagnosis, 16.2% of LC survivors and 11.1% of CRC survivors reported tobacco use in the past 12 months. Among LC and CRC survivors, 77.9% of current smokers at enrollment reported tobacco use in the past 12 months. Factors independently associated with a higher likelihood of tobacco use included younger age, male gender, non-partnered, higher daily smoking rate history, and depression symptoms. Among smokers, 3.1% of LC survivors and 27.4% of CRC survivors endorsed regular use of alternative forms of tobacco (cigar, pipe, snus, chew). Only 6.4% of survivors who reported tobacco use in the past 12 months reported participating in a smoking cessation program in the past 12 months.

Conclusions: Six to eight years following diagnosis, LC and CRC survivors continue to use tobacco and sought little smoking cessation support. Alternative tobacco use was endorsed by one-quarter of CRC survivors who smoked, which underscores the importance of assessing, and intervening upon, all forms of tobacco use among survivors. Tobacco treatment interventions are needed for both cancer LC and CRC survivor groups.

JUSTIFICATION: To highlight the need for development of smoking cessation interventions for long term lung and colorectal cancer survivors.

FUNDING: The work of the CanCORS Consortium was supported by grants from the NCI to the Statistical Coordinating Center (U01 CA093344) and the NCI supported Primary Data Collection and Research Centers (U01 CA093332, U01 CA093324, U01 CA093348, U01 CA093329, U01 CA093339, U01 CA093326, CRS 02-164) and the ACS (Park MSRG 005-05-CPPBP).

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PA22-4

VALIDATION OF A RESPIRATORY SYMPTOM QUESTIONNAIRE IN ADOLESCENT SMokers

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Adolescent smokers experience decreased lung function and negative respiratory symptoms, and tracking these symptoms is important for determining the effects of smoking and smoking cessation on adolescent health. Furthermore, these symptoms may be differentially impacted by novel harm-reduction products such as very low nicotine content cigarettes and e-cigarettes. However, to date a reliable measure of respiratory symptoms has not been thoroughly validated for use with adolescents. Thus, we sought to validate the American Thoracic Society Questionnaire (ATSQ), an 8-item measure querying coughing, wheezing, phlegm...
production, shortness of breath and other symptoms, in two samples of adolescents. The first sample (N=161) consisted of adolescent daily smokers between the ages of 14 and 19. The second sample (N=260) consisted of adolescents; half of the participants were smokers and the other half were not. The ATSQ showed high internal consistency in both samples (Cronbach’s alpha = .8). ATSQ symptoms were significantly higher among adolescents with asthma in both samples (t = -4.0, p < .001 in the first sample; t = -3.8, p < .001 in the second sample); therefore, we excluded asthmatic adolescents from the remaining analyses. Among adolescent smokers in the first sample, ATSQ scores were positively correlated with nicotine dependence in the first sample (N = 118; r = .32, p < .001); and carbon monoxide levels (r = .43, p < .001), cotinine levels (r = .37, p < .001) and number of hours spent smoking (r = .54, p < .001) in the second sample (N = 216). Results from the second sample showed that respiratory symptoms were significantly greater among adolescent smokers compared to non-smokers (t = 10.9, p < .001). Overall, the ATSQ shows strong internal consistency and construct validity in adolescent smokers. A psychometrically validated measure will allow respiratory symptoms in adolescent smokers to be tracked and compared with other indicators of exposure to form a fuller picture of the effects of cigarettes, including of reduced-harm products, on adolescent health.

JUSTIFICATION: A psychometrically validated measure will allow respiratory symptoms in adolescent smokers to be tracked and compared with other indicators of exposure to form a fuller picture of the effects of cigarettes, including of reduced-harm products, on adolescent health.

FUNDING: Research supported by NIDA grant R01 DA16737 (Colby). Abstract preparation supported by NIDA Grant T32 DA016184 (Cassidy) and by (Roberts).

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PA22-5
DOES SMOKING MEDIATE THE RELATIONSHIP BETWEEN CHILDHOOD SOCIOECONOMIC POSITION AND CAROTID Atherosclerosis in MIDlife?

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Objective: Low socioeconomic status in childhood is associated with higher rates of cardiovascular disease (CVD) in adulthood in some, but not all, studies. We were interested in the extent that low socioeconomic index (SEI) at birth and childhood would affect subclinical atherosclerosis as a measure of adult CVD risk. We were further interested in the extent that adult smoking status, adult body mass index (BMI), total cholesterol/HDL ratio (TC/HDL) and adult educational attainment might mediate these effects, if found. Approach and Results: In this prospective study, we analyzed perinatal and age 7 SEI determined during childhood as predictors of carotid intima-media thickness (cIMT) measured at 44-50 years of age in a sample of 349 men and women from the New England Family Study. We observed that age 7 SEI is significantly associated with adult cIMT (beta=0.02, p=0.05) and the presence of carotid plaque (odds ratio=0.72, p=0.02) after controlling for potential confounding by age, gender, and race, whereas perinatal SEI was not. For cIMT, these associations are partially mediated (p<0.05) by adult smoking (20%), adult BMI (20%), adult TC/HDL ratio levels (29%), and adult educational attainment (40%). For carotid plaque, this association was partially mediated by adult smoking (26%) and TC/HDL ratio (21%) but not by adult BMI or adult educational attainment.

Conclusions: Childhood SEI is associated with adult subclinical atherosclerosis, and this relationship is partially mediated by adult smoking status, adult BMI, TC/HDL ratio and educational attainment. These results highlight the importance of smoking prevention and early interventions for childhood overweight and obesity in the prevention of adult CVD.

JUSTIFICATION: Our findings confirming that tobacco smoking and other lifestyle factors mediate the relationship between low childhood socioeconomic status and adult cardiovascular disease highlight the importance of smoking prevention in disadvantaged youth, which may reduce risk of later-life cardiovascular disease in this population.

FUNDING: This work was supported by the National Institutes on Aging (grant RC2AG036666) and the National Heart, Lung, and Blood Institute (grant T32HL076134-04 to JZJM while at Brown University). Dr. Maccani is now at the Penn State College of Medicine Tobacco Center of Regulatory Science (TCORS) and is funded by grant P50-DA-036107-01 from the National Institutes of Health.

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PA22-7
CARDIOVASCULAR RISK PARAMETERS IN MALE SMOKELESS TOBACCO USERS

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Despite considerable decreases in smoking, smokeless tobacco (ST) use prevalence in the US has not significantly changed in the past several years. Due to aggressive marketing and promotion of ST products and increasing use of ST by current smokers, it is important to evaluate ill health effects of ST use. Cigarette smoking is a well-documented major risk factor for cardiovascular disease (CVD); however, there is inadequate evidence of such an association for ST use. The aim of this study was to evaluate cardiovascular risk parameters in male ST users. ST users were compared to cigarette smokers and non-tobacco users. Data from 11,614 male adults who participated in the National Health and Nutrition Examination Survey (NHANES) 2003–2010 were used. Tobacco use was defined on the basis of current smoking and recent use of ST products (chewing tobacco or snuff). Associations were examined using univariate and multiple logistic regression with odds ratios (OR) and 95% confidence intervals (CI) reported. Taylor Series linearization approach was used to account for the complex sample design and to perform weighted analysis of the aggregate data. The prevalence of exclusive ST use in the study sample was 4.5%; whereas, 29.4% were exclusive smokers. The majority of ST users were Non-Hispanic White (92%), 38.1% of ST users were hypertensive and 26.3% had high cholesterol levels. Most (82.5%) were overweight (32.9%) or obese (49.5%). Multiple logistic regression analysis indicated that ST users were 1.68 (95%CI: 1.15–2.45) times more likely to have hypertension compared to smokers when adjusted for other covariates. Similarly, the odds were significantly higher when ST users were compared to non-tobacco users (aOR=1.59, 95%CI: 1.12–2.44). ST users were almost twice as likely to be obese compared to non-tobacco users (aOR=1.98, 95%CI: 1.23–3.18) and their adjusted odds of being obese were increased more than four-fold compared to smokers (aOR=4.25, 95%CI: 2.68–6.77). ST users had significantly higher uptake of nicotine and NNK compared to smokers. Study findings indicate substantial association of ST use with hypertension and obesity which are independent risk factors of CVD.

FUNDING: Oklahoma Tobacco Research Center

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PODIUM PRESENTATION 6: SMOKING CESSATION IN HEALTHCARE SETTINGS

PA11-1
IS IT STILL NECESSARY TO VERIFY SMOKING STATUS IN CESSATION TRIALS? FINDINGS FROM THE CONSORTIUM OF HOSPITALS ADVANCING RESEARCH ON TOBACCO (CHART)

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Verification of self-reported smoking abstinence is the gold standard for outcomes in randomized controlled trials and is often achieved by testing salivary cotinine. Due to reduced population exposure to environmental tobacco smoke (ETS), recent recommendations are that researchers use a lower threshold (3 ng/ml) for cotinine verification than the 15 ng/ml suggested by the SRNT Subcommittee on Biochemical Verification (2002). Our aims were to determine if self-report differed markedly from verified quit rates among hospitalized smokers and to compare verification rates based on old and new threshold recommendations. We conducted a secondary analysis of data from CHART, focusing on participants from 5 sites who reported 7-day smoking abstinence at 6 months post enrollment (n=1,229). Of these, 966 were eligible for cotinine verification because they reported no recent nicotine replacement therapy (NRT) or other (non-cigarette) tobacco use in the past 7 days. These participants were mailed a saliva collection kit or provided a sample in person. Most (744, 77%) returned a sample but 11 provided insufficient saliva for analysis, yielding 733 usable samples. Of participants with usable samples, 62% (455/733) were verified quit at 15 ng/ml and 45% (330/733) at 3ng/ml. Participants (n = 653) from three sites completed a brief survey at the time of saliva collection. Of these, 25.5% reported smoking in the past 7-days, 7% recently used NRT, 6.9% used other tobacco or e-cigarettes, and 59.4% reported no recent cigarette, NRT, or other tobacco use. 70.3% (163/232) without ETS exposure were verified quit at 15 ng/ml and 45% (330/733) at 3 ng/ml. Participants with usable samples, 62% (455/733) were verified quit at 15 ng/ml and 45% (330/733) at 3 ng/ml. Participants (n = 653) from three sites completed a brief survey at the time of saliva collection. Of these, 25.5% reported smoking in the past 7-days, 7% recently used NRT, 6.9% used other tobacco or e-cigarettes, and 59.4% reported no recent cigarette, NRT, or other tobacco use. 70.3% (163/232) without ETS exposure were verified quit at 15 ng/ml and 45% (330/733) at 3 ng/ml. Analyses by race, ethnicity, and ETS exposure found significant variations in verification rates even with race/ethnicity specific cut-offs. Verification of smoking status remains important, especially in intervention studies for hospitalized smokers. Researchers should consider routinely surveying self-reported quitters at the point of verification, or even shifting study end points to the time at which verification is collected.

JUSTIFICATION: Biochemical verification of self-reported abstinence is important in smoking cessation trials; implications of cut-points and timing of assessments should be carefully considered to accurately reflect study outcomes.

FUNDING: The Consortium of Hospitals Advancing Research on Tobacco (CHART) was funded by the National Heart, Lung, and Blood Institute (NHLBI), National Cancer Institute (NCI), National Institute on Drug Abuse (NIDA) and the Office of Behavioral and Social Sciences (OBSSR) by cooperative agreements to a research coordinating unit (Kaiser Foundation Research Institute, PI: Victor Stevens, Ph.D., U01HL52333) and six research projects (New York University School of Medicine, PI: Scott Sherman, MD, U01HL105229; University of California San Diego, PI: Shu-Hong Zhu, U01CA159533; University of Kansas Medical Center, PI: Kimber Richter, PhD, U01HL105232; University of Alabama Birmingham, PI: William Bailey, MD, U01DA031515; University of Michigan Ann Arbor, PI: Sonia Duffy, PhD, 01HL105218; Kaiser Foundation Research Institute, PI: Jeffrey Felows, PhD, U01HL105231). An additional project (Massachusetts General Hospital, PI: Nancy Rigotti, MD, RC1HL099686) has been included in the consortium.

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PA11-2
DOES TREATMENT OF TOBACCO USE IN HOSPITALS VARY BY IMMIGRANT STATUS?

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Background: Despite the efficacy of Nicotine Replacement Therapy (NRT) in promoting smoking cessation, no studies have been done to ensure adequate NRT prescribing rates among immigrants, a vulnerable minority population in the US. The aim of this study is to explore for differences in NRT prescribing behavior by immigrant status.

Methods: Participants were enrolled in a smoking cessation trial for hospitalized patients between July 2011 and April 2014 at two safety-net hospitals in NYC. Patients were eligible for study inclusion if they were 18 years or older; had smoked at least one puff of a cigarette in the last 30 days; spoke English, Spanish, or Mandarin; had a working US telephone number; were not incarcerated; and were not pregnant or breastfeeding. For this analysis, we used baseline data from patient surveys and medical-record reviews. We performed descriptive analysis and logistic regression to examine associations between immigrant status and prescription of NRT in-hospital and on discharge, as well as acceptance of NRT in-hospital. We included age, gender, education, health literacy, insurance status, ethnicity, and preferred language in the models as potential confounders.

Results: Our study population included 1619 participants, of whom 343 (21%) were not born in the US. Seventy-nine percent were male, 53% had a high-school diploma or less, and 19% did not have health insurance. Bivariate analysis found that non-immigrants were more likely to be prescribed NRT in the hospital than immigrants (46.1% vs. 35.7%, p=0.006) and similarly on discharge (19.4% vs. 15.3%, p=0.09). Both groups were equally likely to accept the NRT in-hospital when prescribed. On multivariable analysis, being an immigrant (OR 0.69, 95% CI 0.52-0.92), age<50 years (OR 0.83, 95% CI 0.51-0.80), and the non-VA site (OR 0.57, 95% CI 0.37-0.86) were associated with lower likelihood of being prescribed NRT in-hospital. Age<50 years (OR 0.61, 95% CI 0.45-0.82) and the non-VA site (OR 0.39, 95% CI 0.25-0.63) were associated with lower likelihood of being prescribed NRT on discharge.

Conclusions: These findings indicate suboptimal NRT prescribing for immigrants as compared to non-immigrants.

JUSTIFICATION: These findings indicate suboptimal NRT prescribing for immigrants as compared to non-immigrants.

FUNDING: NHLBI U01HL105229

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PA11-3
LACK OF INSURANCE COVERAGE LIMITS ACCESS TO EVIDENCE-BASED TREATMENT POST-HOSPITALIZATION

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Smoking disproportionately affects the poor. Medicaid provides an opportunity for many poor smokers to access effective smoking cessation therapy and the Affordable Care Act (ACA) has further expanded access to essential preventive services. In states that did not expand Medicaid eligibility under the ACA, however, some of the poorest smokers may still face major financial barriers to effective treatment. To examine the impact of insurance coverage on use of cessation therapy, we identified 806 smokers from hospitals across Kansas. We completed 3 month follow-up on 487 (80%) and assessed their prior use of cessation pharmacotherapy, use during hospitalization, and use post-discharge. We compared use of pharmacotherapy among those who were uninsured, those on Medicaid (either Medicaid alone or dually eligible), and other insurance. Interest in quitting and interest in use of pharmacotherapy did not differ according to the type of insurance. The uninsured were less likely than those with either Medicaid or other insurance to have used cessation pharmacotherapy in the past, but during the hospitalization the uninsured (39%), Medicaid recipients (39%), and other insured...
(32%) used pharmacotherapy at comparable levels. Post discharge only 38% of the uninsured used pharmacotherapy compared to 59% of those on Medicaid and 51% of those with other insurance (p < 0.01). Although treatment during the hospitalization appears to be unaffected by insurance status, lack of insurance is a major barrier to post-discharge, evidence-based care for hospitalized smokers.

JUSTIFICATION: Expansion of insurance coverage might improve access to evidence-based treatment post hospital discharge.

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PA11-4
AN EDUCATION PROGRAM FOR PERINATAL NURSES ON SMOKING RELAPSE PREVENTION COUNSELING IN THE POSTPARTUM PERIOD.

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Background: There have been significant gains in smoking cessation among pregnant women, but the rate of postpartum relapse remains high. Smoking is harmful to both the mother and child’s health and women need to be educated about the risk of relapse and effective strategies to remain smoke free. The high rate of early postpartum relapse suggests that interventions must take place soon after delivery and perinatal nurses are in the ideal position to provide these strategies. Despite evidence that nurses can be effective in providing tobacco counseling, few feel confident to actually follow through with recommended guidelines.

Methods: A multi-site, interventional study was conducted using a pre-test/ post-test design. A total of 162 perinatal nurses from four hospitals participated in a smoking cessation and relapse prevention counseling education program. Participants completed pre, post and one month follow up tests assessing perceived knowledge, attitude, self-efficacy, and behavior toward smoking cessation and relapse prevention counseling in the postpartum period. Descriptive statistics were used to characterize respondents; one way repeated ANOVAs were used to evaluate differences in scores on attitude, self-efficacy, knowledge and behavior.

Results: There was a significant increase in scores on knowledge, self-efficacy and behavior from pretest to follow up test. Although quitline referral scores increased from pre to follow up test, the scores were very low. There were no significant differences in scores related to participant age, years of experience or level of education. OB nurses had significantly higher scores than neonatal nurses on all constructs.

Conclusions: Interventions are needed to increase nurses’ quitline referrals for postpartum women at risk of smoking relapse and specific education programs for neonatal nurses need to be developed. Providing perinatal nurses with education about effective tobacco counseling interventions has the potential to decrease the rate of postpartum smoking relapse.

FUNDING: Support for this research was provided by the Nurse Practitioner Healthcare Foundation through the Astellas Promoting Heart Health Across the Age Span Award; and by a faculty research grant from the University of Scranton.

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PA11-5
NO SAFE PLACE TO LAY YOUR HEAD: THIRDHAND SMOKE CONTAMINATION IN A NEONATAL INTENSIVE CARE UNIT

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Thirdhand smoke (THS) forms from secondhand smoke (SHS) and contains toxicants and carcinogens found in SHS and novel THS-specific compounds. It has been linked to DNA damage, hyperactivity, and hindered wound healing and respiratory development in animal and in-vitro assay studies. THS is difficult to remove, reemits for months after forming, and differs from SHS (i.e., exposure can occur by ingestion [e.g., child pica behavior] and dermal transfer, as well as by inhalation). These data are concerning for acutely ill children who are visited and cared for by individuals who smoke and may be problematic during extended stays in neonatal intensive care units (NICU). Because of its chemical properties (e.g., transfer, sorption to and desorption from surfaces, clothes, skin), it is possible that despite smoking bans, THS is transported to the NICU by visitors who smoke or live with smokers. The aim of this pilot work with NICU infants whose mothers smoke (N=5) was to determine if detectable levels of nicotine were present in a NICU and to quantify surface nicotine (a marker of THS pollution) deposited on hospital furniture (e.g., cribs). Using a standardized surface wipe protocol, mothers’ index fingers and plastic-covered NICU furniture were sampled with cotton wipes moistened with a 1% solution of ascorbic acid to measure nicotine. All wipers were corrected for potential confounding by subtracting background nicotine levels present in the cotton, solvent, or air. Analyses found that 75% of cribs had surface nicotine above the limit-of-detection (i.e., 100 ng/m2; max=270 ng/m2). Nicotine on hospital furniture was more variable and much greater (range: 353-34,236 ng/m2; median=6,496 ng/m2) and comparable to smokers’ homes. Index finger nicotine levels were detectable and consistent with other reports for active smokers’ fingers, suggesting smokers are the source of the nicotine contamination. Any amount of THS in a protected setting poses a challenge to hospitals for eliminating exposure for medically fragile patients. More work in this area is needed to characterize the contamination sites, toxins, and the health-related exposure risks.

FUNDING: This study was supported by grant R01 HL107404 through the U.S. National Institute of Health, National Heart, Lung, and Blood Institute.

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PA11-6
TOBACCO INTERVENTIONS WITH PATIENTS AND PARENTS: ASSESSING THE TRAINING AND CONFIDENCE OF INCOMING PEDIATRIC AND FAMILY MEDICINE INTERNS

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Limited information is available assessing physician training and confidence about discussing smoking cessation and second hand smoke exposure (SHSe) with children and families. The purpose of this study was to compare incoming family medicine (FMs) and pediatric (Pis) interns’ training and confidence in these areas. PIs and FMs from University of Oklahoma Health Sciences Center—Oklahoma City, University of Oklahoma Health Sciences Center—Tulsa, University of Arkansas for Medical Sciences, and University of Utah School of Medicine participated in this project. Data collection from 3 of 4 sites has been completed. Participants were surveyed about previous training in tobacco prevention or control and SHSe, levels of confidence in their ability to provide education, and assistance about smoking cessation. Confidence was assessed using a 6-item, Likert scale, with item scores ranging from 1 (Not confident at all) to 7 (Very confident). Confidence total scores were calculated by adding all items resulting in a range of scores between 6 and 42. Sixty-one participants completed the survey. Of these participants, 57.4% were PIs and 42.6% were FMs. Participants had a mean age of 28.5 years (SD=2.44) and 67.2% were female. An one-way analysis of variance (ANOVA) indicated a significant difference between the previous
training of PIs and FMIs, F(1,59)=8.32, p=.005, such that 85.7% of PIs reported previous training in tobacco prevention or control and SHSe compared to 53.8% of FMIs. ANCOVA revealed a significant difference in confidence in addressing smoking cessation and SHSe between PIs and FMIs, F(1,59)=5.12, p<.05, with PIs (M=30.1, SD=6.6) reporting lower confidence ratings than FMIs (M=33.8, SD=5.8). This study highlights reported differences in prior training between PIs and FMIs, as well as PIs having less confidence in intervening with parents regarding smoking cessation and SHSe. This finding suggests PIs could benefit from additional experiences addressing smoking cessation in order to improve their level of confidence in their ability to provide education and assistance.

JUSTIFICATION: This work will help to improve the quality of training provided to medical residents so that they are better prepared to discuss smoking cessation and secondhand smoke prevention with their patients and patients’ families.

FUNDING: Oklahoma Tobacco Research Center

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PODIUM PRESENTATION 6: GRAPHIC WARNINGS

PA19-1
ATTENTION AND RECALL OF GRAPHIC WARNING LABELS ON CIGARETTE ADVERTISING: AN EYE-TRACKING STUDY

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Introduction: Congress has mandated that cigarette advertisements include a graphic health warning label (GWL) that occupies 20% of advertisement area. Little research has focused on the optimum characteristics of these warnings within advertisements to attract smoker’s attention.

Methods: Rural daily smokers (n=208) were randomly assigned to view a cigarette advertisement with one of 9 warning labels in three conditions: two intervention conditions with GWL comprising 20% or 33% of the advertisement area, or a text-only control. Eye-tracking software measured attention to advertisement elements. Binary outcome median explored whether attention (measured as dwell time) on the GWL mediated the effect of study condition on GWL recall.

Results: Intervention participants spent 24% of their time viewing the warning label, compared to 10% for the control (p<0.01). The odds of any recall of the GWL in the combined intervention group were 3.3 times the odds of any recall for control participants. After adjusting for total dwell time on the GWL, this odds ratio decreased to 2.3; total dwell time mediated 33% of the effect of the graphic condition on any recall.

Conclusions: GWLs that covered at least 20% of cigarette advertisement space attracted significantly more attention than traditional text-only health warnings; larger GWLs did not increase attention. Attention paid to GWLs was significantly associated with any recall of warning content, and the total time viewing the GWL mediated warning message recall. Tobacco advertisements should include large warnings with graphic imagery to attract attention from tobacco users.

JUSTIFICATION: Study results are the first of their kind to evaluate the role of size in graphic warnings on consumer attention and recall, and will be informative for tobacco control decision makers in the optimal design of graphic warnings.

FUNDING: This work was supported by the National Cancer Institute/Center for Tobacco Products (R01CA129771). Corresponding Author: Elizabeth Klein, PhD, MPH, Assistant Professor, Ohio State University, Health Behavior & Health Promotion, 1841 Neil Avenue, 352 Cunz Hall, Columbus, OH 43210, USA, 614-292-5424, eklein@cph.osu.edu

PA19-2
YOUNG ADULT SMOKERS’ NEURAL RESPONSE TO GRAPHIC CIGARETTE WARNING LABELS

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Background: The 2009 Family Smoking Prevention and Tobacco Control Act required new graphic warning labels for U.S. cigarette packs, but implementation has been delayed by court rulings scrutinizing the existing evidence. Recent studies show that quantitative measures of smokers’ in-vivo neural response to antismoking messages obtained via functional magnetic resonance imaging (fMRI) are a stronger predictor of future behavior change than self-report assessments. Drawing from this research, this pilot examined young adult smokers’ neural response to graphic cigarette warning labels using fMRI.

Methods: Smokers ages 18 to 30 (n = 38, M age 23.0, 68% male, 63% non-white, M cigarettes/day 5.4) completed a baseline assessment and an fMRI scanning session. fMRI data included high-resolution whole-brain blood oxygenated level dependent functional images collected via gradient echo-planar imaging in a 3T Siemens Trio scanner. In an event-related design, cigarette pack images tailored to participants’ preferred brand (96 stimuli, viewed 4 s each) were presented in random order. Packs displayed a graphic warning, control images with features similar to the graphic warnings but composed of geometric shapes, or a text only warning. During the task participants reported motivation to quit smoking (range 1-4) in response to each pack image using a push-button control.

Results: Motivation to quit smoking was higher for graphic warnings (M 3.2, SD 0.6) than control (M 1.9, SD 0.8) and text warnings (M 1.8, SD 0.8, p's < .001). fMRI data indicate stronger neural activation in response to graphic warnings compared with control warnings in medial prefrontal cortex, amygdala, medial temporal lobe, and occipital cortex. Results were similar when comparing a subset of graphic warnings to text-only warnings.

Conclusions: These pilot results show that graphic warning labels promote neural activation in brain regions involved in affective decision-making as well as visual attention. The preliminary findings, especially medial prefrontal activity, indicate that graphic warnings elicit neural response among smokers that has been associated in past studies with increased quitting behavior.

JUSTIFICATION: This study has the potential to inform decision-making for tobacco control policy by providing new evidence on young smokers’ neural response to graphic cigarette warning labels.

FUNDING: This study was supported through funding from Legacy.

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PA19-3
GRAPHIC WARNING LABELS THAT FOCUS ON HARM TO CHILDREN: ASSESSING THE EFFECTIVENESS AMONG PREGNANT SMOKERS AND SMOKERS WHO LIVE WITH CHILDREN

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Background: Two of the graphic warning labels (GWLs) proposed by the US FDA in 2011 focused on harms to children. These GWLs are likely quite relevant to smokers who live with children or intend to, and provide compelling reasons for them to quit. We assessed the potential effectiveness of these 2 GWLs relative to the 7 other GWLs, and relative to the current text-only labels, among a) pregnant/intending to be pregnant women, b) other women, and c) men; and among d)
smokers living with children and intending to have more, e) smokers living with children, f) smokers intending to have children, and g) smokers not living with nor intending to have children.

Methods: Data were collected online from current smokers randomly assigned to see a GWL or a current text-only warning. Analyses were restricted to primary childbearing ages (18-44; n=698 were exposed to 1 of the 2 target GWLs, n=2458 to 1 of the other 7 GWLs, and n=376 to 1 of the text-only labels). Six outcome measures included negative emotional responses, perceived effectiveness, and quitting-related intentions.

Results: On the whole, the 2 target GWLs out-performed text-only labels for both groups of women, but not for men. Further, pregnant/intending women showed significantly larger immediate responses to the Pregnancy GWL than text-only labels compared to the other 2 groups. Smokers intending to have children (whether or not they lived with them) also experienced stronger negative emotional reactions to the 2 target GWLs compared to the text-only control. In contrast, smokers who lived with children but did not intend to have more showed less negative emotions, perceived effectiveness, and intentions to quit in response to the 2 targeted GWLs than to the other 7 GWLs.

Conclusions: These findings have implications for future GWL policies in the US and globally. Some groups of smokers (i.e., those living with children but not intending to have more) may find warnings focused on harms to children irrelevant if they are de-sensitized or don’t smoke at home – or if they feel stigmatized by such labels. However, on the whole, these 2 GWLs were quite effective for women and smokers intending to have children.

JUSTIFICATION: As was done here, population-level interventions to reduce tobacco use among certain targeted groups need to be tested for differences in effectiveness within sub-populations of those targeted groups, and public health officials should pay particular attention to potentially stigmatizing images.

FUNDING: The authors wish to acknowledge the funding support of the National Cancer Institute through the Center of Excellence in Cancer Communication (CECCR) (P20-CA095856) as well as the funding support from the Food and Drug Administration (FDA) (P20CA095856-0951).

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PA19-4

“IT REALLY MAKES YOU THINK”$: PERCEPTIONS OF THE MOTIVATIONAL IMPACT OF THEORY-BASED GRAPHIC WARNING LABELS AMONG LOW-INCOME SMOKERS IN THE UNITED STATES

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Use of communication theories in graphic warning label development might enhance labels’ impact on motivation to quit, but research in this area has been limited, particularly among low socioeconomic status (SES) populations in the U.S. Using the extended parallel process model, this qualitative study explored perceptions of theory-based labels and their role in motivation to quit among low-income smokers. Interviews were conducted with 25 adult (aged 22-61 years) smokers recruited from low-income neighborhoods in Baltimore, Maryland. We asked participants about 12 theory-based labels falling into four content categories: negative depictions of the health effects of smoking to (a) smokers and (b) others, and positive depictions of the benefits of quitting to (c) smokers and (d) others. Negative depictions also varied by portrayal of high or low threat (i.e., vivid or nonvivid pictures). Data were coded using a combined inductive and deductive approach and analyzed through framework analysis. Participants most often said that labels with negative depictions of the effects to smokers were motivational, followed by labels depicting negative effects to others, regardless of portrayal of high or low threat. Reasons included perceived severity of and susceptibility to the effects, negative emotional reactions (such as fear), and concern for children. Labels with positive depictions of the benefits of quitting to smokers and others were described as motivational because of their helpfulness, characters as role models for quitting and its benefits, and desire to improve familial health and relationships. Reasons why labels were described as not motivational included lack of impact on perceived severity/susceptibility and low credibility. Findings suggest innovative theory-based approaches for label design, such as using former smokers as role models and socially-oriented labels, may help motivate cessation among low SES smokers.

JUSTIFICATION: The findings of this study can inform tobacco control policy and messaging by guiding the design and evaluation of innovative graphic warning labels that promote smoking cessation.

FUNDING: This study was supported by the National Institute On Drug Abuse and the Food and Drug Administration Center for Tobacco Products (Grant #s R01DA032217-04 and R01DA032217-04S), as well as by the National Institute Of Allergy And Infectious Diseases, The Johns Hopkins Center for AIDS Research (Grant # 1P30 AI094189).

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PA19-5

SYSTEMATIC REVIEW OF MEASURES USED IN GRAPHIC CIGARETTE PACK WARNING EXPERIMENTS

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Background: Experiments are commonly used to evaluate the impact of graphic cigarette pack warnings. We sought to better understand measures used in graphic cigarette warning experiments, describe their psychometric properties, and provide recommendations for future studies.

Methods: We systematically reviewed measures from graphic cigarette pack warning experiments (k=37). Two independent coders coded all studies on several features, including sample characteristics, theoretical framework, and constructs assessed. They also coded measurement characteristics, including construct measured, number of items, item wording, response scale, measure source, and reliability and validity information.

Results: We identified n=128 measures assessing 40 constructs. Few experiments used the same outcomes as other experiments. The most common constructs assessed were perceived effectiveness of warning to discourage smoking, negative affective reactions (e.g., fear), negative pack or brand attributes, and intention to quit smoking. Measure names were not always consistent with what construct the measure was assessing. Nineteen of 37 studies, or 51%, mentioned a theory as informing the study. Papers reported sources of measures only 26% of the time. Almost half (48%) of the measures were single-items. For multi-item measures, papers reported reliability data 57% of the time (mean alpha = .86, range .68-.98).

Conclusions: We found great variability in constructs assessed, measures used, and reporting on measures in experiments evaluating the impact of graphic warnings for cigarettes. Many measures were single items with unknown psychometric properties, and measure names did not always line up with what was being assessed. Recommendations for future studies include a greater emphasis on theoretically-informed measures, use of reliable and validated (preferably multi-item) measures, and better reporting of measure source.

JUSTIFICATION: Graphic cigarette pack warning studies should include a greater emphasis on theoretically-informed measures, use of reliable and validated (preferably multi-item) measures, and better reporting of measure source.

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PODIUM PRESENTATION 6: TOBACCO PRODUCT REGULATION

PA20-1
TOBACCO REGULATORY RESEARCH MEASURES IN THE PHENX TOOLKIT

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The PhenX (consensus measures for Phenotypes and eXposures) Toolkit (https://www.phenxtoolkit.org/) is a well-established, Web-based catalog of measures for collaborative biomedical research. The PhenX Toolkit has 1,586 registered users and has been accessed in 155 countries. The NIH has recommended the use of PhenX measures in 95 Funding Opportunity Announcements (FOAs). PhenX Working Groups (WGs) consider measures for inclusion in the toolkit that are suitable for a variety of study designs, including longitudinal, clinical and genomic studies. The Toolkit includes 295 measures of phenotypes and exposures for 21 research domains, including Demographics, Cancer, Environmental Exposures, and Alcohol, Tobacco, and Other Substances (ATOS). An Administrative Supplement (NIDA) added 44 measures to the Toolkit in support of Substance Abuse and Addiction (SAA) research. In 2013, an Administrative Supplement (NIH Tobacco Regulatory Science Program and FDA) was launched to add depth in support of Tobacco Regulatory Research (TRR). A Tobacco Regulatory Research Panel (TRRP) was assembled to define the scope of the Specialty Collections to be addressed by TRR WGs and to define a Core Collection of TRR-related measures. The TRRP includes nine academic and federal governmental scientists who defined the initial scope of five Specialty Collections based on the HAVE (Host, Agent, Vector, and Environment) model: • Social/Cognitive (Host): intrapersonal factors that influence product use • Biobehavioral (Host): characterization of product use, exposure, and outcomes • Agent: assessment of tobacco products • Vector: industry and retailer activities • Environment: environmental factors influencing tobacco use For each Specialty Collection, WGs of 6-8 TRR experts review measures in the field and then selects eight high-priority measures to include in the PhenX Toolkit. The WGs use a consensus-based process, which includes input from the scientific community, to select measures for inclusion in the PhenX Toolkit. We present the rationale and preliminary results from the TRRP and the first two WGs. It is expected that up to 42 new TRR measures will be added to the Toolkit by spring 2015.

JUSTIFICATION: PhenX Toolkit provides tobacco control researchers with easy access to freely available resources and hold promise for improved quality of scientific assessment through measurement standardization, validity, and comparability across studies.

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PA20-2
SUPPORT FOR VARIOUS GOVERNMENT RESTRICTIONS ON CIGARETTE CONTENTS AMONG U.S. YOUNG ADULTS

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Background: The FDA has the authority to regulate nicotine content and more likely to be added. Studies have assessed attitudes towards these policies among adult audiences, but little is known about policy support and correlates among young adults.

Methods: We used data from a nationally representative sample of 18-34 year olds (n=4,236) in the Legacy Young Adult Cohort from December 2011. We conducted weighted analyses to estimate prevalence and correlates of support for government restrictions of cigarette content and specifically for 1) banning menthol and 2) reducing nicotine content of cigarettes in order to a) “help smokers quit” or b) “to keep kids from getting addicted to smoking.” We conducted multinomial logistic regression comparing “agree” to “disagree” and controlling for age, gender, race/ethnicity, education and smoking status. For smokers, we also controlled for intention to quit and time to first cigarette.

Results: Sixty percent of the total sample, including a majority of current smokers (54%), supported government restriction of cigarette content, but support for the three individual policies varied. Support for each policy was higher among females, African-Americans, Hispanics, and non-smokers. Only 26% of the total sample and 16% of smokers supported a ban on menthol cigarettes. Among smokers, current menthol users were significantly less likely (ARR=1.1, 95% CI: .06, .23) to support a menthol ban controlling for demographic and smoker covariates. We saw majority support for nicotine reductions, with higher support for reductions framed “to protect youth” than “to help smokers quit” (56.1% vs. 52.7%). In multivariable models, smokers who lived with a child were 3.46 times more likely to support nicotine reductions to protect youth. Smokers with any intention to quit compared with no intention were more likely to support nicotine reductions to help quit.

Conclusion: The majority of young adults support government restrictions of cigarette contents, but the degree of support varies by policy and frame. Framing policies in salient ways can build support and ensure that young adults, including smokers, understand the benefits of these policies.

JUSTIFICATION: Young adults are at-risk of nicotine dependence as they establish smoking patterns and have high menthol cigarette use. Understanding their opinions about tobacco control policies that would restrict nicotine or menthol in cigarettes can help to inform policymaking in these areas.

FUNDING: This study was funded by Legacy.

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2015 Paper Sessions
PA20-3
‘SOUNDS LIKE CROUTONS’: ADULT SMOKER AND NON-SMOKERS’ KNOWLEDGE AND PERCEPTIONS OF CIGARETTE SMOKE CONSTITUENTS

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Introduction: Tobacco products and cigarette smoke contain more than 5,000 constituents, many of which are toxic. Smoking is the main source of toxic chemical exposure and chemically-caused disease in humans, but awareness of most cigarette smoke constituents remains low.

Methods: We conducted 6 focus groups with 40 adult smokers (n=25) and nonsmokers (n=15) in order to explore what they knew about cigarette smoke constituents in general, their perceptions about specific constituents, and what they would like to know about these constituents. Audio recordings were transcribed verbatim and then coded for emergent themes by 4 independent readers.

Results: Smokers and non-smokers both knew cigarette smoke has chemicals, but they did not have a clear sense of what or how many are in cigarette smoke. Most participants indicated that they thought the tobacco companies put most of the chemicals into the tobacco during the manufacturing process. Almost all participants recognized nicotine and carbon monoxide as being in cigarette smoke. Though most participants had heard of formaldehyde and ammonia, many fewer realized that they were in cigarette smoke. When constituents were unfamiliar, participants often compared them to words or chemicals that they knew or that sounded similar. Participants had differing beliefs about which constituents most and least discouraged them from smoking. Some participants noted it was the ones they were more familiar with that discouraged them from wanting to smoke, while others said they experienced more discouragement from unfamiliar constituents.

Conclusion: Smokers and non-smokers had limited knowledge about constituents in cigarette smoke, and they incorrectly believed that most harmful constituents were added to tobacco. This research can help tobacco prevention and control researchers design more effective messages about the harms of smoking.

JUSTIFICATION: People’s misunderstanding that most harmful constituents do not occur naturally when smoking cigarettes is important, because federal law requires FDA to disseminate information on the levels of harmful constituents in cigarette smoke in a format that is understandable to a lay person.

FUNDING: FDA/NIH grant P50CA180907

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PA20-4
COMMUNICATING PROGRAM OUTCOMES TO ENCOURAGE POLICYMAKER SUPPORT FOR EVIDENCE-BASED STATE TOBACCO CONTROL

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Tobacco use is the leading cause of preventable death in the United States, and yet can be reduced through state support of tobacco prevention and cessation programs, such as school-based education programs and telephone counseling services. For such programs to be sustainable, they must be supported by state-level policymakers responsible for allocating continued funding. In the absence of much research about how to communicate to policymakers the need for tobacco prevention and cessation programs, this qualitative research study was conducted to understand the motivations, needs, and priorities of state policymakers and lobbyists integral to the policymaking process in North Carolina, a state that enacted a strong tobacco control program from 2003-2011, but drastically reduced funding in recent years. Six former legislators (3 Democrats and 3 Republicans) and 3 lobbyists of health-related organizations were interviewed about their attitudes toward tobacco use and regulation, and their support of state-funded programs. They were also asked to provide feedback two policy briefs framed either in terms of saving lives or dollars. Five main themes emerged from the interviews with respect to communicating tobacco prevention and cessation program outcome data in a useful way to policymakers: (1) high awareness of tobacco-related health concerns but limited awareness of program impacts and funding, (2) the primacy of economic concerns in making policy decisions, (3) ideological differences in views of the state’s role in tobacco control, (4) the impact of lobbyist and constituent in-person appeals, and (5) the utility of concise, contextualized data. These findings suggest that building relationships with policymakers to communicate ongoing program outcomes, emphasizing economic data, and developing a constituent advocacy group would be valuable to encourage continued support of state tobacco control programs.

JUSTIFICATION: This study suggests ways that tobacco control program evaluation results can be effectively communicated to state policymakers, including building ongoing relationships with policymakers, highlighting the economic impact of such programs, and involving constituent groups to encourage continued funding of tobacco control programs.

FUNDING: This study was conducted by the University of North Carolina Tobacco Prevention and Evaluation Program (TPEP), housed within the Department of Family Medicine in the UNC School of Medicine at Chapel Hill. TPEP received funds from the North Carolina Department of Health and Human Services, Division of Public Health, Tobacco Prevention and Control Branch for the period of February 1, 2012 through June 30, 2012 for activities that strengthen organizational infrastructure and enhance prospects for long-term sustainability of evidence-based tobacco use prevention and control work in the community and state (Sustainability Grant Contract # 26229).

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PA20-5
KEY OPINION LEADERS AS PARTNERS IN FDA REGULATORY EFFORTS WITH RETAILERS IN VULNERABLE POPULATIONS


The majority of tobacco marketing expenditures have focused on the retail environment. This is especially true for vulnerable communities such as African-Americans, American-Indians, Koreans and Hispanics. Tobacco marketing is cleverly segmented and targeted in these vulnerable communities; however, tobacco control and regulatory messages are not always conveyed in the most culturally specific ways. Effective tobacco regulatory messaging is necessary to prevent uptake and resulting nicotine addiction by these vulnerable populations. This study presents data from 8 focus groups conducted with Key Opinion Leaders (KOL) (N=70) to explore role KOL could play as potential allies for the FDA in delivering tobacco regulatory messages to retailers. Findings show that the majority of participants in the African American and American Indian community were females. KOL’s among Hispanics and Koreans however, were for the most part males. KOL’s had a mean age of 41 across all ethnic communities. Over 50% of both American Indian and Korean KOL’s were current smokers. The lowest percentage of smokers was found among Hispanics. The vast majority of key opinion leaders had visited tobacco shops in their community. The majority of KOL in all, except the African American community, believed e-cigarettes could be used for quitting. There was very low use of social media in this group. AA and Al did not recognize the FDA logo, and most, except American Indians, believed the FDA was a reliable source of information. The KOL were well to moderately informed about tobacco laws. The groups least informed were African Americans and Hispanic/Latinos. Further qualitative results from the focus groups will be presented. The current project provides an opportunity to better understand community KOL knowledge about tobacco laws, retail density perceptions, FDA tobacco regulation perceptions, FDA communication with the retailers, explore ideas about use of...
e-cigarettes for quitting, and use of social vs traditional media to relay anti-tobacco messages. KOL have the potential to aid FDA in its regulatory efforts, and will be key for their success in vulnerable populations.

JUSTIFICATION: This study will inform public health and policy professionals on the best methods on gaining trust and collaboration from community Key Opinion leaders to address tobacco control.

FUNDING: National Cancer Institute of the National Institutes of Health and the FDA Center for Tobacco Products (CTP) under Award Number 1P00CA180905 (Pentz/Samet).

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PA23-1
SEXUAL MINORITY SPECIFIC AND RELATED TRAUMATIC EXPERIENCES ARE ASSOCIATED WITH INCREASED RISK FOR SMOKING AMONG GAY AND BISEXUAL MEN

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Sexual minorities have an increased risk for smoking, and smoking can lead to a variety of health complications such as cancer and respiratory diseases. Our study examined the hypothesis that sexual minority specific stress and trauma histories may explain some of the increased risk for smoking among gay and bisexual men. Patients at a Boston community health center with a longterm commitment to the needs of sexual minorities were invited to complete a 25-item questionnaire assessing demographics, general health, trauma history, and substance use. Of the 3,103 who responded, 1309 identified as male and gay or bisexual. The sample was predominantly White (82.8%) with a mean age of 38.55 years (sd = 9.76). Logistic regression analyses (adjusted for age, education, and race) revealed a significant dose effect of number of sexual minority stressors/traumas onto anytime, current, and former smoking status. For example, in comparison to participants with no trauma history, those who reported 1, 2, 3, and 4 traumas were respectively 1.45 (OR=1.45, p < .05, 95% CI: 1.07-1.96), 1.72 (OR=1.72, p < .01, 95% CI: 1.20-2.46), 2.29 (OR=2.29, p < .01, 95% CI: 1.43-3.67), and 2.85 (OR=2.85, p < .01, 95% CI: 1.42-5.71) times more likely to identify as a current smoker. Specific analyses for types of traumas identified that experiencing intimate partner violence, anti-gay verbal attack, and childhood sexual abuse were each associated with increased risk of any smoking, current smoking, and/ or former smoking, while anti-gay physical attack was not associated with smoking status. A sexual minority specific trauma history may represent a vulnerability for smoking among gay and bisexual men. Tailored interventions that address trauma may enhance the efficacy of smoking cessation efforts for gay and bisexual men.

JUSTIFICATION: A sexual minority specific trauma history may represent a vulnerability for smoking among gay and bisexual men and tailored interventions that address trauma may enhance the efficacy of smoking cessation efforts for gay and bisexual men.

FUNDING: No funding

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PA23-2
RATES OF TOBACCO USE AMONG YOUNG ADULT LGB SUBPOPULATIONS

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Background: It is well established that the Lesbian, Gay, and Bisexual (LGB) population smokes at higher rates than the heterosexual population. However, little information is available about the relative rates of tobacco use and smoking intentions among L, G, and B, young adult subpopulations.

Methods: A sample of 885 LGB individuals, ages 18-24, were sampled at LGB bars and clubs in Las Vegas, Nevada in 2011-2012 as part of an evaluation study of Southern Nevada Health District’s CRUSH campaign. Short surveys with questions on tobacco use intentions and actual use were collected in person and the data entered into a statistical program. Frequency analysis was used to calculate rates of use among the entire LGB sample as well as L,G,B subpopulations (transgender individuals were included in the survey but omitted due to low sample size), and regression analysis used to determine whether there was differential rates of tobacco use among these groups.

Results: Rates of past 30-day smoking among the entire LGB population were 43.5% (n=368), with 70.1% of these individuals being daily cigarettes users. Other tobacco products most commonly used in the past 30-days included hookah (33.9% of sample), e-cigarettes (14.9% of sample) and cigars (13.4% of sample). Although rates of past 30-day smoking and other tobacco use were similar across LGB subgroups, regression analysis showed that gay men were most likely to report intentions to smoke in the next year or 5 years, and both gay men and lesbians reported higher intentions to smoke than bisexuals (p<0.05).

Discussion: Rates of current tobacco use among the LGB population are high overall and the data suggests that these elevated rates are relatively uniform across the L,G, and B subpopulations. Public health interventions may benefit from addressing intentions to smoke, particularly among gay men and lesbians.

JUSTIFICATION: By informing on rates of tobacco use among L,G,B subpopulations, clinicians and public health professionals can better understand how to prevent and treat tobacco use among these special populations.

FUNDING: Funding for data collection was obtained from a Communities Putting Prevention to Work (CPPW) grant from the Centers for Disease Control as part of an effort to implement and evaluate a LGBT smoking prevention campaign, CRUSH . Analysis of tobacco use among LGB subpopulations was not funded.

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PA23-3
GENDER DIFFERENCES IN E-CIGARETTE USE: RESULTS FROM AN ONLINE SURVEY

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Since their introduction into the market, use of electronic cigarettes (e-cigarettes) has grown exponentially. As the popularity of e-cigarettes increases, it is important to examine the characteristics of e-cigarette users. Gender differences in tobacco use and tobacco product preferences have been well established (e.g., Eriksen et al., 2012); yet preliminary research suggests no clear association between e-cigarette use and gender (Hsiiej et al., 2014). However, data on gender differences in e-cigarette use is limited and requires further exploration. The aim of this study was to explore gender differences among e-cigarette users, and in particular, differences in patterns of use, reasons for using, and expectancies (beliefs) about e-cigarettes. A sample of 1434 participants completed an online survey hosted by the Moffitt Cancer Center from August through November 2013. Results indicated significant gender differences in all three areas assessed. Specifically, there were significant gender differences in type of e-cigarette used,
flavors used, nicotine dosage, modifications, brands used, source of information about e-cigarettes, place of purchase, and use of e-cigarettes where smoking is not allowed. In addition, males were more likely to report initiating e-cigarette use to quit smoking due to health concerns, whereas females were more likely to report initiation based on recommendations from family/friends. Moreover, males attributed maintenance of e-cigarette use to positive reinforcement (enjoyment), whereas females attributed it to negative reinforcement (stress reduction or mood management). Males reported more positive expectations about e-cigarettes, including good taste, social facilitation, and energy as benefits of e-cigarette use. However, males also reported e-cigarettes as more addictive compared to females. Overall, the results show substantial differences by gender in the patterns of use, reasons for use, and expectancies about e-cigarettes. Futures studies should examine gender differences in a population-based sample. These differences may help direct both research and intervention with respect to e-cigarette initiation, maintenance, and cessation.

JUSTIFICATION: This study may help direct both research and intervention with respect to e-cigarette initiation, maintenance, and cessation

FUNDING: Moffitt Cancer Center and P30CA072692; National Cancer Institute Behavioral Oncology Training Grant (R25CA090314); Grants R01CA134347 and R01CA154596; Galician Programme for Research, Innovation and Growth 2011-2015 (I2C Plan), modality A.

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PA23-4
PREMENSTRUAL SYMPTOMS ASSOCIATE WITH SMOKING WITHDRAWAL EXPECTANCIES

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Background: Studies suggest that withdrawal symptoms are the greatest in the luteal phase of the menstrual cycle when menstrual symptoms are the greatest. Furthermore, there is evidence that nicotine may offset premenstrual symptoms during the luteal phase. Given this literature, it is possible that females with more severe premenstrual symptomology may express greater expectations that smoking abstinence results in withdrawal. This study examined relations between general premenstrual symptoms (i.e. last month) and smoking abstinence expectancies for withdrawal (i.e. expectancies that abstaining from smoking will result in withdrawal) while controlling for nicotine dependence and mood symptoms.

Methods: In a cross-sectional design, 46 non-treatment seeking female daily smokers completed self-report measures of smoking abstinence expectancies, premenstrual and mood symptoms, and nicotine dependence.

Results: Linear regression models showed that severity of premenstrual symptoms associated with withdrawal abstinence expectancies (beta = .50; p less than .001) and this relationship remained even when controlling for individual differences in depressive symptoms (beta = .38; p less than .01) and nicotine dependence (beta = .35; p less than .05).

Conclusions: Females with greater premenstrual symptoms may have greater expectations that abstaining from smoking will result in withdrawal symptoms. Addressing concerns about withdrawal may be particularly important in females with greater premenstrual symptomology.

JUSTIFICATION: This study suggests that addressing concerns about withdrawal may be particularly important in females expressing more severe premenstrual symptomology.

FUNDING: This research was supported by funds from Tobacco-Related Disease Research Program of the University of California, Grant Number 22FT-0062 and by NIDA grants R21-DA034768.

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PA23-5
SEX DIFFERENCES IN RELIEF FROM ABSTINENCE-INDUCED NEGATIVE AFFECT AND WITHDRAWAL DUE TO CIGARETTE NICOTINE CONTENT

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Symptoms of tobacco abstinence may be differentially relieved by brief cigarette smoking in women vs. men, but the contribution of nicotine intake per se to this sex difference is uncertain. Dependent adults (N=44), who were not trying to quit, participated in two comparable sessions after abstaining overnight prior to each (validated by CO<10 ppm), in a within-subjects design. Over each 2 hr session, the 21 men and 23 women smoked a total of 24 puffs (via controlled puffing procedure) from either a nicotine (Quest 1, 0.6 mg) or denicotinized (Quest 3, 0.05 mg; “denic”) cigarette while blind to brand. Negative affect (via Diener & Emmons Mood Form) was assessed after each of these 4 cigarette exposure trials, which consisted of 6 puffs every 25 mins, and withdrawal (MNWS) was obtained before and after the 4 trials. Baseline negative affect and withdrawal due to overnight abstinence did not differ by sex, but relief was significantly influenced by the interaction of sex x nicotine/denic cigarette (p<.05 for each). Each symptom was generally decreased to a greater degree by the nicotine vs. denic cigarette, but in men only and not in women. Sex differences in relief of abstinence-induced negative affect and withdrawal due to the cigarette nicotine content are very consistent with past research showing that nicotine per se, relative to smoking’s non-nicotine stimuli, is less rewarding in women than in men.

JUSTIFICATION: Relative to men, women may find nicotine per se less rewarding than non-nicotine smoking stimuli, suggesting potential sex differences in responses to very low nicotine cigarettes.

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PA23-6
COPING MECHANISMS AND SMOKING-RELATED SYMPTOMATOLOGY IN WOMEN

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Relapse is the most common outcome of smoking cessation attempts, and women have an especially difficult time sustaining abstinence. This may be related to women’s use of smoking as a way to cope with negative affect. Effective coping is essential for ex-smokers to sustain abstinence, and certain coping mechanisms may help lower smoking-related symptomatology (SRS: withdrawal, craving, and total smoking urges). This study aims to determine the relationship between coping mechanisms and SRS during acute smoking cessation in women. The data for this secondary data analysis is from a parent study (R01-DA08075; PI: S. Allen). At screening visit, participants completed the Revised Ways of Coping Checklist, which assesses five categories of coping. After screening, the participants reported SRS on validated questionnaires daily (one day ad-libitum smoking followed by four days verified abstinence). Each coping category score was split into tertiles (1st=low coping, 3rd=high coping). Differences in SRS scores between low and high coping were assessed. The participants (n=176) were, on average, 28.97±0.49 years old and smoked 12.5±0.45 cigarettes per day. Several significant differences in SRS were found between low and high coping groups during smoking abstinence. For example, participants who used more social support coping reported significantly less of factor 2 (anticipated relief from negative affect) during all four days of smoking abstinence (p<0.04), and participants that used more avoidance coping reported significantly more of factor 2 on the second day of smoking abstinence (p<0.05). Consistent with our hypotheses, there was an association between the type of coping used and the SRS experienced during acute smoking cessation. Women who used more social support coping reported lower levels of SRS during smoking abstinence while women who used more avoidance coping reported higher levels of SRS during smoking abstinence. Additional research is needed to
explore how implementing this knowledge in cessation interventions could affect SRS and relapse, which may lead to improved smoking cessation outcomes in women.

JUSTIFICATION: Additional research is needed to explore how implementing this knowledge in cessation interventions could affect SRS and subsequent relapse, which may lead to improved smoking cessation outcomes in women.

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PA25-1
DEPRESSIVE SYMPTOMS AND CIGARETTE DEMAND AS A FUNCTION OF INDUCED STRESS

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Background: Across development, depressive symptoms and negative mood are risk factors for tobacco use. Cigarette demand may be an especially useful construct for understanding the complex relationship between depression and cigarette smoking as smokers with elevated depressive symptoms may place greater value on cigarettes under conditions of negative mood. The aim of the current study was to examine the relationship between depressive symptoms and cigarette demand as a function of induced mood.

Methods: Participants included 73 daily smokers (38.4% female, 65.8% White, Age M(SD)=19.8(1.3), CPSD M(SD)=7.4(4.7)) who attended two counterbalanced sessions: one social stress session and one neutral session. With the exception of video content, the sessions followed identical procedures. Session order was as follows: 1) smoke a cigarette through a portable smoking topography device, 2) complete self-report measures and the Timeline Followback, 3) watch either a neutral video or a video modification of the Trier Social Stress Task (TSST), 4) complete the Cigarette Purchase Task (CPT), 5) smoke a cigarette through a portable smoking topography device.

Results: We used hierarchical multiple regression to examine the predictive utility of depression for CPT demand indices (intensity, breakpoint, Omax, Pmax, and elasticity) above and beyond CPSD. Depressive symptoms on the day of the neutral session did not significantly predict any of the demand indices. However, results indicated that depressive symptoms on the day of the stress session significantly predicted intensity (ΔR²=0.04, p=0.01), breakpoint (ΔR²=0.09, p=0.01), (F(1, 67)=6.46, p=0.01), Omax (ΔR²=0.08, p=0.01), and Pmax (ΔR²=0.05, p=0.05), but not elasticity (ΔR²=0.02, p=0.23).

Conclusion: Depressive symptoms significantly predicted cigarette demand, but only in the context of induced stress. Thus, when experiencing negative mood, cigarettes may become more valuable for individuals with depressive symptoms. As such, for prevention and cessation, it may be important to continue to address contextual factors such as negative mood that may influence cigarette value.

JUSTIFICATION: The results of this study, which suggest that the relationship between depressive symptoms and cigarette demand vary as a function of mood, can be used to inform targeted intervention programs which focus on depressive symptoms as a risk factor for tobacco initiation and continuation of time.

FUNDING: 1F31DA034999

PA25-2
ADITIVE EFFECTS OF RISK-TAKING AND DISTRESS TOLERANCE IN DIFFERENTIATING CIGARETTE SMOKERS AND NONSMOKERS

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Background: Risk-taking (RT), conceptualized as engaging in behavior that involves potential for both gain and loss (Jessor, 1998), and distress tolerance (DT), defined as persistence in goal-directed activity in the face of affective distress (Leyro et al., 2010) are behavioral analogs for appetitive and avoidant processes relevant to development of smoking behavior. RT and DT individually distinguish between smoking and nonsmoking adults (Lejuez et al., 2003; Quinn et al., 1996), but a cohesive model examining addictive associations of RT and DT to smoking status has not been explored. We tested this model in a college population. As appetitive and avoidant processes operate orthogonally in the development of substance use (Brewer et al., 2014), we expected that RT and DT would each distinctly contribute to smoking status differentiation.

Method: This study employed data from a sample of 81 college-aged cigarette smokers (n=37) and nonsmokers (n=44) yoked by sex, race, and smoking status (Mean Age=19.5 years, 49.4% White). Participants completed a 90-day Timeline Follow-back interview assessing smoking, the Balloon Analogue Risk Task (BART, Lejuez et al., 2002), a computerized behavioral RT task, and the Paced Auditory Serial Addition Task (PASAT, Diehr et al., 1998), a computerized behavioral DT task. Logistic regression analyses included PASAT and BART scores, with the dichotomous outcome of smoker/nonsmoker.

Results: DT (B=.004, SE=.002, p<.05) and RT (B=.062, SE=.037, p<.05) were associated with smoking status. There was not a significant interaction. These results indicate that those with lower DT and higher RT are more likely to be smokers, and that these effects are additive in this sample.

Conclusions: Smoking status is associated with lower DT and higher RT, specifically in the context of a cohesive model that corroborates the orthogonality of these relationships. Future longitudinal research is needed to elucidate these additive effects and their ontogeny across diverse groups of smokers. Such efforts may identify novel targets in the prevention of smoking.

JUSTIFICATION: Results suggest that targeting both risk taking and distress tolerance may be relevant for smoking prevention.

FUNDING: UMD College of Behavioral and Social Sciences Dean’s Research Initiative Award (MacPherson)

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PA25-3
ANHEDONIA AND ABSTINENCE AS PREDICTORS OF SUBJECTIVE ATTRACTIVENESS OF APPETITIVE, AVERSIVE, AND SMOKING-RELATED STIMULI

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Background: The relation between trait anhedonia—diminished capacity to experience pleasure—and smoking has been documented but not entirely explained. It is possible that anhedonic smokers exhibit distortion in the relative motivational salience of smoking-related versus non-smoking related appetitive stimuli, which may promote smoking motivation in anhedonic smokers. To test this hypothesis, this study examined anhedonia as a predictor of subjective
Methods: Non-treatment seeking smokers (N = 125, 10+ cig/day) attended two
counterbalanced sessions (non-abstinent following ad libitum smoking vs. 16-hour
abstinence). Anhedonia and other characteristics were measured at baseline. At
experimental sessions, subjects completed subjective assessments followed by
a computerized task instructing participants to rate the attractiveness of pictures.
Reactivity scores involving the difference between mean ratings of pictures within
each salient category (smoking, appetitive, aversive) and the neutral picture
category were computed.

Results: Generalized estimating equation models showed that across both
abstinence conditions anhedonia was associated with less negative reactivity to
aversive stimuli (beta = -.33, p = .001) and positive reactivity to appetitive stimuli
(beta = .18, p = .03); anhedonia’s relation to greater positive reactivity to smoking
stimuli was a trend (beta = .19, p = .06). Abstinence enhanced positive reactivity to
smoking-related (p = .01) but not other stimuli, and did not significantly moderate
relations of anhedonia to reactivity to any stimulus type.

Conclusions: Anhedonic smokers may experience blunted motivational salience
of smoking-related appetitive and aversive stimuli and potentially heightened
salience of smoking cues across non-abstinent and abstinent states. Smoking
cessation treatments that target altered motivational processing may be valuable
for anhedonic smokers.

JUSTIFICATION: Understanding potential effects of anhedonia on motivational
salience of appetitive, aversive and smoking stimuli may assist in implementing
more effective clinical cessation treatment by informing interventions which target
altered motivational processing that influences smoking motivation in anhedonic smokers.

FUNDING: This research was supported by National Institute on Drug Abuse
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PA25-4
SMOKING BEHAVIOR IN RESPONSE TO A MOOD INDUCTION: A
COMPARISON OF MENTHOL AND NON-MENTHOL SMOKERS

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There is growing interest in understanding the smoking behavior of menthol
smokers, yet little is known about the effect of mood on their smoking behavior.
The present study is a secondary analysis of a study evaluating the effects of three
induced moods on smoking behavior (Fucito & Juliano, 2009). Smokers (n=121)
were randomly assigned to either a sad mood induction or a neutral mood induction
via standardized film clips. Following the film clip, participants were
instructed to smoke a cigarette; they were provided with their preferred type and
brand. Smoking outcomes evaluated included total time spent smoking, total puffs
taken, and boost in carbon monoxide levels (CO) from baseline to after smoking.
We tested menthol status (menthol vs. non-menthol smoker) as a predictor of
smoking behavior. Compared to non-menthol smokers, menthol smokers were
significantly older (40.6 ± 13.2 vs. 25.7 ± 12.5), more likely to be African American
(75.0% vs. 7.3%), and reported a greater number of years smoking (19.4 ± 12.9
vs. 8.7 ± 12.0), higher FTND scores (4.5 ± 1.8 vs. 3.4 ± 1.7), and higher scores on
the Beck Depression Inventory (14.7 ± 10.6 vs. 10.8 ± 6.9) (all p's < .05). There
was a significant interaction of menthol status and condition (p = .004) on smoking
duration, which remained even after controlling for age, race, smoking differences,
and depression scores (adjusted p = .005). Among menthol smokers (n=66),
smoking duration was longer in response to the sad condition than the neutral
condition (280.8 ± 83.8 vs. 223.2 ± 83.3 seconds, p = .007). Similar patterns were
observed for total puffs taken and change in CO, but these outcomes were not
statistically significant (p's > .10). In comparison, there was no differential effect
of mood condition on smoking duration (244.9 ± 75.9 vs. 273.4 ± 89.5 seconds,
101
p = .16) among non-menthol smokers. Likewise, change in CO and number of
puffs were not associated with mood condition in this group (p's > .30). The results
suggest that menthol smokers may be more motivated to smoke in response to
affective variables than non-menthol smokers. This finding could have implications
for treatment approaches with menthol smokers and warrants further investigation.

JUSTIFICATION: Menthol smoking status is associated with greater difficulty
quitting smoking. This study sheds light on potential differences in smoking
motivation between menthol and non-menthol smokers in terms of their response
to affective variables. This information may have implications for tailoring treatment
approaches for menthol smokers.

FUNDING: This research was supported in part by National Institutes of Health

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PA25-5
EXERCISE TO REDUCE ABSTINENCE-INDUCED CRAVING AND
NEGATIVE MOOD DURING NICOTINE WITHDRAWAL

Cynthia A. Conklin*, Isabella Soreca, David J. Kuper, Ronald P. Salkeld, Joel M.
Mumma, Yu Chen, Christopher J. Joyce, Nicholas J. Capozzi, Sophia A. Pikalova

Seventy of nicotine withdrawal, brought on by abstinence from cigarettes, has
been shown to predict smoking relapse. This is particularly true of abstinence-
induced craving to smoke and increased negative mood. One promising
behavioral method to combat these potent elements of relapse risk is exercise.
In the short term, exercise's rewarding and emotion-regulating properties offer
considerable potential to attenuate these negative withdrawal symptoms. To
evaluate the effectiveness of exercise to reduce abstinence-induced craving and
negative mood during acute nicotine withdrawal, we conducted a within-subject
study (N=49, 25 male, 24 female) during which dependent sedentary smokers
were directed to abstain from smoking for three consecutive days on three
separate occasions. At each session, smokers' abstinence-induced craving and
negative mood were assessed prior to and after either exercise (AM exercise, PM Exercise) or a sedentary control activity (reading). Abstinence-induced craving
differed as a function of condition F(2,385)=21, p<.0001. Planned contrasts
revealed no difference between AM and PM exercise, but exercise overall led
to greater pre-post reduction in abstinence-induced craving compared to control
activity, t(385)=23, p<.0001. Likewise, reduction in negative mood differed as
a function of condition (AM, PM exercise or control), F(2,385) = 3.38, p=.03. Again,
no difference between AM and PM exercise was revealed, but planned
contrasts showed a significantly greater pre-post reduction in negative mood
following exercise compared to control activity, t(385) = 2.24, p=.03. The results
add to burgeoning evidence of the clinical potential of exercise to help smokers
manage nicotine withdrawal symptoms during cessation.

JUSTIFICATION: This experimental study of a behavioral method for reducing
nicotine withdrawal during abstinence can directly inform exercise-based
treatments for smoking cessation.

FUNDING: This work was supported by NIDA grants 027508 & 023646

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YIPA-1
IMPACT OF A POST-DISCHARGE SMOKING CESSATION INTERVENTION FOR SMOKERS ADMITTED TO AN INPATIENT PSYCHIATRIC FACILITY: A RANDOMISED CONTROLLED TRIAL

Emily A. Stockings1,2,*, Jenny A. Bowman1,3, Amanda L. Baker1,3, Margaret Terry4, Richard Clancy5, Paula M. Wye1,2, Jenny Knight4, Lyndell H. Moore1, Maree F. Adams1, Kim Colyvas1, John H. Wiggers1,2,5, 1University of Newcastle, New South Wales, Australia, 2Hunter New England Population Health NSW, Australia, 3Centre for Translational Neuroscience and Mental Health, NSW, Australia, 4Mental Health and Substance Use Service, NSW, Australia, 5Hunter Medical Research Institute, New Lambton Heights, Australia

Introduction: Persons with a mental disorder smoke at higher rates and suffer disproportionate tobacco-related burden than the general population. The aim of this study was to determine if a smoking cessation intervention initiated during a psychiatric hospitalisation and continued post-discharge was effective in reducing smoking behaviours among persons with a mental disorder.

Methods: A randomised controlled trial was conducted at an Australian inpatient psychiatric facility. Participants were 205 patient smokers allocated to a treatment as usual control (n = 101), or a smoking cessation intervention (n = 104) incorporating psychosocial and pharmacological support for four months post-discharge. Follow-up assessments were conducted at one week, two, four and six months post-discharge and included: abstinence from cigarettes, quit attempts, daily cigarette consumption and nicotine dependence.

Results: Rates of continuous and seven-day point-prevalence abstinence did not differ between treatment conditions at the six month follow-up, however, point prevalence abstinence was significantly higher for intervention (11.5%) than control (2%) participants at four months (OR = 6.46, p = .01). Participants in the intervention condition reported significantly more quit attempts (F [1,202.5] = 15.23, p = .0001), and lower daily cigarette consumption (F [4, 586] = 6.5, p < .001) and levels of nicotine dependence (F [3, 406] = 8.5, p < .0001) than controls at all follow-up assessments.

Conclusions: Post-discharge cessation support was effective in encouraging quit attempts and reducing cigarette consumption up to six months post-discharge. Additional support strategies are required to facilitate longer term cessation benefits for smokers with a mental disorder.

FUNDING: This was funded by a Commonwealth Department of Health and Ageing (DoHA) Grant (G1000335), Australian Rotary Health (G0188134) and the Hunter Medical Research Institute (HMRI; G0188473). Nicotine replacement therapy for the trial was provided by GlaxoSmithKline (GSK). The trial was registered on the Australian New Zealand Clinical Trials Registry (ACTRN12609000465259). ES was supported by a Commonwealth Postgraduate Award (APA).

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YIPA-2
THE PUBLIC HEALTH IMPORTANCE OF DISTINGUISHING E-CIGARETTE EXPERIMENTERS FROM MOTIVATED E-CIGARETTE USERS

Jessica K. Pepper1,*, Kurt M. Ribisl1,2, Sherry L. Emery3, Noel T. Brewer1,2, 1UNC Lineberger Comprehensive Cancer; 2UNC Gillings School of Global Public Health Center; 3University of Illinois at Chicago

Background: Although most individuals who try e-cigarettes stop using them, little is known about why users discontinue. We sought to understand the reasons that U.S. adults who have tried e-cigarettes stop using them. We also examined whether discontinuation varied by the type of reason for first trial. We categorized reasons like smoking cessation as “goal-oriented” and reasons like curiosity as “not goal-oriented.”


Results: The most frequent reasons for first trial were curiosity (not goal-oriented; 53%); because a friend or family member used, gave, or offered e-cigarettes (not goal-oriented; 34%); and quitting or reducing smoking (goal-oriented; 30%). Nearly two-thirds (65%) of adults who started using e-cigarettes later stopped using them. The most common reasons for discontinuation were that respondents were just experimenting (49%), using e-cigarettes did not feel like smoking cigarettes (15%), and users did not like the taste (14%). Discontinuation rates varied by education, income, smoking status, and type of reason for first trial. Adults whose main reason for trying was not goal-oriented were more likely to discontinue use than those whose main reason was goal-oriented (81% vs. 45%, p<.001).

Conclusions: Differentiating individuals who try e-cigarettes for goal-oriented reasons and typically continue using from those who try for non-goal-oriented reasons and then typically stop using is important for tobacco control efforts. If future studies show that e-cigarettes do not help smokers quit or have other detrimental effects on public health (e.g., lead to smoking initiation among non-smokers), messages that effectively discourage use will need to be appropriately targeted to these different groups. Alternatively, if e-cigarettes prove to be useful for smoking cessation, practitioners may need to design programs that support use for cessation reasons but still discourage use among those who are experimenting or using for other non-goal-oriented reasons.

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YIPA-3
NETWORKS AMONG TRIBAL ORGANIZATIONS FOR CLEAN AIR POLICIES (NATO CAP): A PLACE BASED APPROACH TO UNDERSTANDING COMMERCIAL SMOKE-FREE POLICY AND REDUCING TOBACCO RELATED HEALTH DISPARITIES ON THE NAVAJO NATION

Samantha Sabo*, Patricia Nez Henderson2, Janet Okamoto1, Alfred Yazzie2, Carmenita Chief1, Hershel Clark2, Jacqueline Nahee1, Gregg Moor3, Scott Leischow4, 1University of Arizona, 2Black Hills Center for American Indian Health, 3InSource Research Group, 4Mayo Clinic Arizona

Smoking rates among American Indian/Alaska Native populations are the highest of any ethnic group in the United States, and few tribes have established indoor smoke-free policies to protect against secondhand smoke. The NCI-funded "Networks Among Tribal Organizations for Clean Air Policies (NATO CAP)" aims to inform smoke-free policy on the Navajo Nation through a community-based participatory research approach in which Navajo people are central to every aspect of research. Methods: To identify Navajo leadership perspectives about smoke-free policy, a mixed quantitative, and qualitative research approach was used to survey (n=75) and interview (n=15) Navajo elected officials throughout all five jurisdictions of the Navajo Nation. Through collaborative analysis, which weighs scientific and indigenous ways of knowing equally, bicultural teams triangulated survey and interview data. Results: Navajo elected official's opinions about the health and economic benefits of smoke-free policy significantly differed by elected official's gender, age and region. Qualitative narratives provided a nuanced understanding of elected officials' approach to balance cultural, health and economic issues of smoke free environments, including local and national levels of government. Navajo leadership identified several place based and culturally relevant approaches that could be leveraged to raise awareness about the issue of second hand smoke and the benefits of smoke-free policy within family, community and policy domains. Conclusions: Smoke-free policy perspectives are culturally bound and place-based and require full participation of Navajo people, including elected officials to understand the effects of smoke-free policy and reduce tobacco related health disparities among Navajo people.

FUNDING: This research is funded by the State & Community Tobacco Control Initiative of the US National Cancer Institute (sctcresearch.org) grant number U01CA154300.

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POSTER SESSION 1 - Thursday, February 26, 2015 - 11:30 a.m. - 1:00 p.m.

**POS1-1**

**NICOTINE DEPENDENCE INDICATORS AMONG PREGNANT SMOKERS: TIME-TO-FIRST CIGARETTE VS. CIGARETTES PER DAY AS PREDICTORS OF ABSTINENCE**

Allison N. Kurti*, Danielle Davis, Joan M. Skelly, Thomas J. White, and Stephen T. Higgins, Vermont Center on Behavior and Health, University of Vermont

Under the Tobacco Control Act, the measures taken by the FDA to decrease tobacco product harms will be based on regulatory science, a discipline devoted to conducting research to inform regulatory policies. One step towards developing regulations that decrease tobacco harm is obtaining a thorough understanding of variables associated with dependence potential. Nicotine dependence (ND) is an established risk factor for difficulties quitting smoking. Two indicators of dependence, time to first cigarette (TTFC) and cigarettes smoked per day (CPD), predict quit success in the general population of smokers, with TTFC being the more robust predictor. However, the relative merits of these two measures in vulnerable populations, including pregnant smokers, is less clear. The purpose of this study was to compare the utility of TTFC and CPD in predicting late-pregnancy abstinence among 349 smokers who participated in randomized controlled trials examining the efficacy of financial incentives for smoking cessation. Participants were randomized to an intervention condition wherein vouchers exchangeable for retail items were earned contingent on biochemically verified smoking abstinence or a control condition wherein voucher delivery was independent of smoking status. Backward elimination logistic regression modeling was used to examine the predictive utility of TTFC, CPD, treatment condition, and other baseline characteristics univariately associated with abstinence. Independent predictors retained in the final model included TTFC (chi square (X2)(3) = 9.6, p < .05, odds ratio (OR) = 3.1), CPD (X2(1) = 11.8, p < .01, OR = 3.7), and previous quit attempts (X2(1) = 11.4, p < .01, OR = 3.7). While TTFC more effectively predicts abstinence than CPD in the general population, our results underscore the merit of both measures in predicting abstinence in pregnant smokers. The Heaviness of Smoking Index, comprising TTFC and CPD, may be a useful measure of ND in pregnant smokers. Our results also suggest caution in assuming generality of findings from the general to vulnerable populations when developing tobacco regulatory policies.

**FUNDING:** Acknowledgements: This research was supported by National Institute of Health (NIH) Tobacco Centers of Regulatory Science Award P50DA036114, Research Awards R01DA014028 and R01HD075669, Institutional Training Grant T32DA007242, and Centers of Biomedi...See more.

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**POS1-2**

**FORMATIVE EVALUATION OF A TEXT MESSAGING INTERVENTION TO PROMOTE TOBACCO CESSION THROUGH A HOSPITAL WORKSITE WELLNESS PROGRAM**

Ivy Opoku-Nti*, MPH, CTTTS*, Jack Burkhalter, PhD*, Paul Krebs, PhD*, Jamie S. Ostroff, PhD*, 'Memorial Sloan Kettering Cancer Center, 2VA New York Harbor Healthcare System

Purpose: Text messaging is a promising strategy for addressing practical barriers for promoting tobacco cessation in workplace settings. This study reports acceptability and effectiveness data from a pilot study integrating text-messaging with cessation counseling.

Design: The study used a single-arm, pre-post design with mixed methods evaluation.

Setting: An employee wellness program in a large urban health system. Subjects: N=25 employees seeking tobacco cessation.

Intervention: Participants received 2 months of daily text messages driven by personalized quit dates, 7 sessions of cessation counseling, and cessation medication as requested.

Measures: Outcomes included acceptability and perceived usefulness of the text messaging, confidence in quitting, cigarettes per day (cpd), and self-reported 7-day abstinence at two months post enrollment.

Analysis: Within-subjects t-tests were used to compare cpd and use of quitting strategies. Qualitative feedback was coded and summarized.

Results: At follow up, 62.5% of respondents reported smoking abstinence. Among those still smoking, cpd decreased from a mean of 17.3 to 7.4, p = .04. Participants reported that the texts were helpful for increasing knowledge and motivation to quit, enhanced the support provided by the counselor, and were sent at an acceptable frequency.

Conclusion: Addition of a text messaging cessation support system may provide a low-cost approach to maximize the reach and impact of cessation treatment delivery.

**FUNDING:** No Funding

**JUSTIFICATION:** These preliminary findings highlight the potential value of using text-messaging to deliver smoking cessation treatment in worksite wellness programs.

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**POS1-3**

**RE-FRAMING ACUTE CARE TREATMENT OF TOBACCO DEPENDENCE BY FOCUSING ON SYMPTOM MANAGEMENT: A CASE STUDY**

A.S.H. Schultz, R. Guzman, R. Thurmeier, A. Fedorowicz, J. Sawatzky, K. Fulmore, 1College of Nursing, Faculty of Health Sciences, University of Manitoba, 2Department of Surgery, College of Medicine, Faculty of Health Sciences, University of Manitoba, 3Pharmacy, St. Boniface General Hospital, Winnipeg, 4Surgery Program, St. Boniface General Hospital, Winnipeg

Management of tobacco dependence is a common problem in hospitals, yet research suggests effective management of nicotine withdrawal symptoms is inconsistent and not evidence-based. Policies banning smoking on hospital property are ineffective and smoking cessation tends to be the healthcare goal for patients. Given this policy change and health consequences, management of withdrawal symptoms should be a focus of care during hospital stays. The Utilizing best practices to Manage Acute care patients Tobacco Dependency (U-MAT) demonstration project, a longitudinal case study, aimed to evaluate the implementation of an evidence-based practice intervention designed to support healthcare staff with managing nicotine withdrawal symptoms of patients on an acute care surgical unit. The multi-component intervention included a practice protocol, practice-base tools, and feedback loop. Data was collected through patient and staff surveys, medication usage, and chart review. Findings from all data sources suggest evidence in tobacco dependence treatment. Over the project year, 55 patients responded to the survey; response rate (RR) 34%. Change in patient responses include: decrease in daily smoking and cigarette craving, although reported rates of other withdrawal symptoms remained the same. For patients using NRT, they reported greater symptom relief. Staff were surveyed at three times (baseline n=33; RR73%, mid-point n=23; RR51%, final n=19; RR42%). While assessment of smoking status did not change, assessment of withdrawal symptoms emerged as daily practice and questions about cessation diminished. Offering NRT products shifted from occurring primarily on admission, to offerings throughout hospital stay. Finally, staff’s belief in the effectiveness to manage withdrawal began with 53% disbelieving to by the end 42% of staff respondents were convinced it was possible and 58% thought it is likely. An increase in unit usage of NRT products reflects similar changes. Chart reviews, demonstrated a shift in patient note content and frequency related to tobacco. In summary, the evidence-based intervention influenced unit norms and culture related to tobacco dependence treatment.

**FUNDING:** Funding for this study was provided by Pfizer Canada Inc.

**JUSTIFICATION:** The intervention outlined in this presentation would be useful at other acute care settings interested in shifting the focus of management of tobacco dependence.

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POS1-4

MOLECULAR MARKERS OF EARLY STAGE COPD IN SERUM, SPUTUM, AND NASAL EPITHELM FROM A CASE-CONTROL STUDY

Nveed Chaudhary, Ashraf Elmam, Emmanuel Guedj, Julia Hoeng, Nikolai Ivanov, Karsta Luettich, Patrice Leroy, Florian Martin, Manuel C. Peitsch, Alain Sewer, Marja Talikka, Bjorn Titz, Gregory Vuillaume, Philip Morris International R&D, Philip Morris Products S.A.

Philip Morris International is currently engaged in an effort to develop potentially reduced risk products (RRP) with the potential to reduce tobacco-related diseases compared with combustible cigarettes. COPD is a multicomponent disease of emphysema, chronic bronchitis, and small airway obstruction mainly caused by long-term exposure to tobacco smoking. COPD takes an average 20-25 years to develop, and it would be of interest to identify biomarkers of disease onset to predict the potential health impact of RRPs. One way to achieve this is to first identify molecular changes between COPD and asymptomatic smokers which would then need to be confirmed in a longitudinal study for their suitability as predictive biomarkers of COPD.

This work describes a molecular level (proteomics, transcriptomics, lipidomics) assessment conducted on samples, including induced sputum, nasal scrapes and serum, obtained from a case-control COPD study. The aim was to identify a biomarker panel of biomarkers for the differentiation of subjects with COPD, current smokers, former smokers and never-smokers.

Using microarray analysis, we have identified biological processes that were impacted in the nasal epithelium of COPD subjects compared with asymptomatic smokers. The down regulation of several pathways, including Jak/Stat, MAPK, and NFKB signaling were confirmed with two independent approaches, positioned in the context of basic cellular processes by a network-based approach. We further observed that early stage COPD status was reflected in the sputum proteome with 20 proteins showing differential abundance between COPD subjects and asymptomatic smokers. Finally, we have identified specific changes in serum lipid profiles in subjects with early stage COPD. Together, these molecular markers could be further examined with respect to their potential to indicate disease risk.

FUNDING: This work was supported by Philip Morris International R&D, Philip Morris Products S.A.

JUSTIFICATION: There are a variety of biomarkers indicative of COPD, COPD severity and progression. However, to date, none of these has been proven useful for the prediction of disease risk in long-term smokers. Our study attempted to identify molecular markers that reflect the early stages of disease and that could be further explored with respect to their potential to assess disease risk.

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POS1-5

USE ALL SYNERGETIC EFFECTS OF THE COMBINATION OF HERBAL THERAPY INCLUDING OAT EXTRACT AND CAPITAL LEMON POWDER WITH MUSIC THERAPY ON SMOKING cessation

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Cigarette smoking is a leading cause of morbidity and mortality among people living with HIV (PLWH) and between 40-70% of PLWH in the U.S. currently smoke. While HIV treatment providers acknowledge the importance of assisting PLWH with smoking cessation, this endeavor represents a significant challenge. Development and evaluation of smoking cessation interventions that could be easily integrated into standard HIV care are needed to improve cessation rates in this high-risk population. In the current pilot study, we developed a prototype of a brief, tablet computer intervention to motivate engagement in tobacco quitline treatment for PLWH who smoke (Computer Intervention to Motivate Engagement in Tobacco Quiltine, CI-METQ). The program can be self-administered by patients after a clinic visit and addresses literacy issues via the use of audio-assisted characters to deliver PHS guideline motivational interviewing content targeted to PLWH. To pilot test the developed program, it was delivered to 16 smokers receiving treatment at an urban Northeast HIV clinic. Results indicated high levels of acceptability and satisfaction with CI-METQ. Participants reported that CI-METQ was interesting, relevant, respectful, and helpful (M = 4.38-4.75 on 5-pt scale with 1= not at all and 5= very much). Moreover, significant increases in likelihood of quitting within the next 30 days were reported on 100-pt visual analogue scales administered before and after the intervention (M = 56.75 to 64.58, t(11) = 2.697, p = .021), and 11 of 16 participants (68.8 %) accepted a tobacco quitline referral following the intervention. Participants also reported increases in confidence in quitting (M = 57.9 to 78.08, t(11) = 1.96, p = .076) although this did not reach statistical significance. Post-intervention interviews revealed that the program prompted many participants to think about the impact of smoking on their health (76%), as well as the possibility of quitting (100%). We are currently conducting a randomized controlled trial of CI-METQ versus a time-matched computer tablet nutrition control intervention.

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POSTER SESSION 1 • Thursday, February 26, 2015 • 11:30 a.m.–1:00 p.m.

POS1-7
PSYCHOLOGICAL DISTRESS INTOLERANCE AMONG ADOLESCENT DAILY CIGARETTE SMOKERS ATTEMPTING TO QUIT: CORRELATES AND ASSOCIATION WITH SMOKING LAPSE
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Introduction: Negative reinforcement models may be particularly relevant for smoking relapse among adolescent daily cigarette smokers as this group is likely to possess risk factors including affect regulation difficulties that may complicate efforts to quit. The aim of the current study was to examine prospectively the link between a behavioral measure of distress tolerance (DT) (i.e., the ability to persist in goal-directed activity in the face of affective distress) with relapse in adolescent daily smokers engaging in a quit attempt. Additionally, few data exist on potential cognitive and affective correlates of low DT in youth.

Method: Participants included 45 adolescent daily smokers motivated to make a quit attempt (48.9% female, 59.6% White, Age M(SD)= 17.1 (1.1), CPSD M(SD) = 7.0 (5.6)) who completed a baseline session including the Mirror Tracing Persistence Task (MTPT-C), a behavioral task assessing DT as length of time persisted on the task, dichotomized at the median as quit (low DT) vs. did not quit (high DT). Smoking history, smoking outcome expectancies, mood, and appetitive and avoidant personality traits were also assessed. Participants scheduled a subsequent quit date and were assessed weekly on smoking outcomes over 28 days.

Results: Paired sample t-tests indicated significant increases in irritability, frustration, and urge to smoke in response to the MTPT-C (p’s <.05) although these changes were not related to quitting the task indicating persistence on the task was not due to acute increases in these states but ability to withstand the experiences. Lower DT was also significantly associated with higher negative reinforcement smoking expectancies (r=.29), lower perceived ability to regulate mood (r=.41), and lower trait persistence (r = .27). After covarying for CPSD and errors on the task, lower DT predicted lapsing on quit day (phi coeff =.31, p<.05). However, quitting the MTPT-C did not significantly predict time to relapse during the 28 day period.

Conclusion: Findings have implications for understanding affective and stress-related vulnerability factors underlying the phenomena of adolescent smoking lapse and relapse.

FUNDING: K23DA023143 (MacPherson)

JUSTIFICATION: Findings have implications for understanding affective and stress-related vulnerability factors underlying the phenomena of adolescent smoking lapse and relapse and may provide critical information on specific risk factors that can identify subgroups of youth for whom specialized treatments are warranted.

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POS1-8
EFFICACY AND ADVERSE EVENTS OF VARENICLINE IN VETERANS AT LOMA LINDA VETERANS AFFAIRS MEDICAL CENTER
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Background: Varenicline was approved in 2006, and by 2008 the FDA issued a Public Health Advisory safety warning related to changes in behavior, agitation, depressed mood, suicidal ideation, and actual suicidal behavior. Based on this black-box warning, all Veterans Health Administration facilities restricted its use in 2008. The purpose is to evaluate varenicline’s efficacy and adverse events (AE) in a real-world setting for high-risk tobacco users at Loma Linda Veterans Hospital where the 2008 restriction was not applied.

Methods: We completed a retrospective review of all 343 veterans prescribed & dispensed varenicline in VA pharmacy database and tobacco clinic records from 2007 to 2013; this was 343/2200 (15.6%) of all smokers enrolled. The primary endpoints are clinically documented AEs and carbon-monoxide confirmed, abstinence rates in the VAMC computerized patient record system (CPRS) compared to the published clinical trials for FDA approval of varenicline.

Results: A total of 196 of 343 (57.1%) veterans had at least 1 AE while on varenicline as documented in CPRS. Common AE included: abnormal dreams 22.4%, nausea 20%, insomnia 16.2%, headache 7.9% and vomiting 5.6%. Psychiatric-related AEs were <10%: depression 9.1%, anxiety 3.5%, and suicidal ideation 1.5%. A total of 151/343 veterans (44.0%) abstained for at least 4 weeks (carbon monoxide confirmed) while on varenicline, while 44 out of 343 (12.8%) abstained for up to 2 years. Based on the last visit, 79 out of 343 patients (23.2%) confirmed abstinence, which represents varying tracking intervals from only 1 month to 6 years due to follow-up limitations. Comparing our results to FDA clinical trials: abnormal dreams are higher (22.4 vs 13%), insomnia (16.2 vs 18%) and vomiting (5.6 vs 5%) are similar, while nausea (20 vs 30%) and headaches (5.6 vs 15%) are lower. The 4-week abstinence is similar (44.0% vs 40-51%) to FDA trials.

Conclusion: Varenicline in a real-world VA setting of high-risk smokers had similar AE profiles and remarkable initial efficacy compared to carefully-controlled clinical trials. Post-Traumatic Stress Disorder may be a factor needing study for higher abnormal dreams.

FUNDING: None

JUSTIFICATION: Varenicline shows similar efficacy and adverse event profile in high risk veteran population

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POS1-9
ADVERSE EVENTS IN VETERANS WITH PSYCHIATRIC COMORBIDITY, LOMA LINDA VETERANS AFFAIRS MEDICAL CENTER (LLVAMC)
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Background: When the FDA issued a Public Health Advisory safety warning concerning varenicline (related to changes in behavior, agitation, depressed mood, suicidal ideation, and actual suicidal behavior), all Veterans Health Administration facilities restricted its use in 2008. An exception was the carefully monitored Loma Linda Veterans Affairs Medical Center (LLVAMC) tobacco treatment program.
This study reviews the psychiatric adverse events (AEs) of all veterans who used varenicline comparing the ICD 9 psychiatric stop codes from 2007 to 2013 at LVAMC.

Methods: We reviewed computerized records for all 343 veterans who received varenicline after psychiatric clearance to enroll in tobacco treatment from 2007 – 2013. The primary endpoints were “clinically documented psychiatric AEs while on varenicline” for smokers with psychiatric conditions (by ICD 9) compared to all other smokers without these conditions in the VAMC computerized patient record system (CPRS) while controlling for psychiatric medications.

Results: A majority (75%) of all veterans who received varenicline had ICD 9 psychiatric diagnoses 256/343 (many with multiple diagnoses): 149 depression (43%), 132 anxiety disorder (38%), 112 bipolar disorder (33%), 109 PTSD and adjustment disorder (32%), 60 drug use disorder (17%), and 21 schizophrenia (6%). Depression was significantly elevated after quit attempts using varenicline with bipolar disorder (p<.001; RR 4.3), anxiety (.002; 2.9), schizophrenia (.031; 2.9), and drug use (.006; 2.6) diagnoses. Smokers with anxiety disorder had significantly more anxiety (.01; RR 4.8) and nausea (.001; RR 2.15). Suicidal ideation was noted in 5 smokers (1.5%) who had multiple categories of mental illness (3 to 5 of the following: PTSD, bipolar, anxiety, drug use, alcohol dependence, schizophrenia).

Conclusion: A dual-diagnosis of tobacco dependence and schizophrenia, anxiety, bipolar, or drug use disorders increases clinically-detected depression in veterans who stop smoking using varenicline, but SI was found only in seriously, mentally-ill smokers. Mental health screening is needed before and after quit dates in tobacco treatment programs for veterans.

FUNDING: None

JUSTIFICATION: Varenicline usage should be closely monitored in Serious Psychiatric Disorders

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POS1-10 CHARACTERISTICS OF SMOKING PREGNANT WOMEN IN GUADALAJARA, MEXICO

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The prevalence of smoking in women in Mexico is 12.6% according to the most recent national survey. On the other hand 34% of adult women are exposed to second hand smoke (SHS). We have previously reported a smoking (current) prevalence in Mexican pregnant women between 1.5 and 3.3%. However there is little or no information on how pregnant women in Mexico smoke.

Aim: We examined the pattern of smoking in a group of pregnant women in a major prenatal care clinic of a major governmental general hospital in Guadalajara, Mexico.

Methods: We interviewed 235 women who smoked, current or lifetime use, out of 1481 women screened for tobacco use. Informed consent was obtained. Follow up was carried out in a small number of patients.

Results: Most of the women were non-working unmarried women with a low educational background. The mean age was 23.5 (±6.5) years. Mean duration of their pregnancy was 6.6 (±1.9) months. Smoking commonly first started between 13 to 17 yrs (58.6% cases), and was often motivated by friends (34.5%) and curiosity (33%). Current smoking was every day (2.1%), some days (14.5%) and don’t smoke (82.1%); 14.5% had smoked more than 100 cigarettes in their lifetime. Preferred type of cigarettes were: regular (78.7%), light (11.9%); menthol (20.9%); 5.5 % smoked their first cigarette within 5 min after waking up; most of the women (82.1%) defined as smokers here stopped smoking when they knew they were pregnant, without treatment (92%), of which 44.4% did it during the first month of pregnancy. A large number of women were exposed to second hand smoke from relatives at home (64.3%) while 43.8% worked or socialized with smokers. There was no history of major obstetric or pediatric complication in most of them (98%).

Conclusions: Most of the women included in this study did not have signs of major nicotine dependence nor of previous complications during pregnancy. However, a large group were exposed to second hand smoke as well as other factors which could influence smoking relapse. As the smoking prevalence is increasing among the female population, prevention programs should be directed to special groups like pregnant women.

FUNDING: Funding was obtained from PROMEP Program of the Mexican Education department (SEP).

JUSTIFICATION: These results support the rationale for developing and applying prevention programs directed at special populations such as pregnant women.

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POS1-11 ELECTRONIC CIGARETTES FOR SMOKING CESSION AMONG OPIOID DEPENDENT INDIVIDUALS IN OUTPATIENT TREATMENT

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Cigarette smoking rates are 2-4 times higher among individuals with substance use disorders (SUDs) than in the general population. Smokers with SUDs report interest in quitting cigarettes, though their long-term cessation rates are modest even with the use of counseling and/or pharmacotherapy. These low success rates with traditional treatment approaches may prompt smokers with SUDs to try novel products like electronic cigarettes (ECIGs). In this study, daily smokers receiving buprenorphine/naloxone treatment for opioid dependence were randomized to use placebo (n=9); excluding n=3 noncompliant with ECIG use) or 18mg/mL (n=13) nicotine ECIG (eGo-T). Participants used their ECIGs and lib for two weeks while completing daily assessments via text messaging: use of nicotine/tobacco products twice per day and subjective ratings of ECIG side effects once per day. Participants also rated their motivation to quit smoking via the Readiness to Quit Ladder at baseline (Day 1), the end of the 2-week ECIG use period (Day 14), and a 2-week follow-up (Day 28). Placebo and active ECIG groups did not differ on baseline characteristics of number of cigarettes/day (22.9±3.3 vs. 20.8±1.7, respectively) or quit motivation scores (5.9±0.4 vs. 5.4±0.3, respectively). Across the 2-week intervention period, average number of cigarettes/day decreased within placebo (-9.7±14.6; p=.06) and active (-7.1±7.0; p<.01) ECIG conditions, but did not differ significantly between conditions (p>.05). Motivation to quit smoking increased for placebo ECIG users (n=7), as evidenced by difference scores from baseline to Day 14 (1.0±1.0) and to Day 28 (1.3±0.8). For active ECIG users (n=10), motivation to quit also increased from baseline to Day 14 (difference score = 1.6±0.4), but then decreased by Day 28 (difference score = 0.6±0.2). Still, motivation scores did not differ significantly between groups (p>.05). Few adverse side effects were reported with either ECIG dose. Similar to previous work, ECIG use with or without nicotine decreased smoking behavior acutely. Results also contribute to the currently mixed literature regarding the influence of ECIGs on smokers’ motivation to quit smoking.

FUNDING: Support provided to Drs. Melissa Blank, PhD, Daniel Elswick, MD, and C. Rolly Sullivan, MD from the Department of Behavioral Medicine & Psychiatry, West Virginia University.

JUSTIFICATION: Results may inform clinically-based cessation interventions for individuals with substance abuse disorders.

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Response to smoking cues has been used as a method by which to evaluate the effects of potential smoking cessation interventions. A limitation of some methodologies used include inconsistency in the way the cues are presented between subjects. The use of virtual reality (VR) technology can potentially address this limitation by presenting smoking cues to all subjects in an identical manner. In order to confirm the feasibility of using VR technology to induce a craving and withdrawal response to smoking cues, fourteen smokers completed a laboratory session in which each subject was exposed to four “rooms” in a virtual reality environment. The first and last of the rooms presented neutral cues whereas the second and third rooms presented smoking cues. One of the smoking cue rooms presented objects that would remind subjects of smoking (e.g. cigarettes) whereas the other presented a social environment in which the virtual participants were smoking cigarettes. Withdrawal symptoms and craving were measured after “leaving” each room using the Minnesota Nicotine Withdrawal Scale (MNWS) and the brief version of the Questionnaire of Smoking Urges (QUIS). Withdrawal symptoms as measured by the MNWS were significantly (p=0.012) higher in the smoking cue room than in the neutral rooms. Similar results were found for the single item craving measure from the MNWS (p=0.014) and for factor 1 (p=0.005) and factor 2 (p=0.01) scores of the QUIS. Additionally, within the cue rooms subjects reported significantly higher (relative to the neutral rooms) scores on questions assessing the extent to which they paid attention to the sight of cigarettes in the room (p<0.001), the extent to which they paid attention to the smell of cigarettes in the room (p=0.015) and the extent to which they thought about smoking when they were in the room (p<0.001). This study confirms that the use of VR technology is an effective method by which to present cues to smokers in a laboratory setting so as to increase craving and withdrawal symptoms.

FUNDING: This research was supported by Grant K23DA017307 to the first author from the National Institute on Drug Abuse and Grant M01-RR00400 from the General Clinical Research Centers program of the National Center for Research Resources.

JUSTIFICATION: Data from this study confirms that VR technology can be used to present smoking cues to smokers.

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POS1-13 IMPACT OF TELEPHONE-BASED CARE COORDINATION ON CESSION MEDICATION UTILIZATION POST-HOSPITAL

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Using cessation medications post-discharge increases the odds that hospitalized smokers will stay quit. It can be difficult to transition these smokers to outpatient medications due to their medical complications and the patchwork nature of insurance coverage. This study determined if medication coordination before and after hospital discharge could increase the utilization and adherence to smoking cessation pharmacotherapy.

Smokers from hospitals across Kansas (n=606) were randomized to receive either centralized disease management (CDM) or counseling (C). CDM consisted of telephone-delivered behavioral counseling plus medication coordination, which included assistance in selecting a preferred medication, finding affordable pharmacotherapy, and obtaining a prescription from the smoker’s primary care provider. C consisted of telephone counseling alone. Both groups received counseling during hospitalization; at 2 days post-discharge, and 1, 3, and 6 weeks post-discharge. Follow-up was completed on 487 (80%) participants by telephone at 3 months post-discharge.

Use of pharmacotherapy post-discharge was comparable in both arms (CDM: 49%, C: 52%, p=0.50), with comparable use of NRT patch (28%, short-acting NRT (15%), varenicline (10%), and bupropion (9%). Of those using pharmacotherapy, 42% of CDM and 39% of C recipients continued treatment beyond 4 weeks. Use of pharmacotherapy during hospitalization (35%) was related to pharmacotherapy use post-discharge (OR = 2.6, p < 0.01). Pharmacotherapy use post-discharge was also positively correlated with baseline cigarettes smoked per day and smoking within 30 minutes of waking.

Supplemental medication management did not improve use of post-discharge pharmacotherapy beyond that achieved by inpatient treatment and behavioral counseling.

FUNDING: Supported by National Cancer Institute grant no. SR01CA101963

JUSTIFICATION: If patients are receiving cessation medications in the hospital, additional efforts to support medication utilization, beyond behavioral counseling, have little impact.

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POS1-14 CUE-ELICITED NEURAL ACTIVITY AND FUNCTIONAL CONNECTIVITY ASSOCIATED WITH THE DECISION TO SMOKE IN QUITTING-MOTIVATED SMOKERS

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An extensive literature demonstrates increased activation in several brain areas among smokers when exposed to cigarette-related stimuli, and this activation is thought to be related to clinically-meaningful smoking behavior, such as relapse. As a whole, however, prior research has suffered from a key limitation: few studies have directly examined the extent to which cue-related brain activation is related to actual smoking behavior. The goal of the present study was to address this constraint by assessing the relationship between patterns of brain activation during cue exposure and subsequent smoking behavior in quitting-motivated smokers during the initial hours of a quit attempt, a critical period during which the risk of relapse is highest. Functional magnetic resonance imaging (fMRI) was used to measure brain activity associated with holding and viewing neutral and cigarette-related cues in nicotine-deprived daily smokers during the first day of a quit attempt. Immediately following the fMRI session, participants were given the opportunity to smoke. Using data collected in two parent studies, we identified a subset of participants who chose to smoke when given the chance (n = 19) and a matched subset who declined the opportunity to smoke (n = 19). Based upon dual systems models, we hypothesized that these subgroups would differ with respect to patterns of brain activation between areas implicated in cognitive control and those linked to reward-related and emotional processes. Consistent with this prediction, results showed that smokers who were able to resist smoking displayed significant functional connectivity between the dorsolateral prefrontal cortex and the left anterior insula, whereas there was no such connectivity for those who chose to smoke. Findings suggest that smokers who are able to remain abstinent may be engaging in top-down control of interoceptive processes associated with the urge to smoke. Notably, no differences were observed in mean levels of activation in brain regions of interest, highlighting the importance of examining interregional connectivity when characterizing the links between cue-related neural responses and overt behavior.

FUNDING: Funding source: NIH Grant R01 DA02463

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POS1-15
ECONOMIC DEMAND FOR CIGARETTES AND CIGARETTE ALTERNATIVES: LABORATORY AND REAL-WORLD ABUSE LIABILITY

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In order to inform public policy, assessments of demand elasticity (i.e., sensitivity of consumption to increases in price) may be used to compare abuse liability of cigarettes to cigarette alternatives (e.g., nicotine gum, smokeless tobacco). Under traditional laboratory-based methods, participants self-administer tobacco or nicotine products across a range of fixed-ratio "prices" while alone in a laboratory booth. Whereas these methods provide precise experimental control, they may compromise external validity by failing to capture important environmental determinants of tobacco/nicotine use (e.g., social consequences, smoking bans). Moreover, the use of laboratory-based methods is often impractical, requiring several lengthy sessions in order to obtain estimates of demand. Across two studies, we compared laboratory-based assessment of demand for cigarettes, nicotine gum, and Camel Snus to a novel and more practical "outpatient" method. In the laboratory study, smokers were self-administered these products across a range of fixed-ratio prices. In the outpatient study, smokers completed a purchase task across a range of monetary prices to obtain their weekly supply of these products, with one purchase of each product randomly awarded. In both studies, we observed greater elasticity of demand for Snus compared to cigarettes, but minimal differences in elasticity between gum and cigarettes. Together, these laboratory and outpatient studies indicate lower abuse liability for Snus compared to both cigarettes and gum. Moreover, general agreement between studies suggests that outpatient methods may be employed as a more practical, yet equally sensitive, alternative to laboratory-based methods.

FUNDING: This research was funded by a grant from the National Cancer Institute (1U19CA157545).

JUSTIFICATION: Comparisons of demand for cigarettes and alternative tobacco/nicotine products may inform public policy designed to reduce cigarette use.

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POS1-16
DOES GUANIFACINE DISRUPT THE ASSOCIATION BETWEEN STRESS-RELATED TOBACCO SMOKING AND VAGAL REACTIVITY?

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Stress is a primary mechanism involved in the maintenance of, and relapse to, smoking. Cigarette smokers often report that stress is a causal factor precipitating relapse. Stress increases HPA axis reactivity and alters autonomic function, and heart rate variability, a measure of vagal activity, may be a potential mechanism underlying the relationship between stress and smoking. The noradrenergic system is widely involved in stress-reactivity, and more recently, has been thought to play a key role in mediating drug-motivated behaviors. Preclinical findings support the hypothesis that noradrenergic pathways are involved in stress-induced relapse and that their manipulation may be of therapeutic benefit. This study evaluated the effect of a noradrenergic agent on stress-precipitated smoking and vagal reactivity. Guanfacine is an alpha-2a adrenergic receptor agonist known to attenuate stress-induced reinstatement to drugs of abuse. Thus, the primary aim of this double-blind placebo-controlled study was to examine whether guanfacine (0mg vs. 3mg/day; n=33) attenuated the effect of stress on precipitating smoking lapse behavior in the laboratory, and whether guanfacine disrupted the association between high-frequency heart rate variability (HF-HRV) and smoking following stress. We found that guanfacine significantly improved the ability to resist smoking following stress and decreased ad-libitum smoking. Guanfacine also attenuated stress-induced increases in systolic blood pressure, and increased HF-HRV overall and following stress versus neutral imagery. Similarly, while cigarettes and stress additively decreased HF-HRV in the placebo group, guanfacine attenuated the decreases in HF-HRV following stress and cigarette smoking. Results support current theories which suggest that both tonic and phasic changes in HF are important markers of the stress response. Results also provide important evidence that targeting stress-related relapse and associated mechanisms is a viable treatment development strategy for nicotine dependence.

FUNDING: Supported by NIH P50DA33945, UL1-DE019586, PL1-DA024859, PL1-DA24860, and RL1DA024857; and the Yale CTSA-UL1RR024139 and NIDA T32DA007238

JUSTIFICATION: Results provide important evidence that targeting stress-related relapse and associated mechanisms is a viable treatment development strategy for nicotine dependence.

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POS1-17
CORRESPONDENCE BETWEEN SELF-REPORTED AND BIOCHEMICAL MEASURES OF SMOKING IN OPIOID-DEPENDENT PREGNANT WOMEN

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Smoking exacerbates adverse outcomes among opioid-dependent pregnant women (e.g., a more severe neonatal abstinence syndrome in exposed neonates). Vermont birth certificate data for opioid-dependent pregnant women indicates a significant decrease in their self-reported smoking rate over the course of pregnancy, from a mean of 17.9 cigarettes per day prior to pregnancy to 13.8, 10.9, and 9.7 in the first, second and third trimesters, respectively. The present study examined self-reported smoking rate and biochemical measures of smoking in 18 opioid-dependent pregnant women to test whether self-reported decreases in smoking were paralleled by decreases in biochemical measures. All women were participating in clinical trials for smoking cessation, but were still smoking. Self-reported cigarettes per day prior to pregnancy was collected at the intake assessment. Self-reported cigarettes per day, breath CO, and urine cotinine were collected at the intake assessment, at a second assessment 1 month later (early pregnancy assessment), and again at the end of pregnancy (≥ 28 weeks EGA; late pregnancy assessment). Like birth certificate data, self-reported smoking rate decreased substantially over the course of pregnancy, from a mean of 22.6 cigarettes per day prior to pregnancy to 15.5, 7.5, and 9.0 cigarettes per day at intake, early pregnancy, and late pregnancy assessments, respectively. However, parallel changes were not evident in biochemical measures of smoking. Mean CO was 13.3, 10.0, and 12.3 ppm and mean urine cotinine was 1422.8, 1387.8, and 1294.1 ng/ml at the intake, early pregnancy, and late pregnancy assessments, respectively. Potential explanations for discrepancies between self-report and biochemical measures include misrepresentation of smoking or reductions in cigarettes per day offset by changes in smoking topography. Further research is needed to understand changes (or lack thereof) in smoking among opioid-dependent pregnant women.

FUNDING: This study was support by NICHD R01 HD075669, NIDA R01 DA014028, R01 DA031928, and FDA/NIDA P50 DA036114.

JUSTIFICATION: Characterizing changes (or lack thereof) in smoking among opioid-dependent pregnant women has implications for understanding the relationship between smoking rate and adverse outcomes and for the design of treatment interventions for this population.

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POS1-18
EXPLORING THE RELATIONSHIP BETWEEN TRAUMA AND SMOKING AT THE NICOTINE DEPENDENCE CLINIC: PROGRAM OVERVIEW, TREATMENT OUTCOMES AND IMPLICATIONS FOR FUTURE INTERVENTIONS

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While smoking rates have declined in Canada, they have not fallen equally among all Canadians. Individuals with psychiatric diagnoses are one of these sub-populations; research has found these individuals have a comparable number of quit attempts to those without a psychiatric diagnosis, but lower success rates. PTSD and trauma exposure have also been associated with higher rates of smoking and nicotine dependence, coupled with lower cessation rates.

While there is an increase in research over the last decade examining the treatment of individuals with co-occurring mental health diagnoses and substance dependence, in-depth examination of the relationship between smoking cessation and treatment efficacy among individuals with PTSD and trauma histories is limited.

This presentation hopes to contribute to a better understanding of these relationships by drawing on clinical data from a chart review conducted at the Nicotine Dependence Clinic(NDC) at the Centre for Addiction and Mental Health located in Toronto, Canada. The NDC is an outpatient clinic that provides psychotherapeutic and pharmacotherapy supports to people who want to quit smoking.

This presentation will: (1) Provide an overview of NDC program structure; (2) Provide an analysis of the incidence of psychiatric diagnoses, as well as a reported trauma history, among clients; (3) Compare smoking rates across client populations; (4) Summarize treatment outcomes; (5) Discuss implications for future interventions.

FUNDING: No funding.

JUSTIFICATION: As we work toward improving cessation outcomes for clients who present with multiple issues, exploring the efficacy of community-based trauma-informed interventions that integrate mental health and addiction treatment, is integral in informing future directions in research, policy and clinical practice.

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POS1-19
THE ROLE OF PHYSICAL ACTIVITY IN SMOKING CESSION AMONG LATINO SMOKERS LIVING WITH HIV

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People living with HIV/AIDS (LWH) are at increased risk for cardiovascular disease (CVD). An estimated two-thirds of people LWH currently smoke and engage in limited physical activity (PA). The Integrated Theory of Health Behavior Change suggests that self-management skills learned in changing one health behavior (i.e., quitting smoking) may be useful in improving another (i.e., PA). We therefore studied associations between PA and smoking cessation in a sample of Latino smokers LWH. As part of a smoking cessation trial that tested an individually tailored intervention for PLWH, 302 participants recruited from 9 Northeastern immunology clinics (mean age=45±8 years; 64% male; 51% foreign born; 56% Puerto Rican) completed self-report surveys at baseline and 6 months. At baseline, 36% of the sample reported zero moderate/intense leisure time PA, as measured by the Godin Leisure-Time Exercise Questionnaire. Less frequent PA at baseline was associated with being female (p=0.004), lower educated (p=0.015), expressing a preference for Spanish over English (p=0.17), fewer previous quit attempts (p=0.010), poorer quality of life (p=0.000), and higher depression (p=0.020).

In multivariate analyses, female gender (p=0.010), Spanish language preference (p=0.004), and lower quality of life (p=0.002) predicted lower levels of PA at baseline. There were no differences in PA levels among those who achieved CO-confirmed 7-day ITT abstinence at 6-months. However, in multivariate analyses controlling for covariates of baseline PA, change in PA score was associated with 6-month abstinence, such that those who increased their frequency of PA during the cessation trial were more likely to achieve abstinence (OR=1.02, 95% CI = 1.00-1.03; p=0.02) Results highlight subgroups of Latinos LWH that are at greatest risk for lower PA and demonstrate that participants who increased their PA during the smoking cessation trial were more likely to achieve smoking abstinence. Integrated approaches to health behavior change, such as targeting PA promotion to improve smoking abstinence, could serve to improve cessation success and reduce overall risk of CVD among Latinos living with HIV/AIDS.

FUNDING: This work was supported by NIDA (R01DA018079) and NCI (K07CA091831; P30CA051008) awards.

JUSTIFICATION: Results suggest that integrated approaches to health behavior change, such as targeting PA promotion to improve smoking abstinence, could serve to improve cessation success and reduce overall risk of CVD among minorities and vulnerable populations such as Latinos living with HIV/AIDS.

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POS1-20
GROUP WATERPIPE TOBACCO SMOKING INCREASES USER TOXICANT EXPOSURE

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Background: Smoking tobacco in a waterpipe (hookah, shisha) has become a global public health concern. It involves heating flavored tobacco with charcoal and passing the subsequent smoke through water prior to inhalation. Research reveals that waterpipe tobacco smoke contains a variety of toxicants to which users are exposed, though the focus has been on individuals while group use is common. This study examined toxicant yield and exposure associated with individual and group waterpipe tobacco smoking.

Methods: Twenty-four pairs of waterpipe smokers participated, smoking as a dyad and as singletons. A 12-hour smoking abstinence preceded the 45-min ad lib waterpipe tobacco smoking session (10g/tobacco). Before and after smoking, blood was drawn, expired CO levels were measured, and subjective effects were assessed; puff topography was measured throughout. One randomly selected participant was selected as the singleton for comparison to that same participant when smoking as a dyad member. Puff topography data were played back (Shihadeh & Eisenberg, 2011) to generate smoke for toxicant analysis.

Results: Mean plasma nicotine concentration was significantly higher for dyad (14.92±2.96 ng/ml) versus singleton (10.00±1.52 ng/ml) smoking but mean expired air CO was significantly lower (dyad = 17.1±2.53 ppm; singleton = 22.4±3.00 ppm). Dyad smoking was associated with more puffs (119.38±8.37; 35.58±4.06) taken from the waterpipe and a shorter interpuff interval (IPI; 22.46±3.00 vs. 28.33±9.60) taken from the waterpipe and a shorter interpuff interval (IPI; 22.46±3.00 vs. 28.33±9.60). Air CO was significantly lower (dyad = 17.1±2.53 ppm; singleton = 22.4±3.00 ppm). Dyad smoking was associated with more puffs (119.38±8.37; 35.58±4.06) taken from the waterpipe and a shorter interpuff interval (IPI; 22.46±3.00 vs. 28.33±9.60) taken from the waterpipe and a shorter interpuff interval (IPI; 22.46±3.00 vs. 28.33±9.60).

Discussion: These results are the first to compare the toxicant exposure in dyad versus individual waterpipe tobacco smoking. They suggest that dyad smoking increases exposure to nicotine and potentially other tobacco toxicants, likely because shorter IPIs and more puffs taken from the waterpipe increase tobacco temperature (see Shihadeh, 2003).

FUNDING: Research reported in this publication was supported by the National Cancer Institute (R01CA120142) as well as the National Institute on Drug Abuse of the National Institutes of Health under Award Number P50DA036105 and the Center for Tobacco Products of the U.S. Food and Drug Administration. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or the Food and Drug Administration.
**POS1-21**

**WEIGHT CONCERNS OF MENTHOL SMOKERS VS. NON-MENTHOL SMOKERS IN PREMENOPAUSAL WOMEN**

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**JUSTIFICATION:** This study is relevant to interventions aimed at informing waterpipe tobacco smokers regarding the risks of this method of tobacco use.

**Methods:** For this study, women were recruited between 2010 and 2012. Eligibility was 18 to 40 who smoke ≥5 CPD, are in stable physical and mental health and non-menthol smokers with weight concerns in a sample of premenopausal women.

This is a secondary analysis from two studies, which included women age 18 to 40 who smoke ≥5 CPD, are in stable physical and mental health and have regular menstrual cycles. Both have similar protocols where participants completed a questionnaire about weight concern and the type of cigarette they smoke. P-values, means, and standard errors are from multiple linear regression completed a questionnaire about weight concern and the type of cigarette they smoke.

Participants (n=260) were 28.1(±6.6 SD) years of age. Menthol smokers consumed an average of 12.9(±5.7) cpd while non-menthol smokers averaged 11.8(±5.4) cpd. Significant differences were found in race, age, education, and BMI. Most notably, BMI for menthol smokers was 31.0(±7.7), while non-menthol smokers was 27.5(±7.7; p=0.0003). On a five-point Likert-type scale, menthol smokers had greater concerns about weight gain (3.7±0.1) than non-menthol smokers (3.1±0.1). During relapse, the influence of weight gain was also higher for menthol smokers (2.8±0.1) than non-menthol smokers (2.1±0.2; p=0.002).

These data suggest that menthol smokers may have greater smoking-related weight concerns than non-menthol smokers and is evidence to support why menthol smokers are less likely to quit and are more likely to relapse. This supports the idea that women may use menthol cigarettes to control their weight, which ultimately minimizes quit efforts. The objective of this study is to determine if there is an association between menthol and non-menthol smokers with weight concerns in a sample of premenopausal women.

**Conclusions:** Women are more likely to relapse. This supports the idea that women may use menthol cigarettes to control their weight, which ultimately minimizes quit efforts. Men are more likely to relapse. This supports the idea that men may use menthol cigarettes to control their weight, which ultimately minimizes quit efforts.

**Objective:** To assess key performance characteristics of a new nicotine inhaler: flow rate required to trigger dose delivery and fine particle dose of nicotine emitted.

**Background:** The new nicotine inhaler (Voke[R]; 0.056% w/w nicotine) has been developed to deliver 0.43 mg nicotine per charge (6–8 puffs) of the stick device. Reliable triggering of the nicotine inhaler at low inspiratory flow rates is required for users with compromised lung function. Pulmonary absorption of nicotine depends on the production and emission of respirable particles by the inhaler.

**Design/Methods:** Triggering of dose delivery from 50 inhalers was evaluated over a range of low flow rates applied for 0.5–1.5 seconds. The mass median aerodynamic diameter (MMAD) and fine particle dose (FPD; less than 5 microns in diameter) delivered per charge were assessed using the Next Generation Impactor. The nicotine particle size distribution was quantified using gas chromatography. The fine particle fraction (FPF) per charge was calculated as a percentage of the emitted nicotine dose.

Results: Dose delivery was triggered at a low threshold of 1.5 L/min over 1.5 seconds. 98% of devices tested at 2 L/min triggered within the 1.5-second timeframe. All devices triggered at 3 L/min. At 1.25 L/min, only 10% of devices triggered. The MMAD ranged from 1.8 to 2.2 microns. The FPD ranged from 0.32 to 0.39 mg and a consistent aerosol particle size distribution was observed. The FPF range of the emitted dose was 70.8–85.6%.

**Conclusions:** Dose delivery from the inhaler was triggered over a range of low inspiratory flow rates. Consistent ranges of particle size distribution and FPD were produced by the inhaler. High percentages of the emitted nicotine dose were in the respirable range (less than 5 microns).

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**POS1-22**

**A NEW NICOTINE INHALER DEVICE: TRIGGERING RANGE AND FINE PARTICLE DOSE**


**Objective:** To assess key performance characteristics of a new nicotine inhaler: flow rate required to trigger dose delivery and fine particle dose of nicotine emitted.

**Background:** The new nicotine inhaler (Voke[R]; 0.056% w/w nicotine) has been developed to deliver 0.43 mg nicotine per charge (6–8 puffs) of the stick device. Reliable triggering of the nicotine inhaler at low inspiratory flow rates is required for users with compromised lung function. Pulmonary absorption of nicotine depends on the production and emission of respirable particles by the inhaler.

**Design/Methods:** Triggering of dose delivery from 50 inhalers was evaluated over a range of low flow rates applied for 0.5–1.5 seconds. The mass median aerodynamic diameter (MMAD) and fine particle dose (FPD; less than 5 microns in diameter) delivered per charge were assessed using the Next Generation Impactor. The nicotine particle size distribution was quantified using gas chromatography. The fine particle fraction (FPF) per charge was calculated as a percentage of the emitted nicotine dose.

Results: Dose delivery was triggered at a low threshold of 1.5 L/min over 1.5 seconds. 98% of devices tested at 2 L/min triggered within the 1.5-second timeframe. All devices triggered at 3 L/min. At 1.25 L/min, only 10% of devices triggered. The MMAD ranged from 1.8 to 2.2 microns. The FPD ranged from 0.32 to 0.39 mg and a consistent aerosol particle size distribution was observed. The FPF range of the emitted dose was 70.8–85.6%.

Conclusions: Dose delivery from the inhaler was triggered over a range of low inspiratory flow rates. Consistent ranges of particle size distribution and FPD were produced by the inhaler. High percentages of the emitted nicotine dose were in the respirable range (less than 5 microns).

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**POS1-23**

**A NEW NICOTINE INHALER DEVICE: DELIVERED DOSE, COMPOSITION AND STABILITY OF FORMULATION**


**Objective:** To assess key performance characteristics of a new nicotine inhaler: consistency of the delivered dose of nicotine and impurity profile during stability studies.

**Background:** The new nicotine inhaler (Voke[R]) has been developed to deliver up to 0.43 mg of nicotine per charge of the stick device (20 charges/pack). Unlike electronic cigarettes, this inhaler requires no heat to vaporize the nicotine, thus avoiding the generation of harmful carbonyls. The formulation and device have been produced as per good manufacturing practices.

**Design/Methods:** Dose delivery from a single charge of the inhaler was evaluated over a range of in-use conditions including: single-day use intra-device (10 charges minimum from charges 2–20; 7 devices from 3 batches); single-day use inter-device (charge 4 only; 30 devices from 3 batches); 7-day use with the device upright and inverted (charges 2, 3 and 4; 24 devices from 2 batches); 10-day temperature cycling (5–40°C; 24 hours at each temperature) with the device upright and inverted (10 charges; 12 devices from 2 batches). The mean nicotine dose...
A NOVEL ELECTRONIC CIGARETTE WITH ADVANCED VAPORIZATION TECHNOLOGY: NICOTINE PHARMACOKINETICS (PK), SAFETY AND TOLERABILITY

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Objective: To determine PK profile, safety and tolerability of nicotine delivered via a novel electronic cigarette (EC) vs the Nicorette® (a registered trademark of McNeil Products Limited) Inhalator (NI) and a conventional cigarette.

Background: There is increasing interest in EC use to reduce smoking-related morbidity. A novel EC using advanced vaporization technology has been developed to current regulatory standards to deliver medicinal-grade nicotine.

Design/Methods: In this randomized, open-label, crossover, Phase I study, 24 healthy men (18–65 years) who smoked 10–20 cigarettes/day for at least 5 years received nicotine using a novel EC at two dose strengths (10 [3.0% v/v] and 15 mg [4.5% v/v]), the reference product NI (15 mg) and cigarette (0.9–1.0 mg). Participants received all 4 products in a randomized sequence on consecutive days. One product was used for 4 hours at hourly intervals each day; each usage comprised 10 inhalations (2-sec inhalations for cigarette and 3-sec inhalations for other arms) at 30-sec intervals. PK assessments were made after the fourth use of each product. Safety was evaluated at predetermined time points.

Results: The maximum plasma concentration (Cmax) of nicotine achieved using the novel EC 10 or 15 mg was significantly higher than the NI (5.9 and 7.0 vs 2.6 ng/mL) and significantly lower than a cigarette (29.7 ng/mL). Median Cmax using the novel EC 10 or 15 mg was significantly higher than the NI (5.9 and 7.0 vs 2.6 ng/mL) and significantly lower than a cigarette (29.7 ng/mL). Median Cmax using the novel EC 10 or 15 mg was significantly higher than the NI (5.9 and 7.0 vs 2.6 ng/mL) and significantly lower than a cigarette (29.7 ng/mL).

Conclusions: Peak nicotine plasma concentrations using the novel EC were dose-related, significantly higher and reached more rapidly than with the NI. Peak nicotine plasma concentrations using the novel EC were significantly lower than after cigarette smoking. The novel EC had a safety profile similar to the NI and was well tolerated.

FUNDING: Kind Consumer Limited and Nicoventures Limited

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QUIT & FIT: A PILOT TRIAL FOR SMOKING CESSATION AND EXERCISE PROMOTION AMONG URBAN AFRICAN-AMERICAN WOMEN

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Women are 4 times more likely than men to report fear of weight gain as a reason for smoking cessation relapse and they gain significantly more weight than male smokers post-quit. African American (AA) women report less tolerance for post-cessation weight gain and despite lower overall smoking rates have comparable lung cancer rates to higher smoking groups. Exercise combined with smoking cessation can yield better cessation outcomes, yet trials to-date have not included sufficient numbers of urban minority women. This study sought to examine how a targeted program to promote healthy energy balance through exercise could improve smoking cessation among urban AA women. In a pilot RCT, the feasibility and acceptability of Quit & Fit, a 12-week smoking and exercise intervention targeted to AA women, was examined. Participants were randomly assigned to either a control group (SC; cessation intervention) or the Quit & Fit group (QF; cessation plus 12-week exercise intervention). All participants received 12 weeks of cessation counseling via telephone along with 9-weeks of NRT – lozenges. The QF group also received objective weight measurement and 12-weeks of structured supervised aerobic activities in a university affiliated community-based research center. Outcome was CO biochemically confirmed 7-day intent-to-treat abstinence post-intervention (3-months from baseline). Of the 98 screened, 28% lacked interest in quitting, 32% were excluded due to contraindications with NRT or exercise, and 35% (N=38, mean age 51y/o) were enrolled. Adherence to 50% of the phone sessions was higher in the SC group (SC 44% N=8; QF 20% N=4). At 3-month follow-up, 35% (N=7) of the QF group reported verified abstinence compared to 16% (N=3) of controls. In the QF program, those who attended 3-6 weeks of the exercise sessions had an average 10 lb. weight reduction. Program satisfaction was higher in the QF group (70%, N=14) compared to SC (44%, N=8). While improving adherence to phone calls needs further study, the Quit & Fit program was found to be feasible to deliver, acceptable to participants interested in quitting, and more than doubled the abstinence rates in this pilot.

FUNDING: This work was supported by the National Institutes of Health/National Cancer Institute (P30CA051008).

JUSTIFICATION: Results of this pilot trial suggest there may be great promise in multiple health outcome interventions to address healthy behavior change among the leading lifestyle contributors to morbidity and mortality among minority and low-income women in this country.

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GENDER DIFFERENCES AMONG HIV-INFECTED SMOKERS

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Introduction: Persons living with HIV (PLWH) in the US smoke at triple the rates of the general population. With advances in HIV care, tobacco has emerged as a leading cause of mortality. In the general population, gender differences in smoking behaviors are well-described, but little is known about the extent to which demographic, clinical, or psychosocial correlates of smoking differ between men and women living with HIV.

Methods: Positively Smoke Free (PSF) is an intensive, behavioral tobacco treatment delivered by group therapy or over the web. We analyzed merged data from two prospective trials of PSF for this study. All subjects were current smokers...
Results: The final sample size (which excluded 5 transgender persons) was 267: mean age=47; 54% male, 81% Black, 16% White, 35% Latino. There were no gender differences in age, race, or ethnicity. Men had lower baseline CD4+ counts (468 vs 597 cells/uL, P=0.004), were more likely to report a history of MI or stroke (6.3 vs 0.8%, P=0.02) and less likely to report asthma (30 vs 52%, P=0.001). There was no difference in past use of alcohol or cocaine, but men were more likely to report marijuana, heroin, and ecstasy use (P=0.01;0.03;0.002). There was no difference in mean daily cigarette consumption, past quit attempts, or use of other tobacco products. Men were more likely to smoke≥1 ppd (26 vs 15%, P=0.03), and less likely to have tried NRT or varenicline (P=0.03;0.03). There was no difference in motivation to quit, nicotine dependence, self-efficacy, decisional balance, or anxiety score. There was a trend toward lower depression score in men (P=0.08).

Conclusions: In this cohort of PLWH smokers, men reported higher rates of heavy smoking and other substance use, lower use of pharmacotherapy and higher rates of cardiovascular disease, while asthma was hyperprevalent among women. Depression scores were higher in women. Data such as these may be useful in optimizing tobacco treatments for HIV-infected men and women.

FUNDING: This work was supported by the National Institutes of Health/National Institute on Drug Abuse (Grant # R21 DA023382), and the National Institutes of Health/National Cancer Institute (Grant #S R21CA163100-01 and P30CA051008). It was also supported by the Clinical Core of the Center for AIDS Research at the Albert Einstein College of Medicine and Montefiore Medical Center funded by the National Institutes of Health (Grant #AI-51519). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute on Drug Abuse, the National Cancer Institute, or the National Institutes of Health.

JUSTIFICATION: These data may be helpful in optimizing tobacco treatment strategies for PLWH smokers.

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### POS1-28 PATIENTS UNDERGOING LUNG SCREENING: SMOKING PROFILES AND COMMUNICATION

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Introduction: In 2015, the USPSTF released guidelines recommending annual lung screening for individuals with a heavy smoking history, yet little is known about patients undergoing lung screening. Among patients with pulmonary nodules referred for screening, we examined smoking profiles and pre-screening communication with primary care physicians (PCPs).

Methods: Patients attending a pulmonary nodule and lung screening clinic between April 2013 and August 2014 completed a survey prior to their clinic appointment. Data were collected on smoking status and smoking cessation communication with physicians.

Results: Fifty four patients (74% response rate) participated (mean age=63.3 years, female=63%). 61.8% (n=21) were former smokers; 38.2% (n=13) were current smokers. 29.4% of current and former smokers had a previous cancer diagnosis (other than lung), and 32.4% reported that an immediate family member had had lung cancer. On average, former smokers smoked 20.9 cigarettes per day for 30 years while current smokers smoked 15 cigarettes per day for 44 years. 73.9% of former and current smokers agreed that quitting smoking could reduce their risk of lung cancer. Among current smokers with a PCP visit in the past year (N=12), 91.6% reported being asked about their smoking; 50% reported that their PCP had recommended using pharmacologic aids (nicotine replacement therapy, bupropion, varenicline), and 33% reported that their PCP recommended cessation counseling (classes, quit line). Among current smokers: 50.0% were precontemplating quitting, 13.5% were contemplation quitting, and 12.5% were preparing to quit smoking. Among former smokers: 10% worried about slipping back or relapsing, and 20% were completely confident that they would never smoke again.

Discussion: Among patients attending a pulmonary nodule and lung screening clinic, many had significant smoking histories, but many current smokers were not ready to quit smoking and had not received smoking cessation assistance from their PCP. Pulmonary nodule management and lung screening presents a critical opportunity for providers to initiate smoking cessation communications.

FUNDING: American Cancer Society

JUSTIFICATION: Pulmonary nodule management and lung screening represents an opportune time for providers to begin proactive and effective smoking cessation communication.

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POSTER SESSION 1 • Thursday, February 26, 2015 • 11:30 a.m.–1:00 p.m.

POS1-29
ADOLESCENTS’ UNDERSTANDING OF ADDICTION MAY PREDICT SMOKING OUTCOME EXPECTANCIES

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Tobacco smoking is a risk behavior typically initiated during adolescence, with 54% of high school students having ever tried smoking. Adolescent smoking outcome expectancies (OEs) have consistently been shown to be predictors of smoking initiation and maintenance. The goal of the current study was to test adolescents’ understanding of the addiction process as a predictor of positive and negative smoking OEs.

Forty-three 9th grade students (46.5% female; mean age = 14.5; 69.8% Latino) completed a self-report questionnaire. Participants completed three items measuring understanding of addiction (UOA) by indicating ease of quitting smoking, the time it takes to become a regular smoker, and the time it takes to become addicted to cigarettes. They also rated their expectation of negative and positive consequences from smoking.

Multiple regression analyses were performed to evaluate the three UOA items as predictors of positive and negative OEs separately. UOA did not significantly predict positive or negative OEs. However, an examination of effect sizes indicated that adolescents’ UOA explained a meaningful amount of variance in positive OEs, but not in negative OEs. UOA accounted for approximately 22% of the variance in positive OEs. Individually, beliefs about ease of quitting and time to addiction predicted 4.9% and 4% of the variance in positive OEs, respectively. Belief in a shorter time to addiction and more difficulty quitting was associated with more positive OEs.

Results suggest that UOA may influence adolescents’ positive smoking OEs. Although this relationship was not statistically significant, effect sizes suggest that this relationship is likely to be significant with a larger sample size. The unexpected direction of this relationship may be due to having peers who report positive smoking experiences that may counter the impact of UOA on OEs. Research shows that OEs predict later smoking behavior, and the present findings may provide a third link in this relationship, which has implications for intervention. Given the limited research on what contributes to smoking among Latino adolescents, future research should explore this relationship.

FUNDING: No Funding

JUSTIFICATION: This study addresses the relationship between adolescents understanding of addiction and smoking outcome expectancies to which has potential implications for intervention/prevention efforts among this age group.

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POS1-30
DOES AN ADOLESCENT’S UNDERSTANDING OF ADDICTION PREDICT THEIR WILLINGNESS OR INTENTIONS TO SMOKE CIGARETTES?

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Approximately 60-80% of all smokers begin smoking in adolescence. An important predictor of progression towards smoking initiation is susceptibility to smoking, which encompasses willingness and intent to smoke. The goal of the current study was to test adolescents’ understanding of the addiction process as a predictor of willingness and intent to smoke.

Forty-three 9th grade students (46.5% female; mean age = 14.5; 69.8% Latino) completed a self-report questionnaire. Participants completed three items measuring understanding of addiction (UOA) by indicating ease of quitting, the time it takes to become a regular smoker and to become addicted to cigarettes. They also rated how willing they would be to smoke cigarettes if offered by a friend, and whether or not they intended to smoke in the future.

Multiple regression analyses were performed to evaluate the three UOA items as predictors of willingness and intent to smoke cigarettes separately. UOA did not significantly predict willingness or intent to smoke. However, an examination of effect sizes indicated that adolescents’ UOA explained a meaningful amount of variance in willingness, but not in intent. UOA accounted for approximately 22% of the variance in willingness to smoke. Individually, beliefs about time to addiction and ease of quitting predicted 14.1% and 4.4% of the variance in willingness to smoke, respectively. Belief in a shorter time to addiction and more difficulty quitting was associated with greater willingness to smoke.

Results suggest that UOA may influence adolescents’ willingness to smoke. Although this relationship was not statistically significant, effect sizes suggest that it is likely to be significant with a larger sample size. The unexpected direction of this relationship is likely to be significant with a larger sample size. The unexpected direction of this relationship may be due to having peers who report positive smoking experiences that may counter the impact of UOA on OEs. Research shows that OEs predict later smoking behavior, and the present findings may provide a third link in this relationship, which has implications for intervention. Given the limited research on what contributes to smoking among Latino adolescents, future research should explore this relationship.

FUNDING: No Funding

JUSTIFICATION: This study addresses the relationship between adolescents understanding of addiction and susceptibility to smoking which has potential implications for intervention/prevention efforts among this age group.

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POS1-31
CRAVING TO QUIT: MOBILE MINDFULNESS TRAINING FOR SMOKING CESSATION

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Recent work suggests that mindfulness training may be effective for increasing abstinence from tobacco. In a randomized controlled trial by our research team, mindfulness training was associated with twice the smoking abstinence rate as a leading, widely disseminated and validated smoking cessation treatment (Brewer, 2011). Mindfulness training was also shown to moderate the decoupling of craving and smoking, suggesting a possible mechanism of action behind these outcomes (Elwafi, 2013). Despite these promising findings, dissemination of treatment is challenged by the need for experienced therapists, high time demand, limited access to and high costs associated with in-person treatment delivery. Mobile, smartphone technologies provide a medium for addressing and overcoming these barriers to dissemination, yet most available apps do not follow basic smoking cessation guidelines and do not deliver stepwise, systematic training (Abrons, 2013). We have developed a smartphone application based on our manualized mindfulness training for smoking cessation: Craving to Quit. We have embedded Craving to Quit with experience sampling, a tool to query smokers’ behavior and experience in real time to measure psychological mechanisms of change in vivo. In addition, as online peer support has been shown to increase abstinence rates, we have paired Craving to Quit with a dedicated online community. We have a fully functioning smartphone app and online community (www.cravingtoquit.com). The app is composed of 22 unique sessions designed to teach mindfulness for smoking cessation using educational videos, animations to reinforce key concepts, and in vivo exercises. Features included in the app are designed to help users self-monitor their smoking habits, recognize when and how often they smoke, identify triggers for smoking, and learn methods to become more mindful of cravings and ride them out. Pilot data suggest individual engagement and feasibility of this program for smoking cessation.

FUNDING: American Heart Association 14CRP18200010

JUSTIFICATION: This study translates findings in basic science that mindfulness training may target learned responses, into a clinical application of mindfulness training.
training that targets the learned association between craving and smoking, to promote positive outcomes in smoking cessation.

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POS1-32
CLINICAL AND RISK CORRELATES OF LIFETIME DSM-IV MARIJUANA USE DISORDERS IN A SAMPLE OF RISKY DRINKING SMOKERS WHO WANT TO QUIT IN THE NEXT 6-MONTHS

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Marijuana is the most widely used illicit drug in the United States. Marijuana users frequently use tobacco, while also reporting high rates of concurrent alcohol use. Comorbid tobacco use and marijuana use are associated with poorer tobacco cessation outcomes and other psychiatric and psychosocial problems. The aim of this study was to examine tobacco use correlates in 68 heavy drinking smokers (43% female, 19% White) with and without a history of marijuana abuse or dependence who were enrolled in an observational study of the naturalistic change outcomes of smokers wanting to quit in the next 6-months. Information on demographics, smoking history, nicotine dependence (Fagerstrom Test for Nicotine Dependence/FTND), and alcohol and marijuana use disorder (MUD) diagnoses from the Structured Clinical Interview for DSM-IV were collected at baseline and again at 1-month. Almost 67% of the sample had an alcohol use disorder; 75% reported using marijuana 10 or more times in a one month period at some point in their lifetime; and 34% reported any lifetime MUD (abuse or dependence). Marijuana users reported an average of 9 lifetime quit attempts and were more likely than non-users to have quit for at least 1 week. A one-way analysis of variance between those with and without a MUD on baseline FTND scores was significant, F (1,66) = 6.23, p < .05, such that those with a disorder had higher scores on the FTND (M = 5.48, SD = 2.25) than those with no disorder (M = 3.96, SD = 2.44). In the sub-set of participants who completed the 1-month follow-up (n = 32; data collection are ongoing), a regression analysis revealed that FTND scores at the 1-month follow-up point were significantly higher for participants with a marijuana diagnosis, when controlling for baseline FTND scores (b = 1.50, p < .05, R2 change = .10). This suggests that motivated smokers with a MUD were less likely to show reduction in nicotine dependence over time relative to those without a MUD. A marijuana use diagnosis is related to poor smoking outcomes in adult risky drinkers and may impact the occurrence and success of future cessation attempts.

FUNDING: Midwest Nursing Research Society Seed Grant; NIH/NINR T32 Multiple Morbidities in Vulnerable Populations; NIH/NCI R25 CA090355: Prevention Research

JUSTIFICATION: Results can be used to inform smoking cessation interventions for smokers likely to have higher acculturative stress and in areas that have a high level of African American cultural immersion. Smoking cessation interventions that address cultural influences, as well as the cultural heterogeneity among African Americans, are needed to help increase smoking cessation success.

POS1-34
REWARDING ASPECTS OF SMOKING CUES DURING CRAVING: IMPORTANCE OF CONTEXT

John D. Dimoff*, Michael A. Sayette, Alcohol and Smoking Research Laboratory, Department of Psychology, University of Pittsburgh

Understanding the affective and cognitive dimensions of craving has been of interest to researchers. While most work has focused on the negative affect related to unrequited craving, positive affect also has been linked to craving (e.g., when active smokers anticipate smoking soon). That is, in some cases craving itself may be satisfying—and perhaps even more satisfying than smoking per se (Baker et al., 2004; Sayette, 2004). We tested the possibility that under certain conditions (e.g., when nicotine-deprived smokers not interested in quitting expect to smoke soon), Ps will find viewing smoking cues in themselves to be pleasant. Male and female abstinent smokers (N=228) with vs. without a current interest in quitting (Status) were told they could or would not be able to smoke soon (Allow). Ps rated a series of advertising images pertaining to either smoking or drinking (interspersed) purportedly to be used in a future study. Ps viewed each image (试点 to be similarly pleasant) as long as they wished (TIME) and rated the pleasantness (PLEASANT) of each image using a 1-9 pleasantness scale. These two measures were significantly correlated and an initial multivariate analysis that controlled for group differences in age, dependence (FTND), and mood, revealed a significant 2 (Status) X 2 (Allow) interaction (p<.05). Separate analyses were next computed for both DVs. For PLEASANT, there was a main effect of Status (p<.04) and a marginal effect for Allow (p=.09). Follow-up tests showed that Ps in the “positive craving” group (i.e., active smokers allowed to smoke during the study) enjoyed viewing the cigarette images more than did Ps in each of the other three conditions (all p’s<.04). Regarding TIME, there was a marginally significant interaction, such that “positive craving” smokers and smokers motivated to quit told they could not smoke (i.e., the two groups thought to experience less conflict) tended to spend relatively more time viewing the smoking images compared to the two groups thought to experience conflict (p<.08). Findings suggest that smoking cues, separate from smoking behavior, may become reinforcing to smokers and offer new directions for research.

FUNDING: This research was supported by the National Cancer Institute (NIH) (RO1DA010605) to Michael Sayette.
POS1-35
ECIG-INDUCED SUPPRESSION OF NICOTINE/TOBACCO ABSTINENCE SYMPTOMS IN ECIG USERS: EFFECTS OF LIQUID NICOTINE CONCENTRATION

Carolina Ramôa*, Eric Soule, Kathleen Osei, Alison Breland, Thomas Eissenberg, Virginia Commonwealth University

Background: Electronic cigarettes (ECIGs) heat a nicotine liquid to produce an aerosol. When ECIG users inhale the aerosol, suppression of nicotine abstinence effects is observed (Spindel et al., in press). The extent to which different concentrations of nicotine in the liquid produce differences in abstinence symptom suppression has not been explored systematically. The purpose of this clinical laboratory study is to examine the relationship between liquid nicotine concentration and abstinence symptom suppression in ECIG users.

Methods: In this ongoing study, nine ECIG experienced users (≥ 3 months use, ≥ 1 cartridge/day) used an “eGo” ECIG battery (3.3 V; 1000 mAh) attached to a dual-coil, 510-style cartomizer that was loaded with 1 ml of a flavored (tobacco or menthol) 70% propylene glycol/30% vegetable glycerin liquid in four independent sessions that differed by the nicotine concentration placed in the cartomizer (0, 8, 16, or 36 mg/ml). In each session, participants used the ECIG in two bouts (10 puffs; 30 sec inter-puff interval) separated by 60 minutes. Abstinence symptom severity was assessed before and after each bout using standard scales.

Results: Significant effects were found between higher (36 mg/ml) and lower (8mg/ml) doses. After the first ECIG bout, the 36 mg/ml concentration caused greater decreases on the subjective measures of modified Hughes-Hatsukami “craving”, “urge”, and direct effects of vaping “calm” post-bout compared to 8 mg/ml concentration (ps < 0.05). Importantly, following the initial ECIG bout measures of modified Tiffany-Drobes factor 1 also significantly decreased at greater levels of nicotine liquid concentration as compared to the 8mg/ml concentration (p < 0.05).

Conclusions: In these users, ECIGs reduced withdrawal symptoms and may suppress abstinence effects. This abstinence suppression may be related to nicotine liquid concentration. Understanding the extent to which liquid nicotine concentration is related to withdrawal suppression and other subjective effects is critical to empirically-based regulation of these products that may have both promise and peril for individual and public health.

FUNDING: Research reported in this publication was supported by the National Institute on Drug Abuse of the National Institutes of Health under Award Number P50DA036105 and the Center for Tobacco Products of the U.S. Food and Drug Administration. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or the Food and Drug Administration.

JUSTIFICATION: ECIG popularity has increased though they are unregulated; this necessarily represent the official views of the National Institutes of Health or the Administration. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or the Food and Drug Administration.

JUSTIFICATION: These findings suggest the potential efficacy of smoking interventions designed to manage the loss of positive anticipatory states (independent of actual smoking behavior) after quitting.

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POS1-36
INTERSECTIONALITY OF GENDER AND RACE/ETHNICITY IN THE PREDICTION OF SMOKING OUTCOME EXPECTANCIES IN REGULAR CIGARETTE SMOKERS

Claudia G. Aguirre, BA, Raina D. Pang, PhD, Adam M. Leventhal, PhD

Background: Understanding gender and racial/ethnic differences in beliefs regarding the effects of smoking (i.e. smoking outcome expectancies) may elucidate sources of tobacco-related health disparities and inform the development of population-specific tailored smoking interventions. The current study adds to the sparse literature on this topic and addresses the possibility of intersectionality between gender and race/ethnicity, whereby the extent of gender differences in smoking expectancies may differ as a function of race/ethnicity.

Method: In a cross-sectional design, non-treatment-seeking daily cigarette smokers self-identifying as either Black (N=178), White (N=118), or Hispanic (N=28) reported four domains of smoking expectancies: (a) negative reinforcement (e.g., beliefs of smoking-induced negative affect reduction); (b) positive reinforcement (e.g., pleasure and stimulation), (c) negative consequences (e.g., health effects), and (d) weight control (e.g., appetite suppression). The main and interactive effects of gender and race/ethnicity on expectancies controlling for cigarettes per day, education, and age were tested in 2 x 3 ANCOVA models.

Results: Main effect analyses in the overall sample showed that: (1) women endorsed greater negative reinforcement (p<.0001) and weight control (p<.05) smoking expectancies then men; and (2) Hispanic (vs. Black or White) smokers endorsed greater negative reinforcement smoking expectancies (p<.05). A gender by race/ethnicity interaction was found for weight control expectancies [F (2, 304)=5.173, p<.01], such that White females (vs. males) endorsed greater weight control expectancies (p<.0001), but there were no gender differences among Black (p=.49) and Hispanic (p=.23) smokers.

Conclusion: Beliefs about smoking-induced weight control and negative reinforcement may be more salient in some combinations of gender and race/ethnicity, but perhaps not others.

FUNDING: This research was supported by National Institute on Drug Abuse Grant R01-DA028631 and American Cancer Society Research Scholar Grant CPBB-RSG-13-163-01

JUSTIFICATION: The intersectionality of race and gender should be considered in smoking cessation programs to target smoking-related cognition that might be more salient in some combinations of gender and race/ethnicity, but perhaps not others.

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POS1-37
NEGATIVE URGENCY PREDICTS HEIGHTENED NEGATIVE AFFECT AND URGE DURING TOBACCO ABSTINENCE IN REGULAR SMOKERS

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Background: Negative urgency- the disposition to act rashly during periods of extreme negative emotional states- has been implicated in the etiology of smoking. However, the mechanisms linking negative urgency and smoking motivation are unclear. This study tested the hypothesis that negative urgency amplifies negative
emotions experienced during acute tobacco abstinence, which in turn increases the urge to smoke to suppress negative emotions as part of a mediational pathway that ultimately maintain smoking behavior in urgent individuals.

Method: Adult smokers (n=180, >10 cig/day) attended a baseline session at which self-report measures of negative urgency and other co-factors were administered and then two counterbalanced experimental sessions involving either 16 h of smoking abstinence or smoking as usual. At both experimental sessions, nicotine withdrawal symptoms, affect, and smoking urge were assessed.

Results: Negative urgency predicted larger abstinence-induced increases in withdrawal symptoms, negative affect, and urge to smoke to alleviate negative affect with and without controlling for baseline anxiety, depression, and sensation seeking (betas > .21, ps < .006). The predictive influence of urgency on abstinence-induced increases in urge to smoke to alleviate negative affect was mediated by greater abstinence-induced increases in negative affect (betas > .066, p < .003). Negative urgency did not significantly predict abstinence-induced changes in positive affect or the urge to smoke for pleasure (ps > .13).

Conclusion: These findings suggest a potential risk pathway whereby smokers with higher (vs. lower) negative urgency are prone to more severe negative affect states upon smoking abstinence, which in turn promotes an urge to smoke to suppress these negative emotions. These results also suggest affective specificity to aversive (vs. appetitive) mechanisms underlying the link between negative urgency and abstinence-provoked smoking motivation. Extending these findings to clinical populations and outcomes, such as relapse propensity and dependence, is warranted.

FUNDING: This research was supported by National Institute on Drug Abuse Grant R01-DA026831 and American Cancer Society Research Scholar Grant CPBB-RSG-13-163-01.

JUSTIFICATION: The findings can be applied to smoking cessation programs because they suggest that smokers with higher negative urgency smoke in order to reduce the negative affect experienced during smoking abstinence.

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POS1-38
COMPARISON OF NICOTINE PHARMACOKINETICS AND IMPACT ON CRAVING FOLLOWING SHORT-TERM CONTROLLED ADMINISTRATION AND AD LIB USE OF E-CIGARETTES AND CONVENTIONAL CIGARETTES

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This randomized, partially single-blinded, 6-period crossover clinical study was the initial characterization of the nicotine pharmacokinetics associated with blu e-cigarettes and assessment of whether the blood plasma nicotine levels obtained from e-cigarettes are comparable to conventional cigarettes and result in reductions in urge-to-smoke symptoms. Five e-cigarettes with different formulations containing 1.6% and 2.4% nicotine and a conventional cigarette were randomized among 24 subjects under two exposure scenarios consisting of a 30 minute controlled and a one-hour ad lib use period to assess pharmacokinetics and pharmacodynamics. Study results showed significant (p<0.05) increases in nicotine concentrations occurred within 10 minutes and significant (p<0.001) reductions from baseline smoking urge were observed within five minutes of e-cigarette use. E-cigarette and cigarette blood plasma levels were comparable up to one hour of use. After 90 minutes, nicotine exposure was the highest for the cigarette, with all e-cigarettes showing 23% to 53% less exposure comparatively. During controlled use, peak reduction in smoking urge for e-cigarettes occurred later than the cigarette, but after 90 minutes, smoking urge was 16% to 32% lower for each e-cigarette with statistically significant differences in most products. Nicotine content, vehicle differences, and the presence menthol did not significantly affect smoking urge, suggesting a possible threshold effect for nicotine and/or further reinforcing the importance of the substantial sensory and behavioral aspects of smoking that are mimicked by e-cigarettes.

FUNDING: This work was Funded by LOEC, Inc. d/b/a blu eCigs and the clinical study was conducted at Celerion in Lincoln, Nebraska.

JUSTIFICATION: These findings of this clinical study inform researchers and public health officials that e-cigarettes may be able to obtain reductions in smoking urge symptoms that comparable to conventional cigarettes, but at lower nicotine levels.

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POS1-39
INTERACTION OF DEPRESSIVE SYMPTOMS AND SMOKING ABSTINENCE ON DELAY DISCOUNTING RATES

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Introduction: delay discounting and depressive symptomatology have strong connections with smoking. However, few studies have examined interactions across delay discounting, depressive symptoms, and smoking status. Therefore, the primary goal of the current study was to assess the inter-relations across these three variables among adult seeking-treatment smokers.

Methods: delay discounting and depressive symptoms were assessed in ninety-nine smokers enrolled in a clinical trial for smoking cessation at intake and 6-month follow-up.

Results: participants with and without depressive symptoms did not differ in their discounting rates neither at intake nor at 6-month follow-up. However, delay discounting was significantly lower among abstainers at 6-month follow-up and, changes in discounting associated with smoking status were more pronounced among participants with depressive symptoms.

Conclusions: these results clarify the relationship between delay discounting and depressive symptoms among current and former smokers and suggest that decreases in impulsivity resulting from smoking abstinence are significantly greater among individuals with depressive symptoms vs. those who do not have depressive symptomatology.

FUNDING: Funding for the current study was provided by the Spanish Ministry of Science and Innovation Grant PSI2011-22804 and by a Predoctoral Grant Grant BP11-031 from the Foundation for the Promotion of Applied Scientific Research and Technology in Asturias.

JUSTIFICATION: The current study provides insight into the relationship between impulsivity and delay discounting resulting from prolonged smoking abstinence.

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POS1-40  SOCIOECONOMIC DIFFERENCES IN BASELINE PSYCHOSOCIAL FACTORS AMONG SMOKERS ENROLLED IN A TOBACCO DEPENDENCE TREATMENT STUDY IN HARLEM

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Lower socioeconomic status (SES) groups are more likely than higher SES groups to relapse after treatment for tobacco dependence. Understanding differences in psychosocial characteristics among SES groups will help identify new therapeutic targets to address this disparity. This exploratory study examined socioeconomic differences in psychosocial factors among smokers enrolled in a tobacco dependence treatment study. Factors included multiple measures of tobacco use, dependence, the perceived consequences of smoking, withdrawal, motivation, self-efficacy, stress, positive and negative affect, depression, anxiety, coping, general impulsiveness, self-control, delay discounting, perceived discrimination, and trauma experiences. SES was assessed by income and educational: SES1=lowest, SES2=middle, SES3=highest. The Kruskal-Wallis test was used to examine differences between SES groups. Participants (n=181) were 68.5% African American, 21.5% white, 9.0% other; 16% were Hispanic/Latino; 59.1% were SES1, 26.6% SES2, and 13.3% SES3. Significant (p<.05) differences were found on the Barratt Impulsiveness Scale (BIS) total and two of its subscales: Attentional Impulsiveness (AI) and Non-planning Impulsiveness (NPI); the Poor Regulation Scale total (PRS) and two of its subscales: Distractability (D), Delay of Gratification (DG); delay discounting of $100 (DD$100); and a subscale of the Smoking Consequences Questionnaire, Social Facilitation. Compared with SES3, SES1 reported greater NPI (p=.01) and more difficulty with self-control due to D (p=.05) and DG (p=.05). SES1 discounted $100 more than SES3 (p=.04). SES3 was more likely to smoke to facilitate social interaction than SES2 (p=.02). Painwise comparisons for the BIS total, the AI, and the PRS total were insignificant. The lowest SES smokers were characterized by greater impulsiveness in terms of non-planning, distractability, delay of gratification, and a greater propensity to discount future rewards. Impulsiveness represents an important therapeutic target for addressing socioeconomic disparities. Theoretical explanations and proposed interventions for addressing impulsiveness in treatment will be presented.

FUNDING: This study was funded by a grant from the National Institutes of Health National Institute on Minority Health and Health Disparities (R01 MD007054) and the National Cancer Institute (U54CA137788/U54CA132378).

JUSTIFICATION: These findings identify potential targets for the development of therapeutic interventions to improve the long-term efficacy of evidence-based treatment for tobacco dependence for groups of lower socioeconomic status.

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POS1-41  EFFECTS OF USING ELECTRONIC CIGARETTES ON NICOtINE DELIVERY AND CARDIOVASCULAR FUNCTION IN COMPARISON WITH REGULAR CIGARETTES

X. Sherwin Yan, PhD, MD, DABT*, Carl D’Ruíz, MPH, Scientific Affairs, A.W. Spears Research Center, Lorillard Tobacco Company, Greensboro, NC

The development of electronic cigarettes (e-cigs) has the potential to offer a less harmful alternative for tobacco users. This clinical study was designed to characterize e-cig users’ exposure to nicotine and carbon monoxide (CO), and to investigate the acute effects of e-cigs on the myocardial function in comparison with the effects of regular smoking. Five e-cigs and one Marlboro® cigarette were randomized for twenty three participants under two exposure scenarios from Day 1 to Day 11; half-hour controlled administration and one hour ad lib use. The nicotine plasma concentrations after 1.5 hour of product use (C90) were significantly lower in the users of e-cigs than of Marlboro® cigarettes. The combination of glycerin and propylene glycol as the vehicle facilitated delivery of more nicotine than glycerin alone. The heart rate, systolic and diastolic blood pressure were significantly elevated after use of Marlboro® cigarettes, but the elevation was less after use of most of the e-cigs. Use of e-cigs had no impact on the exhaled CO levels, whereas the Marlboro® cigarette significantly increased the exhaled CO more than 8 times above the baseline. In conclusion, e-cigs could be a less harmful alternative for tobacco users.

FUNDING: This study was funded by the LOEC, Inc. db/a blu eCigs.

JUSTIFICATION: The electronic cigarettes tested in this study delivered less nicotine to the body, induced less magnitude of increase in the cardiovascular parameters measured, and showed no change in CO exposure compared to regular cigarette smoking.

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POS1-42  NEGATIVE AFFECT AND MENTHOL STATUS PREDICT EARLY SMOKING LAPSE DURING A BRIEF LABORATORY-BASED QUIT ATTEMPT

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Many individuals who attempt to quit smoking lapse within the first 48 hours, with most lapses resulting in a return to regular smoking (Brown et al., 2005). Predictors of early lapses may be different than later lapses (Piasecki, 2006), and their identification may increase our understanding of tobacco dependence as well as facilitate the expedient delivery of lapse-responsive interventions, which could ultimately increase overall rates of smoking cessation. Using a laboratory-based model of smoking cessation, this study explored predictors of smoking lapse during a brief abstinence attempt. Eighty-one smokers completed self-report measures, smoked a cigarette in the laboratory, and completed computerized cognitive tasks. Participants were then given brief smoking cessation counseling (~30 minutes) along with a take-home booklet and instructed to abstain from smoking while being provided abstinence incentives (i.e., $40 for two days of biologically confirmed smoking abstinence). The majority of participants who lapsed within the first 2 days (29.6%, n = 24) did so within the first 24 hours (21%, n = 17). While lapse rates were roughly equivalent among males and females (29% vs. 31%), a greater percentage of menthol smokers lapsed compared to non-menthol smokers (35% vs. 14%). As predicted, binary logistic regression analyses revealed that lapsing within the first 24 hours was significantly predicted by measures of negative affect collected prior to abstinence even after controlling for menthol status and daily smoking rate (all p's < .05). For every one point increase on the Profile of Mood States Depression-Dejection factor, the odds of experiencing a lapse increased by 18.7%. Measures of nicotine dependence, abstinence confidence, depression, working memory (Letter N-Back), and decision making (Game of Dice Task) obtained prior to the abstinence attempt failed to predict early lapse. Future research examining predictors of early lapse and their underlying mechanisms is needed and laboratory models offer a controlled and time- and cost-effective framework for such inquiry.

FUNDING: This research was supported by Mellon funds from the College of Arts and Sciences at American University

JUSTIFICATION: This study sought to identify predictors of early smoking lapse during a two-day simulated smoking quit attempt. Identifying predictors of early lapse could serve to increase our understanding of tobacco dependence and facilitate the expedient delivery of lapse-responsive interventions, which could ultimately increase overall rates of smoking cessation.

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**POS1-43**

**KNOWLEDGE AND RESEARCH GAPS ON HEALTH OUTCOMES ASSOCIATED WITH WATERPIPE TOBACCO USE**

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Introduction: Waterpipes (also known as hookah) are used to smoke waterpipe tobacco (also known as shisha) which are available in a variety of flavors. Waterpipe tobacco acceptance and use, particularly among the youth, is increasing in the US and poses potential individual and public health risks.

Objective: Summarize existing knowledge and identify knowledge gaps on health impact of waterpipes.

Method: Five databases (Web of Science, PubMed, SciFinder, Embase and EBSCOhost) were searched from 10/2013 through 03/12/2014 and a systematic literature review was conducted.

Results: Available clinical data are relatively limited. Most published studies were conducted outside the US, had small sample sizes, and were cross-sectional. Few studies included youth or other vulnerable populations. Many users perceive waterpipes as more acceptable and “safer” than other tobacco products; users may not consider themselves to be smokers. However, studies of constituents show that smoke from a waterpipe may be as toxic as cigarette smoke. Due to burning charcoal used to heat the tobacco, waterpipe smokers are exposed to higher levels of carbon monoxide (CO) and carcinogens, such as benzene and polycyclic aromatic hydrocarbons (PAH), than cigarette smokers. The CO and PAH exposure occurs even with “tobacco-free” or “herbal” waterpipe use. Waterpipe use may be associated with adverse health outcomes including increased risk of cardiac events, certain types of cancers, mental health disorders, adverse pregnancy outcomes, and decreased lung function. One of the most serious health concerns is CO toxicity; multiple CO poisoning cases have been reported. The diagnosis of CO poisoning requires a high index of suspicion and more than routine diagnostic testing. Research gaps identified include additional study of short- and long-term health outcomes and studies on use by vulnerable populations such as youth and pregnant women. Additional well-designed studies, particularly longitudinal studies, will improve our understanding on the health impacts of waterpipe tobacco use.

FUNDING: No funding

JUSTIFICATION: Waterpipe tobacco acceptance and use, particularly among the youth, is increasing in the US and poses potential individual and public health risks.

CORRESPONDING AUTHOR: Ling Yang, MD, PhD*, Priscilla Callahan-Lyon, MD, Center for Tobacco Products, Food and Drug Administration.

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**JUSTIFICATION:** Understanding factors that influence ECIG nicotine delivery is critical for effective ECIG regulation.

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**POS1-45**

**BARRIERS TO SMOKING CESSATION IN PATIENTS ADMITTED TO A SUBSTANCE USE DAY TREATMENT PROGRAM**

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Most patients (>70%) in treatment for a substance use disorder also smoke cigarettes. Receiving smoking cessation intervention and quitting smoking are associated with an increased likelihood of abstinence from alcohol and drugs. However, the availability of smoking cessation services in substance use treatment settings is limited and quit rates are low. Examination of barriers to quitting smoking in these patients may aid in the development and implementation of effective interventions. Previous research has identified barriers to quitting among alcohol-dependent patients in residential treatment (Asher et al., 2003). In this study, we examined barriers to quitting in 60 patients in a substance use day treatment program, including associations between barriers and diagnosis (alcohol-only vs. drug use disorder), nicotine dependence severity (FTND), readiness to quit, and previous quit attempts. Barriers were assessed with the 11-item Barriers to Quitting Smoking in Substance Abuse Treatment (BQS-SAT) (Asher et al., 2003). Patients endorsed a mean of 6.59 (SD = 2.51) of 11 barriers. Almost all patients (90%) endorsed beliefs that quitting smoking would cause them to feel irritable and/or anxious. Additionally, 78% of patients believed that quitting smoking would make it more difficult to remain sober from alcohol and other drugs, and 42% reported that quitting smoking would make it more difficult to avoid triggers or avoid use drugs “so strong I won’t be able to stand it.” There were no significant differences in total number of barriers or in the proportion endorsing any specific barrier between patients with alcohol use disorder only (n = 24) vs. patients with drug use disorder (with or without alcohol use disorder, n = 36) (p > .05). Number of barriers endorsed was correlated with cigarettes smoked per day (r = .30, p = .02), readiness to quit (r = .46, p < .001) and number of previous quit attempts (r = -.26, p < .04), but not with FTND (p = .08). Findings suggest that correcting misconceptions about the impact of quitting smoking on sobriety from other substances and addressing other barriers may help to promote smoking cessation among smokers in substance use treatment.

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This research was conducted while the last author was at Alpert Medical School of Brown University and Butler Hospital.
POS1-46
IMPACT OF SMOKING CESSATION ON PSYCHOLOGICAL DISTRESS FOLLOWING CANCER DIAGNOSIS
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Introduction: Despite the health benefits of quitting smoking following a cancer diagnosis, some patients and health care providers wonder whether quitting smoking could be detrimental to patients’ psychological well-being. This study examined differences in distress between patients who quit smoking vs. those who continued to smoke following cancer diagnosis.

Method: Newly diagnosed cancer patients (N=141) who were current smokers participated in a randomized controlled trial of two cessation treatment interventions found to have an equivalent effect on smoking cessation. Participants also provided data on psychological distress. Items from the Hospital Anxiety and Depression Scale and Positive and Negative Affect Schedule were used to create indicators of mood/affect: anxiety, depression, positive and negative affect assessed at study enrollment and 6 months later. Self-reported smoking abstinence was biochemically-verified at the 6 month follow-up.

Results: The overall level of psychological distress was moderate. Controlling for baseline scores, quitters showed a greater reduction in anxiety (beta=-0.43, SD=0.15, p=0.005), depression (beta=-0.29, SD=0.14, p=0.037), and negative affect (beta=-0.34, SD=0.13, p=0.010) than smokers, as well as greater improvement in positive affect (beta=0.39, SD=0.16, p=0.020). There was no evidence of an interaction between baseline score and smoking status at follow-up.

Conclusion: Patients who quit smoking following a cancer diagnosis showed greater reduction in anxiety, depression, and negative affect and greater improvement in positive affect than patients who continued to smoke following diagnosis. These data support implementation of best practices tobacco dependence treatment in oncology settings and may reassure the oncology team, patients, and family members that quitting smoking can actually benefit, rather than adversely impact, patient mood and affect.

FUNDING: This research was supported by grants R01CA90514 and T32CA009461.

POS1-47
PRELIMINARY EVALUATION OF A SMOKING CESSATION INTERVENTION FOR VETERANS IN SUBSTANCE USE TREATMENT
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Smoking rates are particularly high among military members, veterans, and patients with severe mental illness, compared to the general population (e.g., Brown, 2009; Kirby et al., 2008). Review of the literature has shown that individual therapy increases the likelihood of cessation (Lancaster & Stead, 2005). Although effective, smoking cessation interventions targeted to veterans and the mentally ill have yielded low cessation rates (e.g., Zaborowski et al., 2011). This pilot study reports preliminary evidence of efficacy for a smoking cessation intervention targeting veterans seeking services at a substance use outpatient program at a Veteran Affairs Center. Fourteen veterans participated in this evaluation, with the intervention comprising 5, 45-minute long individual therapy sessions, 3 weekly follow-up sessions, and up to 1 year of monthly follow-up sessions. The sample had a mean age of 51 (SD = 9.17), was primarily male (79%), African-American (50%), with a High School degree or some college (57%), divorced (64%), unemployed (43%), and had a tobacco related illness (71.4%). All participants were in a substance use recovery program and the majority reported having one or more psychiatric illnesses (85.5%). At the end of treatment, 5 (35.7%) patients were abstinent. Two out of those five relapsed within weeks of their quit date, resulting in an abstinence rate of 21.4% at the 3rd week follow-up. All the patients who were abstinent at end of treatment and follow-up used NRT in conjunction with the intervention. All but one attended AA meetings on a weekly basis. Two patients relapsed weeks after their quit date, but completed the protocol for a second time and were abstinent at the 12-week follow-up after the second attempt. The intervention yielded abstinence rates at the end of treatment that are comparable to previous studies conducted with veterans and smokers from the general population and abstinence rates at follow-up are higher than previous studies. These results are encouraging and suggest the need for a fully-powered, controlled clinical trial with this population.

FUNDING: No funding

POS1-48
ECIG-INDUCED SUPPRESSION OF NICOTINE/TOBACCO ABSTINENCE SYMPTOMS IN SMOKERS: EFFECTS OF LIQUID NICOTINE CONCENTRATION
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Electronic cigarettes (ECIGs) produce a vapor by heating a nicotine-containing liquid. When cigarette smokers inhale ECIG vapor, suppression of nicotine/tobacco abstinence effects is observed. The extent to which different concentrations of nicotine in the liquid produce differences in abstinence symptom suppression has not been explored systematically. The purpose of this clinical laboratory study is to examine the relationship between liquid nicotine concentration and abstinence symptom suppression in tobacco smokers after short-term ECIG use.

In this ongoing study, 9 cigarette smokers (mean 15.3 cigs/day) used an “eGo” ECIG battery (3.3 V; 1000 mAh) attached to a dual-coil, 510-style cartomizer that was loaded with 1 ml of a flavored (tobacco or menthol) 70% propylene glycol / 30% vegetable glycerin liquid in four independent sessions that differed by the nicotine concentration placed in the cartomizer (0, 8, 18, or 36 mg/ml). In each session participants used the ECIG in two bouts (10 puffs; 30 sec inter puff interval) separated by 60 minutes at the start of each bout. Abstinence symptom severity was assessed before and after each bout using standard scales.

Data were analyzed using repeated-measures ANOVAs, with two factors: liquid nicotine concentration and time. In addition to a variety of main effects, significant interactions of concentration and time were observed on “craving” and “restless” [Fs (9, 72) > 2.20, ps < .05], with the 18 and 36 mg/ml concentrations causing greater decreases on these measures post-bout compared to 0 and 8 mg/ml. Similar patterns were observed with “intention” and “urge” [Fs (9, 72) > 1.98, ps < .06].

These results demonstrate that ECIG use suppresses abstinence effects in cigarette smokers. They also suggest that this abstinence suppression may depend on liquid nicotine concentration. Understanding the extent to which liquid...
nicotine concentration is related to withdrawal suppression and other effects is critical to empirically-based regulation of these products that may have both promise and peril for both individual and public health.

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JUSTIFICATION: Understanding the extent to which liquid nicotine concentration is related to withdrawal suppression and other effects is critical to empirically-based regulation of these products that may have both promise and peril for both individual and public health.

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POS1-49
ANALYSIS OF AGREEMENT BETWEEN EXPired-AIR CARBON MONOXIDE MONITORS

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Expired-air carbon monoxide (CO) is the primary objective method to assess recent (i.e. < 24 hrs) smoking exposure in clinical research. However, no studies to our knowledge have compared CO readings across CO monitor brands. The current study examined the level of agreement in CO readings between two popular CO monitor brands, BreathCO (Vitalograph) and piCO+ Smokerlyzer (Bedfont Scientific). Subjects were 41 adult smokers assessed after ad lib smoking or overnight abstinence (>12 hrs). All subjects were those who smoked at least 10 cigarettes per day for at least one year, had a mean (SD) age of 29.1(9.7), FTND 5.0(1.8), and 56% were male. Participants provided air samples following the directions specific to each CO monitor, with >5 but <10 mins between samples. Paired data collected across multiple visits were analyzed by the Bland-Altman method of Limits of Agreement using a regression-based model to allow for repeated measurements, nonconstant variance, and nonunimform differences. Overall, the CO readings between devices did not agree equally through the range of measurements, with larger differences (i.e., less agreement) as the CO values increased with more smoke exposure, Beta=.28, p<.001. Across the entire sample (253 observations), the piCO+ Smokerlyzer gave CO values averaging about 5 ppm higher than the BreathCO device. Looking at only those who were abstinent overnight (BreathCO CO<10ppm, 104 observations), the piCO+ Smokerlyzer gave CO values averaging about 2 ppm higher than the BreathCO device. For those with more recent smoking exposure (BreathCO CO>10ppm, 149 observations), the piCO+ Smokerlyzer gave CO values averaging about 7 ppm higher than the BreathCO device. When compared to the Vitalograph BreathCO, the Bedfont piCO+ Smokerlyzer provided consistently higher CO values across the range of measurement. These results indicate that CO values obtained across monitor brands may lack agreement, especially as the CO values increase.

FUNDING: Supported by NIH Grants DA35774 and DA35968.

JUSTIFICATION: The findings from this study suggest a lack of agreement in measurement between two popular CO monitor brands.

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POS1-50
INCENTIVE-BASED SMOKING CESSATION TREATMENT REDUCES SEVERITY OF PSYCHIATRIC SYMPTOMS IN PREGNANT & NEWLY POSTPARTUM WOMEN

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Previously, Lopez, Skelly, & Higgins (in press) indicated that, in addition to decreasing smoking, financial incentives for smoking cessation decreased postpartum depressive symptoms, as measured by the Beck Depression Inventory (BDI), in pregnant and newly postpartum women at-risk for depression. The purpose of the present study was to assess whether the intervention impacts a broader array of psychiatric symptoms as measured by the Brief Symptom Inventory (BSI). Participants were 289 pregnant cigarette smokers who participated in smoking cessation efficacy trials examining voucher-based financial incentives. They were assigned to an abstinence-contingent intervention or non-contingent voucher control condition. Based on their history of depression and BDI scores at intake, 120 participants were categorized as Depression-Prone (Dep+) and 169 as Depression Negative (Dep-). The BSI was administered at 8 time points starting in pregnancy through 24 weeks postpartum. Financial incentives significantly reduced BSI total scale scores, as well as, Depression and Anxiety subscale scores in all women in the aforementioned contingent condition. For Dep+ women, Somatization and Anxiety subscale scores were decreased. Among Dep+ women, financial incentives significantly reduced BSI total scale scores and 7 of 9 subscale scores starting in late pregnancy and continuing through 12-weeks postpartum. These results demonstrate that providing smoking cessation-based financial incentives to pregnant and newly postpartum women reduces psychiatric symptoms. This effect is especially evident among Dep+ women who experience reductions across a wide range of symptoms during the period when they are most at-risk for postpartum depression.

FUNDING: This research was supported by the Institutional Training grant T32DA07242 from the National Institute on Drug Abuse. The funding source had no role in the project other than financial support.

JUSTIFICATION: The results of this study demonstrate that providing smoking cessation-based financial incentives to pregnant and newly postpartum women reduces psychiatric symptoms, especially among depression-prone women who experience reductions across a wide range of symptoms during the period when they are most at-risk for postpartum depression.

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POS1-51
THE Efficacy OF Varenicline COMPARED TO PLACEBO FOR SMOKING CESSATION, USING A REDUCE-TO-QUIT STRATEGY: ONE RESEARCH CENTER’S RESULTS

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Purpose: Our primary objective was to compare the efficacy of varenicline to placebo for smoking cessation throughout the final ten weeks of treatment in subjects motivated to reduce their smoking with the ultimate goal of quitting.

Methods: More than 750 smokers contacted us, from which 49 smokers signed an informed consent form, thereby entering a 3-10 day screening phase. The subjects were smoking at least ten cigarettes per day. 44 subjects met all inclusionary criteria and were randomly assigned to varenicline 1 mg. BID or placebo BID (n= 22 per group). During the first 12-weeks “Reduction Phase,” smokers made incremental efforts to reduce their smoking. In the subsequent 12-week “Abstinence Phase,” participants were encouraged/counseled to be abstinent from smoking. Active pharmacotherapy was concluded at Week-24. Subjects then entered the 28-week “Follow-Up Phase” and completed their
participation at Week-52. Successful cessation was pre-defined as end-exhaled carbon monoxide (CO) measurement < 10 ppm, plus subject reports via the Nicotine Use Inventory (NUI).

Results: Statistically significant results were demonstrated at Week-12 (p<0.01) and numerous time points thereafter. At Week-28 the analysis of time to “First Quit” incidence demonstrated a 71% success rate for varenicline versus 32% for placebo (p<0.01). The sustained “Permanent Quit” analysis also demonstrated superior efficacy for varenicline (57%) versus placebo (28%), defined as a non-relapsing sustained successful quit effort and outcome (p<0.05). We analyzed nine baseline variables to investigate their potential impact on subjects’ cessation outcomes. Female gender (p<0.05), lower number of years smoking (p<0.01) and the higher the age when one started smoking (p<0.01) were all associated with a higher probability of successfully quitting.

Conclusions: Our results provide strong evidence that a Reduce-to-Quit cessation strategy can increase ones probability of success. The statistical evidence of varenicline’s efficacy demonstrated at our research center further highlight its value in helping smokers to successfully and permanently quit.

FUNDING: The clinical work performed was funded by a grant from Pfizer, Inc. Funding for the compilation of data and all of the statistical analyses was provided [internally] by Pharmacology Research Institute.

JUSTIFICATION: While the efficacy of varenicline has been published widely, these robust results utilizing a Reduce-to-Quit methodology are important for clinicians and patients, as well as fellow clinical scientists.

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POS1-52
EXTENDED TOBACCO DEPENDENCE INTERVENTION IN BUPRENORPHINE TREATMENT

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Tobacco dependence is prevalent in opioid treatment patients. This study used an innovative motivational system, combined with extended behavioral and pharmacological treatment, to produce abstinence in buprenorphine treatment patients. The primary hypothesis was that the Innovative System (IS) would be more effective than the Standard Treatment Control (STC) at 12 and 18 months after entrance into the intervention. Buprenorphine treatment patients (N=175) smoking more than 5 cigarettes per day (cpd) were randomly assigned to either IS or STC. Intent to quit smoking was not required. In STC, participants received a brochure on quitting, a list of local referrals, and an information sheet on obtaining cessation medication. In IS, participants were counseled using a computerized motivational counseling system at baseline and months 3, 6, 12. If an IS participant requested cessation treatment, they received combined pharmacotherapy and behavioral counseling. Pharmacotherapy was nicotine replacement treatment (NRT), and, if NRT failed, varenicline. Treatment was available for six months after initiation. Assessments were at baseline, and months 3, 6, 12, and 18. Seven-day biochemically verified point prevalence abstinence from cigarettes was the primary dependent variable.

Here, we present baseline descriptive data, and CO-corrected abstinence rates from months 3 and 6. The sample was primarily male (75%), Caucasian (71%), non-Hispanic (83%) and unemployed (60%). Mean age=40.4 years. Only 25.9% had a goal of quitting forever, and most (57.5%) smoked between 11-20 cpd. In IS, 54% of participants requested treatment that was offered as part of the intervention (pharmacotherapy and behavioral counseling), a higher percentage than found in previous studies. At 3 months, CO-verified 7-day abstinence rates were: IS=14.1%, STC=5.6%, p<0.05). At 24 weeks, IS=14.1%, STC=10%, p<.40. These preliminary results indicate high treatment acceptance rates in IS. Although abstinence rates were higher in IS at 3 months than in STC, it is unclear whether this superiority will be maintained to months 12 and 18, the critical points for hypothesis testing.

FUNDING: National Institute on Drug Abuse

JUSTIFICATION: This research, if successful with aid in reducing tobacco prevalence among opioid treatment patients, a group with a high prevalence of tobacco use.

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POS1-53
DOES ELECTRONIC CIGARETTE LIQUID NICOTINE CONCENTRATION AND USER EXPERIENCE INFLUENCE PUFF TOPOGRAPHY?

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Background: Electronic cigarettes (ECIGs) heat a nicotine-containing solution; the resulting vapor is inhaled by the user. Experienced ECIG users puffing behavior (topography) may differ from that of ECIG-naïve cigarette smokers. The extent to which puff topography is related to e-liquid nicotine concentration in either of these populations is uncertain.

Methods: Puff topography was measured in 8 ECIG-naïve cigarette smokers and 9 ECIG-experienced individuals using an “eGo” ECIG in 4 double-blind sessions that differed by e-liquid nicotine concentration (0, 8, 18, and 36 mg/ml). In all sessions, participants underwent two ECIG use bouts in which they took 10 puffs with a 30 second inter-puff interval.

Results: Mixed ANOVAs with group as a between-subjects factor (ECIG-naïve or experienced) and nicotine concentration and bout as within-subject factors were conducted. For puff duration and volume, significant main effects of nicotine concentration [Fs, (3, 45) > 4.0, ps < .05], bout [Fs, (1, 15) > 8.2, ps < .05], and group [Fs, (1, 45) > 5.8, ps < .05] were observed. Relative to ECIG-naïve individuals, those that were ECIG-experienced took puffs that were larger and longer. Both groups took longer and longer puffs in the second bout relative to the first. Paired samples t-tests revealed that collapsed across bout and group, participants took significantly larger and longer puffs when using 0 relative to when using 36 mg/ml nicotine solution (ts (33) > 4.0, ps < .01). No interactions were observed for any outcome.

Conclusions: The observed differences in topography between groups suggest that ECIG experience may alter puff topography, perhaps as an attempt to control nicotine delivery. In addition, larger and longer puffs observed in the 0 mg nicotine condition may indicate compensatory behavior when no nicotine is available. If ECIG topography influences nicotine delivery, it is relevant to understanding the subjective and physiological effects that ECIGs produce. Understanding this relationship may be critical to predicting and controlling individual- and population-level outcomes associated with these products.

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JUSTIFICATION: This study can facilitate understanding of specific factors that may influence nicotine delivery from ECIGs, such as puffing behaviors and e-liquid nicotine concentration, that will be critical for regulatory agencies when assessing the abuse potential and efficacy for smoking cessation associated with these products.

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Self-tailored Online Deposit Contracting to Promote Smoking Abstinence

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More innovative and effective treatments are required to aid the millions of smokers who attempt to quit unsuccessfully each year. We evaluated whether an Internet-based smoking cessation program would promote abstinence and whether participants would find it acceptable. Participants tracked and submitted their smoking levels twice per day using carbon monoxide (CO) meters and a study website. In addition to receiving educational information, participants made a monetary deposit of their choosing, which they could earn back for meeting individualized smoking goals. Following baseline, participants attempted to gradually reduce their smoking across 4 days and to completely abstain for the remaining 10 days of the study. Eight smokers enrolled and completed the single subject design study. During the reducing and abstaining phases, 15% and 53% of the samples were negative for recent smoking (CO < 7 ppm) compared to 1% during baseline. Average ratings of treatment acceptability were favorable across all components, especially for feedback and self-tracking features. This study suggests that an online monetary deposit contract system is a feasible, acceptable, and efficacious intervention to promote smoking abstinence. Abstinence rates were similar to previous deposit contract studies but lower than traditional contingency management treatments. Future applications that extend to mobile platforms and allow for smaller and more frequent micro deposits may be even more efficacious and acceptable.

FUNDING: No funding

JUSTIFICATION: Combining behavioral economic smoking cessation interventions, like deposit contracting, with innovative web-based technologies is feasible, efficacious, and could have widespread health benefits for smokers highly motivated to quit.

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Neural Correlates of Depression in Smokers – A Systematic Review of Imaging Studies

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Objectives: This systematic review aimed to examine the pattern and severity of tobacco use, readiness to quit, perceived personal health risk susceptibility of tobacco and importance of intervention, among patients on maintenance treatment with buprenorphine naloxone for opioid dependence (mostly on Heroin) with a view to plan systematic intervention at a clinic run by National Drug Dependence Treatment Centre, AIIMS, New Delhi.

Materials & Methods: Thirty males on treatment for opioid dependence on maintenance treatment were assessed using Tobacco Use Characteristics, Fagerström Test for Nicotine Dependence (smoker and smokeless tobacco user) (FTND), Readiness to Change questionnaire (RCQ), Smoker’s Perceived Health Risk Evaluation (SPHERE), Perceived Importance of Intervention scale.

Results: 93.4% of the subjects were smokers, 6.6% were using smokeless tobacco only whereas 3.3% were using both. Mean age of starting tobacco use was 13±2.3 years. Most were chronic users(15±5 years) and mean number of bids/day was 18.6±10. Mean FTND (measuring severity of dependence) score was 5.4 ± 2.3 among smokers. Perceived personal health and risk was poor and 75% subjects had never made an attempt to quit tobacco in the past. Currently, 37% were in precontemplation, 40% in contemplation and only 23% were in action stage of change. 43.3% considered intervention for smoking cessation important

Conclusions: Early age of onset, chronicity of tobacco use and moderate severity of nicotine dependence, low perception of harm from tobacco warrant clinical attention. Education regarding the enormous risks of continued tobacco use and provision of Motivation enhancement therapy considering the stage of change is important. An offer and provision of pharmacotherapy for tobacco cessation in this population is essential.

FUNDING: None

Background: There is uncertainty about the psychopathological mechanisms underlying the association between depressive symptoms and smoking behaviors.

Objectives: To summarize neuroimaging studies to better understand the neural correlates of depressive symptoms in tobacco smokers.

Data Sources: Search in PubMed, Web of Science and PsyCINFO database using the keywords “depressive OR depression” AND “tobacco OR nicotine OR smoke” OR cigarette” AND “neuroimage OR magnetic resonance OR smri OR structural magnetic resonance OR fMRI OR functional magnetic resonance OR pet OR positron emission tomography”.

Study eligibility criteria, participants and interventions: Original articles, which used neuroimaging, and presented neural findings regarding depressive symptoms and smoking.

Study appraisal and synthesis methods: The first and the last author read the abstracts of all the studies found in the search (n = 160). The inclusion and exclusion criteria were applied and 131 articles were excluded. Then, both authors read the remaining 29 studies.

Results: 19 studies were included in the review. In the phase of active/chronic smoking, depression is characterized as comorbidity and would be related to an increase of dopamine in the synaptic cleft and decreased MAO-A, what can explain a greater severity in both smoking behaviors and depressive symptoms, respectively. Stimuli-fMRI studies also showed there was a positive correlation between the level of depressive symptoms and a greater response to stimuli. In the withdrawal phase, depressive symptoms would be related to the withdrawal syndrome and increased MAO-A, and stimuli-fMRI studies showed that there is a negative correlation between level of depressive symptoms and reactivity to negative stimuli during abstinence.

Limitations: Risk of bias in individual studies, and across studies, was not assessed, and no method of handling data and combining results of studies was carried out.

Conclusion: These findings support a neural basis for the association between smoking behaviors and depressive symptoms that depends on the phase of smoking (abstinence or active/chronic use).

Registration: This review was registered at PROSPERO (2013-00237).

FUNDING: None
POS1-57
A LONGITUDINAL STUDY OF THE ROLE OF QUITTING BELIEFS IN UTILIZING SMOKING CESSATION ASSISTANCE

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Evidence supports the value of smoking cessation treatment for improving outcomes. However, studies consistently indicate that most cigarette smoking quit attempts are unassisted. A growing literature addresses the need to reduce cigarette smoking prevalence by increasing the use of assistance when attempting to quit. However, little is known regarding mechanisms influencing treatment utilization. To this end, the present study examined the effect of beliefs regarding ability to quit on utilization of assistance for smoking cessation. Specifically, we hypothesized a mediation model whereby the relationship between smoking and use of assistance is influenced by beliefs in one's ability to quit.

The present study included 474 of the 1,000 respondents who completed both baseline and follow-up California Smokers Cohort telephone surveys. Included were baseline current smokers who reported a 24-hour quit attempt at follow-up. Variables representing heaviness of smoking, beliefs in ability to quit and use of assistance were derived from survey items.

The hypothesized mediating model was tested using a product of coefficients method, controlling for demographics. Greater heaviness of smoking and lower belief in ability to quit were each significantly related to use of assistance (p's < .001). As hypothesized, quitting beliefs significantly mediated the relationship between smoking and use of assistance (a*b=0.19, 95% CI = -0.29 to -.010).

The present data support a mechanism whereby the effect of smoking rate on treatment utilization is mediated by beliefs in ability to quit. Greater belief in one's ability to quit may represent an obstacle to treatment utilization thereby reducing treatment utilization. To this end, the present study examined the effect of beliefs regarding ability to quit on utilization of assistance for smoking cessation. Specifically, we hypothesized a mediation model whereby the relationship between smoking and use of assistance is influenced by beliefs in one’s ability to quit.

FUNDING: State of California Department of Health

JUSTIFICATION: This study suggests public health marketing advice benefitting about quitting in order to improve utilization of smoking cessation treatments.

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POS1-58
DETERMINING MENSTRUAL PHASE IN TOBACCO USE RESEARCH: A REVIEW WITH RECOMMENDATIONS

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Menstrual phase has been found to be significantly associated with a several tobacco-related outcomes, including withdrawal symptomatology, cue response, nicotine response and cessation. Unfortunately, identification of menstrual phase in biobehavioral research has not been standardized. Therefore, there is a need to review the current strategies being used to identify menstrual phase and provide recommendations that will enhance methodological uniformity in the field.

We conducted a literature review via PubMed for “menstrual cycle” and “menstrual phase.” Our goal was to review current methods used to identify menstrual phase in women who had physiologically regular menstrual cycles. Therefore, we excluded articles that focused on exogenous hormones, postpartum, menstrual-related problems (e.g. anovulation), and infertility. We also excluded articles that included either younger (<18) or older (>45) study samples.

A total of 370 articles were initially identified. After exclusionary criteria were applied 33 articles remained, among which six different methods (self-report of onset of menses, basal body temperature (BBT), urinary luteinizing hormone (LH) testing, sex hormones via saliva samples, sex hormones via blood samples, and transvaginal ultrasound). The most common method used was self-report of onset of menses (32/33 articles). The least common methods used were BBT (1/33 articles) and transvaginal ultrasound (1/33 articles). We noted variation in the application of each method to determine menstrual phase, as well as the cost, burden, precision and accuracy of each method.

There is a lack of consistency in methodology used to determine menstrual phase. While transvaginal ultrasound is the gold standard, the use of this method is usually too costly and/or burdensome. Therefore, we recommend combining several methods to improve accuracy of phase identification as well as to minimize costs and burden. We also provide recommendations for reducing selection bias and confounding. The adoption of these recommendations will yield a decrease in misclassification bias within individual studies, as well as facilitate cross-study comparisons.

FUNDING: Support for this project was provided by the following Specialized Center of Research (SCOR) on Sex Differences grants: P50-DA033942 (S. Allen and A. Allen), P50-DA016511 (McRae-Clark, Saladin and Gray), and P50-DA033945 (McKee). Additional support was provided by National Institutes on Drug Abuse (K24DA038240; McRae-Clark) and the Building Interdisciplinary Research Centers in Women’s Health Grant (# K12HD055887; A. Allen) from the Eunice Kennedy Shriver National Institutes of Child Health and Human Development (NICHD), the Office of Research on Women’s Health, and the National Institute on Aging, NIH, administered by the University of Minnesota Deborah E. Powell Center for Women’s Health. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

JUSTIFICATION: This project provides methodological recommendations for identifying menstrual phase in biobehavioral research.

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POS1-59
A PRELIMINARY STUDY OF THE EFFECTS OF AN EXERCISE REGIMEN ON CRAVING AND USE OF CIGARETTES IN INDIVIDUALS WITH CONCURRENT COCAINE- AND TOBACCO-USE DISORDER

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The current study evaluated the effects of treadmill exercise on basic fitness measures and objective and subjective measures of nicotine use and craving in cocaine-dependent cigarette smokers. Participants were randomized to one of three exercise conditions: running, walking, or sitting (placebo condition). Exercise sessions were 30 min and conducted 3 times a week for 4 consecutive weeks.

There were no differences in demographic or drug use variables among Runners (N=10), Walkers (N=7) and Sitters (N=7). On average, participants were Black (71%), male (80%), 44.7±1.1 (Mean±S.E.M) years of age, and reported confirmed tobacco use for ~20 years. Participants smoked 12.4±1.8 cigarettes per day (CPD) for 26.4±2.1 years and had FTND scores of 4.5±0.6. Several metrics indicated clear distinctions among Runners vs. Walkers vs. Sitters, including mean distance covered (1.89±0.09, 1.19±0.14, 0±0 miles, respectively; p<0.0001) and calories burned (274.4±32.9, 134.6±10.5, 73.5±6; p<0.0001) during sessions. Remote physiological monitoring via Bioharness during sessions showed that the groups also differed according to mean maximum HR (p=0.0001) and respiration (p<0.0001). Across the 4-week study, exercise improved fitness measures including reducing body weight (-11.3±8.5, -4.0 ±2.9, +2.7±2.3 pounds; p=0.0001) and decreasing resting HR (-3.3±4.1, +5.2±2.6, +9±13.0 bpm; p=0.05). Though not statistically significant, exercise reduced Questionnaire of Smoking Urges scores (-5.2±3.4, -18.4±5.5, +1.4±5.5, p=0.25) and CPD (-2.0±2.1, -1.6±2.1, -0.5±1.8, p=0.82).

To our knowledge, this is the first study to evaluate the effects of a multi-week exercise program in individuals with concurrent cocaine and tobacco-use disorder. The data clearly show significant improvements in basic fitness measures though significant reductions in nicotine use and craving were not observed. This was a preliminary trial with a small sample size, so our power to detect statistically significant effects on cigarette use and craving outcomes was limited.

FUNDING: NIH DAO30722
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Results: Of 39 patients participating in the cessation program, 13% would have been misidentified based upon self-reported tobacco use “every day”, “some days”, or “not at all”. These patients were captured through assessing time since last cigarette use. Though 44% reported trying pharmacotherapy at least once in the past to try and quit, only 5% reported current use. Of 8 patients (21%) using e-cigarettes, none were using other pharmacotherapy to try and quit smoking. Prior quit attempts were reported by 62% of patients including 26% who reported trying to quit within the past year. High intent to quit smoking (score 7+) was reported by 77% of patients and 61% reported strong confidence in ability to quit. Though 74% of patients reported “lessening impact of current health problems” as a motivation to quit, only 3% reported “Dr’s encouragement/advice” as a motivation. Though 36% of patients lived or worked with a smoker and 41% reported having someone to help them quit or quit, only 3% reported having a health provider to help them quit. High concordance was observed between self-reported and biochemically confirmed tobacco use.

Conclusions: Cancer patients who actively participate in a dedicated tobacco cessation program may not receive adequate cessation advice or support from oncology providers. E-cigarette use by cancer patients may be more prevalent than FDA approved smoking cessation medications.

FUNDING: S. Lewis Cooper, MD, is supported as a Hollings Cancer Center Abney Clinical Scholar.
JUSTIFICATION: Cancer patients participating in a tobacco cessation program received little cessation support from oncology providers and demonstrated higher than expected E-cigarette use.

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POS1-60
BASELINE CHARACTERISTICS OF CANCER PATIENTS REFERRED TO A DEDICATED TOBACCO CESSATION PROGRAM USING A MANDATORY ASSESSMENT, MANDATORY REFERRAL APPROACH: A PILOT STUDY

S. Lewis Cooper, MD, Katherine Hoover, PhARMD, K, Michael Cummings, PhD, MPH, Matthew Carpenter, PhD, Kelly Crowley, PhARMD, David Marshall, MD, Dianne Wilson, Graham W. Warren, MD, PhD*, Medical University of South Carolina

Background: Cancer patients who smoke frequently do not receive tobacco cessation support from treating oncologists. Data suggest that mandatory assessment of tobacco use coupled with automated referral to a dedicated cessation program may increase access to cessation support, but there is little information on characteristics of cancer patients who participate in such a smoking cessation program.

Methods: Cancer patients newly referred for radiotherapy were screened using a structured tobacco assessment. Patients who self-reported tobacco use within the past 30 days were automatically referred to a dedicated cessation program. Pilot information on tobacco use, pharmacotherapy, willingness to quit, and existing support were reported.

FUNDING: The Beckley Foundation provided initial funding for this research, with continued funding provided by Heffter Research Institute. Support for Dr. Garcia-Romeu was provided by National Institute on Drug Abuse Grant T32DA07209.
JUSTIFICATION: This research represents a novel approach to smoking cessation combining established cognitive-behavioral therapy techniques with high-dose administration of a psychedelic drug to elicit brief, but powerful experiences, which may substantially decrease craving, and improve long-term treatment outcomes.

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POS1-61
PSYLOCYBIN-OCCASIONED MYSTICAL EXPERIENCES IN THE TREATMENT OF TOBACCO ADDICTION

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Psilocybin-occasioned mystical experiences have been linked to persistent effects including positive changes in behavior, attitudes, and values, and increases in the personality domain of openness in healthy volunteers. In an open-label pilot-study of psilocybin-facilitated smoking addiction treatment, 15 smokers received 2 or 3 doses of psilocybin in the context of cognitive behavioral therapy (CBT) for smoking cessation. Twelve of 15 participants (80%) demonstrated biologically verified smoking abstinence at 6-month follow-up. Participants who were abstinent at 6 months (n=12) were compared to participants still smoking at 6 months (n=3) on measures of subjective effects of psilocybin. Participants abstinent at 6 months showed significantly higher scores on a measure of psilocybin-occasioned mystical experience. No significant differences in general intensity of drug effects were found between these groups, suggesting that mystical-type subjective effects, rather than overall intensity of drug effects, are responsible for smoking cessation. Nine of 15 participants (60%) met criteria for “complete” mystical experience. Smoking cessation outcomes at 6-month follow-up were significantly correlated with measures of mystical experience on psilocybin session days, as well as retrospective ratings of personal meaning and spiritual significance of psilocybin sessions. These results suggest a mediating role of mystical experience in psychedelic-facilitated addiction treatment.

FUNDING: The Beckley Foundation provided initial funding for this research, with continued funding provided by Heffter Research Institute. Support for Dr. Garcia-Romeu was provided by National Institute on Drug Abuse Grant T32DA07209.
JUSTIFICATION: This research represents a novel approach to smoking cessation combining established cognitive-behavioral therapy techniques with high-dose administration of a psychedelic drug to elicit brief, but powerful experiences, which may substantially decrease craving, and improve long-term treatment outcomes.

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POS1-62
THE SOONER THE BETTER: AN EARLIER TARGET QUIT DATE PREDICTS SMOKING CESSATION OUTCOMES
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Having a target quit date (TQD) has been identified as a predictor of smoking cessation, but the evidence remains mixed on whether the timing of the TQD is in itself a predictor of a successful quit attempt. The purpose of this study was to determine if the TQD timing following a smoking cessation workshop was a predictor of smoking abstinence at follow-up.

A total of 5793 adult current cigarette smokers participated in a smoking cessation workshop that provided a one-hour psychoeducation session, a resource booklet, and a five-week pre-packaged kit of nicotine patch treatment. All participants were asked to choose a TQD within 30 days of the workshop. TQD latency in days was calculated as the difference between the workshop date and the TQD at the time of the workshop and were categorized as follows: from the workshop date to 14 days 68% (3934/5793), 15 to 31 days 32% (1852/5793). Seven participants did not list a quit date and were excluded from the analysis. Participants were contacted up to 4 times by email to complete a self-report survey at the end of treatment [5-week post TQD] and at 6 months post TQD.

2736 participants completed the 5 week survey and 2058 completed the 6 month survey.

Using binary logistic regression, TQD latency, Heaviness of Smoking index (HSI), quit confidence, quit importance, mental health comorbidity, gender and age were analyzed as predictor variables for 7-day point prevalence abstinence. Amount of NRT used was asked only at the 5 week survey and thus was only included for the 5 week model. When holding all other variables constant, participants who chose a quit date within the first 2 weeks were 1.38 times more likely to be quit at the end of treatment (95% CI: 1.12-1.69, p=.002) and 1.27 times more likely at the 6 months follow-up (95% CI: 1.01-1.61, p=.044).

TQD latency emerged as an independent predictor of cessation outcomes in exploratory analyses, when controlling for smoking and other baseline characteristics. Additional research is needed on whether participants who chose a later TQD should be encouraged to choose an earlier date, or should instead receive additional resources and motivational interventions.

FUNDING: Support for this research was provided by the Ontario Ministry of Health and Long-Term Care, Health Promotion Branch

JUSTIFICATION: Encouraging a target quit date within the first two weeks of starting treatment may improve quit outcomes.

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POS1-63
COMORBID MENTAL ILLNESS AND CHRONIC DISEASE AS A BARRIER TO SMOKING CESSATION: RESULTS FROM THE SMOKING TREATMENT FOR ONTARIO PATIENTS (STOP) STUDY
Catherine Goldie, PhD, RN*, Laurie Zawertailo, PhD,1,2, Sarwar Hussain, MSc1, Erin Cameron, MPH1, Anna Ivanova, MPH1, Peter Selby, MBBS, CCFP, MHSc, FASAM1,2, Nicotine Dependence Clinic at the Centre for Addiction and Mental Health, 2University of Toronto

Background: Tobacco users described as hardened to cessation efforts often have greater difficulty quitting due to high nicotine dependence and low motivation. Within this population, two subgroups are prominent: people with mental illness (MI), and people with chronic disease (CD). These patients necessitate special attention because they are the most at risk for tobacco related harms and many actively participate in smoking treatment. However, little is known how mental and physical health conditions interact to influence smoking cessation.

Method: In this cohort study, adult smokers (n=6,453, recruited 2011-2013) received up to 26 weeks of personalized nicotine replacement therapy and behavioral counseling delivered across 38 primary care settings. Quit rates were assessed 6-months after study enrollment. Four groups were used for analysis, participants with: MI alone, CD alone, comorbid CD and MI, and a control group of participants without MI or CD. Prevalence estimates for demographic, nicotine dependence, motivational and behavioral characteristics were assessed using descriptive statistics. Associations between participants with and without MI and CD and 6-month post-intervention quit rate were then estimated using logistic regression models.

Results: Participants with both MI and CD were more likely to be socio-economically disadvantaged, have high levels of nicotine dependence, initiate smoking at an early age, and have more quit attempts compared to other groups. Among participants who consented to participate, 1,985 (29%) had complete follow-up data. Based on an intent-to-treat analysis, there was no association between having MI alone (OR 0.70 [95% CI 0.51, 1.21]) or CD alone (OR 0.75 [95% CI 0.52,1.10]) and the 6-month quit rate. However, participants with comorbid MI and CD were less likely to remain quit at 6-month follow-up compared to participants without MI or CD (OR 0.44 [95% CI 0.28, 0.70]).

Conclusion: People with multiple complex health conditions do not achieve the same abstinence rates as other treatment seekers. Investigation into treatment and contextual factors that facilitate or hinder smoking cessation in this group is warranted.

FUNDING: This study was funded by the Ontario Ministry of Health and Long-Term Care. Catherine Goldie is supported through a Centre for Addiction and Mental Health Postdoctoral Fellowship.

JUSTIFICATION: This paper informs clinical practice as it examines a group of patients that have traditionally been viewed as hardened to cessation efforts, explores 6-month abstinence rates as well as hypothesized barriers to quit success.

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POS1-64
DIFFERENCES IN SMOKING BEHAVIORS AND SMOKE EXPOSURE BY NICOTINE METABOLITE RATIO IN LITTLE CIGAR SMOKERS
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The rate of nicotine metabolism alters smoking behaviors. Faster nicotine metabolizers smoke more and puff more vigorously on cigarettes, have greater smoke exposure, and have greater nicotine dependence and rates of lung cancer. Little cigars are significantly less expensive; are less regulated; and are perceived as less harmful, than cigarettes. Little cigar sales have doubled over the past decade and are an emerging health concern. The goal of the current study was to examine the effect of rate of nicotine metabolism on smoking behaviors and smoke exposure when switching from cigarettes to little cigars.

Study eligibility consisted of current daily cigarette smoking with an established history of cigar use, and being identified as slow or fast nicotine metabolizers (3-hydroxycotinine: cotinine values of < .26 and > .42, respectively) as determined from a blood sample. The study sample was predominantly male (80%), African-American (63%), with a mean age of 41.5 (SD=12) years and moderate nicotine dependence (FTND 5.4 (SD=1.8)). 90 participants (46 fast and 44 slow) were equally randomized to Black and Mild or King Edward little cigars and attended 5 laboratory sessions over 20 days: a 5 day cigarette smoking period then a 15 day
little cigar smoking period. Behavioral measures consisted of smoking topography and daily use; biological measures included breath carbon monoxide (CO), total nicotine equivalents, NNK and mercapturic acids.

Results indicate that fast nicotine metabolizers smoke more daily little cigars than slow nicotine metabolizers. In particular, fast metabolizers randomized to King Edwards smoke significantly more than slow metabolizers (9.1 vs. 5.9, p=.04); a contrast to having comparable initial cigarette smoking rates. Increased smoking behavior had an effect on smoke exposure. CO was significantly greater for fast metabolizers than slow metabolizers (p=.04). CO increased in slow metabolizers by approximately 25% when switching to little cigars; CO increased by 36% in fast metabolizers. Results suggest that faster nicotine metabolizers may be at increased risk for greater use and greater smoke exposure when using little cigars.

FUNDING: Funded by: U01-DA-020830-09S1 (Lerman and Tyndale)

JUSTIFICATION: This study is among the first to examine use pattern and toxin exposure in little cigar smokers at a brand specific level and by examination at the individual difference level using heritable markers.

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POS1-65
HEALTH RISK BEHAVIORS IN A RISKY PROFESSION: THE TOBACCO AND ALCOHOL USE OF FIREFIGHTERS IN THEIR FIRST YEARS OF SERVICE

Suzy Bird Gulliver, PhD1,2, Michelle Pennington, BA1,2, Victoria Torres, BA1,2, Samantha Synett, BA12, Rose T. Zimering14, Baylor Scott and White Healthcare, TAMUCOM, VA Boston Healthcare System, Boston University

Firefighters’ occupational exposure places them at risk for multiple health complications including increased cardiovascular disease and higher rates of mental health problems like PTSD (Meyers et al., 2011; Kimbrel et al., 2011) Professional departments typically make tobacco abstinence a condition of employment, yet our early work shows that firefighter recruits relapse to tobacco use in the first year, and that for those relapers, alcohol use is increased as well, irrespective of exposure to traumatic stress (Vanderveen et al., 2012). Here, we expand on the earlier study of 324 firefighter recruits by assessing smoking status and its correlates over the first three years of service. At baseline, 3% were current smokers. At annual 1, smokers made up 5.3% of the sample, and at Annual 2, 6.6% of the sample smoked. At our final follow-up, only 4% smoked. However, other tobacco use steadily increased over time, with 6.5%, using other tobacco at Year 1, 7.1% at Year 2, and 8.4% at Year 3. Smokers and other tobacco users were heavier drinkers at all time points, and this relationship appears to be independent of traumatic exposure. Additional analyses of this complete data set are underway. We anticipate that tobacco relapse and movement between tobacco use groups will continue to relate to other health risk behaviors such as heavy drinking. The public health and public safety implications are discussed.

FUNDING: This project was funded by an NIH award R01 MH73808 to the first author.

JUSTIFICATION: Stress and coping models of tobacco relapse can be explored in a sample of high-stress-exposed workers like firefighters.

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POS1-66
WHAT DO YOUNG ADULTS DEFINE AS “SMOKING?” A STUDY OF INDIVIDUAL DIFFERENCES

Amy S. Farrell, MA1, Leslie A. Robinson, PhD, Jeannelle S. Ali, MS, The University of Memphis

Study validity often depends on accurate self-reports of participant smoking. However, a dearth of empirical literature exists addressing how individuals define what a ‘smoker’ is. Methods used to assess self-reports of tobacco use vary from study to study, and associations between a smoker’s identity and researcher-derived categories do not always coincide. The purpose of this study was to explore individual differences in how young adults define smoking.

Data were drawn from a young adult cohort of a longitudinal study of risk factors for smoking onset. A measure of what constitutes ‘smoking’ was created, ranging from restrictive definitions of smoking to unrestricted definitions. An unrestricted definition would include those that smoked even at the lowest levels. A 3-way factorial ANOVA was conducted, using ethnicity, gender, and smoking level as predictors of the degree of restriction in participants’ definition of smoking.

Results revealed an interaction effect between ethnicity and amount smoked, F (1, 197) = 6.80, p = .01. Among LITS, Caucasians were more likely to have a more restrictive definition of smoking than African Americans. In contrast, among heavy smokers, Caucasians were more likely to have an unrestricted definition of smoking when compared to African Americans. The main effect of smoking level was also significant, F (1, 197) = 5.79, p = .017, with heavy smokers being more likely to be unrestricted in their definition of smoking as compared to LITS.

In summary, African Americans who smoked heavily, Caucasian LITS, and LITS in general were more likely to be restrictive in their definition of smoking, meaning they were less likely to include themselves as smokers on self-report measures. In contrast, Caucasians who smoked heavily and heavy smokers in general were more likely to include themselves as smokers on self-report measures. Together, these findings suggest that simply asking about participant smoking level is not a sufficient measurement strategy, because young adults do not interpret the term smoking in a homogeneous way. Individuals should be asked about specific levels of use, not whether or not a participant is a smoker.

FUNDING: This research was supported by the National Institutes of Health, HL50723

JUSTIFICATION: Because individual differences exist among ethnic groups and different levels of smokers, measurement to identify smokers can be improved in clinical research, clinical practice, and public health settings.

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POS1-67
MENTAL DISORDERS ARE ASSOCIATED WITH SMOKING ABSTINENCE MOTIVATION AND CESSATION ATTEMPTS AMONG INDIVIDUALS IN OPIATE DEPENDENCE TREATMENT

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More than 80% of people in opiate dependence treatment smoke, and cessation interventions fail to achieve long-term outcomes in this population. Understanding how mental disorders influence smoking behavior and attitudes in this population could aid the development of more effective interventions for opiate dependent smokers. Participants (n=116), recruited from two urban methadone clinics, completed the Millon Clinical Multiaxial Inventory–III and were asked about their smoking behavior and smoking abstinence motivation. Almost all reported current smoking (89%); 71% ever made a quit attempt; and, 54% percent had goals to quit smoking or remain abstinent. Almost all participants (97%) had a mental disorder other than a substance use disorder; 80% had a mood or anxiety disorder; and, 93% had clinically significant traits of at least one personality disorder. We used the Least Absolute Shrinkage and Selection Operator method, a novel statistical method for dealing with high-dimensional covariate data.
to develop models predicting ever making a quit attempt and having a goal to quit smoking or remain abstain. Demographics, mental disorders, and specific traits of individual personality disorders were entered into the models. Schizoid, avoidant, histrionic, negative, and borderline personality disorders as well as specific traits of schizoid, depressive, dependent, histrionic, antisocial, sadistic, negative, masochistic, schizotypal, and paranoid personality disorders were selected as predictors of ever making a quit attempt, with a c-statistic of .85 (95% CI: .77, .93). Race, anxiety, bipolar, thought, and delusional disorders, narcissistic and schizotypal personality disorders, and specific avoidant, dependent, and negative personality disorder traits were selected as predictors of having a goal to quit smoking or remain abstain, with c-statistic of .80 (95% CI: .71, .88). Interventions for opiate dependent smokers may have underestimated the high prevalence and impact of mental in this population. Future studies should explore new and/or adapted interventions to help these highly co-morbid smokers quit or reduce harm.

FUNDING: Supported by NIDA grant #K23DA025049.

JUSTIFICATION: Understanding how mental disorders influence smoking behavior and attitudes in this population could aid the development of more effective interventions for opiate dependent smokers.

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POS1-69

RXCOACH™: DEVELOPMENT AND EVALUATION OF A MOBILE APP TO INCREASE TOBACCO CESSION MEDICATION ADHERENCE

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Introduction: Although effective tobacco cessation medications exist, the impact of these medications is diminished by lack of adherence. Factors that are commonly associated with poor adherence to medication therapy include: medication side effects, lack of patient-provider communication, and complicated dosing schedules. A mobile health application (app) could help overcome these barriers. We developed and evaluated RxCoach™, a prototype iPhone mobile app to increase adherence to varenicline. Methods: The study was conducted in three stages: 1) A developmental stage consisting of app content creation, interface design, prototype app programming and revisions based on input from our consultant, iterative focus groups, and user testing with 15 smartphone users; 2) A feasibility test of the prototype app with five participants; and 3) A supplemental stage in which a barcode scanning feature was developed and user tested with 10 participants. Results: At the 1-month feasibility assessment, 80% of participants reported current use of varenicline. The average number of days reported for taking medication was 28 out of the past 30 days. All participants (n=5) reported never forgetting to take their medication. 40% of participants reported refilling their prescription once, 40% twice, and 20% did not refill (due to side effects). At the 3-month assessment, 20% reported using varenicline, as 60% had finished their course of treatment, and 20% had stopped due to side effects. The mean number of days of use was 63.7 over the past 90 days. 75% of participants reported never forgetting to take their medication. 20% reported refilling their prescription once, and 80% reported filling their prescription three times (the maximum) over the past 90 days. Participants liked the program overall, thought it was easy to use, found it helpful, and would recommend it to others. Conclusions: The use of RxCoach™ resulted in good medication adherence, received high consumer satisfaction ratings, and demonstrated substantial feasibility and usability. We plan to expand to Android and Windows Phone devices, and to include OTC and other prescription tobacco cessation medications.

FUNDING: This research was funded by a grant from the National Cancer Institute (Grant #R41-CA162502).

JUSTIFICATION: The RxCoach™ mobile app facilitated take medication adherence, which could lead to enhanced cessation outcomes as well as improved adherence to other types of medication.

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POS1-68

ATTITUDES, BELIEFS, AND PRACTICES REGARDING ELECTRONIC NICOTINE DELIVERY SYSTEMS IN PATIENTS SCHEDULED FOR ELECTIVE SURGERY

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Introduction: Smokers are at increased risk for postoperative complications after surgery. Although the duration of abstinence needed to reduce risk has not been defined, evidence suggests that even a brief period of abstinence may be beneficial. Electronic Nicotine Delivery Systems (ENDs or e-cigarettes) could be a useful method to reduce harm in the perioperative period. This pilot study examined the attitudes, beliefs, and practices of smokers scheduled for elective surgery regarding e-cigarettes.

Methods: This was a cross-sectional survey of current cigarette smokers who were scheduled for elective surgery at Mayo Clinic Rochester and evaluated in a preoperative clinic. Measures included demographics, smoking history, two indices assessing perception of how smoking influenced health risk, e-cigarette use history, and three indices assessing interest in, perceived benefits of, and barriers to using e-cigarettes in the perioperative period.

Results: Among the 112 smokers who completed the survey, the majority (62, 55%) had tried e-cigarettes and 24 (21%) reported current use. The most common stated reason for using was to quit smoking. Approximately 2 in 3 subjects would be willing to use e-cigarettes to help them eliminate or reduce perioperative cigarette use, and similar proportions perceived health benefits to doing so. Of the factors studied, only having made a quit attempt within the last year was significantly associated with higher interest in the perioperative use of e-cigarettes. Compared with subjects who had tried e-cigarettes (n=62), those who had never tried e-cigarettes (n=50) had a significantly higher interest in the perioperative use of e-cigarettes.

Conclusions: A substantial proportion of patients scheduled for elective surgery has tried e-cigarettes and would consider using them to reduce perioperative consumption of cigarettes. The relatively high level of interest in using e-cigarettes to maintain perioperative abstinence suggests that this strategy could be feasible and of potential benefit (provided e-cigarettes are efficacious) on a population level.

FUNDING: No funding
POS1-70
ENHANCEMENT OF SENSORY REINFORCEMENT FROM NICOTINE VIA CIGARETTE SMOKING
Kenneth A Perkins*, Joshua L Karelitz, Department of Psychiatry, University of Pittsburgh, Pittsburgh PA

Nicotine intake enhances reinforcement from rewards not directly related to nicotine, as shown in research with animal models and, more recently, with humans. However, this nicotine effect on reinforcement enhancement may not apply to all rewards but specific to rewards consisting of stimuli that are “sensory” in nature. This study compared acute nicotine amounts (via brief controlled cigarette smoking) on responding for music or video sensory rewards, for non-sensory monetary reward, or for no reward (control), to examine the generalizability of the rewards enhanced by nicotine. In a within-subjects design, 20 dependent smokers participated in three very similar experimental sessions, with each following overnight abstinence (>12 hr; CO<10 ppm). These 3 sessions, differing only in cigarette smoking condition, involved no smoking, smoking denicotinized (“denic”, 0.05 mg), or smoking nicotine (0.6 mg) Quest brand cigarettes (in a controlled manner) before responding on an operant computer task for small units of each reward. Rewards, of equal reinforcing efficacy under abstinence conditions, were made available singly on separate task trials using the same progressive ratio schedule of reinforcement. Reinforcing effects of music and video rewards (both p<.05), but not of money, were significantly greater due to the nicotine vs. denic cigarette (i.e. nicotine per se), while there were no differences between the denic cigarette versus no smoking (i.e. smoking behavior per se), except for the no reward trial. These effects were not influenced by relief of withdrawal from smoking either cigarette. Our results, showing that nicotine enhancement of reinforcement generalizes from an auditory to a visual reward, confirm that acute nicotine per se enhances the reinforcing value of sensory rewards. Findings also suggest nicotine’s effects on the reinforcing value of other (perhaps non-sensory) types of rewards may be minimal.

FUNDING: Supported by NIH Grant DA35774.

JUSTIFICATION: Persistence of smoking may be partly due to nicotine’s reinforcement enhancing effects, in addition to its primary and secondary reinforcing effects.

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POS1-71
PREVALENCE OF DEPRESSION AND OTHER NON PSYCHOTIC MENTAL DISORDERS IN PATIENTS ASSISTED IN A UNIT OF SMOKING CESSATION AT PRIMARY CARE LEVEL IN BUENOS AIRES CITY: A CROSS-SECTIONAL STUDY
Karina N. Agolino, MD, Adriana A. Angel, MD, Sandra N. Braun, MD*, Diego Sanchez Gelos, MD, Smoking Cessation Unit, Hospital de Clinicas, University of Buenos Aires, Argentina.

Several researches showed that the prevalence of anxiety and depression are higher in smokers. There is significant variability in the literature depending where studies were conducted: general population, primary care or smoking cessation clinics. In Argentina, there is no studies that describe prevalence in this area.

Objective: to describe the prevalence of depression and non-psychotic mental disorders (NPMD) in patients treated at a smoking cessation unit. In addition, the prevalence of previous psychiatric disease and use of psychotropic drugs in this population are described

Method: This study was conducted in outpatients assisted during 2008 to 2014 at the Smoking Cessation Unit of the “Hospital de Clinicas”, University of Buenos Aires, Argentina. The sample included 665 patients selected systematically. In addition, demographic data, data related to their smoking behavior, previous psychiatric disease and current medication were surveyed. To assess depression and NPMD we applied the Beck’s Test and the Self Reporting Questionnaire (SRQ-20, developed by WHO) respectively. All instruments were locally validated.

Results: All agreed to participate. The sample of 665 patients had 65.71% of women, with mean age of 51 years (SD±12), 49% with university level. They reported a consumption of 25 cigarettes/day (SD±13.27) and a mean for Fagerström score of 5.05 (SDs 2.44).

The NPMD prevalence was 60.9% (n=405) and depression of 15.49% (n=103). Previous psychiatric disease reported was 24.1%, the two most common diagnoses were depression 12.5% and 5.9% anxiety disorders. More than the half of the sample, 53.68% (n=357) consumed some kind of psychoactive drugs, 40.3% of them as a single medication.

The NMPD prevalence was 60.9% (n=405) and depression of 15.49% (n=103). Previous psychiatric disease reported was 24.1%, the two most common diagnoses were depression 12.5% and 5.9% anxiety disorders. More than the half of the sample, 53.68% (n=357) consumed some kind of psychoactive drugs, 40.3% of them as a single medication.

Logistic regression analysis showed that female gender (OR = 2.95 CI 1.32-3.08) and age older than 60 years (OR = 2.40 95% CI 1.23-4.68) were associated with the diagnosis of NPMD. While, living alone (OR = 2.59 95% CI 1.33-5.04) and being unemployed (OR = 2.6 95% CI 1.09-6.61) were associated with depression.

Conclusions: Prevalence of NPMD and depression in this sample of smokers were high, but is necessary more data to generalize these findings.

FUNDING: No funding.

JUSTIFICATION: As depression and others non-psychotic mental disorders are well-known negative predictor of quitting it is necessary to implement the systematic screening in smoking cessation units in Argentina.

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POS1-72
SHORT TERM EFFECTIVENESS OF ONE SMOKING CESSATION UNIT IN BUENOS AIRES CITY SINCE 2008 TO 2013: PROSPECTIVE COHORT STUDY
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Although there is sufficient evidence about the effectiveness of smoking cessation treatments, there are few reports on this topic in our country. This study evaluated the interventions applied in the Smoking Cessation Unit (SCU) of the “Hospital de Clinicas” (University of Buenos Aires) following the “Russell Standard (Clinical)”. They were established by the National Health Service (UK) to assess the performance of the Stop Smoking Services. A recent evaluation of their performance in the first 10 years found rates of abstinence at four weeks about 35%.

Objective: To assess the effectiveness of the intensive interventions in patients assisted in the SCU during 2008 to 2013 at four weeks and to identify predictive factors associated with the success of the treatment.

Methods: Since to 2008 to 2013, 820 patients were attended at the SCU. Only those who completed at least one treatment session (n=454) were included in the analysis. It were collected demographics data, data related to addictive behavior and the prevalence of non-psychotic mental disorders (NPMD)by the implementation of the “Self Reporting Questionnaire” Test (SRQ-20, developed by WHO) which was locally validated, more than 7 points means probably NPMD. Cessation rates at 4 weeks were obtained by self-reporting and measurement of CO in expired air.

Results: The sample included 55.4% (n=454) who started treatment. The mean age was 52 years (SD±13), 63% were women and 49% had university level of education. The mean number of cigarette/day was 25 and the mean for the Fagerström score was 5.14. There were no significant differences between abstinence or not abstinence in demographic variables, but the abstinence group smoked less number of cigarettes/day and had more previous quit attempts.

The abstinence rate at 4 weeks was 44.49% (n=202), 42.95% validated by CO and 1.54% by self-report. The predictors of abstinence at 4 weeks were to be referral by the staff (OR = 2.31 95% CI 1.32-4.07) and SRQ-20 test less than seven (OR = 0.83 95% CI 0.5-1.36). The relapse rate at 52 weeks was of 14% (n=27).


Poster Session 1 • Thursday, February 26, 2015 • 11:30 a.m.–1:00 p.m.
Conclusions: Satisfactory rates of abstinence at short-term were obtained, FUNDING: No funding.

JUSTIFICATION: This study looking for showing and disseminate a standardized way to evaluate the effectiveness of smoking cessation units in Argentina.

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POS1-73
DOES MENTHOL PREDICT SHORT TERM QUIT RATES IN SMOKERS SEEKING INTENSIVE TREATMENT?

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Objective: To investigate whether preference for menthol cigarettes influences quit rates after a month of group smoking cessation treatment.

Design: Outpatient medical practices in Hershey Pennsylvania area.

Methods: Participants were 225 smokers of at least 5 cigarettes per day, aged over 21 years and willing to make a quit attempt in the next 30 days. 105 (47%) were menthol smokers. At the initial visit all participants completed a comprehensive baseline assessment. 120 were randomly allocated to receiving motivational feedback on their lung function. All participants were then offered 6 weekly group smoking cessation sessions and transdermal nicotine patches and followed up 28 days after the target quit date. The primary outcome measure was 7-day point prevalence tobacco abstinence, biochemically-confirmed by exhaled carbon-monoxide less than 10ppm.

Results: Menthol and non-menthol smokers had similar baseline cigarettes per day (17.7 v 17.5) and plasma cotinine concentrations (244 v 238 ng/ml). Menthol smokers were less likely to quit, (47 v 56%), and this was significant (p<0.024) when controlling for other significant baseline predictors (dependence, confidence, weight concern, baseline stress, and having received substance use treatment). There was no effect of lung function feedback on smoking cessation.

Conclusion: Consistent with many prior studies, menthol smokers appear to have a lower quit rate when trying to quit.

FUNDING: This study was funded by the Cancer Institute at Penn State College of Medicine.

JUSTIFICATION: Mentholated cigarettes may be harder to quit.

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POS1-74
CIGAR USE AMONG ADOLESCENT TOBACCO SMOKERS

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Introduction: Although cigarette use among adolescents is on the decline, the rate of cigar use is high, with as many as 13% reporting use in 2012. When a brand specific item, such as Black & Mild, was added to surveys asking about cigars, reported use increased to 21%. Increasingly small cigars and cigarettes differ little in appearance, but greatly in regulation: cigars can be sold singly and with flavors. To accurately assess adolescent tobacco exposure, an understanding of how adolescents report cigar use, as well as the correlates of use, is critical. This study examined adolescents’ self-reported cigar use and co-use with cigarettes.

Methods: The sample was N=186 cigarette smokers aged 13-17 years old, living in the San Francisco Bay Area. Measures assessed demographics, nicotine dependence, cigarette and cigar use, the latter assessed: (1) as an option for cigarette choice among those who reported smoking a cigarette in the past 30 days (i.e., Black & Mild), and (2) queried separately as, “have you smoked a cigar in the last 30 days.”

Results: Past-month cigar use was reported by 51 adolescents (27%), this number increased to 76 (41%) when identifying cigar use by brand name. Cigar use did not differ by gender (p=.53). African Americans (80%) were more likely to smoke cigars than Whites (30%, p<.01) or participants identifying as more than one race (40%, p=.05). Cigar users smoked fewer cigarettes per day than cigarette only users (2.3 versus 3.2, p=.04), yet levels of nicotine addiction as measured by the HONC (p=.35) and number of prior quit attempts (p=.44) did not differ by group. Group differences were found on the mFTQ, with cigar users found to be less likely to report inhaling (p<.01).

Conclusion: The distinction made in research and regulation between cigars and cigarettes is blurred among users. Assessment only of cigar use would have missed a third of the adolescent users in this sample. Despite smoking fewer cigarettes per day, co-users of cigars had similar levels of dependence. To capture a more accurate portrait of tobacco use and dependence among adolescents, surveys of use ought to broaden the definition to include brands names of cigars.

FUNDING: This study was conducted while the first author was at the University of California, San Francisco. Funding for this study was provided by NIDA Grant R01DA036508.

JUSTIFICATION: To capture a more accurate portrait of tobacco use and dependence among adolescents, surveys of cigar use need to broaden the definition to include brand names.

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POS1-75
SHOULD THE CARBON MONOXIDE (CO) CRITERIA TO VERIFY NONSMOKING STATUS BE LOWERED FROM 9 TO LESS PPM?

Shari Hrabovsky, MSN, CRNP*, Susan Veldheer, MS, RD, Jessica Yingst, MS, Erin Hammett, BS, Jonathan Foulds, PhD, Penn State College of Medicine

Objective: To describe the CO levels of participants in a smoking cessation trial to inform decisions about appropriate CO cut-points.

Methods: Participants were 225 smokers of a Randomized Controlled Trial who smoked >4 cigarettes per day, aged ≥21 years and willing to make a quit attempt in the next 30 days. At initial assessment all participants had exhaled CO measures recorded. Weekly smoking cessation sessions were conducted for 6 consecutive weeks starting shortly after the assessment visit with the target quit day (TQD) being the 2nd group session. At each visit self report of past week smoking status was taken in addition to a CO measurement. Participants were provided with transdermal nicotine patches and followed up one month after the TQD. The primary outcome measure was 7-day point prevalence tobacco abstinence, biochemically-confirmed by CO<10ppm.

Results: The intent-to-treat CO-verified <10 quit rate was 52% at one month and 28% at 6 month. Over 99% of participants had a CO>3 at assessment and 86% were >9, mean CO 20.63. Within 24 hours of self-reported quit, 94% (152/162) had a CO>4, 24/24% had CO of 4-9, and 5/5% failed biochemical verification with a CO>9. 25% of those with a CO>4 had a slip or relapse by the one month follow-up, 37.5% of those with CO 4-9 had a slip or relapse by one month as did 60% of those with CO>9. Of those attending the one week follow-up without having CO verified abstinence during that week, 86% had smoked again by one month. The higher relapse rate among those with CO 4-9,
which was intermediate between low CO abainers and smokers at week one, suggests that some of those with a CO of 4-9 may have been recent smokers when they attended that visit.

Conclusion: In smoking cessation trials using exhaled CO to verify self-reported abstinence of over 24 hours, consideration should be given to using a cut-point lower than the current standard of <10.

FUNDING: Penn State Cancer Institute, Hershey, PA
JUSTIFICATION: Previous studies have suggested that with lower levels of public exposure to passive smoke, CO criteria for verification of claimed abstinence should be lowered.
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POS1-76
PREDICTORS OF ADHERENCE TO COUNSELING IN A TOBACCO CESSATION TRIAL
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Introduction. Increased treatment dose is positively related to tobacco cessation outcomes, but adherence to multi-session telephone counseling remains a problem. This study examines demographic and hospital-related correlates of adherence to 7 sessions of telephone-based tobacco cessation counseling.

Methods. Participants were 1,619 patients at two large urban safety-net hospitals randomized to receive multi-session telephone-based tobacco counseling from study-sponsored tobacco treatment specialists plus NRT or referral to the state Quitline. At study completion, 109 of 810 patients in the in-house treatment arm completed all 7 counseling sessions. We employed logistic regression to examine the following correlates of adherence to completion of all sessions: age, sex, race, education (HS or more), length of hospital stay, receipt of NRT at hospital discharge (yes/no), and study site (Bellevue Hospital or Veterans Administration).

Results. Controlling for other covariates, age (OR = 1.03, 95% CI, 1.02-1.05), length of stay (OR = 0.94, 95% CI, 0.91-0.98), and having received NRT at discharge (OR = 0.55, 95% CI, 0.30-0.99) were significantly related to completion of counseling (p<.05). These results indicate that older age, having a shorter length of stay, and not receiving NRT before hospital discharge were associated with completion of counseling calls.

Conclusions. In contrast to prior work, few demographic variables were related to the number of counseling calls completed. Older participants may have had increased time to complete calls as well as more significant consequences of long-term tobacco use increasing motivation to quit. In addition, those with shorter length of stay may have been less medically compromised and more willing to participate in intensive counseling. The largest effect size was seen for receipt of NRT at discharge. These patients may have been more likely to begin the quitting process and feel less need to continue counseling. Results suggest that if similar quit rates are observed, providing NRT at discharge can reduce need for prolonged counseling counseling.

FUNDING: NHLBI #1U01HL105229
JUSTIFICATION: Results suggest that if similar quit rates are observed, providing NRT at discharge can reduce need for prolonged counseling cessation.
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POS1-77
EVALUATING THE REAL-WORLD EFFECTIVENESS OF VARENICLINE AND BUPROPION FOR SMOKING CESSATION USING AN INNOVATIVE INTERNET-BASED APPROACH (MATCH STUDY)
Tara Mansoursadeghi-Gilan, BSc*, Sarwar Hussain, MSc, Bernard Le Foll, MD, PhD, Peter Selby, MBBS, Laurie Zawertailo, PhD, Nicotine Dependence Service, Centre for Addiction and Mental Health, Dept. of Pharmacology and Toxicology, Dalla Lana School of Public Health, University of Toronto

Varenicline and bupropion are efficacious, prescription-only pharmacotherapies for smoking cessation; however, their real-world impact is limited by affordability and accessibility.

The primary objective of this study is to evaluate real-world effectiveness of mailed bupropion and varenicline in a sample of interested smokers, utilizing web-based recruitment and follow-up.

In an open label, randomized study, Ontario residents, 19 years or older, who smoke 10 cigarettes or more per day, intend to quit within 30 days, and meet the study’s criteria are recruited through the study website (matchstudy.ca). Eligible participants are randomized 1:1 (n=750 per arm) to receive a standard script for bupropion or varenicline to take to their physician. Signed scripts are faxed to the study’s pharmacy, who counsels 12 weeks of medication to patients. All participants receive weekly motivational emails for 12 weeks. Follow-ups are conducted via email at 4, 8, 12, 26 and 52 weeks after start of treatment. Saliva cotinine test confirms baseline smoking status and self-reported abstinence. The Big Five Aspect Scale (BFAS) personality test is completed.

To date, 280 participants have attempted to enroll. Out of 259 participants who completed the baseline survey, 156 met eligibility criteria and were randomized to varenicline (n=79) and bupropion (n=77). Participants completed BFAS. They are 42 (+/-12) years old, 58% female, and scored 5.9 (+/-2.0) on FTND. At 24, 59 participants have received medication in mail (bupropion, n=22; varenicline, n=37). A preliminary analysis of the week 4 follow-up completed by 28 participants showed that 19 (68%) had stopped smoking for one day or longer since enrolling in the study. The 7-day point prevalence quit rate and 30 days continuous abstinence rate at end-of-treatment, as well as effect of personality traits on treatment outcomes will also be presented.

To our knowledge, this is the first study to mass-distribute prescription medications for smoking cessation using a randomized design. If widely implemented, this method could have a population-level effect on smoking prevalence.

FUNDING: Study funding provided by Global Research Awards for Nicotine Dependence (GRAND) (Dr. L Zawertailo, PI)
JUSTIFICATION: Increasing accessibility and affordability of prescription medication for smoking cessation may have a significant impact on quit success

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POS1-78
ATTENTIONAL BIAS PREDICTS ABSTINENCE-INDUCED CIGARETTE CRAVING IN A LABORATORY SETTING
Matthew G. Kirkpatrick, PhD*, Casey R. Guillot, PhD, Raina D. Pang, PhD, Adam M. Leventhal, PhD

Background: Previous studies indicate that abistent smokers exhibit greater attentional bias to smoking cues compared to non-abistent smokers, and this bias is related to greater risk of relapse outside the laboratory. Here, we further examine the effects of smoking abstinence versus non-abstinence on attentional bias and its relationship to two domains of cigarette craving in the same participants under controlled laboratory conditions.

Methods: Non-treatment-seeking smokers (N=271) completed two counterbalanced sessions (following 16-hour abstinence; following ad libitum smoking). During each session, participants completed the Smoking Stroop...
task followed by the Questionnaire of Smoking Urges (QSU), which measures two aspects of craving: desire for positive smoking effects (Factor 1) and desire for relief from withdrawal symptoms (Factor 2). We evaluated abstinence versus non-abstinence on Stroop Task performance and craving, and the relationship between these two dependent variables, while controlling for session order, sex and nicotine dependence severity.

Results: As expected, participants reported greater craving during abstinence compared to non-abstinence (F=141, p<.001). There was a Condition x Session interaction on the Stroop effect in response to smoking cues (F=10, p<.01). While performance did not differ for those participants who completed the abstinence session second, the Stroop effect was greater during abstinence for those who completed the abstinence session first, suggesting that practice influenced task performance. Nevertheless for this group only, Stroop performance during abstinence, but not non-abstinence, was positively related to craving (QSU Factor 1; Condition x Stroop: beta=.42, p<.001).

Conclusions: Consistent with previous research, greater attentional bias to smoking cues was related to greater subjective craving, specifically the desire to experience the acute positive effects of smoking. However, this relationship was only observed when participants were abstinent and completed the Stroop task for the first time, suggesting that practice effects may mask the relationship between attentional bias and smoking-related outcomes.

FUNDING: This research was supported by National Institute on Drug Abuse Grant DA026831, American Cancer Society Research Scholar Grant CPBB-RSG-13-163-01 and National Cancer Institute Grant T32-CA09492.

JUSTIFICATION: This study further investigates the role of attentional bias to smoking cues on cigarette craving in order to better understand the psychological mechanisms underlying smoking relapse.

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POS1-79
LOW CARBOHYDRATE AND MODERATELY FAT-REDUCED DIETS PREVENT WEIGHT GAIN WITHOUT IMPAIRING CESSATION RATES IN OVERWEIGHT AND OBSESE SMOKERS TREATED WITH VARENICLINE

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Background: In meta-analysis untreated quitters or quitters treated with varenicline are shown to gain about 2-3 kg after three months and about 4 kg after six months of stopping smoking.

Aim: To compare the effects of low-carbohydrate versus moderately fat-reduced diets on body weight in overweight and obese smokers treated with varenicline.

Subjects and Methods: In a randomized controlled clinical trial 122 men and women aged 28-68 years who were overweight or obese (BMI 25-41 kg/m2) and smoked 10 or more cigarettes/day were assigned to a low carbohydrate versus a moderately fat-reduced diet one week before starting varenicline. Both diets reduced energy intake by 500 kcal/day. Varenicline was administered in a standard dose for 12 weeks and follow-up with brief dietary and motivational counseling at 1, 2, 3, 4, 6, 8, 10, 12 and 24 weeks. The target quit date was 1-2 weeks after start of varenicline. Body weight was measured at all visits and self-reported smoking status was validated with expired breath carbon monoxide.

Results: The percentage of energy from protein in the low carbohydrate versus moderately fat-reduced diet was 26.4 versus 20.0%, percentage fat was 38.2 versus 30.1% and percentage carbohydrates was 29.0 versus 41.7% (p<0.0001 for all). One-week point prevalence cessation rates at four, 12 and 24 weeks were 77.9%, 68.0% and 44.3% respectively. Weight change was -1.7 (standard deviation [SD] 2.2) versus -1.1 (SD 2.2) kg for the low carbohydrate versus the moderately fat-reduced diet at four weeks, -0.7 (SD 3.3) versus -0.1 (SD 2.8) kg at 12 weeks and +1.7 (SD 4.5) versus +1.6 (SD 3.9) kg at 24 weeks. Weight changes in quitters were -1.7 (SD 2.1) versus -1.0 (SD 2.3) kg, -0.7 (SD 3.4) versus 0.0 (SD 2.9) kg and +2.7 (SD 4.2) versus +2.3 (SD 3.6) kg at four, 12 and 24 weeks and did not differ significantly between diets.

Conclusion: Moderately energy-restricted diets started before cessation prevented early cessation-associated weight gain, even leading to small weight loss in varenicline-treated subjects with overweight and obesity. Diets reduced six-month gain and did not appear to impair efficacy of varenicline.

FUNDING: Departmental funds independent of industry

JUSTIFICATION: The results may have potential translational application for clinical practice to prevent weight gain associated with smoke cessation

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POS1-80
RATES AND CORRELATES OF TOBACCO CESSATION SERVICE USE IN THE VETERANS HEALTH ADMINISTRATION: A REVIEW OF NATIONAL VA ADMINISTRATIVE DATA

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Tobacco use is a substantial problem for Veterans using Veterans Health Administration (VHA) services, but relatively little is known about the association of patient characteristics or the facility-level supply of VHA tobacco cessation services and use of such services. Using a cross-sectional analysis of national VHA administrative databases (N=5,531,379) from fiscal year 2012, we evaluated rates of tobacco cessation service use among Veterans with a tobacco use disorder diagnosis (N=796,774), and examined associations between patient characteristics and such service use (i.e., 1-3 tobacco cessation visits and 4 or more tobacco cessation visits). A separate analysis examined the relationship of the supply of such services at each VA medical center to likelihood of use. Only 3.8% of Veterans diagnosed with a tobacco use disorder used any VHA tobacco cessation services, and only 0.9% met U.S. Public Health Service clinical practice guidelines for the recommended amount of counseling (i.e., 4 or more visits). Veterans who used tobacco cessation services were more likely to have been homeless in the recent past (OR=2.33-2.56), have comorbid depression (OR=1.67-1.79) and drug use disorder (OR=1.97-2.18), and were more likely to use other VHA services than Veterans who did not use tobacco cessation services (d=0.4-0.7). The supply of tobacco cessation services had a stronger association with use of these services than any patient characteristic. Veterans who smoke substantially underuse VHA tobacco cessation services. Use is greatest at facilities that supply more tobacco cessation services. Future efforts should focus on increasing the supply of VHA tobacco cessation services, and evaluating whether Veterans are under-aware or under-motivated to use these services.

FUNDING: This material is based upon work supported by the VISN 1 Mental Illness Research, Education, and Clinical Center. The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the United States government.

JUSTIFICATION: The results from the present study suggest that Veterans who use tobacco substantially underuse VHA tobacco cessation services, and identify potential reasons for this, which can help point to solutions for helping more Veterans to quit using tobacco.

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POS1-81
SALIVARY COTININE LEVELS OVER THE FIRST THREE MONTHS OF E-CIGARETTE USE

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Background: Electronic cigarettes (e-cigarettes) are relatively new in the global tobacco market with the first e-cigarette introduced in 2003. A paucity of literature exists regarding the use patterns and impacts on other tobacco use after initiation of e-cigarette use. The current study uses data from new e-cigarette users to model how salivary cotinine levels change over time.

Methods: This observational study enrolled 41 participants within seven days of their first e-cigarette purchase. Visits occurred in our research clinic at baseline, 1, and 3 months after purchase. Salivary cotinine, measured by ELISA/EIA (Salimetrics, Inc., Carlsbad, CA), served as the primary outcome to assess changes in nicotine intake. Because no smoking restrictions were placed participants, models were adjusted for participants' self-reported average cigarettes smoked per day measured at each visit. Linear mixed-effects models were employed—polynomial effects were evaluated and person-mean centering was used to partition the between- and within-participant effects of the time-varying cigarettes smoked predictor.

Results: Non-daily smoking was reported by 10 participants at month 3. One participant was using nicotine free liquid in the e-cigarette, but no participants abstained from both smoking and e-cigarette use. Results indicated no change in salivary cotinine over time; however, a between-participant effect of cigarettes was observed with a one-cigarette per day average increase compared to other participants resulting in cotinine levels increasing by an average of 17.14 ng per ml (p less than 0.05). Mean cigarettes per day were 19.7, 9.8, and 10.6 at baseline, 1, and 3 months, respectively.

Conclusion: Nicotine intake, assessed by salivary cotinine, did not significantly change from baseline despite a reduction in cigarettes per day. E-cigarettes may lead to self-titration of nicotine intake to maintain a similar intake as smoking. We are continuing to collect data from participants up to one year from enrollment.

FUNDING: State of Nebraska Cancer and Smoking Disease Research Program

JUSTIFICATION: This project provides information on potential changes in nicotine intake. Because no smoking restrictions were placed participants, models were adjusted for participants' self-reported average cigarettes smoked per day measured at each visit. Linear mixed-effects models were employed—polynomial effects were evaluated and person-mean centering was used to partition the between- and within-participant effects of the time-varying cigarettes smoked predictor.

References: 1.

Poster Session 1 • Thursday, February 26, 2015 • 11:30 a.m.–1:00 p.m.

POS1-82
BEHAVIORAL ECONOMICS DIFFERENTIATES SMOKERS WITH AND WITHOUT OTHER DRUG DEPENDENCIES

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Behavioral economic indices of demand have been used extensively to understand aspects of tobacco consumption. To date, demand curves for cigarettes have not been compared among tobacco-dependent individuals with and without other drug dependencies. In the current study, cigarette demand was compared across four groups of tobacco-dependent participants: alcohol-dependent smokers, stimulant-dependent smokers, alcohol- and stimulant-dependent smokers, and smokers alone. Demand was characterized using estimated cigarette consumption across 73 unit prices ranging from no cost to $10.00 per individual cigarette in a hypothetical cigarette purchase task. Participants were asked to purchase cigarettes to smoke for the next 24 hours that could not be stockpiled or shared and must be the only products consumed. Demand curve analyses were conducted to investigate demand intensity and elasticity between the four smoking phenotypes. Demand intensity was greater for the multiple substance users than for the tobacco-dependent only group, where demand was more elastic for the other groups compared to the tobacco-dependent only participants. These results suggest that in comparison to users of multiple substances, tobacco-dependent smokers value cigarettes more at higher unit prices. Examining the correlation of these observations with treatment outcome would indicate whether intensity or elasticity of demand is a better predictor of therapeutic success.

FUNDING: R01DA034755 and R01DA34755-01A1S1

JUSTIFICATION: This project provides information on potential changes in nicotine intake. Because no smoking restrictions were placed participants, models were adjusted for participants' self-reported average cigarettes smoked per day measured at each visit. Linear mixed-effects models were employed—polynomial effects were evaluated and person-mean centering was used to partition the between- and within-participant effects of the time-varying cigarettes smoked predictor.

Discussion: Two weeks of AR administered on a modified dot probe task on a mobile-device. Non-treatment seeking light and heavy African American smokers (N = 64) were randomly assigned to an AR or Control training condition. Participants were given a mobile-device for weeks, which prompted them to complete three AR (or control) trainings per day. Participants also completed one assessment of attentional bias (Visual Probe task), as well as assessments of exposure to tobacco advertisements, craving, and smoking.

Method: We investigated the efficacy of AR administered using a modified dot probe task on a mobile-device. Non-treatment seeking light and heavy African American smokers (N = 64) were randomly assigned to an AR or Control training condition. Participants were given a mobile-device for weeks, which prompted them to complete three AR (or control) trainings per day. Participants also completed one assessment of attentional bias (Visual Probe task), as well as assessments of exposure to tobacco advertisements, craving, and smoking.

Results: Overall, participants initiated 2,419 trainings and assessments. Participants in the AR and Controls conditions completed an average of 29.07 AR (SD = 12.48) and 30.61 control training tasks (SD = 13.07) respectively, AR reduced attentional bias assessed in the laboratory, F (1,126) = 9.20, p = .003, and field F (1, 374) = 6.18, p = .01. This effect generalized to new stimuli, but did not generalize to a new task. AR did not significantly reduce craving or reported exposure to advertisements. Smoking assessed on the mobile-device declined over days in the AR group, F (1, 28) = 10.95, p = .003, but not in the Control group, F (1, 27) = 0.02, p = .89. AR did not reduce biochemical measures of smoke exposure.

Discussion: Two weeks of AR administered on a mobile device can reduce attentional bias in African American smokers. AR also reduced reported smoking. Further research can clarify the mechanisms underlying the effect of AR on smoking.

FUNDING: NIH F31 CA180625

JUSTIFICATION: This project provides evidence for a novel treatment target for African American smokers.

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HEAVINESS OF CIGARETTE SMOKING AMONG TREATMENT-SEEKING CANNABIS USERS

Lauren R. Pacek, PhD*, Ryan Vandrey, PhD, Department of Psychiatry and Behavioral Sciences, Johns Hopkins University School of Medicine

Cigarette smoking is ubiquitous among substance-using populations. Despite its pervasive nature and negative associated health consequences, the epidemiology of cigarette smoking among drug users remains poorly understood. Little is known about what differentiated light and heavy smokers among substance-using populations, particularly among treatment-seeking cannabis users. Data came from the screening visit of a 12-week outpatient cannabis treatment program in Baltimore, Maryland. Descriptive statistics and logistic regression analyses were used to describe the associations between sociodemographic and drug use characteristics with heavy smoking (i.e., 10+ cigarettes per day [CPD]). Of 182 participants, 65% were current smokers. Smokers reported smoking an average of 4.2 (SD=5.4) CPD, and smoking for an average of 12.7 (SD=9.8) years. Approximately 32% were heavy smokers. In adjusted analyses, the average number of alcoholic drinks per week over the past 4 weeks (aOR=1.08, 95% CI=1.00-1.16) and daily cannabis use (aOR=4.96, 95% CI=1.03-23.93) were significantly associated with heaviness of cigarette smoking. Despite heavy and regular cannabis use, as well as an average lifetime smoking history of almost 13 years, smokers in this sample reported smoking few cigarettes per day on average. Characteristics (i.e., substance use characteristics) typically found to be predictors of smoking status and intensity among the general population and other groups were found to be significantly associated with heaviness of smoking in the present analyses. Findings help to further characterize the epidemiology of cigarette smoking among a vulnerable group. Future research is needed to investigate the low intensity of smoking among treatment-seeking cannabis users, and whether these findings generalize to non-treatment-seeking groups as well.

FUNDING: This work was funded by: T32 DA007209 (Pacek, P.I.; George Bigelow) and U01-DA031784 (Vandrey).

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SELF-REPORTED DISTRESS INTOLERANCE PREDICTS NEGATIVE REINFORCEMENT CRAVING AND URGE DURING EARLY SMOKING ABSTINENCE

Teresa M. Leyro, PhD*, Marina Peralta, BS1, Jordan Stiver, BA2, Allanah VanBuskirk, BA1, Judith J. Prochaska, PhD, MPH1, Sharon M. Hall, PhD1, Rutgers University, 1University of California, San Francisco, 2Stanford University

Distress intolerance, the inability to withstand physical or emotional perturbation, has been identified as a risk factor for a smoking related processes including engagement in smoking cessation treatment, as well as lapse and relapse. To date, no research has comprehensively investigated the relation between distress intolerance and quit day outcomes. This pilot investigation examined whether self-reported distress intolerance prior to quitting was related to quit day nicotine withdrawal, cigarette craving, smoking urges, and negative affect. We hypothesized that distress intolerance would most strongly relate to outcomes consistent with a negative reinforcement model of substance use. Participants were N=34 community recruited daily smokers (65% male; Age M=40, SD=11; CPD M=18, SD=5); many with a comorbid DSM-IV substance abuse (34%) or mood/anxiety (24%) disorder, who reported high motivation to quit (Readiness to Quit M=6.8, SD=0.7; 7:1 defined as willing to quit smoking in the next 30 days). On average, they scored a 25 (SD=8) on the self-report distress intolerance scale. CO analysis of breath sample <8 ppm classified 54% as abstinent on their quit day. Separate linear regression models for each outcome of interest were run; presence (yes/no) of a current DSM-IV substance abuse (excluding nicotine) disorder, mood/anxiety disorder, and abstinence status were entered as covariates at step 1, and distress intolerance was entered as the main predictor at step 2. Distress intolerance significantly predicted craving in anticipation of relief from withdrawal or negative mood (emotionality craving: β=-.43, p<.02) and quit day negative affect (covarying for baseline negative affect; β=-.69, p<.01). Also, distress intolerance evidenced trend level relations to the desire to smoke to relieve craving (β=-.33, p=.08) and nicotine withdrawal (β=-.39, p=.06). Findings suggest that distress intolerance predicts quit day urges and cravings relevant to negative reinforcement. Interventions to increase distress tolerance may in turn help mitigate emotionality craving during 24 hours of smoking cessation, helping smokers increase their ability to achieve initial abstinence.

FUNDING: NIDA NRSA T32DA007250 and a NIDA Center Grant Pilot Study award P50-DA09253

JUSTIFICATION: Findings from this work will greatly inform the utility of distress tolerance oriented interventions specifically designed to increase early abstinence outcomes.

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POS1-87
THERAPEUTIC SYNERGETIC EFFECTS OF THE CONSUMPTION OF PUMPKIN SEED AND AROMATHERAPY OF SPIKE LAVENDER OIL ON REDUCE OF CIGARETTE SMOKING CRAVING

Nasir Dehghan, MD*, Bahman P. Omran, MD, Nader Isavi, MD, Samin Dehghan, MD, Fatemeh Khorasani, Master of Psychology, Eliaz Shirazi, MPH Research Department of Smoking Cessation Clinic, Tehran University of Medical Sciences, Tehran, Iran.

Background: Considering the especial position of Pumpkin as a rich source of tyrosine amino acid (a main precursor to dopamine) and also the potential role of Spike lavender oil as a sympatholytic agent to reduce the stress response, we hypothesized that the concurrent use of these herbal agents can be very helpful to quit smoking through reducing stress responses.

Methods: During two months, in a randomized double blinded controlled trial, 180 heavy current smoker men (smoking ≥20 cigarettes daily or ≥20 pack-years) were randomly assigned to receive, i) pumpkin seed 300 g/day, or ii) the oil of Spike lavender, 20 min of aromatherapy, or iii) both regimens concomitantly for one month, and iv) a sex and age-matched group which received placebo (n = 60) that was considered as the control group. The data on cigarette smoking was obtained through structured interviews. The cumulative amount of cigarette consumption was expressed as the Brinkman index (number of cigarette consumed per day multiplied by the years of smoking) initially as well as the following interventions.

Results: The groups were matched for gender and body mass index. The average of the Brinkman index was comparable across the four groups at baseline (p = 0.789). After the intervention period, the mean value of the index was significantly lower in the third group that received both pumpkin seed and oil of Spike lavender concurrently compared to other three groups assessed by the ANOVA test (p < 0.001). The difference in Brinkman index score between combined therapy group and other interventional groups was also shown by the Tukey's Post Hoc analysis (p = 0.002). The multivariable linear regression model showed that the concurrent consumption of the two herbal regimens resulted in significant reduction of the Brinkman index adjusted for gender and body mass index (Beta =13.649, SE = 5.177, p = 0.009).

Conclusion: The role of the pharmaceutical composition consists of Pumpkin seed and Spike lavender oil on lowering the cigarette smoking craving can be due to its synergetic effects on dopamine productive and secretive system and also on lowering the sympathetic function.

FUNDING: This Study was supported by Research Department of Smoking Cessation Clinics in Tehran University of Medical Sciences.

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POS1-88
CIGARETTE SMOKING, PROBLEM-GAMBLING SEVERITY, AND HEALTH BEHAVIORS IN HIGH-SCHOOL STUDENTS

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Introduction: Smoking and gambling are two significant public health concerns. Little is known about the association of smoking and gambling in adolescents. The aims of the current study were to examine in a sample of high-school adolescents: smoking behavior, gambling behavior, and health-related variables by problem-gambling severity and smoking status.

Methods: Analyses utilized survey data from 1,591 Connecticut high-school students. Adolescents were classified by smoking status (current smoker, non-smoker) and problem-gambling severity (Low-Risk Gambling [LRG], At-Risk/ Problem Gambling [ARPG]).

Results: More adolescents with ARPG than LRG reported regular and heavy smoking, early smoking onset, no smoking quit attempts, and parental approval of smoking. APRG and LRG smokers, compared to non-smokers, reported earlier onset of gambling, greater time spent gambling, anxiety as a trigger for gambling, and decreased measures to prevent gambling. Stronger relationships were found between smoking and gambling at casinos, gambling due to pressure, earlier onset of gambling, and parental perceptions of gambling for ARPG versus LRG adolescents. LRG and ARPG adolescents who smoked were more likely to report poor grades and less likely to report participation in extracurricular activities overall and specifically for team sports, school clubs, and church activities. There was a stronger relationship between extracurricular activities and smoking for LRG compared to ARPG. LRG and ARPG adolescents who smoked were more likely to report lifetime use of marijuana and other drugs, current heavy alcohol use, current caffeine use, depression, and aggressive behaviors.

Conclusions: Smoking was associated with more severe gambling and poorer health-related behaviors for adolescents engaged in both high- and low-risk gambling.

FUNDING: This work was supported in part by the NIH (R01 DA018647, R01 DA019039, RC1 DA028279, RL1 AA017539), the Connecticut State Department of Mental Health and Addictions Services, The Connection, and the Yale Gambling Center of Research Excellence grant from the National Center for Responsible Gaming.

JUSTIFICATION: This novel study of gambling, smoking, and health behaviors in adolescents suggests that interventions to improve health behaviors with adolescents may benefit from targeting both smoking and gambling.

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POS1-89
AN EXAMINATION OF REACTIVITY TO CRAVING ASSESSMENT: CRAVING RATING FOR CIGARETTES DO NOT CHANGE OVER THE COURSE OF A MULTI-ITEM CRAVING QUESTIONNAIRE

Lisa J. Germeroth, MA*, Stephen T. Tiffany, PhD, University at Buffalo, The State University of New York

Self-report measures are typically used to assess drug craving, but researchers have questioned whether completing these assessments can elicit or enhance craving. Previous studies have examined cigarette craving reactivity and found null craving reactivity effects. However, the current study addresses limitations of these studies and extends this area of research by examining: (1) item-by-item changes in craving level during questionnaire completion, (2) craving reactivity as a function of craving intensity reflected in item content, (3) craving reactivity differences between nicotine dependent and nondependent smokers, and (4) potential reactivity across multiple sessions. This study also used a more comprehensive craving assessment (the 32-item Questionnaire on Smoking Urges; QSU) than employed in previous studies. Nicotine dependent and nondependent smokers (n = 270; nicotine dependence determined by the Nicotine Addiction Taxon Scale) completed the QSU on six separate occasions across 12 weeks. Craving level was observed at the item level and across various subsets of items. These subsets included groups of 8 successive items, the first half and second half of the items, and intensive analyses over the first 8 items. In addition, potential changes in craving level were examined as a function of the intensity of the craving represented in the content of the immediately preceding item. Analyses indicated that there was no significant effect of item/subset position on craving ratings, nor were there any significant interactions between item/subset position and session or level of nicotine dependence. These findings indicated that, even with relatively sensitive procedures for detecting potential reactivity, there was no evidence that completing a craving questionnaire induced craving.

FUNDING: This research was funded by an NIH grant to S. Tiffany (R01 CA120412).

JUSTIFICATION: This research addresses the important issue of whether or not the completion of a craving assessment generates craving, which has implications for the use of craving instruments in clinical research and treatment.

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POS1-90
HEALTH BEHAVIOR THEORY CONSTRUCTS AND SMOKING AND CESSATION-RELATED BEHAVIOR AMONG SURVIVORS OF TEN CANCERS NINE YEARS AFTER DIAGNOSIS

J. Lee Westmaas, PhD*, Carla J. Berg, PhD, Kassandra I. Alcaraz, PhD, Jeuneviette Bontemps-Jones, MPH, CHES, Kevin D. Stein, PhD, American Cancer Society, and Emory University, Atlanta.

Objective: Quitting smoking is important for cancer patients, but some survivors continue to smoke post-diagnosis. Little is known of the psychological correlates of smoking status and patterns, likelihood of quitting, and intentions to quit among survivors many years after diagnosis.

Methods: Cross-sectional analyses of relationships between psychological constructs from health behavior theories and smoking and cessation-related behavior were conducted among survivors of 10 cancers recruited by stratified random sampling from cancer registries in a nationwide, longitudinal, quality-of-life study (n=2938).

Results: Approximately 9 years post-diagnosis, current smokers perceived lower cancer risks from smoking compared to former and never smokers, and perceived risk was higher among current smokers intending to quit versus those not or unsure. Stronger beliefs that smoking causes severe health problems was associated with having quit since diagnosis (versus currently smoking), and with intending to quit. More frequent exposure to others’ smoking, and perceived barriers (e.g., difficulty obtaining cessation medication) were associated with a lower likelihood of having quit since diagnosis. Compared to daily smokers, nondaily smokers perceived greater risks of smoking for cancer and fewer barriers to quitting. Self-efficacy was not significantly associated with smoking and cessation-related behavior.

Conclusions: Nondaily smokers’ greater perceived risk and lower perceived barriers to quitting suggest they may be especially receptive to cessation interventions if accessible. Increasing long-term survivors’ perceptions of their risk and of the severity of health problems associated with smoking post-diagnosis, and reducing their perceptions of the barriers to quitting, may be appropriate targets for intervention for those who smoke.

FUNDING: None

JUSTIFICATION: Risk related beliefs of cancer survivors, and their perceived barriers, need to be addressed in cessation treatment.

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POS1-91
MOTIVATION TO QUIT AND INTEREST IN CESSATION TREATMENT AMONG HOMELESS YOUTH SMOKERS

William G. Shadel, PhD*, Joan S. Tucker, PhD, Daniela Golinnelli, PhD, Brett Ewing, MS, Leslie Mullins, MS, RAND Corporation

Background: Approximately 70% of unaccompanied homeless youth are current smokers. Although a few studies have described smoking behavior among homeless youth, none has focused on how to help homeless youth quit smoking. As such, there are significant gaps in understanding their interest in quitting and what strategies might best fit their specific needs.

Methods: Unaccompanied homeless youth were randomly sampled from street sites, where homeless youth are known to congregate, in Los Angeles County (N=292). All were current smokers and completed a survey on their smoking-related behaviors and cognitions.

Results: 65.69% of youth had quit for at least 24 hours in the past year, and 43.37% were motivated to quit. Previous quit attempts tended to be unassisted, but 58.59% reported that they would be interested in formal cessation treatment (although only 1 in 4 were interested in what is considered the gold standard for cessation treatment: counseling plus medication). Multivariable linear regression analyses indicated that motivation to quit was significantly higher among youth who were older, African American or Hispanic (vs. White), and asked about smoking by a service provider, but lower among those with higher levels of nicotine dependence (p<.05). Being interested in cessation treatment was significantly more likely among youth who were asked about smoking by a service provider, anticipated more barriers to quitting, and were motivated to quit, and less likely among youth who slept outdoors in the past 30 days (p<.05).

Conclusions: Smoking cessation is often considered a low priority for homeless youth. However, many are motivated to quit and interested in smoking cessation products and services (although further research is needed to identify strategies for encouraging youth to make quit attempts using a combined treatment approach). Our results highlighting the importance of routine screening for smoking in settings where homeless youth typically seek services, as well as the importance of bolstering their confidence in quitting and increasing their negative attitudes towards smoking as ways of strengthening their motivation to quit smoking.

FUNDING: Funded by grant #21RT-0118 from the California Tobacco Related Disease Research Program

JUSTIFICATION: This study provides information that could be used to inform the development of treatments to help homeless youth smokers quit smoking.

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POS1-92
INITIAL EVIDENCE FOR THE INCENTIVE-SENSITIZATION THEORY OF ADDICTION IN ADOLESCENT SMOKERS
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Robinson and Berridge's theory of the progression of casual use to substance dependence (the incentive-sensitization theory of addiction) postulates that over time and repeated dosing, substances with intrinsic reward value begin to differentiate hedonic motivation ('liking') from appetitive drive ('wanting'). Initial support was gleaned from observing locomotor activity in rodents, and recent work supports similar conclusions in human stimulant users (Boileau et al 2006). Sensitization to nicotine has proven to be more difficult to demonstrate in vitro, but self-report measures may offer insight into face-valid assertions of 'liking' and 'wanting' and how these appraisals change over time. This study examines a subsample of 9th and 10th graders enrolled in a longitudinal study assessing the social and emotional contexts of adolescent cigarette smoking. Five hundred and sixteen adolescents (279 females, average age 15.6 years) who reported smoking in at least two follow up waves over the first two years of data collection completed a battery of questionnaires including Shiffman et al's NDSS (whose "craving subscale" served as a proxy for "wanting") & a subjective smoking experiences survey based on work by Pomerla with et al (whose "pleasurable subscale" served as a proxy for the internal experience of "liking"). Regression analyses showed that at participants' first measured smoking instance, both "liking" and "wanting" predicted past month total cigarette consumption (B = -13.11, p=0.003 & B = 63.28, p < 0.001), while controlling for baseline total lifetime cigarette consumption. At their final measured smoking instance, "liking" no longer predicted past month cigarette consumption (B = -5.23, p = 0.48), whereas "wanting" remained a significant predictor of consumption (B = 103.13, p < .001). Paired sample t-tests revealed no differences in "liking" over time, t(1, 467) = -1.72, p=0.09, but craving significantly increased, t(1, 51) = -7.44, p<0.001, suggesting that hedonic appraisals of cigarettes remain stagnant while craving increases. Future work will draw upon multi-level modeling to account for both within and between subjects' effects over time.

FUNDING: This research was supported by the National Cancer Institute of the National Institutes of Health under award number 5PO1CA86262.

JUSTIFICATION: By identifying internal subjective experiential changes associated with nicotine dependence, better targets for clinical treatment may be identified.

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POS1-93
AUTOMATED TOBACCO CESSATION FOR INPATIENTS AND EFFECTS ON READMISSION RATES
Graham W. Warren*, Kathleen Cartmell, Danny Woodard, Dianne Wilson, Martina Mueller, K. Michael Cummings, Medical University of South Carolina

Background: Few hospitals meet Joint Commission (JC) standards for hospitals to provide inpatient tobacco cessation support and follow-up at 1 month for all inpatients who are identified as current smokers. A standardized process was implemented at the Medical University of South Carolina to address JC standard inconsistencies with patients after discharge consistent with JC standards.

Methods: Daily inpatient tobacco use status was used to identify patients, a trained tobacco cessation specialist would visit eligible patients, and all patients who would be entered into an automated IVR follow-up program to provide cessation assistance and track cessation outcomes. Monthly rates of unplanned hospital readmission were tracked and a multiple poisson regression was used to analyze the effect of the IVR program on the number of unplanned hospital admissions per month.

Results: Between February 18-June 30 2014, 9,233 inpatients were admitted and 5718 (62%) had documented tobacco use status reported. A total of 1179 patients (21%) were current smokers and 632 were eligible for bedside counseling. The dedicated cessation counselor was able to effectively reach 500 patients (79%) of which 398 (79%) completed counseling as an inpatient. Including additional smokers identified after admission but prior to discharge, a total of 1559 patients were referred to the IVR for cessation support. Of 398 patients who received bedside counseling, 256 (64%) were reached by the IVR within 30 days and reported quit rates were 51%. Of 1161 patients who did not receive bedside counseling, 363 (31%) were reached by the IVR within 30 days and reported quit rates were 33%. Unplanned 30-day hospital readmission rates were 9.1% for patients seen by the bedside counselor as compared with 15.7% for patients who did not receive bedside counseling.

Conclusions: Data suggest that an inpatient tobacco cessation service coupled with an automated IVR follow-up reduces unplanned hospital readmissions.

FUNDING: No funding

JUSTIFICATION: This abstract presents practical methods of implementing widespread tobacco cessation services for hospitalized patients and related cessation support to clinical outcomes (readmission rates)

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POS1-94
ACUTE EFFECTS OF “HYPING” A BLACK&MILD CIGARILLO
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Cigars remain the second most widely used tobacco product among adolescent and adult populations. The appeal of cigar products may be enhanced by users' beliefs that they are less lethal than cigarettes and that its harm potential can be moderated through user-initiated product modification. Specifically, users engage in a process known as “hyping” whereby they remove the inner tobacco liner of a cigarillo before use. To date, only one study has compared directly the nicotine and carbon monoxide (CO) exposure associated with a cigarillo smoked in its original form versus user-modified. The purpose of this within-subject study was to compare the acute effects of smoking an original Black&Mild (B&M) cigarillo, a modified B&M cigarillo, and an unlit B&M cigarillo (sham smoking control). Primary outcomes, assessed before and after each of two 30-min smoking bouts, included plasma nicotine and expired air CO levels, subjective ratings of product effects and withdrawal suppression, and puff topography. Twenty smokers (19 men; 19 non-Hispanic African Americans; meansSD=24.6±3.3 years) of 27 B&M cigarillos/week (19.2±15.8 cigarillos/week) and ≤5 cigarettes/day completed the study. Relative to baseline, plasma nicotine increased significantly within original and modified B&M conditions (not during sham), but levels did not differ between smoking conditions. CO levels were significantly lower for modified, relative to original, B&M smoking at all post-administration timepoints. Both smoking conditions produced significant increases in subjective ratings of satisfaction (e.g., taste good) and significant decreases in nicotine abstinence symptoms (e.g., urges to smoke), but ratings did not differ between smoking conditions. Subjective ratings for sham exhibited little change over time. Puff counts were similar between smoking conditions, and while average puff volume was higher and average inter-puff-interval was lower for modified, relative to original, B&M smoking, neither were significantly different between smoking conditions. Results are consistent with a previous report in that “hyping” a B&M cigarillo may decrease users’ CO exposure despite increased puffing behavior.

FUNDING: IR21CA161317

JUSTIFICATION: Results from this study inform our understanding of how a cigarillo modification technique impacts measures of harm potential.

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POS1-95  
TIME TO FIRST CIGARETTE AND HOUSEHOLD SMOKING RESTRICTIONS

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The time a smoker waits until the first cigarette of the morning is often used as a measure of dependence with the rationale that more dependent smokers will smoke sooner upon waking than will less dependent smokers after going several hours without a cigarette overnight. Objective: We sought to examine the relationship between time-to-first-cigarette (TTFC) and household smoking restrictions in two independent samples. Methods: Two samples of smokers, one treatment-seeking community sample (N = 433) and one non-treatment-seeking sample of smokers with serious mental illness (N = 94), provided information on cigarette dependence with the Fagerström Test for Nicotine Dependence and on household smoking restrictions. Results: Half (50%) of smokers with serious mental illness and 36.7% of smokers from the general population reported that there were no limitations to smoking in their home. Household smoking restrictions were significantly and positively related to TTFC in both samples. Conclusions: These data indicate that greater attention to TTFC may be warranted. The TTFC item is intended to measure dependence based on the premise that greater dependence should be associated with shorter TTFC. If TTFC is related to a household smoking ban, however, this item may not be assessing dependence as intended in some cases.

FUNDING: This study was supported by the National Institute on Drug Abuse grants R34DA030652 and K23DA018203 (to Marc L. Steinberg).

JUSTIFICATION: If the commonly used time-to-first-cigarette variable is related to the presence or absence of a household smoking ban, it may not be assessing dependence as intended in some cases.

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POS1-96  
PATIENT PERSPECTIVES ON TOBACCO USE TREATMENT IN PRIMARY CARE

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Purpose: Evidence-based tobacco cessation interventions increase quit rates, yet most smokers do not use them. Every primary care visit offers the potential to discuss such options, but communications can be tricky for patients and provider alike. We explored smokers’ personal experiences of interacting with health care providers with a view to identifying feasible and appealing interventions for the primary care setting.

Methods: Three 90-minute focus groups, including a total of 33 patients from three primary care clinics, were conducted. Participants were current or recent (quit within 6 months) smokers. Topics included tobacco use, quit attempts, and interactions with providers, followed by more pointed questions exploring specific actions patients want from providers and outcome measures that would be meaningful to patients.

Results: Using inductive coding techniques, four themes were identified, namely: 1) the experience of being tobacco user (inconvenience, shame, isolation, and benefits), 2) the medical encounter (expectations of providers, trust and respect, and positive, targeted messaging), 3) high value actions (consistent dialogue, the addiction model, point of care nicotine patches, educational materials, carbon monoxide monitoring, and infrastructure), and 4) Patient-centered outcomes.

Conclusions: True patient-centered research requires that the patient voice be sought early in the planning process. The overall message we heard from patients is the desire for honest, consistent and pro-active discussion and action about a serious and deleterious addiction. Several practical interventions arose that could be implemented with minimal burden in busy primary care settings. Finally, patients offered a generous list of creative, patient-centered outcome measures.

FUNDING: This work was supported by Health-e-NC, an initiative of the University Cancer Research Fund at the University of North Carolina (UNC) at Chapel Hill.

JUSTIFICATION: The patient perspective contributes to developing protocols to increase evidence based treatment offered in health care settings, and also addresses potential policy related to insurance coverage and public health community resources.

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POS1-97  
STANDARDIZING TOBACCO ASSESSMENTS FOR CANCER PATIENTS

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Background: Continued smoking after a cancer diagnosis causes adverse health effects and increases both cancer-specific and all-cause mortality. Despite this evidence, many cancer patients persist in smoking after their diagnosis and most do not regularly receive tobacco cessation support from treating oncologists. This study reports on a standardized assessment tool used to identify those who use tobacco and who would benefit from referral to a tobacco cessation service.

Methods: A 13 question standardized annotated tobacco screening assessment was designed to assess tobacco use history, patterns of tobacco use, use of other tobacco products, and medications to identify patients for referral to a dedicated tobacco cessation program. The questionnaire was administered to cancer patients seen in the radiation oncology service at the Medicine University of South Carolina between December 2013 and August 2014.

Results: Of 430 patients who completed the assessment, 87 (31%) reported current tobacco use ("every day" or "some days") and 191 (44%) reported former tobacco use. In 87 patients reporting current tobacco use, 29% reported using one or more FDA-approved cessation medications and 18% reported using e-cigarettes to help quit. In 191 patients reporting former tobacco use, 10 (5%) reported tobacco use within the past week and an additional 13 (7%) reported tobacco use within the past month. In patients with former tobacco use, but not in the past month, 5 (3%) reported current use of FDA approved cessation medications and 5 (3%) reported current e-cigarette use. A total of 72 patients (17%) reported currently living with a smoker including 8% of never smokers, 16% of former smokers, and 34% of current smokers. Asking about time since last cigarette increased referral rates by 26% while asking about FDA medications and e-cigarettes increased referral rates by 11%.

Conclusions: Using a simple standardized questionnaire to ask patients about tobacco use can help identify cancer patients who would benefit from tobacco cessation support.

FUNDING: No funding

JUSTIFICATION: Using a standardized approach to assess tobacco use status can help identify cancer patients who would benefit from tobacco cessation support.

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The prevalence of daily smoking among Aboriginal and Torres Strait Islander peoples is 2.6 times that of non-Indigenous Australians. There has been little research in this setting on differences in indicators of dependence beyond those about smoking intensity (cigarettes per day, CPD). This paper explores indicators of dependence among Aboriginal and Torres Strait Islander smokers, their cross-sectional associations with quitting, and comparisons with other Australian smokers. We used 2012/13 baseline data from 1,392 Aboriginal and Torres Strait Islander daily smokers in 'Talking about the Smokes,' a national survey based on the International Tobacco Control (ITC) Policy Evaluation Project, and comparison data from the ITC Australia survey in 2011/12.

More Aboriginal and Torres Strait Islander daily smokers smoked 1-10 CPD (40% vs 33%) than other Australian smokers, but more smoked their first cigarette within 30 minutes of waking (75% vs 65%), so they had similar Heaviness of Smoking Index scores (based on CPD and time to first cigarette, TTFC). Aboriginal and Torres Strait Islander daily smokers were less likely to report frequent strong urges to smoke (51% vs 61%) or that staying off the smokes would be very hard (39% vs 48%). In spite of most indicators suggesting Aboriginal and Torres Strait Islander smokers were less dependent and so more likely to be able to quit smoking, they were less likely than other Australian smokers to have made a quit attempt that lasted a month or longer (47% vs 59%). This was not because these questions did not predict having made a longer quit attempt; among those who had made a quit attempt in the last five years, all questions except urges were significantly associated with longer quit attempts, as were other questions only asked of Aboriginal and Torres Strait Islander smokers related to previous attempts about cravings and about how hard it is to stay off smokes, be around smokers and say no when offered smokes. Some of these more situational factors may be more important than CPD and TTFC in this setting, where running out of money to buy cigarettes (45% at least fortnightly) and sharing cigarettes are common.

FUNDING: The project was funded by the Australian Department of Health. David Thomas was supported by a National Heart Foundation fellowship and Matthew Stevens by a National Health and Medical Research fellowship.

JUSTIFICATION: Situational factors may be more useful than traditional clinical indicators of dependence (CPD and TTFC) in understanding dependence or predicting quit success among the high smoking prevalence population of Australian Aboriginal and Torres Strait Islander smokers.

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Background: Persistent tobacco use among racial and ethnic minority populations in the United States is a critical public health concern. Yet, potential sources of racial/ethnic disparities in tobacco use remain unclear. The present study examined racial/ethnic differences in a clinically-relevant underpinning of tobacco use that has received sparse attention in the disparities literature—tobacco withdrawal—using a controlled laboratory design.

Methods: Participants [Non-Hispanic Black (N = 178), Non-Hispanic White (N = 118), and Hispanic (N = 28)] attended two counterbalanced sessions (non-abstinent vs. 16-hour abstinence). At both sessions, self-report measures of urges to smoke, nicotine withdrawal, and affect were administered and performance on an objective behavior task that assessed the motivation to reinstate smoking was recorded. Abstinence-induced changes (scores while abstinent vs. non-abstinent) were analyzed as a function of race/ethnicity.

Results: Results illustrated that Non-Hispanic Black smokers reported greater abstinence-induced declines in several positive affect states in comparison to the other racial/ethnic groups. Relative to Hispanic smokers, Non-Hispanic Black and Non-Hispanic White smokers displayed larger abstinence-provoked increases in urges to smoke. No racial/ethnic differences were detected for overall nicotine withdrawal symptomatology, negative affect states, and motivation to reinstate smoking behavior.

Conclusions: These results suggest qualitative differences in the expression of different components of the tobacco withdrawal syndrome across three racial/ethnic groups. This research helps shed light on bio-behavioral sources of tobacco-related health disparities, informs the application of smoking cessation interventions across racial/ethnic groups, and may ultimately, aid the overall effort towards reducing the public health burden of tobacco addiction in minority populations.

FUNDING: The current study was conducted while the first author was at the University of Southern California Keck School of Medicine. This research was supported by grants from the Tobacco-Related Disease Research Program of the University of California, Grant Numbers 22FT-0062, National Institute on Drug Abuse grants R01-DA026831 and K08-DA025041, and American Cancer Society Research Scholar Grant CPBB-RSG-13-163-01.

JUSTIFICATION: The present study will elucidate potential bio-behavioral sources of tobacco-related health disparities as well as inform the application of smoking cessation treatment approaches across racial/ethnic groups.

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Gender differences in the relationship between alcohol use and current LCC use in American women, as well as frequent alcohol users. The present study examined popular types of cigars. Women are more likely to use LCCs, particularly African-American women, as will steadily increase. Little cigars/cigarillos (LCCs) are becoming increasingly popular. Women are more likely to use LCCs, particularly African-American women, as well as frequent alcohol users. The present study examined gender differences in the relationship between alcohol use and current LCC use in a sample of 364 adult smokers (44% female) who responded to an advertisement for a study on smokers who drink regularly. Data were collected on demographics, frequency of LCC use (never, one or two times in the past three months, once per month, once every two weeks, once per week, two to four times per week, daily or almost daily), and quantity and frequency of alcohol use. Of those screened, 29.7% reported LCC use at least once in the past 3 months. LCC use was associated with being male (p < .05) and younger (p < .005). Among LCC users (n = 105), the mean age was 34.00 (SD = 12.81), and LCC users were predominately male (86.7%), African-American (71.4%), employed full or part time (40.6%), and reported smoking at least 10 cigarettes per day for the past year (89.5%). Further, 28.8% reported using LCCs one or two times in the past three months, 25.0% used almost every day, 19.2% used two to four times per week, 10.6% used once every two weeks, 9.6% used once per week, and 6.7% used once per month. Hierarchical regression analyses revealed a main effect for gender (p < .05) indicating that when controlling for alcohol use, men used LCCs more frequently than women. There was also a significant gender x alcohol interaction on frequency of LCC use, such that women who drank on a greater number of days per week reported using LCCs more frequently (p < .05). However, the relationship between alcohol use and frequency of LCC use was not significant for men. Overall, alcohol appears to influence the degree to which women smoke LCCs, whereas among men LCC use is independent of alcohol use. Results point to alcohol use as a risk factor among women that may have utility for prevention efforts.

FUNDING: NIMH Grant R01-MH076629 and NCI Grant T32-CA009492

JUSTIFICATION: Results point to alcohol use as a risk factor among women that may have utility for prevention efforts.

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POS1-102 MAINTENANCE TREATMENT VISITS AFTER QUITTING ARE ASSOCIATED WITH GREATER LONG TERM QUIT SUCCESS

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Prolonged abstinence is a major goal in smoking cessation treatment, however there is a lack of sufficient evidence to support specific relapse prevention strategies. The aim of this study was to determine whether quitting earlier in treatment and maintaining clinic visits post-quit were associated with continued abstinence.

The study sample included 2,210 participants who quit during a treatment program that combines up to 26 weeks of no-cost NRT and smoking cessation counseling to smokers accessing primary care services in Ontario, Canada. Smoking status was assessed at enrollment, every treatment visit, and at 6 months post-enrollment. Bivariate analyses were used to examine the relationship of earlier quitting and number of maintenance visits after quitting with psychiatric history, number of health comorbidities, baseline Heaviness of Smoking Index (HSI) scores, baseline confidence and importance of quitting, and key demographic variables. Multivariable analyses were conducted to determine whether earlier quitting and number of maintenance visits predicted staying quit at 6 months post-enrollment.

Of those who quit during treatment, 85% had quit within the first 3 clinic visits and 77% continued to attend maintenance treatment visits after quitting. Of those who quit, 74% remained quit at 6 months. Earlier quitters had higher confidence and importance in quitting scores at baseline (both p < .001) but did not differ on any other baseline characteristics. Greater number of post-quit clinic visits was associated with more health comorbidities, lower education, lower income, unemployment, higher baseline HSI scores, and older age (all p < .05). Quitting earlier during treatment did not predict quit status at 6 months (p = .28). More maintenance visits did predict better long term quit success (adjusted OR = 1.094, 95% CI = 1.015-1.180), with best outcomes seen for those with 5-8 maintenance visits (OR=3.082, 95% CI = 1.377-6.899).

Participants who quit smoking tend to do so early in treatment. Continuing to attend treatment visits after quitting may reduce relapse. Programs should allow for at least five post-quit maintenance visits to ensure long term quit success.
FUNDING: Support for this research was provided by the Ontario Ministry of Health and Long-Term Care, Health Promotion Branch

JUSTIFICATION: Continuing to attend treatment visits after quitting may reduce relapse.

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POS1-103
THE EFFECT OF WITHDRAWAL SYMPTOMS ON QUIT OUTCOMES 3 MONTHS FOLLOWING ENROLLMENT IN A SMOKING CESSATION TREATMENT PROGRAM

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Many smokers have concerns that quitting smoking will lead to withdrawal symptoms such as increased anxiety. While these symptoms are well known, few studies have a large enough sample at follow up to examine the effects of withdrawal symptoms on quit rate.

The objective of this analysis was to understand the differences in withdrawal symptoms by age, gender, level of dependence, and co-morbidities and the effect of withdrawal symptoms on quit outcomes.

The sample consisted of 2162 participants who enrolled in a smoking cessation program through their primary care provider, which offered up to 26 weeks of individualized doses of NRT and behavioural counseling at no cost, and were available for 3 month follow up surveys at the time of this analysis. Chi-square and t-tests were conducted to analyze the differences in withdrawal symptoms by age, gender, level of dependence and co-morbidities. Binary logistic regression analyses were used to examine the relationship of number and type of withdrawal symptoms and 3 month quit rate.

At 3-month follow-up, over 85% of the sample reported experiencing at least one withdrawal symptom. The most frequently reported withdrawal symptoms were irritability (60.0%), restlessness (57.7%) and increased appetite (49.6%). Smokers under 45 years old (p=0.004) and female smokers (p=0.003) expressed greater symptoms of withdrawal. Cigarettes per day (CPD) at baseline had no significant effect on whether a smoker reported any withdrawal symptoms. The number of reported withdrawal symptoms increased the odds of failure to quit smoking (OR=1.13, 95%CI=1.074-1.193), with anxiety (OR=1.78, 95%CI=1.485-2.143) and inability to concentrate (OR=1.62, 95%CI=1.342-1.960) having the greatest association with failure to quit.

Different segments of the sample experienced different withdrawal symptoms with the number and type of withdrawal symptoms felt by participants being associated with the success of their quit attempt. Understanding how different smokers might have different experiences with withdrawal symptoms may aid smoking cessation practitioners in tailoring their behavioural counseling to targeted segments of the population.

FUNDING: Support for this research was provided by the Ontario Ministry of Health and Long-Term Care, Health Promotion Branch

JUSTIFICATION: Clinicians should pay attention to withdrawal symptoms when treating patients for tobacco dependence

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POS1-104
A VISUALIZATION-AIDED TRAJECTORY PATTERN RECOGNITION APPROACH TO SMOKING AND DEPRESSION AMONG ASIAN AMERICANS

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Introduction: Depressed smokers are less likely to quit smoking. Smokers with a history of depression have a greater risk of relapse after a cessation attempt. A randomized controlled trial of a culturally adapted cessation intervention was conducted with a group of Korean-American smokers. A visualization-aided trajectory pattern recognition method was developed to examine to what degree depression would affect cessation outcomes and whether gender would moderate the relationship between depression and treatment outcomes among Korean Americans.

Method: Our visualization-aided method was built on an enhanced projection pursuit method and multiple imputation algorithms. This longitudinal RCT data (N = 109; N_females = 18; missing rate <25%) were collected at baseline with four follow-ups: 1, 3, 6, and 12 months from the quit date. Our RCT components include cognitive behavioral therapy, cultural tailoring, and nicotine replacement therapy. Each patient was repeatedly measured 4 times on these components. Our method was compared to validity-index-only and single-imputation-only methods using the same trial data and simulated data to verify results. Identified patterns were related to smokers’ depression scores (measured by the Center for Epidemiologic Studies Depression Scale) and their abstinence rates by gender at 6 and 12 month follow-ups.

Results: Our method teased out non-culturally-aware, culturally-tailored, and culturally-aware patterns and achieved the highest accuracy rates. Three levels of depression were detected [High (M/SE): 17.63/4.33; Near-low: 8.60/1.29; Low: 6.07/1.36]. The high-depressed had 6% and 12% abstinence rates at 6 and 12 month follow-ups, the low-depressed had 26% at both follow-ups, and the near-low-depressed with the culturally-tailored pattern achieved the highest rate of 52% and 46%. Gender did not moderate the relationship between depression and abstinence rates, which may attribute to a smaller number of female smokers.

Conclusion: Our approach provided in-depth understanding of smoking and depression among Korean Americans, and could assist in finer and broader patients’ outcome tests and behavioral intervention evaluation.

FUNDING: This research was Supported by both the Pilot Project Award from NCCR 5UL1RR031982-04 and NIH/NINDA R01 1 R01 DA033323-01A1 to Dr. Fang and partially by NIDA 5K23DA021243-02 to Dr. Kim.

JUSTIFICATION: The findings from this trajectory pattern recognition approach can aid adaptive intervention design for clinical research and practice.

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POS1-105
PREDICTORS OF UTILIZATION OF A NOVEL SMARTPHONE APP FOR SMOKING CESSATION

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Introduction: The rapid growth of smoking cessation apps is yet to be matched with equal amount of rigorous research examining their efficacy and factors predicting their usage. Building upon previous work that tested the preliminary efficacy of an Acceptance and Commitment Therapy (ACT) smoking cessation app (SmartQuit), and then identified key SmartQuit features predictive of smoking cessation, the present study examined baseline and demographic variables that could predict the utilization of such features.

Methods: App utilization data from 98 daily smokers who were randomized to the SmartQuit arm of a pilot trial were automatically recorded. Demographic predictors of website utilization, baseline acceptance of cravings (a key ACT
process), and mood symptoms (a key ACT target) were used to predict 2-month follow up counts of (1) SmartQuit app openings, and (2) key SmartQuit features shown to predict smoking cessation: Quit Plan feature, Tracking Letting Urges Pass feature, and Tracking ACT Skills Practice feature. Negative binomial count regression models were chosen provided their excellent fit with the observed data.

Results: Users with lower education (RR=0.492; CI=0.28-0.94), heavier smoking (RR=0.613; CI=0.38-0.95) and depression (RR=0.958; CI=0.83-0.99) opened the app less frequently. Quit Plan feature openings were negatively predicted by lower education (RR=0.491; CI=0.28-0.88) and positively predicted by acceptance (RR=1.7; CI=1.01-2.90). Tracking Letting Urges Pass openings were negatively predicted by heavier smoking (RR=0.418; CI=0.17-0.92). Tracking ACT Skills Practice openings were predicted by acceptance (RR=4.691; CI=1.05-22.68) and being male (RR=3.104; CI=1.17-8.39). Age, levels of anxiety, and having friends who smoke did not predict overall app usage or use of any of the three features included in the analysis.

Conclusions: This is the first study examining baseline predictors of utilization of a smoking cessation app. Results of this study suggest the need to tailor smoking cessation apps to specific populations (e.g., underserved or psychiatric populations) in order to maximize their population level impact.

FUNDING: NIDA K99 DA037276 [to RV], NIDA K23DA026517 [to JLH], NCI RO1 CA166646, and The Hartwell Innovation Fund [both to JBB].

JUSTIFICATION: This study builds upon previous efforts to empirically test smoking cessation apps to specific populations (e.g., underserved or psychiatric populations) in order to maximize their population level impact.

POS1-106
COMMUNITY-BASED, RESPIRATORY FEEDBACK INTERVENTION TO INCREASE SMOKING CESSATION RESOURCES UPTAKE AMONG LOW INCOME PERSONS LIVING WITH HIV/AIDS: RESULTS OF A PILOT RANDOMIZED CONTROLLED TRIAL

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The U.S. prevalence of smoking among persons living with HIV/AIDS (PLWHA) is 45-74%, compared to 18.1% in the adult general population. Tobacco-related cancers among PLWHA are rising, and respiratory and cardiovascular diseases in an aging PLWHA population are a growing healthcare challenge. Non-medical, community AIDS agencies provide a unique opportunity to intervene in clients’ smoking. A pilot randomized controlled trial examined the feasibility of a community-based intervention to increase uptake of free/low cost public health smoking cessation resources in low income PLWHA smoking > 20 cigarettes/week. N=52 PLWHA recruited at 3 community-based AIDS service organizations (ASOs) were randomized to either Treatment as Usual (TAU, n=27; Brief counseling, print materials, offer to refer to state Quitline) or AIR (n=25: TAU + biomarker feedback using CO level, respiratory symptoms, and spirometry lung age, delivered within a motivational framework). One in-person session was provided at the home ASO of participants by trained ASO staff (TAU) or tobacco treatment clinicians (AIR). New York State provides free Quitline support and nicotine patches, and Medicaid covers most medications. Trial participants’ mean age was 53, 52% were women, 71% African American, and 52% had high school education or less. Most (71%) smoked daily a mean 11 cigarettes/day, and 65% smoked within 5 minutes of waking. Primary outcomes demonstrated feasibility: 1) reached accrual goals in 3 months; 2) delivered treatment to 85%; 3) exceeded (81%) the threshold feasibility indicator of 67% treated and retained at 1-month follow up. Secondary analyses showed that verified uptake of Quitline services was 40% for TAU and AIR. Those with more years of smoking and with greater difference between birth and lung ages were more likely to take up Quitline services. Satisfaction with AIR was higher than for TAU (p<.01). This is the first reported trial targeting low income PLWHA who smoke conducted within non-medical community agencies with ASO staff providing usual care. Study feasibility supports community dissemination of evidence-based cessation practices and linkage to public health resources.

FUNDING: Supported by NCI grants U54CA137788; 3U54CA137788-03S1; 3P30CA08748-44S2-47S3

JUSTIFICATION: In the context of community-based, non-medical HIV service agencies, it is feasible to recruit and retain low income HIV-infected smokers in a trial promoting uptake of low cost public health cessation resources.

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POS1-107
INDIRECT EFFECTS OF AVOIDANCE/RUMINATION ON THE RELATION BETWEEN BIS SENSITIVITY AND SECONDARY DEPENDENCE MOTIVES IN TREATMENT-SEEKING SMOKERS

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Introduction: Mechanisms by which behavioral inhibition system (BIS) sensitivity, in which the goal is to move away from something unpleasant, is related to nicotine dependence motives has not been thoroughly investigated. We examined avoidance/rumination as a possible mediator, as it examines behavioral and cognitive approaches relevant to both the regulation of aversive motives in the BIS and motivations to smoke. We predicted indirect effects on secondary dependence motives which focus on the functional aspects of smoking (e.g., smoking to gain relief from aversive stimuli).

Method: The sample included 323 adult smokers responding to quit smoking advertisements (43.2% female, 83.6% African-American, Age Mean(SD) = 44.79(11), Median Income = $20,000 - $29,999, Cigarettes per Smoking Day (CPSD) Mean(SD) = 14.28(7.9)) with depressive symptoms (BDI score ≥10). Participants completed a measure of BIS sensitivity in which the goal is to mitigate possible damage. Participants also completed the Behavioral Activation for Depression Scale (BADS) Avoidance/Rumination subscale, which focuses on avoidance of negative aversive states and the tendency to ruminate rather than solve problems. Lastly, participants completed the WISDM, which measures primary and secondary nicotine dependence motives.

Results: Mediation models of the role of avoidance/rumination in the relationship between BIS sensitivity and secondary dependence motives were tested using linear regression with bias corrected bootstrapping methods in Hayes’ PROCESS (Hayes, 2013). Average CPSD was entered as a covariate. A bias corrected bootstrap 95% CI indicated that the indirect effect through BADS’ Avoidance/Rumination subscale was significant for the WISDM subscales: Positive Reinforcement (95% CI: [0.04 - 0.24]), Negative Reinforcement (95% CI: [0.08 - 0.67]), Cognitive Enhancement (95% CI: [0.04 - 0.27]).

Conclusion: The tendency to avoid negative aversive states may be one mechanism by which behavioral inhibition system sensitivity is related to various secondary motives for nicotine dependence among smokers with current depressive symptomatology who are seeking help to quit smoking.

FUNDING: R01 DA018730 (MacPherson)

JUSTIFICATION: Improving our understanding of avoidant processes as they relate to secondary dependence motives may provide information for behavioral intervention targets.

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POS1-108
USE OF MOBILE HEALTH TECHNOLOGY TO DETECT SMOKING REMOTELY: A REVIEW OF THE LITERATURE
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Background: Mobile health (mHealth) is an emerging and highly innovative field that incorporates mobile technology in various forms into health-related research, treatment delivery and fidelity, dissemination, etc. The potential contributions of mHealth methodology to smoking research and treatment are virtually endless, but limited work has been conducted in this area thus far. Given that cigarette smoking remains the leading cause of preventable death in the United States, sophisticated systems are greatly needed to prevent, detect, and treat smoking in a cost-effective and widespread manner.

Aim: This literature review will highlight the integration of mHealth technology into smoking research, specifically focusing on the remote monitoring of smoking.

Methods: An extensive review of the literature was conducted among medical and health-related databases, but also among engineering and computer science journals and databases. Ongoing research was also examined through grant databases.

Results: The remote monitoring of smoking through self-report has been studied extensively with the use of ecological momentary assessment methods, which has greatly contributed to our understanding of the variables occasioning relapse. More recently however, the remote monitoring of smoking has been studied through the integration of unobtrusive and sophisticated hardware and software designed for use in the natural environment, such as body sensors to monitor physiological measures and movements of the arm and wrist. Additionally, some research has focused on collecting and monitoring biomarkers of smoking (i.e., breath carbon monoxide) several times per day from the participant's home.

Conclusions: The use of mHealth to detect and treat smoking is an area still in its infancy, but represents an exciting advancement for researchers and clinicians interested in smoking cessation. The integration of mHealth technology into smoking research holds the potential to better understand smoking and relapse, while allowing for the improvement, refinement and delivery of highly efficacious treatment interventions with reduced burden to the participant.

FUNDING: NIDA grants K01DA036739 (PI, McClure), U01DA031779 (PI, Gray) and U10DA013727 (PI, Brady)

JUSTIFICATION: This review of the literature will help to inform researchers and clinicians of the methods available for mobile integration into research and treatment.

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POS1-109
NEGATIVE COTININE TWO-WEEKS POST QUIT DATE PREDICTS OVERALL VARENCLINE TREATMENT SUCCESS
T.F. Marcus*, K.E. Dunn, C. Kim, R. Vandrey, A. Umbricht

Varenicline is the leading prescription medication for nicotine addiction treatment, however only approximately 44% of people who take varenicline stop smoking. Smoking cessation during the first 2 weeks of treatment is predictive of future cessation for patients receiving nicotine replacement therapy (NRT) or incentives, however this effect has not yet been evaluated within the context of varenicline treatment. The secondary analysis of this randomized, double-blind, controlled trial explored if early abstinence is a prognostic indicator for long-term smoking cessation. Participants in this pilot study (N=74, healthy smokers) all received active varenicline and were randomized to concurrent zonisamide (N=34) or placebo (N=40). Treatment-seeking smokers were required to attend weekly sessions for 10 weeks, undergo structured behavioral counseling, report on smoking behaviors and leave urine samples tested for cotinine. Participants were 71% male, 45 (± 6) years old, and smoked 19 (± 7) cigarettes/day. Primary outcomes revealed no significant between-group differences, so the placebo and experimental groups were collapsed together for this analysis. Results showed that 75% of participants provided a urine sample that tested positive for smoking at the 2-week post QTD; and of these 95% were positive for smoking at the final visit. Of the 25% of participants whose urine sample tested negative for smoking at the 2-week visit, only 37% had relapsed to smoking by the final visit. A logistic regression revealed significant effects, whereby participants who were still smoking at 2-weeks post QTD were 46 times more likely to be smoking at the final visit, when compared to those who had quit. The 2-week post QTD model has been replicated in other smoking cessation interventions, i.e., NRT, but has not yet been tested with varenicline. This demonstrates that smoking cessation success can be predicted early in an intervention. The implications of this finding could be useful in designing a metric for physicians to tailor more effective treatment interventions in a step-up level of care, which ultimately, could lead to greater smoking cessation outcomes.

FUNDING: NIDA grant: R21DA034164

JUSTIFICATION: The findings of this study can inform future protocols, policies, and practitioners, who are using varenicline for treatment, of likely outcomes based on early smoking cessation success, and allow them to alter the course of treatment accordingly.

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POS1-110
SMOKING AND DEMOGRAPHIC CHARACTERISTICS OF DAILY LIGHT AND INTERMITTENT SMOKERS LIVING ALONG THE U.S./MEXICO BORDER
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Despite the decline in the prevalence of general smoking, light and intermittent smoking rates have increased. Given that patterns of tobacco use are changing, this study examined characteristics associated with daily light (DLS) and intermittent smokers (ITS) in a predominantly Hispanic sample.

Data from two iterations of a brief light and intermittent smoking intervention (N = 286; Mage = 34.49; SD = 15.99; 57% male, 82% Hispanic, 59% DLS, 41% ITS) were analyzed for the current study. Participants completed baseline measures assessing demographics, tobacco use and history, The Stage of Change Scale, Fagerstrom Test for Nicotine Dependence (FTND) and the Perceived Competence Scale (PCS). Secondary data analyses to identify significant demographic and tobacco-related variables associated with DLS and ITS were conducted. First, univariate analyses assessed empirically and theoretically relevant variables (age, gender, ethnicity, education, stage of change, PCS, FTND) to determine marginally significant (p<.1) associations with smoking status and subsequent inclusion in a final logistic regression model (Smoking status DV: 0 = ITS; 1 = DLS).

The logistic regression model included age, perceived competence, and FTND score as potential correlates of smoking (χ2(7)=99.67, p<.001). Nagelkerke R² = .509. Higher odds of being a DLS were associated with increased age (OR = 1.05, p < .001), greater levels of nicotine dependence (OR=315.52, p<.001) and decreased levels of PCS (OR=1.73, p=.015).

Findings suggest targets of intervention that may be more salient for DLS relative to ITS, particularly the potential need to focus more heavily on reducing dependence and enhancing competence in promoting abstinence. Thus, it may be that ITS will benefit from intervention before potential progression to DLS and/or heavier smoking. Future studies should continue to assess smoking status group differences to determine if unique interventions for DLS and ITS are warranted.

FUNDING: This study was funded by A Smoke Free Paso del Norte Grant No. 26-8113-90.

JUSTIFICATION: Findings from this study suggest specific and unique targets of intervention for daily light and intermittent smokers.
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POS1-111
DUAL USE OF CIGARETTES AND E-CIGARETTES: THE ROLE OF E-CIGARETTE EXPECTANCIES

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Anecdotally, many former smokers have reported successfully quitting smoking using electronic nicotine delivery systems (“e-cigarettes”), which likely represents harm reduction. However, most smokers who have tried e-cigarettes continue to smoke (Giovenco et al., 2014). It is critically important to understand the drivers of dual use, so as to assist in the facilitation of smoking cessation by e-cigarette users, as well as reduce dual use of both e-cigarettes and cigarettes. One important may be beliefs, or expectancies, about the effects of e-cigarettes. We surveyed current e-cigarette users (“vapers”, N=1815), including both former smokers (n=381) and current cigarette smokers (i.e., dual users; n=1434). Respondents provided information on their demographics and e-cigarette usage patterns as well as their beliefs about e-cigarettes based on a modified version of the SCQ-A (Copeland et al., 1995), a validated measure of smoking expectancies. Unadjusted, adjusted, and forward selection regression models were used to examine associations with cigarette smoking. In comparison to those who were only using e-cigarettes, we found dual users were more likely to be younger, without any prior marital history, and to have started cigarette smoking in adulthood rather than youth or adolescence. In addition, they tended to be more recent, non-daily e-cigarette users, who used tobacco flavors rather than fruit flavors, and used higher levels of nicotine. Dual users generally reported less positive views of e-cigarettes, rating e-cigarettes as more expensive, addictive, and damaging to health, as well as less satisfying and helpful for dealing with stress. However, they were more likely to state e-cigarettes were convenient. The patterns suggest that dual users are driven by the convenience of e-cigarettes as a nicotine-delivery system, despite less satisfaction with the product, whereas former smokers are driven by the perceived satisfaction derived from vaping. The distinct usage characteristics and expectancies of these two groups have potential implications for regulation, prevention, and treatment of nicotine dependence.

FUNDING: This research was funded by the National Cancer Institute Behavioral Oncology Training Grant (R25CA090314) at Moffitt Cancer Center in Tampa, FL, awarded to Paul Jacobsen, and by grants R01CA134347 and R01CA154596, awarded to Thomas Brandon and Vani Simmons, respectively.

JUSTIFICATION: The distinct usage characteristics and expectancies of these two groups have potential implications for regulation, prevention, and treatment of nicotine dependence.

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POS1-112
SATISFACTION AND SENSORY CHARACTERISTICS OF ELECTRONIC CIGARETTES AFTER INITIAL USE AND FOUR WEEKS OF REGULAR USE

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Background: Electronic cigarettes (EC) have potential to help people stop smoking. However, to have the greatest public health benefit they must be able to compete with regular cigarettes. We examined ratings of satisfaction and sensory characteristics after first use of a first generation EC and then after 4-weeks use. We also explored if first impressions predicted use in the first week.

Methods: 40 smokers intending to quit attended a baseline session one week prior to their target quit date (TQD). They received an EC (Green Smoke, 2.4% nicotine) at TQD and were seen weekly over 4 weeks. After EC first use on TQD and again at the end of treatment (EOT), participants rated how satisfying they found EC compared to normal cigarettes (NC) on a scale of 1-10 (1=not satisfying; 10=as satisfying as NC) and how fast EC relieved their urge to smoke on a scale of 1-5 (1=did not relieve urge; 5=within a few puffs). They also rated EC on a scale of 1-5 (1=it did not relieve urge; 5=just air). They also rated EC on a scale of 1-5 (1=much less than NC; 5=much more than NC) on a number of sensory characteristics (e.g. taste, vapour, harshness, cigarette taste vs. ‘just air’).

Results: 33 participants were using EC at EOT and were included in the analyses. 16 were abstinent during the previous week (validated by CO < 10 ppm) and 17 smoked. At both first use and EOT EC were less satisfying than NC and there was no significant difference between time points (TQD: 5.8 vs. EOT: 6.3, p=0.277). EC were also less pleasant, did not taste as good, and the vapour had less effect than NC. There were no significant differences over time on sensory ratings, with the exception of harshness (TQD: 3.3 vs. EOT: 2.9, p=0.045) and how much cigarette taste vs. ‘just air’ there was (TQD: 2.7 vs. 2.2, p=0.007). Only speed of urge relief at first use was correlated to cartridge use over the first week of use (r=0.36, p=0.044, N=31).

Conclusions: Smokers trying EC for the first time should be advised that an adjustment period may be required and that the replacement and satisfaction EC provide may not mimic NC fully. Having such realistic expectations may help smokers adjust to and persevere with EC use.

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POS1-113
TASK PERSISTENCE IS RELATED TO SOME, BUT NOT ALL FACTORS OF IMPULSIVITY IN TREATMENT SEEKING SMOKERS

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Introduction: Task persistence is defined as the act of continuing with a desired task even when the task is difficult or frustrating, and has also been defined as the behavioral correlate of distress tolerance. The task persistence construct has been linked to tobacco dependence treatment outcome because, for a motivated smoker, quitting smoking is a goal-directed task that is often difficult and frustrating. Indeed,
task persistence has been shown to prospectively predict tobacco dependence treatment outcome. The current study sought to examine the relationship between task persistence and a potentially similar construct, impulsivity.

Methods: Smokers (N=58) seeking tobacco dependence treatment completed a commonly used measure of impulsivity, the Barratt Impulsivity Scale (BIS-11) and four measures of task persistence (mirror tracing, breath-holding, Temperament Character Inventory – Persistence scale (TCI-P), and a 2-item self-report measure). It has been suggested that mirror tracing and breath-holding measure state task persistence while the two paper/pencil measures measure trait task persistence.

Results: All four measures of task persistence (mirror tracing (p = 0.008), breath-holding (p = 0.010), TCI-P (p = 0.017), and the 2-item persistence measure (p = 0.002)) were significantly, negatively correlated with the BIS-11 Non-Planning factor. The trait (TCI-P and 2-item), but not the state (mirror tracing and breath-holding) measures were significantly, negatively correlated to the BIS-11 Attention factor (p = 0.019 and p = 0.005). Only the 2-item persistence measure was related to the BIS-11 Motor factor (p = 0.041).

Conclusions: These data indicate that state measures of task persistence are better at differentiating between different facets of impulsivity than are trait measures. All four measures of task persistence were negatively associated with a lack of planning or self-control, while associations between persistence and a lack of attention, or a tendency to act in the spur of the moment, were inconsistent. The field would benefit from future research including multiple measures of impulsivity in addition to multiple measure of persistence.

FUNDING: This work was supported by NIDA 1R34DA030652, awarded to the first author (MLS).

JUSTIFICATION: Clinical research is informed by greater knowledge related to the relationship between established predictors of tobacco dependence treatment.

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POS1-114
ANXIETY AND DEPRESSION ARE RELATED TO SELF-REPORTED TEMPTATION TO SMOKE IN RESPONSE TO CRAVING AND WITHDRAWAL
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Introduction: A smoker’s confidence in their ability to abstain from smoking in a given situation (self-efficacy) predicts successful treatment outcome. Research indicates that symptoms of anxiety and depression in smokers negatively influence treatment outcome. We therefore sought to examine the relationship between symptoms of anxiety and depression and temptations to smoke in a variety of scenarios utilizing a commonly used measure of self-efficacy.

Methods: Smokers (N=58) seeking tobacco dependence treatment completed a commonly used measure of self-efficacy, the Self-Efficacy/Tempation - Short Form (Velicer et al., 1990) and multiple measures of mental health symptoms (Beck Depression Inventory (BDI), State-Trait Anxiety Inventory (STAXI), Brief Symptom Inventory (BSI), Positive and Negative Affect Schedule (PANAS)) at baseline.

Results: Self-reported temptation to smoke in response to situations associated with craving and withdrawal was significantly, positively correlated with measures of anxiety from the STAXI (p = 0.009 for state; p = 0.006 for trait) and BSI (p = 0.018), with the Global Severity Index from the BSI (p = 0.025) and with the BDI (p = 0.030). It was significantly, negatively correlated with the Positive Affect Scale of the PANAS (p = 0.009). Measures of anxiety and depression were unrelated to self-reported temptation to smoke in affect-laden situations.

Conclusions: Contrary to expectations, temptation to smoke in affect-laden situations was unrelated to measures of anxiety and depression. Instead, these data indicate that smokers experiencing symptoms of anxiety and depression may be particularly sensitive to experiences of craving and withdrawal. Should these data be replicated, clinical implications include the need to focus more on preparing for situations in which anxious or depressed smokers are likely to experience withdrawal or craving.

FUNDING: This work was supported by NIDA 1R34DA030652, awarded to the second author (MLS).

JUSTIFICATION: Clinical implications include the need to focus more on preparing for situations in which anxious or depressed smokers may be likely to experience withdrawal or craving.

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POS1-116  
IMPULSIVITY AND CIGARETTE CRAVING AMONG ADOLESCENT DAILY AND OCCASIONAL SMOKERS

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Impulsivity is a multi-dimensional construct that is robustly related to cigarette smoking. While underlying factors that account for this relation are not well understood, craving has been proposed as a central mechanism linking impulsivity to smoking. In order to further refine our understanding of associations between impulsivity and cigarette craving, the current study examined impulsivity as a predictor of tonic and cue-elicited craving among a sample of adolescent smokers. We expected that impulsivity would be positively associated with both tonic and cue-elicited craving, and that this relationship would be stronger among daily vs. occasional smokers. Data were drawn from 107 smokers (ages 16-20) who completed questionnaires and reported their cigarette craving prior to and immediately following presentation of each of three counterbalanced cues: (a) in vivo smoking, (b) alcohol, and (c) neutral cue. Impulsivity was assessed with the Barratt Impulsiveness Scale-11 (BIS); craving was assessed with the Questionnaire of Smoking Urges-Brief (QSU). Daily smokers smoked 28.5 of the past 30 days (SD=4.9) and averaged 94.4 cigarettes/week (SD=46.0), while occasional smokers smoked 14.1 of the past 30 days (SD=6.0) and averaged 10.2 cigarettes/week (SD=9.9). For daily smokers, BIS total score (p=.003) was significantly associated with QSU total score. BIS non-planning subscale (p=.03), inattention subscale (p=.03), and motor subscale (p=.01) were also associated with QSU total score. For occasional smokers, neither BIS total score (p=.95) nor BIS subscale scores (all p’s>.73) was associated with QSU total score. Impulsivity was unrelated to craving following smoking or alcohol cue, regardless of smoker group (all p’s>.15). The interaction of impulsivity by smoker group (p=.03) was significantly associated with QSU total score. Results suggest a moderated effect in which impulsivity is positively associated with tonic craving for daily smokers, but not occasional smokers. Tonic craving may serve as a mechanism linking impulsivity, smoking persistence, and nicotine dependence among daily smokers.

FUNDING: Funding through NIDA grants K23 DA020482 (PI: Carpenter) and F32 DA038947 (PI: Mathew).

JUSTIFICATION: Results of the current study add to a growing literature on impulsivity and smoking behavior, and suggest tonic craving as a potential target of intervention among high-impulsive daily smokers.

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POS1-117  
PHYSICIAN COMMUNICATION ABOUT SMOKING TO ADOLESCENTS WITH ASTHMA

Jeanelle S. Ali, MS*, Leslie A. Robinson, PhD, Preeti Rao, MA, Amy S. Farrell, MA, The University of Memphis, Department of Psychology

Recent reports of smoking prevalence suggest that high smoking rates among adolescents still occur. Adolescents who smoke are more likely to experience significant health consequences, such as reduced lung growth and function, and other respiratory complications. Smoking among medically fragile children, such as those with asthma, is particularly dangerous due to their compromised health functioning. However, children with asthma continue to smoke at alarming rates compared to their peers without asthma. Physician communication about smoking constitutes one type of intervention that has previously been shown to reduce smoking onset and increase quitting in adolescents. One study reported that physician communication about smoking occurred more frequently in adolescents with asthma than in healthy children, but the interaction of physician advice and smoking behaviors was not explored.

Data for this study were derived from the Memphis Smoking Prevention Program, a longitudinal study exploring the effects of tobacco prevention programs in a biethnic student cohort. Adolescents were asked about their asthma status, whether a physician had asked them if they smoked or advised them not to smoke, and both smoking and quitting behaviors. A binary logistic regression was performed in order to examine the relations between asthma versus non-asthmatic adolescents, physician communication, and tobacco use.

The current sample consisted of 1,828 adolescents who reported their smoking behavior (M age= 13 years, SD=0.76). Results revealed that physician communication on smoking differed depending on the child’s asthma status, OR=3.19, p<01. Additionally, adolescents with asthma who were asked about their smoking and advised to quit by their physician were approximately 9 times more likely to plan to quit than those adolescents never asked or advised by their physician, OR= 9.21, p = .06.

Findings suggest that it is critically important for physicians to address tobacco use, specifically with children who have asthma. Even brief interventions are likely to reduce smoking onset and increase quit attempts among young people, including those who are medically fragile.

FUNDING: This research was supported by a grant from the Partnership for Women’s and Children’s Health, Memphis, TN.

JUSTIFICATION: The research may inform clinical practice and research regarding smoking among medically fragile adolescents.

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POS1-118  
SMOKING BEHAVIORS IN SEXUAL MINORITY VERSUS HETEROSEXUAL WOMEN AND MEN IN THE UNITED STATES: NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY 2001-2010

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Background: There is growing recognition of health inequities among sexual minority men and women in the United States. We used nationally representative data to investigate differences in smoking behaviors between sexual minority versus heterosexual adults in the United States.

Methods: We analyzed data from 11,114 adults participating in the 2001-2010 waves of the National Health and Nutrition Examination Survey. Using multiple logistic regressions, we compared sexual minority and heterosexual adults in the odds cigarette smoking and use of marijuana/hashish, adjusting for co-variates (age, race/ethnicity, education, employment, marital status, family income, health insurance, and access to a regular health care provider). Analyses were conducted separately for men and women. Heterosexuals were the reference group in regression analyses.

Results: After adjustment for sociodemographic characteristics, sexual minority women had greater odds of smoking more than 100 cigarettes in their lifetime (AOR = 1.50, 95% CI 1.11, 2.03) and ever using marijuana or hashish (AOR = 2.11, 95% CI 1.48, 3.02), compared with heterosexual women. Sexual minority men did not differ from heterosexual men in either behavior.

Conclusions: In this representative national sample, sexual minority women had greater odds of smoking behaviors. Notably, health disparities persisted above and beyond the role of socioeconomic position and access to insurance and primary care, suggesting a need to understand social and psychological factors that contribute to smoking behaviors in sexual minority women.

FUNDING: Supported by NIAAA U24-022000
**POS1-119**

**INTEGRATED TELEHEALTH CARE MANAGEMENT AND SMOKING CESSATION FOR VETERANS WITH POSTTRAUMATIC STRESS DISORDER (PTSD)**

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Veterans with PTSD who smoke often have low quit rates and face unique barriers accessing cessation services. Motivation Interviewing (MI) increases readiness to change and telehealth care coordination can help manage chronic conditions while increasing access. Our goal was to test the integration of MI into an existing PTSD telehealth program. We randomized patients with PTSD who smoked, whether or not they wanted to quit. The usual care group received home telehealth and nurse care coordination. The intervention group received usual care plus a 90-session cessation curriculum delivered via home telehealth and weekly MI cessation counseling calls by a nurse. Cessation outcomes were self-reported 24-hour quit attempts and 7-day point prevalence abstinence at the end of the intervention and at the end of a 6 month follow-up period. Satisfaction and psychological symptoms were measured. There were 175 participants. Baseline characteristics were similar between groups. There was no difference between groups in 24-hour quit rate (38.2% intervention; 32.6% usual care; p= 0.44) and 7-day point prevalence (22.5% intervention; 23.6% usual care; p=0.69) at end of intervention (81.8% had CO level equal or less than 10). There was no difference between groups in 24-hour quit rate (27% intervention; 36.1% usual care; p=0.20) and in 7-day point prevalence (23.6% intervention; 23.3% usual care; p=0.96) at end of follow-up (67.9% had CO level equal or less than 10). Multivariable analyses remained non-significant at end of intervention (quit: p=0.83; 7-day: p=0.27) and follow-up (quit: p=0.63; 7-day: p=0.69). Satisfaction with MI content (mean: 9.06, ideal: 11) and MI counseling (mean: 73.62, ideal: 92) was high. Depression (p=0.005) and PTSD symptoms (p=0.05) improved for the intervention group during the study. Our cessation curriculum and MI counseling were successfully integrated into the existing PTSD home telehealth and care coordination program with high levels of satisfaction and improved psychological symptoms. Given the high rates of smoking and barriers accessing cessation services, it is essential to continue addressing smoking in this population.

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**POS1-120**

**REACTIONS TO LABORATORY STRESS PREDICT STRESS-INDUCED RELAPSE AMONG SMOKERS WITH HEIGHTENED LEVELS OF PSYCHOLOGICAL DISTRESS**

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Emotional stress has long been considered an important antecedent to cigarette cravings and lapse to smoking. Consistent with this possibility, numerous studies have attempted to model the effects of stress in the laboratory, demonstrating that smokers who are exposed to experimental stressors exhibit significant increases in both psychological distress and cigarette craving. Whether these stress reactions are predictive of stress-induced smoking lapses during an actual quit attempt, however, has not been examined. Furthermore, the possibility that such effects are particularly strong among smokers with higher ambient levels of distress, has not been addressed. To address these possibilities, nicotine-dependent smokers (n=61, 67% male, 51% African American, 13% Hispanic, 64% other reported ethnicities, 28% completed high school, Mean age=30.5 years, Mean FTND = 6.0) completed the Profile of Mood States (POMS) and then participated in a laboratory stress task one week before a quit attempt. Craving and psychological distress were measured immediately before and after exposure to stressful and neutral stimuli. After they quit, participants completed a lapse diary for 14 days in which they recorded the degree to which their lapses were precipitated by emotional stress or other triggers. Consistent with our hypotheses, findings revealed that POMS scores predicted both exaggerated laboratory stress responses (p < 0.02) and lapses that were due to stress during the 14 day post quit period (p < 0.01). In addition, laboratory stress reactions were predictive of stress-induced lapses (p < 0.01), but not lapses induced by other triggers (e.g., smoking cues), during the 14-day post-quit period. Results underscore the utility of measuring stress reactivity as a predictor of stress-induced lapses during a quit attempt, especially among smokers with high ambient levels of distress.

**FUNDING:** This research was supported by NIH grants #R34DA031327, R21CA118703 and #UL1RR029887 (Erblich - PI).

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**POS1-121**

**BASELINE LEVEL OF NICOTINE DEPENDENCE PREDICTS SMOKING CESSATION IN HAZARDOUS DRINKERS CALLING A SMOKING QUITLINE**

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Predictors of treatment outcomes in hazardous drinking smokers calling a quitline have been incompletely characterized. We examined nicotine dependence as a predictor of treatment outcome in hazardous drinking smokers who called the New York State Smokers' Quitline. Nicotine dependence was assessed by the item “time-to-first-cigarette” on the Fagerstrom Test for Nicotine Dependence. Shorter time-to-first-cigarette in the morning, a marker of more severe nicotine dependence, is a predictor of smoking cessation success in previous clinical trials. Participants (all hazardous drinking smokers, N = 1,948) were randomized to receive standard quitline counseling (TOC) or a combination of alcohol and tobacco counseling (ATC). All participants were eligible to receive a two-week supply of nicotine patches. In the primary analysis, smokers in the ATC group had higher smoking cessation rates at 7 month follow-up. Logistic regression was used to analyze the relationship between smoking cessation at month 7 and time-to-first-cigarette at baseline, controlling for treatment condition. Results show that participants with a shorter time-to-first-cigarette at baseline were less likely to be abstinent at month 7 (as defined by self-reported 7-day point prevalence abstinence) compared to participants who reported smoking later after waking.
POS1-122
PRE-QUIT REDUCTION OF ANXIETY SENSITIVITY IN RELATION TO NICOTINE WITHDRAWAL SYMPTOMS DURING SMOKING CESSATION

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Anxiety sensitivity is a relatively stable, but malleable, cognitive-based individual difference factor reflecting sensitivity to, and anticipation and fear of, the negative consequences of aversive internal states (McNally, 2002). It appears to be particularly relevant to various aspects of cigarette smoking. Indeed, smokers high, relative to low, in anxiety sensitivity perceive quitting as more difficult (Johnson et al., 2013) and have less success when making quit attempts (Assayag et al., 2012), even when statistically controlling for variation in anxiety symptoms (Zvolensky et al., 2009). The present study sought to examine relations between the extent of change in pre-quit reductions in anxiety sensitivity and the course of nicotine withdrawal symptoms experienced during the initial two weeks of a cessation attempt among successfully abstinent smokers. The sample consisted of 29 adult daily smokers (34% female; Mage=47.7, SD=13.1) participating in a randomized clinical trial comparing a standard cognitive-behavioral smoking cessation program with a cognitive behavioral smoking cessation program with an added anxiety sensitivity reduction component. Multilevel Modeling (i.e. time within subjects) using PROC MIXED (SAS 4.0) was utilized to examine the growth curve of change in withdrawal symptoms from quit day to week 2 post quit. Results indicated that after adjusting for the effects of gender, nicotine dependence, baseline levels of negative affect, and pre-quit reductions in negative affect, greater pre-quit reductions in anxiety sensitivity were related to faster decreases (i.e. negative slope of change) in post-quit levels of withdrawal symptoms. However, it was baseline levels of anxiety sensitivity but not pre-quit reductions in anxiety sensitivity that showed significant effect on quit day levels of withdrawal symptoms (i.e. intercept). The current data present novel insight into the role of reduction in anxiety sensitivity on withdrawal symptoms during a quit attempt. These findings will be discussed in terms of clinical merit to employ anxiety sensitivity reduction methods for the management of withdrawal symptoms in smoking cessation treatment.

FUNDING: No Funding

JUSTIFICATION: These findings suggest that there may be clinical merit to employ anxiety sensitivity reduction methods for the management of withdrawal symptoms in smoking cessation treatment.

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POS1-123
THE IMPACT OF NICOTINE LOZENGES AND STIMULUS EXPECTANCIES ON RESPONSES TO ANTICIPATED AND UNANTICIPATED SMOKING OPPORTUNITIES

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Rationale: Non-pharmacological factors have been found to make a substantial contribution to cigarette craving reduction associated with acute nicotine replacement therapy (NRT) use; however, little is known about the extent to which such factors impact actual smoking behaviour. Objectives: This study examined the impact of the pharmacological and expectancy components of NRT administration on craving and cigarette self-administration in smokers either anticipating or not anticipating an imminent smoking opportunity. Methods: One-hundred and fifty-four smokers (84 male) completed an experimental session where participant beliefs regarding the nicotine content of a lozenge (4mg vs. no nicotine) and the availability of a future smoking opportunity were manipulated. Cigarette craving was assessed before and after the manipulations. Participants were then allotted one hour to self-administer their preferred brand of cigarettes. Results: Being presented with an unanticipated smoking opportunity reduced latency to smoke (p<0.001), regardless of nicotine expectancy or pharmacology. In males, nicotine expectancy reduced intention to smoke only when a smoking opportunity was not perceived to be available (p=0.036); however, nicotine expectancy was found to increase self-administration when males were presented with a smoking opportunity (p values<0.005). In contrast, nicotine expectancy was associated with reduced self-administration in females (p values<0.005). Conclusions: Findings suggest that nicotine expectancy and perceptions about the availability of a smoking opportunity make important contributions to the impact of acute NRT use on subjective craving and smoking behaviour and that beliefs about prior nicotine ingestion may differentially impact male and female smokers’ subsequent smoking behaviour.

FUNDING: This work was supported by a discovery grant awarded to Sean P Barrett by the Natural Sciences and Engineering Research Council of Canada, and a research grant awarded to Hera E Schlagintweit by the Department of Psychiatry Research Fund at Dalhousie University.

JUSTIFICATION: This paper suggests that non-pharmacological factors, perceptions regarding future smoking opportunities, and sex differences make an important contribution to the outcome of smoking cessation attempts using nicotine replacement.

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POS1-124
E-CIGARETTES IN DIGITAL HEALTH DOCTORS’ ANSWERS TO PATIENTS’ QUESTIONS

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Background: E-cigarettes (EC) are electronic devices that vaporize a nicotine-based liquid for inhalation. Rapidly growing in popularity, US sales approached $1.8 billion in 2013. With limited evidence and much speculation in the media, pro-EC arguments include possible decreased morbidity and mortality if entrenched smokers switch from combustible cigarettes, while con-EC arguments warn of re-normalization of smoking, attraction to youth, and gateway drug potential.

FUNDING: This research was supported in part by National Heart, Lung, and Blood Institute Grant 5T32HL007778-19, National Cancer Institute Grant R01-CA140256, and the NYS Department of Health.

JUSTIFICATION: Hazardous drinkers with high baseline nicotine dependence calling a quitline may require more intensive interventions to achieve smoking cessation.

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Notably, patients have questions about their use, and consensus medical practice guidelines do not yet exist. This study characterized patient questions about EC and doctors' responses posted to a digital health service.

Method: Content analysis based on anonymous patient questions and doctor answers from HealthTap, an online and mobile, public digital health service that receives over 10 million visitors each month and has a vast repository of patient questions, as well as answers to those questions from U.S. licensed doctors.

Results: From 2010-2014, there were 11,218 smoking-related questions, with 316 (3%) about EC. The percentage of EC to total smoking questions increased from 0% in 2010 to 6% in 2014. Most (81%) patient EC questions asked about risks of use including in relation to combustibles (23%); secondhand exposures (3%) and gateway to other drugs (2%); 20% asked if EC use is helpful for quitting conventional cigarettes. Doctors' responses were coded as 16% pro-EC, 21% neutral, and 63% con-EC; 29% stated preference for EC to combustible cigarettes; 24% emphasized more research is needed; and 4% indicated lack of regulation by the FDA as a concern.

Conclusion: EC questions were found to be a minority but growing proportion of patient smoking-related questions in a public digital health service that allows patients to ask doctors questions anonymously. Patients want to know about risks of using EC, use of EC to quit combustible cigarettes, and second-hand exposure. Doctors varied in their opinion of EC safety. While a majority was negative toward EC use, some discussed EC use in terms of harm reduction for patients who are already smoking and unable to quit. The need for more research to inform practice recommendations was identified.

FUNDING: No Funding.

JUSTIFICATION: This method of data-collection provides unique insights into real-time clinical practice norms around e-cigarettes and have cross-disciplinary value to clinicians, researchers, and policymakers, thus preliminary results were included in an open letter to the FDA recommending oversight and regulation of e-cigarettes due to significant concerns about e-cigarettes from both patients and doctors, and lack of clinical consensus around e-cigarettes.

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POS1-126
THE EFFECTS OF NICOTINE EXPECTANCIES ON RESPONSES TO NICOTINE-FREE ELECTRONIC CIGARETTES
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Electronic cigarettes (e-cigarettes) have been reported to reduce tobacco craving and withdrawal; however, the mechanisms underlying these effects have not been elucidated. This study examined the contributions of nicotine stimulus and response expectancies to responses to nicotine-free e-cigarettes in 21 e-cigarette naive smokers (12 male). Participants completed two randomized experimental sessions in which they administered a nicotine-free e-cigarette. During one session they were informed the e-cigarette contained nicotine and during the other session they were informed that the e-cigarette was nicotine-free. Participants completed subjective assessments before and immediately after sampling ten puffs from the e-cigarette and were then invited to earn additional puffs using a computerized progressive ratio task. Prior to their enrolment in the study, participants provided an estimate of the relative importance of the nicotine content of e-cigarettes for craving relief. Instructions that the e-cigarette contained nicotine were found to reduce both intention to smoke (p=0.017) and withdrawal-related (p=0.018) craving, regardless of a-priori reported beliefs regarding the relative importance of nicotine. Nicotine content instructions were also found to be associated with a shorter latency to self-administration (p=0.0065); however, a Sex x Instructions x Response Expectancy interaction (p=0.008) revealed that this effect was specific to women who had strong a-priori nicotine content craving relief expectations. Neither nicotine content instructions nor response expectancies impacted number of puffs self-administered. Findings suggest that nicotine content expectations contribute to smokers’ responses to e-cigarettes, and that a-priori beliefs about nicotine effects may be especially important in women.

FUNDING: Natural Sciences and Engineering Research Council of Canada

JUSTIFICATION: This study illustrates how psychological factors impact electronic cigarette effects on tobacco craving and withdrawal

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POS1-127
A BEHAVIORAL ASSESSMENT OF ELECTRONIC CIGARETTES IN REDUCING CUE- AND WITHDRAWAL-INDUCED CRAVING IN DAILY DEPENDENT SMOKERS

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Electronic cigarettes (e-cigs) are smoking products often marketed as an alternative to traditional cigarettes. Preliminary research indicates that e-cigs reduce traditional smoking and tobacco craving and withdrawal symptoms. The aim of this study was to empirically evaluate the efficacy of no-nicotine e-cigs in decreasing tobacco craving in daily dependent smokers with no prior e-cig experience. The study was a within-subject, single-blind, randomized design. Using QSU-B, PANAS, and VAS, nicotine craving and mood were assessed under four experimental conditions: smoking their own cigarette brand; an e-cig with concurrent administration of a nicotine or placebo lozenge; a nicotine lozenge alone. The study consisted of four 4-hour visits. Participants arrived overnight smoking abstinent and underwent one experimental condition per visit in a ventilated experimental room for 5 minutes. Neutral and smoking-related cues were presented 1 and 3 hours after experimental conditions and participants completed questionnaires to assess cue- and withdrawal-induced cravings. To date, 14 participants (5M/9F) have completed (age=36.8±11, CPD=20.2±8.5, FTND=5.9±3.2). In all conditions, subjective craving was greatest prior to experimental condition and most reduced after exposure to neutral cues 1-hour post-condition, followed by exposure to smoking cues at 1-hour, and neutral cues and smoking cues at 3-hours. Reduction in craving at 3-hours (end of visit) compared to baseline and maintenance of reduced craving between neutral and smoking cue presentations were most significant in the e-cig with nicotine lozenge condition (p<0.05). At 1-hour post-condition, a significant difference in craving (QSU-B) was observed between cigarette (52.7±3.1) and e-cig with nicotine (46.4±3.9) conditions (p=0.023). Craving reduction after e-cig with placebo lozenge was also significant and in the same range as nicotine lozenge alone. No significant changes in mood were seen. E-cigs reduce craving regardless of concurrent nicotine exposure. Further research is needed to evaluate craving reduction from nicotine delivery through vapor.

FUNDING: Funding provided by the Health Services Research Fund, Ontario Ministry of Health and Long-term Care

JUSTIFICATION: E-cigarettes may not need to contain nicotine to reduce craving for cigarettes

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POS1-128
COLD TURKEYS AND E-CIGS: CESSATION STRATEGIES YOUNG ADULT SMOKERS USE AFTER PARTICIPATING IN A FACEBOOK INTERVENTION

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Background: Little is known if smoking cessation interventions implemented in online social networks stimulate quit attempts (QAs) and how QAs are influenced by participant characteristics. We examined frequency, strategies used, and predictors of QAs among young adult smokers participating in the Tobacco Status Project (TSP), a smoking cessation intervention implemented on Facebook.

Methods: A total of 79 young adult smokers (mean age=20.8; 20.3% female) were recruited on Facebook to participate in a feasibility trial of the TSP. Participants joined motivationally-tailored secret Facebook groups and received daily posts over 12-weeks. Optional cognitive behavioral smoking cessation therapy was implemented via Facebook chat. Assessments were completed at baseline, 3-, 6-, and 12-month follow-up.

Results: In 12 months, 52 (65.5%) of participants completed 215 QAs (M=4.1; range 1-14). Of these QAs, 162 (75.4%) were undertaken without assistance, 40 (18.6%) with electronic cigarettes (e-cigs), 16 (7.4%) with nicotine replacement therapy (NRT), and 8 (3.7%) with professional advice (use of strategies not mutually exclusive). Participants making at least 1 QA were less likely to be daily smokers (Chi2(1)=4.4; p<.05) and smoked fewer cigarettes during the past 7 days (t(77)=2.5; p<.05) and on fewer days (t(75)=2.3; p<.05) at baseline compared to those not trying to quit during the study period. The use of e-cigs during the study was associated with reporting a quit attempt in the past year at baseline (Chi2(1)=4.9; p<.05). No baseline characteristics predicted the use of NRT. QAs with any assistance (incl. e-cigs) lasted longer than QAs without assistance (z=2.1; p<.05) but did not differ with regard to reported level of discomfort.

Discussion: After participating in an online cessation intervention on Facebook, young adult smokers predominantly try to quit without assistance. E-cigs are used more frequently as cessation aid than NRT in this population, even though clear evidence for their effectiveness is still lacking and their use was not recommended in the intervention. The use of evidence-based smoking cessation strategies should be improved in this population.

FUNDING: This study was funded by a grant from the National Institute on Drug Abuse awarded to Dr. Ramo (grant number K23 DA032578). Dr. Thrusl is supported by National Cancer Institute Grant CA-113710.

JUSTIFICATION: Results of this study can inform online smoking cessation interventions implemented on social networks such as Facebook.

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POS1-129
EXPLORING THE SEVERITY OF DEPENDENCE SCALE (SDS) AS A POSSIBLE MEASURE OF NICOTINE DEPENDENCE

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The first time to first cigarette (TTFC) of the day is an emerging single-item indicator of nicotine dependence due to its robust associations with indices of physical dependence. However, it is unclear if this measure adequately captures other dimensions of dependence. The Severity of Dependence Scale (SDS) is a brief questionnaire used to assess psychological and affective aspects of dependence that has not yet been extensively applied to smoking research. We examined associations between the SDS and TTFC among 255 non-treatment seeking daily smokers during the baseline session of a cessation trial. We also examined associations of the SDS and TTFC with biobehavioral indices of dependence, quitting behaviors, and cognitive-affective variables, and compared the relative contributions of both measures in predicting these variables. TTFC was unrelated to SDS total score, but was correlated with individual SDS items related to experiencing difficulty and anxiety/worry when unable to smoke (r=.27-.32, p's<.001). TTFC, but not SDS, was correlated with physical indices of dependence such as cigarettes per day (r=.29, p=.000) and carbon monoxide (r=.25, p=.000). Both TTFC and SDS were associated with quitting behaviors (e.g., number of lifetime quit attempts, motivation and plans to quit), but differed in directionality of associations. TTFC and SDS were both associated with cognitive-affective variables (e.g., self-efficacy, risk perception), but SDS outperformed TTFC in strength and number of these relationships. Including both the SDS and TTFC as regression model predictors often increased the amount of variance explained. Findings suggest that the SDS and TTFC assess different constructs of dependence; among smokers, the SDS appears to tap into non-physical components of dependence such as motivation to quit and affect. Assessing nicotine dependence with the SDS in addition to TTFC may offer utility over using TTFC alone.

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JUSTIFICATION: Findings may inform clinical practice via suggesting the utility of the SDS as a potential supplemental measure of nicotine dependence; given that the SDS and TTFC assess different domains of nicotine dependence, when administered together prior to quit attempts, these measures may aid researchers and clinicians in tailoring cessation resources.

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POS1-130
SEX DIFFERENCES IN TIME PERCEPTION DURING SMOKING ABSTINENCE
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Nicotine withdrawal leads to impulsive decision-making, which reflects a preference for smaller, immediate rewards, and often prompts relapse to smoking. The mechanism by which nicotine withdrawal leads to poor decision-making is not well known. An essential dimension of decision-making is time perception. Impulsive decisions reflect intolerance of temporal delays and the perception that time is passing more slowly. Sex may be an important factor in impulsive decision-making and time perception, but no studies have investigated whether sex moderates the effects of nicotine withdrawal on impulsive decision-making and time perception. Smokers (N=33; 12 female) completed two laboratory sessions: following 24-h abstinence and once smoking-as-usual (order counterbalanced, abstinence biochemically verified). Participants completed two time perception tasks and a decision-making task. There was a significant sex by session interaction during time reproduction (p=0.01). Males overestimated time during abstinence (p=0.001, d=1.13), compared to smoking, whereas there was no session effect for females (p=0.27, d=0.06). On the time discrimination task, smokers were less accurate during abstinence (p=0.005) and this effect tended to be stronger in females (p=0.005, d=0.57) than in males (p=0.10, d=0.31). In general, males had higher discounting rates compared to females (p=0.02, d=0.81), but there was no effect of abstinence. The current data suggest that the effect of abstinence on time perception may be stronger in males and that males generally exhibit steeper delay discounting rates, indicating greater impulsivity. Time perception may be an important mechanism in smoking abstinence. Understanding these underlying mechanisms and the degree to which they differ between males and females may help identify more targeted treatment strategies to help more smokers successfully quit smoking.

FUNDING: This work was supported by the National Cancer Institute (NCI Cancer Center Support Grant P30 CA016520) and the National Institute on Drug Abuse at the National Institutes of Health (K23 DA035295 to R.L.A.) and by the Abramson Cancer Center of the University of Pennsylvania.

JUSTIFICATION: Understanding the degree to which changes in time perception during abstinence differ between males and females may help identify more targeted treatment strategies to help more smokers successfully quit smoking.

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POS1-131
10 YEAR WEIGHT GAIN IN SMOKERS WHO QUIT, NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (NHANES) 2003-2010
Susan Veldheer*, Jessica Yingst, Jonathan Foulds

Introduction: Long term weight changes among smokers who quit are not well characterized in the general population.

Methods: Adults age 36 and older with a Body Mass Index (BMI) > 18.5 were selected from the 2003-2010 National Health and Nutrition Examination Survey (NHANES). Participants self-reported their current smoking status, height, weight and their weight 10 years ago. BMI weight class was defined as normal weight (BMI <25), overweight (BMI >25 and <30) and obese (BMI > 30). Statistical analyses were performed according to NHANES analytical guidelines. Multiple linear regression was used to test the association between weight change from 10 years ago and smoking status. All analyses were adjusted for BMI 10 years ago, gender, race, age and education level.

Results: The sample (n= 9,876) was 9.7% former smokers (n=979), 25.7% current smokers (n=2568) and 65% never smokers (n=6329) with a mean age of 53.4 years. Former smokers had been quit for an average of 5.8 years and had smoked an adjusted mean of 17.7 cigarettes per day (CPD) prior to quitting while current smokers smoked 16.9 CPD (p=0.24). Compared to their weight 10 years ago, former smokers gained 17.8 pounds (95% CI: 15.2, 20.4), never smokers gained 10.0 pounds (9.2, 10.8), and current smokers gained 6.6 pounds (5.2, 8.0). Among former smokers, number of CPD smoked prior to quitting was positively associated with weight gain (p<0.001) while BMI 10 years ago was negatively associated with weight gain (p=0.001) (adjusted for length of time quit). Weight gain among former smokers who smoked > 30 CPD (n=202) was more than twice that of those who smoked < 20 CPD (n=484) (27.4 pounds v. 10.9 pounds, p<0.001).

Conclusion: Among former smokers, BMI 10 years ago and CPD prior to quitting are important predictors of weight gain with heavy smokers and those who were normal weight prior to quitting experiencing the greatest 10 year weight gains. Surprisingly, weight gains were the lowest for those who were obese prior to quitting.

FUNDING: This research was supported by funds from the Penn State Cancer Institute to JF.

JUSTIFICATION: This paper can help to inform providers when helping smokers to quit.

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POS1-132
TEXTING TO PROMOTE TOBACCO ABSTINENCE IN EMERGENCY DEPARTMENT SMOKERS: A PILOT STUDY
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Background: Emergency department (ED) patients have a high smoking prevalence. Current treatment approaches use motivational interviewing, which is effective, but resource-intensive. Mobile health approaches may be more generalizable. Objective: To assess the feasibility of an ED-initiated program of tobacco dependence treatment that employs a publicly available text messaging program. Methods: Smokers age 18 or older were randomized to intervention or control arms. Control subjects received a brochure describing the state smokers’ quitline. Intervention subjects received the brochure, 4 weeks of nicotine patches and gum, with the initial dose administered in the ED, a faxed referral to the quitline, and enrollment in SmokeFreeTxt, a free SMS-messaging service developed by the National Cancer Institute (www.smokefreerx.gov). SmokeFreeTxt delivered 28 days of 2-5 messages/day. Message content adapts principles of
cognitive behavioral therapy. Some messages ask subjects to provide data on mood or craving. Subjects received $25 at enrollment; texting subjects received an additional $25 to offset potential costs to cellphone plans. Follow-up was by self-reported phone call. Subjects lost to follow-up were considered to be smoking.

Data were analyzed with Microsoft Excel and SPSS 19.0. Results: 60 subjects were enrolled in May 2014. Of all subjects, 30 (50%) were female, 27 (45%) were white, 33 (55%) nonwhite, mean age 40 years (SD 11), and insurance coverage of Medicaid, self-pay, or other, respectively, of 78%, 8%, 14%. All intervention subjects used the texting program, with 24/30 (80%) using the program for all 28 days; 6 subjects opted out at some point. At 1 month, 14/30 subjects (47%) in the intervention arm reported tobacco abstinence, vs. 3/30 (10%) in the control arm (P=0.003). At 3 months, the self-reported abstinence rates in the intervention and control arms was, respectively, 9/30 (30%) and 4/30 (13%) (P=0.21). Conclusion: A texting program, combined with pharmacotherapy and a quitline referral, shows promise to promote tobacco abstinence in ED smokers. These data will provide an effect size to power a larger randomized clinical trial.

FUNDING: NIH/National Cancer Institute R01CA141479

JUSTIFICATION: Because of the high prevalence of smoking in ED patients, and the near-universality of cellphones, a successful ED-initiated program of texting could promote cessation for otherwise hard-to-reach smokers.

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**POS1-133**

**SMOKE AND MIRRORS: HOW WELL DOES OUR TYPICAL PARADIGM REFLECT TRUE INDIVIDUAL DIFFERENCES IN ABSTINENCE EFFECTS ON COGNITION?**

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Individual differences in smoking abstinence effects on cognition (AEC) are of great interest as mechanisms/endophenotypes linking psychiatric disorders/genes to relapse, and AEC is increasingly posited as a therapeutic target. These trait models implicitly assume that AEC are stable traits, that individual differences in AEC observed in the typical paradigm – the difference between smoking-as-usual (SAU) and overnight abstinent visits – would be maintained if examined in a second visit pair. Surprisingly, the present study is the first to evaluate the degree to which AEC exhibit acceptable test-retest reliability. Thirty-two dependent smokers completed two smoking vs. abstinent visit pairs (4 visits at 1-week intervals; counterbalanced). During each visit, participants completed typical tasks (continuous performance, n-back, spatial span, stop signal) that provided two indices each of attention, working memory, and inhibitory control. Typical AEC patterns were observed in each visit pair (VP: median Cohen’s d = .19 and .28), and AEC were larger when aggregated across VPs (median d = .32) or tasks (ds = .50 and .54 for VP1 and VP2). However, the test-retest reliability of AEC was uniformly poor across all cognitive indices, rs < .36, median r = -.07. Similar results were obtained for residual change scores and intraclass correlations. Thus, the use of AEC derived from the typical paradigm (one SAU visit vs. one abstinent visit) as traits/endophenotypes is ill-advised. That said, to the extent that cognition during abstinence, rather than the smoking-abstinence difference, is of interest, the good-to-mixed correlations across the four sessions (median rs range from .66 to .73 for the six cognitive measures) are promising as indicators of traits. More broadly, the present data encourage explicit evaluation of ‘traitiness’ of putative traits and psychometrically-informed efforts to improve the degree to which our measures accurately reflect the individual differences of interest.

FUNDING: Funding support: Tobacco-Related Disease Research Program grant 21BT-0056

JUSTIFICATION: The novel interactive “Mobile Doctor” (IMD) intervention has promising potential to enhance provider-patient communication and in improving consistency in delivering the recommended “5 A’s” for smoking cessation treatment in clinical settings particularly with Asian American immigrant patients.

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**POS1-134**

**AN INTERACTIVE MOBILE DOCTOR DELIVERING “5 A’S” TO KOREAN AND VIETNAMESE SMOKING PATIENTS IN PRIMARY CARE: A PILOT STUDY**

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BACKGROUND: Low proportions of Asian-American smokers receive physician advice to quit. We examined the feasibility of implementing an interactive “Mobile Doctor” intervention (IMD) for Korean- and Vietnamese-speaking male patients whose smoking prevalence rates remain high. METHODS: Using a community-based participatory research approach, we created the IMD that delivers tailored in-language video messages via a mobile tablet to Korean and Vietnamese male smokers right before their clinic visit with a provider. The development process was guided by the Clinical Practice Guideline, formative qualitative findings from healthcare providers and patients, and input from providers, clinic staff, patients, and researchers. IMD delivers the “5 A’s” and generates a bilingual tailored printout. Participants were Korean- and Vietnamese-speaking patients who self-identified as current smokers and received primary care at a federally-qualified health center. RESULTS: Participants were 29 male patients (85% participation rate). Their mean age was 55.5 (SD=9.9), 48.3% had < high school education, mean cigarettes smoked/day was 9.1 (SD=4.1); 51.7% attempted quitting past year but few utilized provider advice (0%), quitline (0%), or medications (6.9%); 86.2% were thinking about quitting. IMD took an average of 13.7 minutes (range: 10-25 minutes) to complete right before a clinic visit. At post-visit, all patients reported discussing their smoking with their providers during the visit. Many perceived IMD was helpful in their decision of quitting (86.2%) and in enhancing their communication with providers (86.2%); all were satisfied with the amount of time spent at the clinic. Medical record documentation of physician advice for the participants increased from 31.0% at one visit prior to IMD to 72.4% at the visit right after IMD (p<0.002). CONCLUSIONS: The IMD is feasible in a primary care setting. It was highly acceptable to Korean and Vietnamese smoking patients and is promising in increasing provider-patient discussion of tobacco use. Results warrant a future randomized trial to establish efficacy in promoting smoking cessation among Asian American immigrants.

**POS1-135**

**DYSREGULATION OF THE HYPOTHALAMIC-PITUITARY-AXIS AMONG BLACK SMOKERS: IMPLICATIONS FOR DISPARITIES**

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Research aimed at understanding racial/ethnic health disparities in tobacco-related outcomes is needed. The unique stress experienced by Blacks may impact smoking relapse, yet no studies have examined race differences in physiological stress. This pilot study examined differences in hypothalamic-pituitary-adrenal...
axis (HPA) functioning between treatment-seeking Black and White smokers, and differences in smoking relapse. We hypothesized that Blacks would exhibit greater HPA dysregulation and relapse compared to Whites.

Adult smokers received 8-sessions of group cognitive behavioral therapy (CBT) plus transdermal nicotine patches. Assessments included demographics, salivary cortisol (collected at session 1, end-of-therapy [EOT], and 1-month post-therapy), and carbon-monoxide-verified smoking status.

Participants (N=91; n=63 Blacks, n=28 Whites) were mostly single, middle aged, at least high school educated, and low-income. Whites reported higher income and education. Participants smoked 19 daily cigarettes and were moderately nicotine dependent. Overall, we found significant declines in salivary cortisol over the course of the day at baseline (target quit day), the EOT, and the 1-month follow-up. Black smokers exhibited lower cortisol levels compared to Whites at each time point. We also examined race differences in cortisol slopes, which demonstrated flatter slopes among Blacks versus Whites at each time point. By the 1-month follow-up, the slope difference still showed blunting in Blacks, but was not significantly different from Whites (p=0.07). Finally, relapse rates were greater among Blacks, and significantly greater at the 1-month follow-up.

These findings have implications for tobacco health disparities. The blunted cortisol pattern observed in Blacks may be a result of prolonged and repeated stress exposures that lead to hormonal dysregulation. Black smokers were also more likely to relapse. The greater allostatic load (i.e., cumulative physiological toll of chronic stress on the body), may lead to HPA exhaustion and aid in our understanding of disparities in this population. More research is warranted in this area.

FUNDING: Pap Corps Champions for Cancer Research

JUSTIFICATION: Findings from this study have implications for smoking cessation treatment and reducing/eliminating health disparities.

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POS1-136
NICOTINE AND NON-NICOTINE SMOKING FACTORS DIFFERENTIALLY MODULATE WORKING MEMORY AND ASSOCIATED BRAIN FUNCTION

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Smoking abstinence significantly impairs executive function which in turn may promote continued smoking behavior and relapse. Prior research has demonstrated that sustained attention (the ability to maintain focus over time) and working memory (the ability to encode, store and update information over short periods of time) are disrupted soon after and for up to a month after smoking cessation. Whereas prior evidence suggests that these deficits are due to abstinence from nicotine rather than non-nicotine factors (i.e. sensory, motor aspects of smoking), the differential influence of nicotine and non-nicotine smoking factors on brain function has not been systematically evaluated in a single study. In a fully-factorial, within-subjects design, 33 smokers (51.5% female; 45.5% non-white; mean age=36.4±5.2; cigs/day=16±5.4) underwent fMRI scanning following 24-h of wearing a nicotine or placebo patch while smoking very low nicotine content (VLNC) cigarettes or remaining abstinence from smoking. During scanning, blood oxygenation level-dependent (BOLD) signal was acquired while participants performed a verbal N-back task. fMRI analysis was conducted by examining % signal change extracted from ROIs associated with sustained attention/working memory. Following 24-h placebo (vs. nicotine) administration, accuracy on the N-back task was significantly worse (main effect of PATCH, F=11.04, p=0.001) and task-related BOLD signal was lower in dorsomedial frontal cortex (main effect of PATCH, F=5.01, p=0.026). These effects were observed irrespective of smoking. We also examined relations between craving and task activation. In left dorsolateral prefrontal cortex, under the nicotine condition, lower craving was associated with reduced BOLD signal (PATCH x CRAVE interaction, F=7.47, p=0.007). Our data provide novel evidence that abstinence-induced deficits in memory and attention and changes in underlying brain function are due in large part to abstinence from nicotine compared to non-nicotme factors. This work has implications both for designing interventions that target abstinence-induced cognitive deficits and for nicotine-reduction policy.

FUNDING: This research was supported by R01 DA023516 (FJM).

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POS1-137
PREDICTORS OF ADHERENCE TO TELEPHONE COUNSELING FOR SMOKING CESSATION AMONGST VETERANS PRESENTING TO VA MENTAL HEALTH CLINICS

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Background: Smoking is a leading cause of preventable morbidity and mortality and disproportionately affects Veterans and those with mental health conditions. Proactive telephone quitline counseling is effective compared to no counseling, self-help, and pharmacotherapy. Despite its wide use, little is known about optimal implementation. Few studies have analyzed the baseline factors predictive of adherence to the quitline treatment process. This secondary analysis of a regional telephone smoking cessation program evaluates factors that predict adherence and the relationship between adherence to telephone counseling and smoking cessation.

Methods: TeleQuitMH was a 6 month multi-centered, randomized trial of a proactive telephone counseling program among veterans with mental health conditions. From a baseline patient questionnaire, we selected nineteen potential predictors to explore—including demographics, motivation, stage of change, and environment/support. Bivariate analysis was used to build a multivariate model to determine factors associated with adherence to counseling sessions. A bivariate analysis then explored the association between adherence to counseling sessions and smoking cessation at 6 months.

Results: 1206 patients were referred to TeleQuitMH for telephone counseling, of which 577 were enrolled and 270 were randomized to receive VA-based telephone counseling. Age (p = 0.017) and motivation to quit (p < 0.05) were associated with adherence to more counseling sessions. Increased age (p < 0.023) and motivation to quit (p = 0.035) were also maintained in multivariate model. Participants who reported smoking cessation at 6 months completed more counseling sessions (6.89, SD 3.6 vs. 2.97, SD 2.90; OR 1.43, CI 1.29 – 1.60).

Conclusion: In a proactive quitline counseling program for veterans in care of mental health providers, increased age and motivation are associated with increased adherence to telephone counseling. As adherence to the treatment regimen is strongly associated with smoking cessation, research targeted at enhancing adherence offers a potential way to increase rates of cessation.

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Aims: Prior research suggests the reported outcomes of some medications decline over time. A previous study suggests this trend occurs with nicotine replacement therapies (NRT) because remaining users are more difficult to treat. The present research aims to test this hypothesis for NRT gum, NRT patch, bupropion and varenicline use by exploring changes in outcomes of randomized controlled trials (RCTs) of these medications over time.

Methods: Data were acquired from RCTs in the Cochrane Database. The analyses included abstinence rates from 56 NRT gum trials from 1979 to 2009 (N=22,581), 43 NRT patch trials from 1988 to 2012 (N=19,586), 44 bupropion trials from 1994 to 2013 (N=13,728) and 14 varenicline trials from 2006 to 2012 (N=6,166). We examined the incidence of a) abstinence rate in the active conditions, b) abstinence rate in the control conditions, and c) the active vs placebo effect size via the odds ratios (OR). Thus, we conducted 12 fixed-effects meta-analyses (4 medications x 3 outcomes). To illustrate the magnitude of effect, we conducted regressions of amount of change over a decade, in which study weights were determined by their sample size.

Results: In studies of NRT gum, the rate of abstinence decreased in active groups (-2.7%/10yrs; p<.05) and control groups (-2.1%/10yrs; p<.001) but the OR did not change over time. In studies of bupropion the rate of abstinence increased in the control groups (+6.3%/10yrs; p<.001) and showed a similar trend in the active groups (+4.6%/10yrs; p=10) but the OR decreased over time (-0.8/10yrs; p=.05). There were no changes in abstinence or OR in NRT patch or varenicline trials over time.

Conclusions: Our hypothesis that the abstinence rates would decrease over time was evident only in the NRT gum trials but the OR did not decrease in the NRT gum trials. The hypothesized OR decrease only occurred in the bupropion trials even though quit rates actually increased. These findings suggest changes in the trials' methodology, changes in study populations or publication bias. We are currently analyzing study characteristics to explore these explanations for our results.

FUNDING: This work was supported by NIDA 5 T32 DA 7242-23

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Nicotine dependent individuals (N=125) participated in an intravenous nicotine delivery session following biochemically-confirmed overnight smoking abstinence and were administered a placebo dose followed by two escalating nicotine doses. Smokers were grouped in the analyses based on self-reported cigarette preference (menthol (N=102) or non-menthol (N=23)). Relative to non-menthol-prefering smokers, menthol-prefering smokers i) reported a smaller reduction in smoking urges from baseline to end-of-session, ii) performed worse on cognitive measures, and iii) did not report differences in their ‘enjoy’ experience of the two nicotine doses, while non-menthol-prefering smokers rated the lower dose as more enjoyable (p<0.05). The observed differences between menthol-prefering and non-menthol-prefering smokers responses to acute nicotine administration could reflect pre-existing individual differences which may have influenced initial development of menthol preferences, or could have arisen secondary to prolonged use of menthol versus non-menthol cigarettes.

FUNDING: This research was supported by the National Institute on Drug Abuse (NIDA) (R01 DA12690, R01 DA12849, R03 DA027474) and the Veterans Administration Mental Illness Research, Education and Clinical Center (MIRECC).

JUSTIFICATION: Understanding how menthol-prefering and non-menthol-prefering smokers differ in their responses to acute nicotine or acute nicotine administration may shed light on mechanisms by which risk for nicotine dependence may be increased in menthol-prefering smokers.

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Menthol is found in approximately 90% of cigarettes, but at much higher levels in ‘menthol’ than ‘non-menthol’ cigarettes. Menthol is a flavoring agent that it is reportedly included in cigarettes because of its well-known capacity to create a cooling and soothing sensation in the throat. However, individuals who smoke ‘menthol’ cigarettes have an increased risk for developing nicotine dependence and menthol may increase the reinforcing properties of cigarettes. The mechanisms through which menthol may increase risk for nicotine dependence are poorly understood, in part since personal cigarette preferences impact subjects’ responses to cigarettes. This makes it difficult to assess the impact of menthol on nicotine’s effects using standard cigarette smoking laboratory paradigms. Here, we compare subjective and physiological responses and cognitive performance between regular ‘menthol’ cigarette smokers and ‘non-menthol’ smokers to overnight abstinence and intravenous nicotine delivery.

FUNDING: Funded by R01CA127491 from the National Cancer Institute

Self-efficacy has been associated with smoking cessation and relapse in myriads of research studies over the last three decades. Despite the robustness of this association, self-efficacy has never been shown to exert a causal effect on smoking cessation outcomes. The lack of causal evidence limits both theorizing about the role of social-cognitive variables like self-efficacy in smoking research and the provision of treatments that target smokers’ self-efficacy for change. This experiment was designed to test whether self-efficacy causally influences smoking cessation. A sample of n=80 smokers who were motivated to quit was recruited from the community. All participants were provided with brief (<15 minutes) smoking cessation treatment on each of three days (days 1-3) in preparation for quitting smoking on a target quit day (day 6). In addition, participants were randomized to one of two experimental conditions in which they were provided with bogus feedback on days 1-3 about their chances of quitting smoking as a way to manipulate their quitting self-efficacy. Participants in the Average Chances of Quitting Feedback (ACQ) condition took a computerized test and were told that the results of the test suggested that they had the same chances of quitting as everyone else in the study; participants in the High Chances of Quitting Feedback (HCQ) condition took the same computerized test and were told that the results of the test suggested that they had a greater chance of quitting compared to everyone else in the study. The main outcome was whether participants were able to quit for 24 hr (CO verified) on the target quit day. Results revealed that HCQ participants experienced significantly greater increases in self-efficacy from days 1-3 compared to ACQ participants (p<0.03) and they had a significantly greater chance of quitting smoking compared to ACQ participants (p=0.02). Mediation analyses suggested that the increased chances of quitting in HCQ participants was due to the experimentally-generated increases in their self-efficacy prior to quit day (p<0.03). This study provides the first evidence that quitting self-efficacy is causally-related to smoking cessation.

FUNDING: Funded by R01CA127491 from the National Cancer Institute

Poster Session 1 • Thursday, February 26, 2015 • 11:30 a.m.–1:00 p.m.
POS1-143
HEALTH RISK BEHAVIORS AMONG YOUNG ADULT SMOKERS PARTICIPATING IN A FACEBOOK SMOKING CESSATION TRIAL

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Introduction: In the context of a smoking cessation intervention delivered on Facebook, we examined other health risk behaviors in young adult smokers, with the goal of understanding ideal treatment targets for future intervention.

Method: Young adult smokers (N=79; age M=20 years; 79% male; 89% White) were recruited on Facebook to participate in a cessation intervention tailored to readiness to quit smoking. Eligible participants completed a baseline survey, a 3-month smoking cessation intervention on Facebook, and were surveyed again at 3, 6, and 12-months. The intervention used motivational interviewing and cognitive behavioral counseling, with brief attention to other health risk behaviors related to smoking (e.g., drinking, diet, exercise). The Staging Health Risk Assessment assessed prevalence and transtheoretical model readiness to change 11 health risk behaviors at each timepoint.

Results: Participants averaged 11 cigarettes per day (SD=8.2); 42% smoked within 30 minutes of waking; and 73 were daily smokers. In our smoking sample, baseline prevalence of other risks was highest for high-fat diet (84%), poor sleep (67%), and risky sexual behavior (64%). Among those at risk, participants were most prepared to change inactivity (55% ready to change within 1 month), poor diet (43%), and stress (38%), and least ready to change drinking (15%), risky sex (13%), and substance use (10%). Health risk behaviors were generally more related and relations were stronger after participation in the intervention (3, 6, 12 mo; range r=|.22-.57|) than at baseline (range r=|.23-.41|). Tobacco use was related and relations were stronger after participation in the intervention (3, 6, and 12-months. The intervention used motivational interviewing and cognitive behavioral counseling, with brief attention to other health risk behaviors related to smoking (e.g., drinking, diet, exercise). The Staging Health Risk Assessment assessed prevalence and transtheoretical model readiness to change 11 health risk behaviors at each timepoint.

Conclusions Health risk behaviors are common and related among young adult smokers, however prevalence is inconsistent with readiness to change. There is potential to benefit from targeting multiple health risk behaviors in the context of a single intervention, and strategies that tailor to readiness to change are likely to be most appropriate in this population.

FUNDING: National Institute on Drug Abuse K23 DA032578

JUSTIFICATION: There is potential to benefit from targeting multiple health risk behaviors in the context of a single intervention, and strategies that tailor to readiness to quit are likely to be most appropriate for a young adult population.

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POS1-144
REDUCED NICOTINE CONTENT CIGARETTES: PREDICTORS OF INDIVIDUAL DIFFERENCES IN THE EXTENT OF COMPENSATION

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Progressive reduction of nicotine content in cigarettes is one potential approach to reduce nicotine dependence. However, there is concern that smokers may compensate for the reduced nicotine content by smoking more to sustain nicotine levels. Individual differences in the rate of nicotine metabolism, as predicted based on smokers’ genotype for the nicotine metabolizing enzyme CYP2A6, and variation in the nicotinic receptor gene CHRNA5-A3-B4 can alter the level of smoking and dependence. We investigated differences in these genotypes influenced compensation and exposure to tobacco toxicants when smokers were switched to reduced nicotine content cigarettes (RNC). Data was derived from 51 participants in a randomized clinical trial of RNC (Benowitz et al. 2012). Nicotine content of the cigarettes was progressively reduced over 6 months from 12 mg to 1 mg and tobacco biomarkers, including plasma cotinine and 3-hydroxycotinine, and tobacco toxicants including urinary 2-naphthol (2-NP) and 2-hydroxyfluorene (2-HF) were measured and compensation was calculated. Results: Genetic variation in CYP2A6 and CHRNA5-A3-B5 did not influence the extent of compensation or tobacco toxicant exposure as nicotine content was reduced over time - all groups equally successfully reduced their nicotine intake (p<0.001) without increasing intake of tobacco smoke; the magnitude of cotinine-based compensation was similar: 54.2% and 43.6% for reduced vs. normal CYP2A6 metabolizers; and 55.5% vs. 44.9% for smokers possessing the high risk nicotinic receptor variant (p=0.5 between genotype groups at 1 mg). Levels of expired carbon monoxide, 2-NP, 1-HF and smoking intensity, as measured by cotinine per cigarettes per day did not increase as smokers were switched to RNC cigarettes (p>0.5) and did not differ between genotype groups (p>0.5). Conclusion: Genetic variation in CYP2A6 and in the nicotinic receptor does not appear to influence the extent of compensation when switching to reduced nicotine content cigarettes. This suggests that faster nicotine metabolizers and those with high susceptibility receptor variants may not be disproportionately at risk from a nicotine reduction strategy.

FUNDING: We acknowledge the support of the Endowed Chair in Addictions for the Department of Psychiatry (R.F. Tyndale), CIHR (THMRI09787), NIH (PGDR DA 020830) (R. F. Tyndale), NIH (NIDA DA 02277, DA 12393, and DA016752) and NCI (CA78603) (N. L. Benowitz) grants, Campbell Family Mental Health Research Institute of CAMH, the CAMH Foundation, the Canada Foundation for Innovation (#20289 and #16014 to R.F. Tyndale) and the Ontario Ministry of Research and Innovation.

JUSTIFICATION: Our findings help inform regulatory planning in implementation of a nicotine reduction strategy as a potential approach to promote smoking cessation.

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of ecological momentary assessment data collected from 109 treatment-seeking smokers 4 times a day for 21 days following a quit attempt. All smokers received nicotine replacement therapy and smoking cessation counseling. Multinomial hierarchical linear models were used to evaluate ways momentary impulsiveness, affect, urge, cigarette exposure, alcohol use and their interactions predicted temptations (vs. abstinent) and smoking (vs. temptation) up to 8 hours later. Level-one data comprised occasion-level predictors and outcomes nested within individuals at level-two. Results suggested temptations were predicted by higher momentary agitation, distress, and urge, and lower positive affect. The inability to resist temptations was predicted by prior smoking, higher distress, and recent alcohol use. Baseline trait impulsiveness (measured by the Barrett Impulsiveness Scale) significantly moderated the relation between momentary impulsiveness and smoking. There were significant interactions between level-one predictors that influenced the risk of temptations (positive affect x impulsiveness, urge x agitation, agitation x cigarette exposure, urge x cigarette exposure) and the odds of smoking (alcohol x impulsiveness). These results suggest the predictors of temptations and smoking differ. Studies of complex relationships between proximal risk factors may provide new information about relapse processes and inform smoking cessation interventions.

FUNDING: This research was supported by Award Number RC1DA028129 from the National Institute on Drug Abuse. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute on Drug Abuse or the National Institutes of Health.

JUSTIFICATION: This study identifies risk factors for smoking relapse to improve intervention efforts.

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POS1-146 PSYCHIATRIC DISTRESS AND MENTHOL USE OVER TIME IN A NATIONALLY-REPRESENTATIVE SAMPLE OF YOUNG ADULTS

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Background: Menthol cigarette use is increasingly popular among young adults (YAs). Psychiatric distress is highly prevalent among smokers and has been linked to mental use, greater nicotine dependence and lower success at quitting smoking. This study examined the association over time of psychiatric distress to young adult mental use.

Methods: Data were drawn from the sub-group of participants who completed Waves 1 through 3 of the Legacy Young Adult Cohort, a large nationally-representative sample of men and women aged 18 to 34 who are assessed at Waves 1 through 3 of the Legacy Young Adult Cohort, a large nationally-representative sample of men and women aged 18 to 34 who are assessed at all time points (n=203). A psychiatric distress group was created for those who received a score above the cut-off for Major Depressive Disorder (MDD) on the two-item Patient Health Questionnaire or Generalized Anxiety Disorder (GAD) on the two-item Generalized Anxiety Disorder scale.

Results: Unweighted analyses were conducted at each time point, first examining participants who smoked (menthol or non-menthol) across all three waves (n =158), and then including participants who initiated smoking at Wave 2 and who continued to smoke at Wave 3 (n = 45). Rates of psychiatric distress in menthol users ranged from 35% to 42% (across all waves), while rates in non-menthol smokers ranged from 23% to 25%. Results showed a significantly higher percentage of consistent menthol smokers had psychiatric distress at Waves 1 (p = .03) and Waves 3 (p = .04) compared to consistent non-menthol smokers; but there were no differences at Wave 2 (p = .14). When Wave 2 smoking initiates were added into the models, consistent menthol smokers were marginally more likely than consistent non-menthol smokers to report psychiatric distress at Wave 2 (p = .08), and differences between menthol and non-menthol smokers on psychiatric distress at Wave 3 became more pronounced (p = .02).

DISCUSSION: Efforts should be made to disentangle the mechanisms linking psychiatric distress to mental use in young adults, as they may impact quit attempts in later adulthood.

FUNDING: This study was funded by Legacy

JUSTIFICATION: Findings suggest the need to disentangle the mechanisms linking psychiatric distress to menthol use in young adult.

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POS1-147 GUANFACINE, AN ALPHAZA AGONIST, ATTENUATES AMPHETAMINE-PROVOKED DOPAMINE RELEASE IN TOBACCO SMOKERS

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Objective: The mesocortical dopamine (DA) system is critically involved in the reinforcing effects of tobacco smoking. The positron emission tomography (PET) radiotracer, C-11 FLB457, permits the detection of changes in synaptic DA levels at D2 receptors in extrastriatal regions, including the cortex. Guanfacine may be effective for smoking cessation and preclinically has been shown to reduce cortical DA release. Amphetamine is a pharmacological probe that provokes DA release resulting in a reduction of C-11 FLB457 receptor binding. The aim of our study was to measure amphetamine-induced DA release before and after guanfacine treatment with C-11 FLB457 and PET.

Methods: Twelve tobacco smokers had two C-11 FLB457 PET scans on the same day, one before and one 3 hours after amphetamine (0.4-0.5 mg/kg, PO). A subset of the subjects (n=8) underwent guanfacine treatment (3 mg/kg, PO, daily for 3 weeks) and then repeated the set of C-11 FLB457 PET scans. C-11 FLB457 binding potential (BP) was measured pre- and post-amphetamine in extrastriatal brain regions (hippocampus, occipital, parietal, temporal, cingulum, prefrontal cortex, thalamus and amygdala). The fractional change in BP from before to after amphetamine (ΔBP) is an indirect measure of DA release. The difference in ΔBP was compared between the untreated and guanfacine-treated conditions.

Results: In the untreated condition, significant reductions in C-11 FLB457 BP from amphetamine were found in the amygdala (6±7%), hippocampus (12±12%), thalamus (7±8%), cingulum (9±7%), dorsolateral (13±15%) and ventromedial (9±10%) prefrontal cortex, and occipital (7±11%), parietal (9±13%), and temporal (7±6%) cortices. Under guanfacine, no significant reductions in C-11 FLB457 BP were observed in this small sample. Guanfacine treatment attenuated amphetamine-induced DA release by 40%, averaged across regions.

Conclusions: These preliminary data suggest that chronic guanfacine treatment attenuates amphetamine-induced DA release as measured by C-11 FLB457 PET. Guanfacine-induced attenuation of dopamine release may be an important mesocortical mechanism for effective treatment for tobacco smoking cessation.

FUNDING: Supported by P50DA033945 and K02DA03175

JUSTIFICATION: An application is to inform clinical research about the neurobiological mechanisms of guanfacine treatment on tobacco smoking cessation.

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**POS1-148**

**EFFECTS OF APOE E4 ALLELE ON ABSTINENCE-INDUCED ALTERATIONS IN WORKING MEMORY FUNCTION IN HEALTHY SMOKERS**

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Deficits in working memory during smoking abstinence are associated with decreased activity in brain regions important in cognitive function and reduced suppression of activation in regions in the default mode network (DMN) and are predictive of smoking relapse. We previously showed that the E4 allele of the Apolipoprotein E (APOE) gene, studied for its role in cognitive aging and risk of developing Alzheimer’s disease, may also contribute to relapse. In the current study, we predicted that during abstinence, compared to smoking, smokers carrying at least one E4 allele would exhibit poorer task performance, reduced blood oxygen level-dependent (BOLD) signal in task-positive regions, and less suppression of task-negative regions, compared to E4 noncarriers. Smokers (N=78; 26 E4 carriers) performed a visual N-back task while undergoing BOLD functional magnetic resonance imaging (fMRI) on two separate occasions: following 24h of confirmed abstinence and during smoking as usual. APOE E2, E3 and E4 alleles were determined from allelic variants of two SNPs (NCBI SNPs rs429358 and rs7412). A whole-brain APOE E4 carrier status by session (abstinent vs. smoking) repeated measures ANOVA was performed on the effect of task (cluster corrected z=2.3, p=0.05). APOE genotypes were in Hardy-Weinberg equilibrium (p=0.78). Overall, reaction time (RT) was longer during abstinence compared to smoking (p=0.036); there were no other effects on RT or accuracy. There were significant interactions in the cingulate gyrus, lingual gyrus, bilateral occipital lobe, left hippocampus, posterior cingulate cortex (PCC), right insula, and ventromedial prefrontal cortex (vmPFC). For the E4 carriers, smoking (vs. abstinence) suppressed activation (or increased deactivation) in the hippocampus (p=0.015), PCC (p=0.001), insula, visual cortex, and vmPFC (p<0.05). Among E4 noncarriers, this pattern was reversed in the vmPFC and cingulate gyrus (p<0.01), but there were no session effects in the hippocampus or insula. Based on our prior work, it is plausible that difficulty suppressing abstinence-induced activation in task-negative regions may contribute to increased relapse risk in E4 carriers.

**FUNDING:** This research was supported by NIH grant P30 CA016520 and P50 CA143187 from the National Cancer Institute.

**JUSTIFICATION:** Abstinence-induced changes in working memory-related brain activation among E4 carriers may represent a biomarker of relapse vulnerability and help identify novel treatment targets.

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**POS1-149**

**MONITORING RELAPSE RISK AMONG RECENTLY QUIT SMOKERS USING INTERACTIVE VOICE RESPONSE (IVR) TECHNOLOGY**

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People with serious mental illness (SMI) are a priority population for tobacco control. Of growing interest but limited understanding is elevated menthol smoking in this group. In a diverse sample of adult smokers with SMI in the SF Bay Area we: 1) characterized preference and sensory correlates of menthol smoking and 2) examined purchasing preferences based on 6 packs of menthol and non-menthol packs with varied price differentials ranging in $1 increments from -$2 to +$2.

The sample (N=487, 53% male; 48% white; aged 18-75) was 42% non-menthol only, 28% menthol only, and 30% both. Younger adults, nonwhites, and those with more education were more likely to smoke menthol. Adjusting for demographics, relative to non-menthol smokers, menthol only smokers reported: greater nicotine dependence (b=6.6, p<.003) and expected difficulty with abstinence (b=7.7, p<.04), lower desire to quit (b=-7, p<.04), less frequent teeth/gum pain in their mouth (OR=0.3, p<.03), more frequent teeth/throat pain (OR=1.8, p<.04), and be more likely to value that their cigarette be: smooth (OR=1.8, p<.02), soothing (OR=2.1, p<.002), clean-tasting (OR=2.0, p<.02), minty (OR=12.1, p<.001), with an icy cool taste (OR=13.6, p<.001), cool the mouth/throat (OR=7.8, p<.001), and be affordable (OR=2.2, p<.01). Compared to non-menthol users, users of both reported greater hunger (OR=1.9, p<.001) and more frequent metallic taste in their mouth (OR=1.6, p<.03), less frequent dry mouth (OR=0.6, p<.05), and greater valuing that their cigarette be pleasant (OR=2.0, p<.04) with an easy draw (OR=2.2, p<.01), though not sooth (OR=0.8, p=.01). Non-menthol smokers were least...
likely to select menthol cigarettes across 6 price points (0.4 times), compared to smokers of both (2.7 times) and menthol only (5.3 times) (ps<.05). Smokers of both were the most price-sensitive (ps<.0001).

Results indicate that sensory and price preferences differ by menthol use. Regulating prices and/or restricting menthol characterizing flavoring in cigarettes may reduce smoking initiation and support cessation efforts for menthol only users in this vulnerable group.

FUNDING: NIH (#R01 MH083884)

JUSTIFICATION: Findings from the current study suggest that regulating prices and/or restricting menthol characterizing flavoring in cigarettes may reduce smoking initiation and support cessation efforts for menthol users with serious mental illness.

CORRESPONDING AUTHOR: Vance Rabius, PhD, The University of Texas MD Anderson Cancer Center, which can inform smoking cessation programs in other hospital

JUSTIFICATION: This is a descriptive study of clinical practice at MD Anderson Center Support Grant to MD Anderson. The Tobacco Treatment Program is

FUNDING: The authors are supported in part by the NCI P30 CA16672 Cancer and the highest rate was associated with counseling plus pharmacotherapy.

TTP’s reach. Higher abstinence rates were associated with counseling services, demographic and psychographic information (stress, racial centrality, social support, etc.), and environmental factors (community norms, community attributes, and access to substances). Hierarchical regression analyses were utilized to explore the predictors of LCC use and LCC alteration.

Results: Within the sample, 28.2% had experience of LCC alteration and 23% had smoked LCC products as is. Males are more likely to use LCC products as is and as the carrier of marijuana. Racial mistreatment turned out to be a positive predictor of LCC alteration, and such association is fully mediated by attitude toward LCC alteration. While perceived control over LCC alteration was positively related to the frequency of LCC alteration behavior, none of the environmental factors appeared significant. Conversely, environmental factors seemed to play a more important role in predicting LCC use (as is): support norms and racial mistreatment indirectly contributed to LCC use through attitude toward LCC use, while community stress directly predicted LCC use.

Conclusions: Findings suggest a need for educational and intervention programs targeting culturally-linked factors (e.g., racial mistreatment) as a potential intervention points to decrease cigar use among AA young adults living in disadvantaged communities.

FUNDING: This research was funded by an institutional grant provided by St. David’s Center for Health Promotion and Disease Prevention Research, The College of Nursing, The University of Texas at Austin.

JUSTIFICATION: To describe culturally-linked patterns of little cigar and cigarillo use among African-American young adults.

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POS1-154
PROACTIVE SMOKING CESSEATION TREATMENT FOR MINNESOTA PRIORITY POPULATIONS: “OPT-IN”

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Background: Smoking prevalence and tobacco-related disease burden are high among low-income populations. Low-income smokers are less likely to use evidenced-based cessation treatments, especially treatments combining pharmacotherapy and behavioral counseling.

Methods: We conducted a randomized controlled trial of the effects of a proactive intervention on population-level abstinence and tobacco treatment utilization in low-income smokers. We randomized 2406 smokers (aged 18-64), enrolled in the Minnesota Health Care Programs (MHCP) for low-income persons, to proactive outreach or usual care. Randomization was stratified by MHCP program, age, and sex. The intervention proactively contacted smokers (mailed invitations and telephone calls containing targeted health messages) and provided free cessation treatment comprising NRT and intensive, telephone-based counseling. MHCP enrollees in the usual care arm had coverage for smoking cessation medications. Baseline MHCP administrative and participant survey data were collected prior to randomization. One year post-randomization data were collected via survey of all randomized individuals, regardless of treatment participation, and MHCP data. The primary outcome was six-month prolonged abstinence at one year. Secondary outcomes included short-term abstinence and treatment utilization.

Results: We identified 2406 smokers among 9362 respondents to our baseline MHCP enrollee survey who were then randomized to condition. Among the sample, 69% of the intervention arm and 78% of the usual care arm completed the follow-up survey. Among proactive outreach participants, 24% engaged in telephone counseling. The prolonged abstinence rate was 16.5% in the intervention arm and 12.1% in usual care. A stratified logistic regression estimated a prolonged abstinence odds ratio of 1.47 (95% CI, 1.12-1.93, p=.006) for proactive outreach.

Conclusions: We observed a 24% treatment engagement rate with proactive outreach. Moreover, proactive outreach led to greater rates of prolonged abstinence compared to usual care. Results suggest dissemination of proactive treatment approaches may reduce tobacco-related health burdens for low-income smokers.

FUNDING: This study is funded by the National Cancer Institute (1R01CA141527-01), National Institutes of Health. This material is the result of work supported with resources and the use of facilities at the Minneapolis VA Health Care System Center for Chronic Disease Outcomes Research. The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the United States government.

JUSTIFICATION: The present study demonstrates that proactive care increases the reach of smoking cessation treatment among low-income smokers and may increase smoking abstinence rates in this population.

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POS1-155
CHARACTERIZING SMOKING ABSTINENCE-RELATED EXPECTANCIES IN SMOokers IN METHadONE MAINTENANCE TREATMENT

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Introduction: Adults in methadone maintenance treatment (MMT) smoke at rates as high as 83%, but most smoking interventions in this population produce low response rates (Gyedish et al., 2011). In the general population, smoking abstinence-related expectancies show robust relations with several smoking-related constructs (e.g., nicotine dependence) and prospectively predict the intensity of smoking withdrawal. The current study characterizes smoking abstinence-related expectancies in smokers in MMT, with the goal of informing future smoking interventions in this population.

Methods: Data are from the baseline assessment of 140 participants in a clinical trial of MMT. Participants completed a self-report measure on smoking history, including the Withdrawal, Adverse Outcomes, Treatment Effectiveness, and Barriers to Treatment scales from the Smoking Abstinence Questionnaire (SAQ) (Hendricks et al., 2011). The 128 participants who reported smoking at least one cigarette in the past 30 days were included in the analysis.

Results: Participants consumed, on average, 12.8 (SD = 7.0) cigarettes per day, and 61% smoked within 30 minutes of waking. Scores on three SAQ scales (Withdrawal, Adverse Outcomes, and Barriers to Treatment) were each positively correlated with number of cigarettes smoked per day (all rs > 0.22 and ps < .02) and negatively correlated with intention to quit smoking (all rs > -0.24 and ps < .01). SAQ Withdrawal scores were significantly higher in participants who were female, White, and younger. SAQ Treatment Effectiveness scores were not related to any demographic or smoking-related variable.

Conclusions: Several abstinence-related expectancies were associated with intention to quit smoking, and future research will examine how they longitudinally predict smoking cessation outcomes. Smokers in MMT who are female, White, and of younger age hold stronger negative expectancies pertaining to smoking withdrawal and thus may benefit from counseling on withdrawal management strategies and pharmacotherapy. Modifying expectancies for smoking abstinence may represent a novel intervention for boosting smoking cessation in smokers in MMT.

FUNDING: Funding for this study was provided by the National Institutes of Health (2 R01 DA015842).

JUSTIFICATION: Results can inform clinical research by identifying smokers in methadone maintenance treatment who may benefit from interventions that modify expectancies for smoking abstinence.

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POS1-156
INCREASE IN PROVIDER ADHERENCE TO TOBACCO USE TREATMENT GUIDELINES IN DENTAL CARE SETTINGS

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Background: Given the oral consequences of tobacco use and that a majority of smokers see a dentist annually, dentists are ideally situated for treating tobacco use. However, provider implementation of tobacco use treatment (TUT) guidelines remains inadequate in dental care settings.

Methods: As part of a larger cluster randomized clinical trial evaluating systems-level strategies (clinical reminder systems, staff training, practice facilitation) for implementing TUT guidelines in dental clinics, we conducted surveys of dental care providers at baseline (BL), and 9 months follow-up (9FU) post-intervention to assess TUT guideline adherence. Providers were asked what percentage of
their patients (<20%, 21-40%, 41-60%, 61-80%, and >80%) they delivered each of the 5As of TUT (asking about tobacco use, advising smokers to quit, assessing readiness to quit, assisting smokers via a referral or prescription, and arranging follow-up). Practice behaviors (5As) that were delivered to most (>80%) patients were considered adherent to high quality TUT care. A generalized estimating equation was used to test for statistical significance.

Results: Provider adherence improved for all TUT practice behaviors. At BL, 29% of providers asked most of their patients about tobacco use, compared with 58% of providers at 9FU (<p<.01). 45% of providers advised and 22% of providers counseled most smokers to quit at BL, whereas the percentage of providers that advised and counseled increased at 9FU to 70% (p<.01) and 47% (p<.01), respectively. No providers prescribed medication at BL, but 9% (p<.01) of providers prescribed to most smokers at 9FU. Finally, more providers referred smokers to a tobacco cessation service after study intervention. At BL, 4% of providers referred most smokers to the New York State Smokers’ Quitline, compared to 45% of providers at 9FU (p<.01).

Conclusion: The findings illustrate that the implementation of system-level change of a clinical reminder system and facilitation of referrals to a quitline cessation service increased dental care provider adherence to TUT guidelines. Further analysis will be presented on factors influencing practice behavior change.

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POS1-158
DECREASED NICOTINE RECEPTOR AVAILABILITY AND CRAVING FOLLOWING OVERNIGHT ABSTINENCE IN SMOKERS WITH SLOWER HEPATIC NICOTINE METABOLISM
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The nicotine metabolite ratio, NMR, is defined as the ratio of 3'-hydroxocotinine (3-HC) to cotinine has proven to be a reproducible predictive biomarker of tobacco cessation therapy. Smokers with decreased CYP4502A6 hepatic nicotine metabolism, as reflected by lower NMR levels, are more likely to quit using nicotine replacement therapy. In order to determine if this relationship is mediated by nicotinic acetylcholine receptor (nAChR) behavior, we used 2-[18F]FA-85380 (2-[18F]FA) positron emission tomography (PET) brain imaging to identify differences in nAChR α4β2* subtype availability between abstaining smokers with low NMR levels (<0.26, within the lowest quartile) and those with normal levels (> 0.26) (n=12 in each group, n= 24 total). Participants were recruited as part of a larger treatment study (Pharmacogenetics Research Network Grant) and imaged following overnight abstinence as quit attempts most often fail within the first 24 hours. Nicotine craving was measured using the questionnaire of smoking urges (QSU-brief) prior and following PET imaging. We found smokers with lower NMR levels had significantly decreased nAChR availability in thalamus (ANOVA, P=0.04) compared to those with normal NMRs. Although statistical significance was not achieved for other brain regions, there was also a whole brain trend for this relationship. Nicotine craving decreased in those with slow metabolism while remaining stable in those with normal NMR levels (P=0.02). Because the 2-[18F]FA radioligand directly competes with nicotine to bind to nAChRs, these data suggest that persistent binding of nicotine in brains of slower metabolizers may underlie greater quitting success.

FUNDING: PNAT: Pharmacogenetics Research Network Grant (NIDA/NICHD/NIGMS), Abramson Cancer Center at the University of Pennsylvania, Pennsylvania, Institute for Translational Medicine and Therapeutics, Perelman School of Medicine at the University of Pennsylvania (NIH), McCabe Pilot Award (UPENN). CTRC: National Center for Research Resources and the National Center for Advancing Translational Sciences, National Institutes of Health (UL1TR000003). NIH grant T32 GM008076 to Randall Pittman.

JUSTIFICATION: This study links nicotine receptor availability in brain with hepatic nicotine metabolism, a predictive biomarker of tobacco cessation using nicotine replacement therapy.

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POS1-159
THE IMPACT OF PRENATAL POINT-OF-CARE TOBACCO SCREENING ON THE RELATIONSHIP BETWEEN PATIENTS AND PROVIDERS

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Background: Tobacco use during pregnancy is a common and preventable cause of infant morbidity and mortality. Up to 30% of pregnant women with Medicaid who smoke do not disclose their smoking status to their prenatal care providers and thus do not benefit from standard tobacco cessation counseling, proven to be very effective during pregnancy.

Aim: We sought to evaluate the perspectives of patients and health care providers on the use of a biochemical urine dip test for tobacco byproducts during prenatal care. We explored the impact testing would have on the clinical relationship and its potential to encourage tobacco cessation.

Methods: We conducted 19 individual interviews and 4 focus groups (focus group n=21) with pregnant or recently postpartum women with Medicaid who smoked prior to or during pregnancy. Providers provided a urine sample for cotinine testing and received feedback on their results. Another 20 interviews were conducted with physicians, nurses, and medical assistants who provide prenatal care in Obstetrics/Gynecology and Family Medicine clinics. Interview transcripts were transcribed verbatim, coded through consensus, and evaluated for key themes by study team members.

Results: Patients were more likely to view the test as positive in promoting discussions on tobacco cessation. Two-thirds of patients thought the test could negatively impact relationships, compared to 86% of providers. Participants identified three factors that could impact these relationships: the pre-existing relationships; how the provider presents the test and their reaction to the results; and patient fears surrounding consequences and judgment of a positive test.

Conclusions: Patients had a surprisingly favorable view of urine testing for tobacco as a method to reduce use and promote cessation during pregnancy. Providers on the other hand, reported testing would negatively impact trust with their patients and were less likely to see positive benefits.

FUNDING: This study was funded by the Blue Cross Blue Shield of Michigan Foundation. Dr. Gold received salary support from a K23 through the National Institute of Mental Health.

JUSTIFICATION: This study provides insight on issues of trust surrounding tobacco screening during prenatal care and provides a platform for further investigation of the use of cotinine urine testing to increase tobacco cessation in pregnancy and ultimately improve birth outcomes.

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POS1-160
ARE PEOPLE WITH SCHIZOPHRENIA RESPONSIVE TO REGULATORY EFFORTS?

Mary F. Brunette*, Delbert G. Robinson, Daniel J. Coletti, Mollie E. Patrick, Jennifer W. Tidey*

As the prevalence of smoking has declined in the U.S., there has been increasing concern about vulnerable sub-populations who continue to smoke. People with mental illness use 40% of cigarettes sold in this country, and within this group, people with schizophrenia are most likely to smoke and have high rates of health consequences, including preventable death due to cancers and cardiovascular diseases. While prevalence research to date implies that people with schizophrenia are less responsive to regulatory efforts than others, very little research has directly explored this group's response to regulatory approaches, thus schizophrenia is an excellent example of an understudied vulnerable population.

This symposium will explore new evidence related to the potential impact of various regulatory approaches on people with schizophrenia. Dr. Robinson will present data on tobacco product and e-cigarette use among youth and young adults with schizophrenia, demonstrating higher rates and unique patterns of use when compared to young people without mental illness. Dr. Coletti will describe exposure and response to tobacco marketing and health messages among young people with schizophrenia as compared to people without mental illness, showing that this group reports high exposure but difficulty applying the information in health messages to themselves. Dr. Brunette will describe frequent use of low cost tobacco products in a sample of smokers with schizophrenia and other severe mental illnesses, and will demonstrate the associations between price minimizing behavior, cessation treatment utilization and cessation outcomes, suggesting that taxation to increase price of cigar products and loose tobacco could reduce smoking in this population. Dr. Patrick will discuss the acute effects of very low nicotine cigarettes among people with schizophrenia in a laboratory setting, suggesting that this regulatory approach could be tool to reduce smoking. The discussant, Dr. Tidey, will engage the audience and speakers in a discussion about the impact of regulatory approaches on vulnerable populations such as people with schizophrenia.

FUNDING: This work was supported by a grant from the National Institute on Drug Abuse (R01- DAO24640-01A1 to JMW). Pfizer, Inc provided product support.

POS1-161
RANDOMIZED, DOUBLE-BLIND, PLACEBO CONTROLLED TRIAL OF NICOTINE NASAL SPRAY FOR SMOKING CESSATION IN SCHIZOPHRENIA

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Background: Smokers with schizophrenia have high levels of nicotine dependence and reduced success in quitting. Several aspects of the nicotine nasal spray (NNS), including its rapid onset of action, its intermittent dosing, its effective craving relief and reinforcing properties make it an appealing treatment for smokers with schizophrenia.

Methods: In this randomized, double-blind, placebo-controlled trial, subjects were clinically stable adult outpatients, with SCID confirmed schizophrenia who smoked ≥ 10 cigarettes/day and were motivated to try to quit. Subjects were randomized to receive either active nicotine or piperine placebo nasal spray placebo for 20 weeks, with post-treatment follow-up up to 1 year. Both groups received behavioral intervention designed for schizophrenia delivered as 15 sessions over 26 weeks. Self-reported abstinence was verified by expired carbon monoxide at all visits.

Results: A total of 86 patients were consented to participate in the study with 55 randomized as the intent to treat group. Subjects in each treatment group did not differ with regard to baseline cigarettes per day smoked, expired carbon monoxide level, serum cotinine level or number of past quit attempts. Overall study retention (80%) was not different between groups although drop out due to adverse events was higher in the active NNS group. Quit rates were low overall and not different between treatment groups in this small sample. At the 4-week end of treatment assessment, the 7-day point prevalence abstinence was 15% (4/27) in the NNS compared with 8% (2/25) for placebo.

Conclusions: This is the first placebo controlled trial of a nicotine replacement product in schizophrenia.

FUNDING: This work was supported by a grant from the National Institute on Drug Abuse (R01- DAO24640-01A1 to JMW). Pfizer, Inc provided product support.
JUSTIFICATION: This study can inform treatment decisions in helping smokers with schizophrenia.

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POS1-163
WEIGHT GAIN AND CARDIOVASCULAR RISK REDUCTION ASSOCIATED WITH TOBACCO ABSTINENCE IN SMOKERS WITH SERIOUS MENTAL ILLNESS

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Background: Heavy smoking and obesity-related risk factors contribute to high rates of cardiovascular disease (CVD) and premature mortality in individuals with serious mental illness (SMI). Smoking cessation reduces risk of CVD but is also associated with weight gain in the general population. Patients with SMI have a higher prevalence of both smoking and obesity, and the impact of smoking cessation on weight gain and overall CVD risk in this population is unknown.

Methods: We enrolled 201 smokers in a smoking cessation trial to test the long-term effectiveness of varenicline in patients with SMI. At the end of a 12-week open-label course of varenicline and cognitive behavioral therapy (CBT), eighty-seven attained 14-day point prevalence abstinence and were randomized to continue either varenicline or placebo and CBT for 40 weeks. Weight, body mass index (BMI), and Framingham 10-year CVD risk were assessed over the 52-week trial and modeled with repeated measures analyses of variance (PROC MIXED in SAS).

Results: The mean BMI at baseline was 32. Participants who demonstrated 21-day point-prevalence abstinence at the end of treatment (week 52), gained more weight than subjects who relapsed to smoking (4.8 (6.6) kg vs. 1.2 (6.5) kg gain, baseline to week 52 respectively, (time*abstinence interaction F1, 336 = 7.2, p<0.01). Despite a significant increase in weight, those who were abstinent reduced their 10-year risk of developing CVD from 14.2% (IQR: 9.1 – 26.6%, n=30) at baseline to 9.3% at week 52 (IQR: 6.6 – 14.3%, n=29), and those who relapsed did not have any change in their CVD risk (10.8% at baseline, IQR: 6.0-19.2%, n=49; 9.3% at week 52, IQR: 6.9-13.6%, n=28). The beneficial effect of point prevalence abstinence at week 52 on CVD risk was significant (time*abstinence interaction F1,50 = 20.21, p<0.0001) adjusting for sex, site, varenicline use and concurrent weight gain.

Conclusion: Despite the high prevalence of obesity at baseline and substantial weight gain associated with long term abstinence, smoking cessation significantly reduced the Framingham estimated 10-year CVD risk among patients with serious mental illness.

FUNDING: NIDA R01 DA021245: Smoking Cessation and Smoking Relapse Prevention in Patients with Schizophrenia;
Investigator Initiated Grant Pfizer Inc.: Extended duration varenicline for prevention of relapse to smoking in patients with schizophrenia
NIDA K24 DA030443: Mentoring in Addiction Treatment Research

JUSTIFICATION: The reduction in CVD risk with sustained abstinence in this population with high prevalence of premature mortality from CVD should inform policies that would increase availability of smoking cessation treatment for those with serious mental illness.

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POS1-164
ASSOCIATION BETWEEN TOBACCO SMOKING AND DEATH BY SUICIDE: A COMPETING RISKS HAZARD MODEL IN A LARGE COHORT WITH 35-YEAR FOLLOW UP

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Importance: Studies have shown that tobacco smoking is associated with an increased risk for suicide, but have had conflicting findings as to the magnitude and degree to which the association is independent of co-morbid psychiatric illness and have not addressed whether smoking is a marker for a suicide risk factor or whether tobacco smoking has a causal role in the association.

Objectives: To estimate the association between smoking and suicide, and the degree to which it is influenced by dose, cessation, psychiatric and somatic morbidity, genetic, and environmental factors.

Design: 16,282 twin pairs alive and aged over 18 years in 1974 were queried with detailed health and smoking questionnaires in 1975 and 1981, with response rates of 89% and 84% respectively. Smoking status and dose, marital, employment, and socioeconomic status, and psychiatric and somatic co-morbidity were assessed at both time points. Participants were then followed for 35 years for vital status. The association between tobacco smoking and suicide over the follow-up period was determined in a competing risks hazard model.

Results: Current smokers had a higher cumulative suicide incidence than former or never smokers at every age. Heavy current smokers had higher suicide risk (hazard ratio (HR) = 3.47; 95% CI, 2.31-5.22) than current smokers who smoked less (HR = 2.3; 95% CI, 1.61-3.23). Former smokers did not show increased suicide risk. Current smokers had increased risk for suicide (HR = 2.84; 95% CI, 1.58-5.10) adjusting for depressive symptoms, alcohol or sedative hypnotic use, excluding those with serious medical or psychiatric illness. In the 28 twin pairs discordant for both smoking and suicide, 24 of the suicides were in smokers and 4 in non-smokers, (OR = 6; 95% CI 2.06-23.8).

Conclusions: Tobacco smoking is associated with suicide in a dose dependent fashion, independent of age, sex, depressive symptoms, heavy alcohol use, and major psychiatric or medical illness. The results are consistent with an interpretation that genetic factors do not significantly modify the relationship between smoking and suicide and that exposure to tobacco smoke may have a causal role in relation to suicide.

FUNDING:Supported by the Academy of Finland (grants 265240, 263278, 264146) and the Sigrid Juselius Foundation. (JK) and NIDA K24 DA030443 AEE.

JUSTIFICATION: The demonstrated independent dose-dependent relationship between smoking and suicide justifies further research on the effect of tobacco use on neurobiology underlying suicide and may call into question claims that novel nicotine delivery devices are safe, as exposure to nicotine may be the causal factor in this association.

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POS1-165
INITIAL NICOTINE NASAL SPRAY EXPERIENCE AMONG SMOKERS WITH AND WITHOUT SCHIZOPHRENIA

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Background: Use of nicotine nasal spray (NNS) has been limited due to its aversive side effects although its rapid onset may be reinforcing in some individuals. Smokers with schizophrenia (SS) have reduced smell function that may result in fewer side effects and better clinical response to NNS. Positive response to a test dose of NNS was associated with better abstinence in a general population study.

Methods: This is a secondary data analysis from a NNS vs placebo cessation study in 55 outpatient smokers with schizophrenia (SS) and 59 control smokers (CON) without mental illness who did not participate in the cessation trial but underwent the same baseline procedures. Subjects completed the University of Pennsylvania Smell Identification Test (Doty 1984; UPSIT). Subjects were randomized to a single test dose of NNS or matched placebo. At baseline and 2 minutes following nasal spray administration subjects completed the Initial Spray Experience survey (ISE; Kaufmann 2004). Results: No differences were found between SS versus CON smokers on baseline demographic characteristics including gender, age, race/ethnicity, and measures of nicotine dependence including cigarettes smoked per day. SS were more impaired in overall smell function compared to controls (moderate vs mild microsmia). SS were significantly impaired in all subscale scores of smell valence (lower detection of neutral, pleasant and unpleasant smells vs. controls). SS had a mean increase in the ISE positive subscale score while CON had a decrease (compared to baseline) although this was not significant in this small sample. SS had a lower increase in the ISE negative subscale score compared to CON, suggesting they had fewer negative side effects to the active nasal spray (p=0.082). SS who received the active NS had a greater change in ISE positive scores compared to those who received the placebo NS (0.26 vs -0.04; NSS).

Conclusions: Reduced smell function in schizophrenia may increase the tolerability of nicotine nasal spray. Smokers with schizophrenia may experience more positive reinforcing effects from nicotine nasal spray that could contribute to better clinical outcomes.

FUNDING: This work was supported by a grant from the National Institute on Drug Abuse (R01- DA024640-01A1 to JMW). Pfizer, Inc provided product support.

JUSTIFICATION: This is a study to better understand tolerability and use of nicotine nasal spray in smokers with schizophrenia.

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POS1-166
MATERNAL NICOTINE DEPENDENCE, PRENATAL SMOKING AND THE RISK OF OFFSPRING MENTAL DISORDERS IN THE COMMUNITY

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Background and Aims: A number of studies suggest a link between prenatal smoking and offspring mental disorders, though findings to date are inconclusive. The goal of the current study is to disentangle the impact of maternal nicotine dependence from that of prenatal smoking on the risk of mental health problems among offspring, taking into account the potential effects of smoking smoking status prior to the disorder, prenatal alcohol and other substance use, and maternal psychopathology.

Methods: Data come from a 10-year prospective-longitudinal community and family study. Prenatal smoking, maternal nicotine dependence, and mental disorders were assessed using the DSM-IV Munich Composite International Diagnostic Interview (DIA-X/M-CIDI) in a community cohort of 1,017 individuals aged 14-17 at baseline and their biological mothers.
Results: Prenatal smoking was associated with increased risk of offspring mood and substance use disorders, independently from maternal nicotine dependence, while maternal nicotine dependence was associated with increased risks of offspring externalizing disorders, ADHD, and anxiety disorders. Adjusting for maternal mental disorders, prenatal alcohol and other substance use and offspring smoking behaviors had little effect on these associations. Further, only few additional risks for onset of offspring disorders emerged when both risk factors—prenatal smoking and maternal lifetime nicotine dependence—were present.

Conclusion: Prenatal smoking and maternal nicotine dependence appear to independently confer risks to offspring that extend beyond the prenatal period. Our results suggest that treating nicotine dependence before conception and postnatally may be as important as smoking cessation during pregnancy in terms of mental health risk to offspring.

FUNDING: No funding

JUSTIFICATION: These findings could substantially inform translational work on etiology of mental and substance use disorders as well as prenatal smoking cessation programs, but providing new information on associated risks to offspring.

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POS1-168
CORRELATES OF CESSATION ACTIVITIES AMONG TRANSIT WORKERS

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Blue-collar workers have lower cessation rates and are more likely to smoke than white-collar workers. Transit workers are a blue-collar occupational group who maintain elevated smoking rates despite having access to free or low-cost cessation treatment through their HMO as an employee benefit. Gaining insight into factors associated with participation in cessation activities can aid worksite efforts to promote cessation and reduce smoking-related disparities. This study describes participation in, and correlates of, past-year cessation activities among transit workers who are current smokers (n=186). Data were obtained from a cross-sectional survey on tobacco use conducted among 1,572 eligible employees at an Oakland, California-based public transit agency in cooperation with transit agency management and the transit workers union. The survey was completed by 935 workers (59% participation rate). All procedures were approved by the PIRE Institutional Review Board, and informed consent was obtained from all participants. Approximately 54% of smokers (n=101) stopped smoking for one day or longer during the past year in order to quit. The most common cessation activity was use of nicotine patch, gum, or nasal spray (19.9%), followed by "cold turkey" (14.5%). Few reported using group cessation programs, quitlines, or pharmacotherapy (e.g., varenicline). We developed a multivariate logistic regression model of past-year cessation activity with non-participating smokers as the reference group. Results show that coworker norms for quitting were positively associated with past-year cessation activities. Workers in the contemplation/precontemplation stage for intention to quit were significantly less likely to have engaged in cessation activities than those in the action/preparation stage. Afternoon shift workers were less likely to report cessation activities than those on rotating or split shifts. No demographic factors (e.g., gender) were associated with likelihood of participation. Findings suggest that most transit workers who are smokers try to quit. Coworker norms for quitting can be leveraged in the worksite to encourage participation in cessation activities.

FUNDING: Funding for this study was provided by the Tobacco-Related Disease Research Program, Office of the President, University of California, Grant No. 21RT-0113.

JUSTIFICATION: The findings suggest that coworker norms for quitting can be leveraged in the worksite to encourage transit worker participation in cessation activities.

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POS1-169
EXPLORE A CESSATION INTERVENTION FOR LOW INCOME SMOKERS IN AN EMERGENCY SETTING

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Introduction: The prevalence of smoking among low income caregivers who bring their children to the pediatric emergency department (PED) is high. The PED is an underutilized setting in which to provide tobacco cessation interventions. Our objective was to examine the efficacy of a PED-based cessation intervention for low income caregivers who brought their children to the PED.

Methods: We conducted a single-arm, prospective, intervention trial to examine the effectiveness of a cessation intervention on caregiver smoking. Equal numbers of caregivers who brought their child to the PED for either a SHSe-related or non
SHSe-related illness were given a brief intervention consisting of counseling, an offer of connection to the Quitline, and a voucher for free nicotine replacement therapy. Outcomes assessed changes in smoking behavior.

Results: Of the 200 caregivers enrolled, mean age was 30.8 years old (s.d. 8.0); mean child age was 5.5 (s.d. 5.0); 183 (91.5%) were female; 101 (50.6%) were African American and 87 (43.7%) were White; 100% were Medicaid recipients. At baseline, 179 (90%) of caregivers were considered to be heavy smokers; 60.3% and 75.8% allowed smoking in the home and car, respectively. Caregivers were followed up 3 and 6 months; 80% made quit attempts between baseline and 3 months and 89% made quit attempts between 3 and 6 months. Over time, there were statistically significant decreases in the number of cigarettes smoked, time to first cigarette of the day, nicotine dependency, and smoking in the home or car. Sixteen (12.2%) caregivers reported that they had quit at 3 months (44% biochemically confirmed); 19 (14.6%) reported that they had quit at 6 months (32% biochemically confirmed), and 8 (6%) reported that they had quit at both the 3 and 6 month follow up (50% biochemically confirmed). There were no differences in cessation outcomes in caregivers who brought their children in for a SHSe-related illness compared to those with non-SHSe-related illness.

Conclusions: A brief cessation intervention including medication prompted a substantial number of quit attempts and successful quits. Future research is needed to test the efficacy of a cessation intervention in a large randomized trial.

FUNDING: This study was funded by a grant to Dr. Mahabee-Gittens from NCI K22CA163747.

JUSTIFICATION: The findings from this study may be applicable to other pediatric healthcare settings such as the primary care, urgent care, or hospital setting.

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POS1-170
REDUCING TOBACCO SMOKE POLLUTION IN HOMES: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Context: Smoke-free homes are gaining popularity for protecting children from the harmful effects of tobacco smoke exposure (TSE). Effects of interventions for child protection from TSE on home air quality are not well understood.

Objective: To perform a systematic review and meta-analysis to quantify effects of programs designed to protect children from TSE on home air quality. Data Sources: MEDLINE, PubMed, Web of Science, PsychNet, Embase. Study selection: We included controlled trials of interventions aimed at parents of children aged 0-12 which aimed to protect children from TSE. Data Extraction: Three reviewers extracted data on changes in home air quality (air nicotine or particulate matter (PM)) and air quality at study end. Risk differences were calculated using the DerSimonian and Laird random-effects model.

Results: Seven studies were identified. Air quality improved in all intervention groups which included intervention from baseline. Improvement in air quality was greater in intervention groups compared to control groups (6 studies, N= 681, p<0.02). End of study values showed a non-significant benefit to intervention participants (7 studies, N=753, p=0.08). Analyses of air nicotine and PM separately showed some benefit to intervention groups (PM Change:3 studies, N=340, p=02; PM at study end:3 studies, N=341, p=0.04; Air nicotine change:4 studies, N=421,p=0.08; Air nicotine at study end: 6 studies, N=706,p=0.32)

Conclusions: Interventions designed to protect children from TSE appear to improve air quality. Standardization of home air quality measures is lacking. Dissemination of effective interventions for promoting smoke-free homes should be encouraged.

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POS1-171
CHALLENGES IN MEASURING HOME AIR QUALITY FOR THE PROMOTION OF SMOKE-FREE HOMES: FINDINGS FROM A PILOT STUDY

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Background: Smoke-free homes can help protect children from harm due to tobacco smoke exposure (TSE). Home air quality may be used to provide objective feedback to parents, and to evaluate effectiveness of interventions which promote smoke-free homes. Home air quality may be measured by air nicotine or Particulate Matter (PM). We report on our experience with home air quality measurement.

Methods: Between June-November 2013, we enrolled 29 families with at least one smoking parent, and a child up to age 8, into a pilot of an intervention program, Project Zero Exposure, which was designed to reduce child TSE. We used a Sidepak to continuously measure PM2.5 for a period of 8 hours, and passive nicotine dosimeters to measure air nicotine over a period of one week. The Sidepak was left in the home at baseline and at the first post-baseline visit (approximately 1 month later). We measured air nicotine at baseline and after 6 months.

Results: Home PM2.5 levels were often associated with sources unrelated to indoor smoking such as cooking, construction, or outdoor sources. The many unexplained peaks found during the 8-hour continuous monitoring period caused confusion among parents. Because of this, we introduced real-time PM2.5 monitoring, in which the machine was turned on, parents lit cigarettes, and the PM2.5 levels were tracked. The immediate increases in PM2.5 which occurred while cigarettes were burning provided unambiguous evidence to the parents of tobacco smoke exposure. Usefulness of air nicotine monitors for objective parental feedback was hampered by the lag-time necessary for obtaining laboratory results, and unanswered questions regarding the shelf-life of the monitors.

Conclusions: Real-time feedback of home PM2.5, but not continuous monitoring, is a feasible and promising approach to help parents internalize the reality of tobacco smoke in the home. Usefulness of air nicotine may be compromised by logistic issues and concerns about validity of results.

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POS2-1
MENTHOL ATTENUATES RESPIRATORY IRRITATION AND ELEVATES BLOOD COTININE IN CIGARETTE SMOKE EXPOSED MICE

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Addition of menthol to cigarettes may be associated with increased initiation of smoking. The potential mechanisms underlying this association are not known. Menthol, likely due to its effects on cold-sensing peripheral sensory neurons, is known to inhibit the sensation of irritation elicited by respiratory irritants. However, it remains unclear whether menthol modulates cigarette smoke irritancy and nicotine absorption during initial exposures to cigarettes, thereby facilitating smoking initiation.

Using plethysmography in a C57Bl/6J mouse model, we examined the effects of L-menthol, the menthol isomer added to cigarettes, on the respiratory sensory irritation response to primary smoke irritants (acrolein and cyclohexanone) and smoke of Kentucky reference 2R4 cigarettes. We also studied L-menthol's effect on blood levels of the nicotine metabolite, cotinine, immediately after exposure to cigarette smoke.

L-menthol suppressed the irritation response to acrolein with an apparent IC50 of 4 ppm. Suppression was observed even at acrolein levels well above those necessary to produce a maximal response. Cigarette smoke, at exposure levels of 10 mg/m3 or higher, caused an immediate and marked sensory irritation response in mice. This response was significantly suppressed by L-menthol even at smoke concentrations as high as 300 mg/m3. Counterirritation by L-menthol was abolished by treatment with a selective inhibitor of Transient Receptor Potential Melastatin 8 (TRPM8), the neuronal cold/menthol receptor. Inclusion of menthol in the cigarette smoke resulted in roughly a 1.5-fold increase in plasma cotinine levels over those observed in mice exposed to smoke without added menthol.

These findings document that, L-menthol, through TRPM8, is a strong suppressor of respiratory irritation responses, even during highly noxious exposures to cigarette smoke or smoke irritants. . and increases blood cotinine. Therefore, L-menthol, as a cigarette additive, may promote smoking initiation and nicotine addiction.

FUNDING: Supported by grants from the National Institutes of Health of the United States (NIH) and the US Food and Drug Administration (FDA); R01ES015056 (to SEJ); R01HL106635 and R01HL106635-S1 (to SEJ and JBM).

JUSTIFICATION: Our studies provide essential insights into the pharmacology of menthol as a tobacco additive and will inform the FDA's regulatory efforts.

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POS2-2
ASSESSMENT OF AN IN VITRO MODEL OF LUNG EPITHELIAL CELL STRESS RESPONSES EXPOSED TO AQUEOUS EXTRACTS GENERATED FROM A HEATED TOBACCO DEVICE

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Cigarette smoking is an identified cause of a number of human disorders including heart disease, lung disease and cancer. Although the mechanisms underlying these disorders are diverse, they are each underpinned by smoke-induced cellular oxidant, inflammatory and apoptotic responses. These cellular responses are mediated by many cell signalling pathways, including those controlled by the transcription factors Nrf2 (antioxidant responses) and NF-κB (inflammatory responses).

As part of a harm reduction approach we are developing a range of products including e-cigarettes and heated tobacco devices which yield lower levels of toxicants than cigarette smoke. For an in vitro testing strategy to compare different nicotine delivery products, we have developed an in vitro model of lung epithelial cell stress responses that include oxidative, pro-inflammatory, apoptotic and necrotic endpoints. Human bronchial epithelial (H292) cells were exposed to positive controls or aqueous extracts from a regular cigarette or a heated tobacco product, for 1-6 hours depending on the assay. Cellular oxidative stress was characterised by measurement of the intracellular glutathione ratio, intracellular ROS production and activation of the Nrf2-controlled Antioxidant Response Elements (AREs). The inflammatory response of the cells was determined by quantification of the secreted cytokines IL-1α, IL-6 and IL-8. Apoptotic and necrotic responses were characterised by measuring Caspase 3/7 and live-cell protease activities. Stably transfected luciferase reporter cell lines were used to quantify the transcriptional control of antioxidant pathways.

All cell stress response endpoints were activated by exposure to positive controls or heated tobacco aqueous extracts. The observed concentration-dependent lowering of the glutathione ratio and increase in intracellular ROS generation corresponded with an increase in Nrf2 transcriptional activation of the ARE. This model was able to distinguish between aqueous extracts from the heated tobacco product and the cigarette. We propose that this model may be suitably sensitive for comparisons of cigarettes and novel products such as heated tobacco devices and e-cigarettes.

FUNDING: This work was funded by British American Tobacco.

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POS2-3
EXAMINING THE COGNITIVE REGULATION OF SMOKING BEHAVIOR: CONTROL BY AUTOMATIC AND NONAUTOMATIC PROCESSES

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There has been little systematic research on the cognitive processes governing the action of smoking behavior in individuals who are tobacco dependent. This study, which was a replication and extension of previous research, examined the theory that drug-use may be controlled by automatic processes that develop over repeated use. Participants were heavy smokers (n = 34; M age = 22.3) who smoked 30 of the last 30 days and a minimum of 15 cigarettes/day (CPD) in the past month (M CPD = 19.4; CO level = 29.0) and occasional smokers (n = 31; M age = 20.3) who smoked no more than 5 of the past 30 days and a maximum of 5 CPD in the past month (M CPD = 0.1; CO level = 1.7). To examine the cognitive effort required to complete or inhibit smoking behavior, participants engaged in a button-press reaction time (RT) task while concurrently smoking a cigarette, pretending to smoke a lit cigarette, or not smoking. The results replicated previous findings, with a significant interaction between smoking level (heavy, occasional) and smoking task performance (smoking, pretend smoking, not smoking), p < .05. As predicted, occasional smokers' RTs were slowed when smoking or pretending to smoke compared to when not smoking, ps < .01, suggesting their smoking was regulated by more controlled than automatic cognitive processes. Also as predicted, heavy smokers' RTs were slowed significantly when pretending to smoke versus not smoking, p < .0001; however, their RTs were comparably fast when smoking compared to not smoking. These findings provide additional evidence that automatic processes may regulate smoking behavior among young, heavy smokers. To extend previous findings, we also examined the relationships between RT slowing relative to latency to puff during the smoking and pretend smoking tasks. An assessment of whether the individual components of the smoking sequence (e.g., puffing) may become more or less highly automatized with repeated drug administrations will be presented.

FUNDING: No Funding
POS2-4
PRELIMINARY EXAMINATION COMPARING WHITE AND NON-WHITE SMOKERS’ RESPONSE TO ELECTRONIC CIGARETTE VIDEO ADVERTS

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E-cigarette use is more prevalent in White smokers than in other racial/ethnic subgroups. Television and internet advertisements for e-cigarette products are currently targeted at White smokers, and there are few racial/ethnic minorities depicted in such adverts. In this analysis, we compared the effects of observing e-cigarette adverts on smoking desire and urge between non-Hispanic White and non-White smokers. Participants [N=78, mean age: 26.3 year (range 19-36 year)] were predominantly White (72% and 89% in e-cigarette and water ads, respectively). Before and after viewing the advert, each participant completed the Brief Questionnaire of Smoking Urges (BQSU) and 100mm visual analogue scale ratings of desire to smoke a regular cigarette, e-cigarette, and desire to drink water. Results showed that viewing the e-cigarette advert increased ratings of BQSU smoking urge (p<0.002), and these increases were similar for Whites and non-Whites (6.1±9.9 vs. 4.6±8.5, respectively). The e-cig advert also evoked similar increases in the race groups for ratings of desire to use a combustible cigarette and an e-cigarette (p<0.045). Viewing the water advert did not increase smoking or e-cigarette urge/desire for either group. In sum, we showed that e-cigarette adverts evoke smoking urges in both Whites and non-Whites. This is of interest as the latter group is not directly targeted or depicted in these adverts. While prevalence of e-cigarette use is lower in non-Whites than Whites, they appear to be similarly responsive to current marketing and advertisement efforts. This could have future public health implications if manufacturers begin to engage in targeted marketing to racial/ethnic minority groups.

FUNDING: This research was supported in part by National Institutes of Health grants, R01-AA013746 and P30-CA14599 and the University of Chicago Department of Psychiatry Research Fund and University of Illinois at Chicago Health Systems Science Faculty Fund.

JUSTIFICATION: The current study provides the first examination of race in terms of smoker response to e-cigarette advertisement campaigns, which may inform tobacco control policy and rules governing advertising of e-cigarette products.

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POS2-5
A SYSTEMATIC REVIEW OF COGNITIVE TASKS SENSITIVE TO ACUTE ABSTINENCE AND PREDICTIVE OF CESSATION OUTCOME IN SMOKERS

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Introduction/Background: Withdrawal symptoms reduce the likelihood of successful smoking cessation, still little is known about the underlying mechanisms of withdrawal. Cognitive performance has been shown to be sensitive to tobacco abstinence and may relate to cessation outcome, and thus could potentially act as a precise laboratory measurement of withdrawal. The primary aim of this systematic review is to identify cognitive tasks sensitive to acute abstinence, and predictive of smoking cessation success.

Methods: We conducted searches on the medical and behavioural science literature using Embase, Medline, PsycINFO and Web of Science. A total of 35 articles were retrieved for acute abstinence, and 9 relating cognition to cessation outcome. 6 of the tasks reported were meta-analysed.

Results: We found clear evidence for an effect of abstinence on delay-discounting, mental arithmetic, and recognition memory measures and weak evidence for an effect on the dot-probe performance. Stroop task performance was not influenced by abstinence.

Conclusions: Abstinent smokers prefer smaller, more immediate rewards over larger, longer-term rewards in the delay-discounting task, and show impaired mental arithmetic and recognition memory measures compared to satiated smokers. Effects of abstinence were weak for the dot-probe task and absent for the Stroop task, suggesting that reaction time measures of attentional bias show poor sensitivity to tobacco deprivation. Conclusions about other cognitive tasks to predict smoking cessation success are hampered by methodological inconsistencies. Future research should focus on replication which in turn would aid evidence synthesis, inform sample size calculations, and act as a positive control when testing novel tasks.

FUNDING: This research was supported in parts by an ESRC (Economics and Social Research Council) PhD grant and the pharmaceutical company Rusan Pharma Ltd.

JUSTIFICATION: Establishing which cognitive tasks measure acute abstinence is important because measures of cognitive performance, which indicate abstinence reliably, could be used in the future to test the efficacy of novel cessation treatments, in a cost-and time-effective way.

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POS2-6
IMPULSIVITY AND CUE REACTIVITY: PRELIMINARY RESULTS INDICATING INCREASED BRAIN RESPONSES TO SMOKING CUES AMONG HIGHLY IMPULSIVE SMOKERS

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Background: Impulsivity is a multidimensional personality characteristic associated with enhanced sensitivity to reward. Impulsivity is associated with higher levels of nicotine craving, increased physiological response to smoking cues, and relapse within 30 days of smoking cessation. The current study examined the relationship between self-reported impulsivity and brain responses to smoking cues.

Methods: Forty-one moderate to heavy smokers were recruited to complete one 3-hour testing session. Participants were required to abstain from smoking approximately 4 hours prior to an fMRI scan. During the fMRI scan participants were shown smoking related images (e.g. packs of cigarettes) and non-smoking images (e.g. packs of pencils). Participants were divided into high and low impulsivity groups based on a median split of their Barratt Impulsiveness Scale score. Twenty high impulsive (BIS > 64) and 21 low impulsive (BIS < 64) smokers were compared to determine whether there were significant differences in patterns of brain activation to smoking cues between high impulsive smokers and low impulsive smokers.

Results: High impulsive smokers showed greater activity in the anterior cingulate cortex (ACC, xyz = -1, 47, 24, 57 voxels) than low impulsive smokers when viewing smoking vs. non-smoking images.

Discussion: The results demonstrate that highly impulsive smokers activate the ACC, an area involved smoking cue reactivity and cognitive control, more than less impulsive smokers. In other addictions it has been suggested that increased activation of cognitive control regions may reflect less efficient inhibitory processes. This suggests that impulsive smokers may activate the ACC in response to smoking may be associated with less efficient inhibition to smoking related cues. Future research is needed to understand the implications of the association between impulsivity and smoking reward sensitivity on treatment outcomes.

FUNDING: NIH R03 DA030868; NIH R00 DA025153

JUSTIFICATION: This study examines the interaction between impulsivity and brain responses to smoking cues. Findings from this study could inform smoking cessation treatment approaches focused on more tailored treatments.

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POS2-7
APPLICATION OF SYSTEMS PHARMACOLOGY TO IDENTIFY EXPOSURE RESPONSE MARKERS IN PERIPHERAL BLOOD AFTER SWITCHING TO A CANDIDATE MODIFIED RISK TOBACCO PRODUCT: THE TOBACCO HEATING SYSTEM 2.1 (THS 2.1)

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Establishing exposure-response markers is imperative for the assessment of candidate modified risk tobacco products (MRTPs) against conventional cigarettes (CC). Biomarkers derived from the primary site, such as the airway, require invasive sampling, whereas blood offers a less invasive alternative for the general population. Various diseases and exposures, including cigarette smoke, have been shown to alter the molecular profile of the blood. To identify exposure-response relationships, we have conducted a whole genome Affymetrix microarray analyses from blood derived from a clinical study comparing smokers switching from CC to THS 2.1, and from smokers who continued smoking their own CC for 5 consecutive days. Samples were obtained from an open-label, randomized, controlled, 2-arm parallel group study recruiting 42 healthy smokers of both genders, aged between 23 and 65 years. This study was conducted according to Good Clinical Practices (GCP) and was registered on ClinicalTrials.gov, number NCT01780714.

By analyzing the whole blood transcriptome of smoker and non-smoker subjects from an independent study and utilizing previously identified genes that exhibited a response to smoking in blood, we derived a classification tool using statistical learning methods. The classifier consists of eleven genes and was applied to classify the subject from this study. It enabled users of THS 2.1 to be differentiated from smokers of CC: 89% of THS 2.1 users were classified as non-current smokers, while 69% of CC smokers as current smokers. Several of these genes have been previously reported to be differentially expressed in the blood of smokers as compared to never smokers.

In conclusion, our systems pharmacology approach showed that the impact of switching to THS 2.1 can be detected in 5 days in whole blood transcriptome, thus providing a sensitive and less invasive tool to assess exposure-response.

FUNDING: Philip Morris International Funded the Research

JUSTIFICATION: Biomarker of exposure response

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POS2-8
MONOAMINE OXIDASE INHIBITION ENHANCES LOW-DOSE NICOTINE SELF-ADMINISTRATION: IMPLICATIONS FOR NICOTINE REDUCTION

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In human smokers, the activities of both isoforms of monoamine oxidase (MAO), MAO-A and MAO-B, are 30-40% inhibited, but it is unclear which constituents in cigarettes cause this effect. We and others have previously shown that when tranylcypromine (TCP), a nonselective MAO inhibitor, is given to rats chronically, there is an increase in the rate of NIC self-administration (SA), and in motivation to obtain nicotine (NIC). Current studies sought to determine whether selective inhibition of each MAO isoform has the ability to enhance SA of a low dose of NIC, near the threshold for SA. Rats were randomly assigned to receive an i.p. injection of either 1.0 mg/kg clorgyline (a selective MAO-A inhibitor, n=10); 10 mg/kg pargyline (a selective MAO-B inhibitor, n=8), a mix of clorgyline and pargyline (n=10), or saline vehicle (n=8) 1-hr prior to an operant SA session during which they nosepoked for infusions of a 10 µg/kg/nIC on an FR2 schedule of reinforcement. Administration of clorgyline or pargyline led to greater SA of a low dose of NIC than if MAO was not inhibited (ps<0.05) and the clorgyline, pargyline, and clorgyline and pargyline mix injection groups were not different from each other. These results suggest that inhibition of MAO-A or MAO-B is sufficient to increase NIC SA. The U.S. Food and Drug Administration now has regulatory control over cigarette constituents, including the authority to reduce the amount of NIC to any non-zero amount. Observations from this experiment suggest that if a reduction policy were implemented, the impact of MAO inhibition by cigarettes should be considered.

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POS2-9
THE EFFECTS OF ACUTE NICOTINE ON SAFETY LEARNING
Chicora Oliver*, Munir Gunes Kutlu, Thomas J. Gould, Temple University, Department of Psychology, Neurobiological investigations of Learning and Addiction.

Anxiety disorders such as Post-Traumatic Stress Disorder (PTSD) are attributed to deficits in extinction learning with several studies showing that fear extinction is delayed in these patients. In support, PTSD patients fail to learn inhibitory safety signals and children who show safety learning deficits are at a higher risk for developing anxiety disorders in adulthood. Given the high rate of cigarette smoking in anxiety and PTSD patients and the recent finding that an acute dose of nicotine impairs safety learning during extinction, a series of experiments were conducted to investigate the effect of acute nicotine on an animal model of safety learning. Following saline or nicotine administration, mice were trained in a contextual discrimination paradigm in which the subjects received presentations of conditioned stimuli (CS) co-terminated with a foot-shock in one context, context A (CA), and CS only presentations in another context, context B (CBX). Therefore, CA was designated as the “dangerous context” whereas CBX was designated as the “safe context”. Our results suggested that saline-treated animals showed a strong discrimination between the dangerous and safe contexts while nicotine administration dose-dependently impaired contextual safety learning (Experiment 1). Furthermore, our results demonstrated that nicotine-induced impairment of contextual safety learning was not a result of increased generalized freezing (Experiment 2) or contingent on the common CS presentations in both contexts (Experiment 3). Finally, our results also showed that increasing the temporal gap between CA and CBX during training abolished the impairing effects of nicotine (Experiment 4), which suggests that nicotine acts on the memory trace of the context and bridges the temporal gap between two contexts during training. The findings of this study help link nicotine exposure to the safety learning deficits seen in anxiety disorder and PTSD patients.

FUNDING: NIDA Grant DA017949
JUSTIFICATION: This study helps link nicotine exposure to the safety learning deficits seen in anxiety disorder patients, such as those suffering from PTSD, who consistently use tobacco at a higher rate than health individuals.

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POS2-10
TARGETING THE NORADRENERGIC SYSTEM WITH GUANFACINE TO DECREASE THE NEGATIVE MOOD EFFECTS INDUCED BY NICOTINE WITHDRAWAL
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Clinical data indicate that negative affect has a greater negative impact on smoking cessation in women than in men. Data also show that women are less responsive to nicotine replacement therapies than men and are three times more likely to relapse to smoking than men. These observations suggest that focusing on gender-specific interventions, and in particular on the mood dysregulation induced by nicotine abstinence, is relevant to improve the outcome of smoking cessation strategies. Sex differences exist in brain structures involved in stress reactivity, and the neurotransmitters noradrenaline (NE) and acetylcholine (ACh) regulate many of these brain circuits. In turn, release of NE and ACh is modulated by both stress and the nicotine in tobacco. Thus, sex differences in the NE and ACh systems and their interaction could contribute to smoking relapse. We therefore investigated the effect of guanfacine, an α2-adrenergic agonist that inhibits NE release by acting at autoreceptors, in tests of anxiolytic and antidepressant efficacy. Guanfacine completely reversed the negative effects of phsyostigmine, suggesting that the NE and ACh systems may have synergistic effects. Finally, we determined whether receptors for nicotine might be important for the effects of guanfacine. Down-regulation of β2 subunit-containing nAChRs in the amygdala completely blocked the ability of guanfacine in tests of antidepressant efficacy, suggesting that the effects of NE autoreceptors on behaviors related to depression require intact ACh signaling in the amygdala. These data identify novel interactions between the NE and ACh systems and could provide support for further development of gender-sensitive strategies for smoking cessation.

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JUSTIFICATION: Gender-sensitive treatment for smoking cessation

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POS2-11
NICOTINE ATTENUATES DEPRESSION-RELATED BEHAVIORS IN FEMALE BUT NOT MALE RATS
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Current cigarette use in the U.S. includes roughly 20% of civilian adults, 30% of Armed Forces personnel, and a majority of psychiatric patients. Tobacco use by American Warriors deployed to Iraq and Afghanistan is estimated at approximately 50%, with Warriors exposed to direct combat at higher rates of use and enlisted personnel also at higher rates of use. Potential mood altering effects of nicotine-containing tobacco products might help to explain the high rates of reported “self-medication” among Warriors in theater. Further, subjective reports from OEF/OIF suggest males and females may use tobacco products for different reasons (e.g., mood regulation, remaining alert). This research project used an animal model to examine whether nicotine, the drug of addiction in tobacco, decreases anxiety-related and depression-related behavior in rats.
Two experiments were conducted. In Experiment 1, rats (both male and female of Sprague-Dawley strain) were exposed to a “Warrior Stress Paradigm” (a paradigm that mimics the threat of death and combat by exposing rats to fox urine and environmental stressors) and nicotine was delivered via SC implanted osmotic minipumps at three levels of nicotine dosages (0, 3, and 6 mg nic/kg/day) that model moderate and heavy tobacco consumption. Results revealed that unstimulated female rats receiving 6 mg nic/kg/day had significantly less depression-related behavior than saline controls. There were no anxiolytic effects of nicotine in the first experiment and no other depression-related effects of nicotine were found. A second experiment used four dosages of nicotine (0, 3, 6, 9 mg nic/kg/day) with unstimulated female rats. Overall, these experiments indicated that nicotine attenuates depression-related behaviors in unstimulated female rats. If these findings generalize to humans, then they suggest that clinicians should focus on smoking prevention and cessation strategies that address mood in addition to the biological underpinnings of addiction with female tobacco users.

FUNDING: This project was supported by SRNT Grant G172FG.
JUSTIFICATION: This project may help to inform tobacco cessation treatment strategies for female Warriors in the United States Military.

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POS2-12
A BEHAVIORAL ECONOMICS APPROACH TO NICOTINE REDUCTION: SENSITIVITY TO INCREASES IN THE COST OF NICOTINE PREDICTS SENSITIVITY TO DECREASES IN THE DOSE OF NICOTINE

Tracy T. Smith*, MS, Laura E. Rupprecht, BS, Rachel L. Schassburger, MS, Alan F. Sved, PhD, Eric C. Donny, PhD, University of Pittsburgh

The FDA has the authority to regulate the nicotine (NIC) content in cigarettes to provide a framework for a behavioral economics approach to predicting response to NIC reduction. We hypothesize that NIC intake is a function of the unit price of NIC (unit price = NIC cost / NIC dose). Thus, increases in the cost of NIC and decreases in NIC content should be equivalent manipulations. If this assumption is correct, cost may be an important moderator of response to NIC reduction, and an individual’s or subpopulations’ response to increase in cigarette cost may be used to predict response to NIC reduction. The present study tested this assumption in adult male rats using a self-administration procedure. Cost of NIC was manipulated using the number of responses required to earn a NIC infusion (i.e., FR). Rats were exposed to 12 unit price combinations in a random order. Six combinations had the same FR and decreasing doses of NIC. A second set of six combinations had the same NIC dose and increasing FRs. Combinations in the two sets created matching unit prices, and for each rat two curves corresponding to the two sets were created, each plotting NIC consumption as a function of unit price. An exponential function was fit to each curve, and a parameter estimating sensitivity to increases in unit price was obtained. Consumption was similar at each unit price regardless of the cost or dose within each unit price. The largest discrepancy was for the highest unit price where rats earned significantly less NIC when dose and cost were high than when dose and cost were low. Sensitivity to increases in cost and sensitivity to decreases in dose were highly correlated (r = .749, p < 0.05), suggesting that individuals who are insensitive to increases in the cost of cigarettes are also likely to be insensitive to decreases in the content of NIC. These data suggest that existing information like the response of critical subpopulations to cigarette taxation could be used to predict the response of those populations to NIC reduction. The hypothetical economic framework suggests that NIC intake is a function of the unit price of NIC, and this framework can be used to predict how individuals respond to changes in the cost of cigarettes.

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JUSTIFICATION: These data suggest a potential therapeutic benefit of low dose varenicline in the treatment of heart failure.

FUNDING: Western University of Health Sciences Intramural Grant Program and the Western University of Health Sciences College of Pharmacy, Pharmaceutical Sciences Graduate Program.

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POS2-14
adolescent NICotine exposure CAuses DYSREGULATIONS in the cholinerGic sysTem

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Adolescent nicotine abuse is problematic because earlier ages of smoking initiation are correlated with more severe nicotine dependence later in life as well as cognitive and affective impairments in adulthood. Chronic administration of nicotine during adolescence leads to upregulation of the α4β2 nicotinic receptor subtype and persistent deficits in hippocampal-dependent contextual fear learning in adulthood (Portugal et al., 2012; Trauth et al., 1999). Since the hippocampus has a high concentration of nicotinic acetylcholinergic receptors, it is possible that adolescent nicotine disrupts normal cholinergic functioning within the hippocampus. This study tested whether prior chronic nicotine exposure in adolescence leads to a hyporesponsive or hyperresponsive nicotinic acetylcholinergic system. To test this, animals were chronically treated with nicotine (12.6mg/kg/d) starting at postnatal day 38 (P38) for 12 days after which puffs were removed and animals underwent a 30 day period without treatment. At the end of 30 days animals were trained and tested in fear conditioning. Acute nicotine was administered at the time of testing and training at varying doses (0.045mg/kg, 0.18mg/kg, and 0.36mg/kg/day). While the medium dose of 0.18mg/kg enhanced learning in mice pretreated with saline, only the higher dose of nicotine reversed the deficit in fear learning caused by adolescent nicotine exposure. Thus, the cholinergic system is hyporesponsive following adolescent nicotine as a larger quantity of nicotine is needed to enhance learning. Further supporting the notion of a hyporesponsive cholinergic system, dietary choline supplementation (9g/kg) following the cessation of chronic adolescent nicotine treatment and continuing through training and testing in fear conditioning reversed deficits in adult hippocampal-dependent learning associated with adolescent nicotine exposure. Taken together, these findings suggest that adolescent nicotine exposure creates a hyporesponsive cholinergic system resulting in learning deficits that emerge in adulthood and these deficits may be reversed with choline dietary supplementation.

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POS2-15
ACUTE NICOTINE DISRUPTS TRACE CONDITIONED SAFETY

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Smokers have an increased risk of developing Post-Traumatic Stress Disorder (PTSD), a condition in which fear inhibition is disrupted. While previous findings show that acute nicotine enhances hippocampus-dependent forms of fear learning, the effects of nicotine on learned safety are not clear. Learned safety occurs when a conditioned stimulus (CS) comes to predict the absence of an aversive unconditioned stimulus (US). Recent work from our lab suggests that acute nicotine disrupts contextual safety, but not unpaired cued safety learning, indicating that acute nicotine may disrupt hippocampus-dependent forms of learned safety. Thus, we investigated the effects of acute and chronic nicotine on a backwards trace safety conditioning protocol in mice. Training and testing occurred over 4 days with 3 training sessions over each day. 5 trials per session. Each trial consisted of a light cue (CS-) that co-terminated with a foot-shock (0.57 mA, 2s) followed by a 20 s interval and then tone (30 s, CS-). Testing occurred on the 4th day in an altered context where light CS+ and light-tone (CS+/-) compound stimuli were presented. Conditioned safety was measured by freezing to CS+/- based on work indicating that acute nicotine can disrupt contextual safety by altering hippocampal processes, we hypothesized that acute nicotine would disrupt backwards trace conditioned safety, a task that may recruit the hippocampus. Conversely, chronic nicotine, which does not similarly alter hippocampal learning, was predicted to have no effect. In our study chronic nicotine (12.6 mg/kg/d) was administered for 10 days prior to and throughout training and testing via osmotic mini-pumps while acute nicotine (0.09 mg/kg) was given prior to all training and testing sessions. On testing, mice administered acute nicotine showed equal freezing to the CS+ and CS+/- stimuli, indicating disrupted learned safety. In contrast, chronic mice showed reduced freezing to the CS+/- compound, indicating learning. Previous work suggests that acute nicotine may disrupt learned safety in this paradigm by altering hippocampal processes. Future work will investigate the nature of hippocampal involvement.

FUNDING: This work was funded with grant support from the National Institute on Drug Abuse (T.J.G., DA017949).

JUSTIFICATION: We found that acute nicotine can alter learned safety, this may have implications for understanding the relationship between smoking and anxiety disorders such as PTSD.

POS2-17
EFFECTS OF ACUTE, CHRONIC AND WITHDRAWAL FROM CHRONIC NICOTINE ON CONTEXTUAL FEAR EXTINCTION

Munir G. Kutlu*, Chicora Oliver, Rob Cole, David Connor, Thomas J. Gould, Temple University

Anxiety disorders such as Post-Traumatic Stress Disorder (PTSD) have been associated with deficits in fear extinction as several studies have shown that fear extinction is delayed in the patients with anxiety disorders. Given the high rate of cigarette smoking in anxiety and PTSD patients, the current experiments were conducted to examine the effects of acute and chronic nicotine as well as withdrawal from chronic nicotine on contextual fear extinction in mice, an animal model of exposure therapy for anxiety disorders. Animals were first trained in a background contextual fear conditioning paradigm using white noise as a conditioned stimulus (CS), which co-terminated with a 2 s 0.57 mA unconditioned foot-shock stimulus (US). During initial testing and extinction sessions, animals were placed in the same context with no CS or US presentations, and freezing was measured as an indication of fear. Acute nicotine animals were given nicotine injections (0.18 mg/kg) prior each extinction session whereas chronic animals were administered nicotine (12.6 mg/kg/d) for 10 days and throughout training, initial testing, and extinction sessions and withdrawal animals were given nicotine during training and initial testing but not during extinction sessions. All three types of nicotine administration impaired contextual fear extinction (Drug X Test Trial interaction p<0.05). Based on the previous studies showing an interaction between nicotine and brain-derived neurotrophic factor (BDNF), a potential mechanism for the nicotine-induced impairment of contextual fear extinction may involve changes in BDNF signaling. To test this hypothesis we systemically (i.p.) injected a sub-threshold dose (2.5 mg/kg) of 7,8-dihydroxyflavone (7,8DFH), a small-molecule TrkB agonist that fully mimics the effects of BDNF, an hour before acute nicotine injections. While the animals that received only 7,8DFH did not show any changes in extinction, 7,8DFH ameliorated the extinction deficit in the acute nicotine administered animals. Overall, these results suggest that acute nicotine-induced impairment may be related to a disrupted BDNF signaling, a hypothesis that will be further tested in future studies.

FUNDING: This work was funded with grant support from the National Institute on Drug Abuse (T.J.G., DA017949).

POS2-16
CHRNA5 GENOTYPE INTERACTS WITH SCHOOL-BASED INTERVENTION TO REDUCE HIGH SCHOOL SMOKING


Individual differences in response to an intervention to reduce substance use, including tobacco, might be due to interactions between genes and the intervention (G x I). We have asked whether the effect of an intervention on smoking in high school (grades 9-12) was different based on genotype at a SNP (rs18969968) in the CHRNA5 gene that has been associated with many smoking-related phenotypes. Participants (N = 424) were from the PROSPER study (PRomoting School-community-university Partnerships to Enhance Resilience) that delivered an intervention in the 7th grade, with follow-up surveys through the 12th grade. The intervention was randomly assigned to equal numbers of schools, and delivered in health class. The control schools received their standard class. Smoking in the past month was assessed with 4-point scale (0 = Never smoked, 1 = Smoked but not in last month, 2 = Once or a few times, 3 = About once a week or more). There was a main effect of the SNP on high school smoking, with more smoking in individuals with the AA genotype compared to those with the GG genotype (b = 0.34, p < 0.05). Smoking was marginally higher in those with the AA compared to GA (b = 0.24, p = 0.07), and no difference was found between G/G and G/A genotypes. When evaluating the interaction with intervention we found a statistically significant effect such that the intervention reduced smoking in the individuals with AA and GA genotypes to similar levels as the G/G genotype (G/G vs. A/A: b = -0.67, p < 0.05; A/G vs. AA: b = -0.61, p < 0.05; G/G vs. A/G n.s.). The effect of genetic ancestry, a potential confound in association tests, was not significant using a principal coordinates analysis of additional markers tested on these individuals.

These results suggest that interventions designed to reduce substance use generally, have effects on smoking that extend through high school, a period of great risk for becoming a smoker. The role of interactions between genes and interventions designed to reduce smoking is in early stages of study, and these results suggest genetic effects are important to consider in evaluating intervention outcomes.

FUNDING: National Institute on Drug Abuse (grants DA030389 and DA013709).

JUSTIFICATION: Determining how genotype alters the outcome of an adolescent intervention will help improve future intervention design.

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POS2-18  
CINGULATE-STRIATAL CIRCUIT ALTERATIONS IN A RODENT MODEL OF NICOTINE DEPENDENCE  
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We previously demonstrated in human smokers that strength of functional connectivity between the dorsal anterior cingulate cortex (dACC) and ventral striatum (VS) negatively correlates with nicotine addiction severity, while connectivity strength of specific cortical-cortical circuits increases following NRT. To determine whether this dACC-VS connectivity relationship predisposes an individual to or results from nicotine dependence, we developed a rodent model to assess alterations in circuitry following dependence and withdrawal from intermittent nicotine. We used an osmotic minipump attached to a Lynch coil alternately filled with nicotine (1.2 mg/kg/d (low dose) or 4.8 mg/kg/d (high dose)) or saline and mineral oil to automatically administer nicotine intraperitoneal to rats (n=12/group) in a 1 hr on/off pattern for 14 days. Resting-state fMRI was performed on anesthetized rats at pretreatment baseline (Day 0), immediately after nicotine exposure (Day 14), and after 14 days of abstinence (Day 28). One day prior to each imaging session, nicotine dependence was assessed by administering mecaminylamine and scoring behavioral withdrawal signs for 50 min. A generalized linear mixed model revealed a Day × Treatment Interaction (p<.004), whereby high-dose rats showed more withdrawal signs than both low-dose (p<.05) and saline (p=0.001) rats at Day 14. Both low- and high-dose rats displayed more withdrawal signs at Day 14 than at either Day 0 or Day 28 (p<0.055), suggesting nicotine dependence dissipates within 14 days of abstinence. Whole brain analysis of fMRI data revealed a negative correlation between dependence severity and a functional circuit between the cingulate seed (area CG1) and dorsal striatum, and positive correlations between dependence severity and circuits between the CG1 seed and VS, orbitofrontal cortex, and retrosplenial cortex (rat posterior cingulate cortex). These correlations were no longer evident at Day 28. Our results demonstrate effective back translation of the aforementioned human study and suggest that the relationship between dependence severity and circuit strength is addiction-induced rather than predispositional.  
FUNDING: Supported by the NIDA-IRP and a grant from the FDA Center for Tobacco Products.  
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POS2-19  
CYP2A6 GENOTYPE DIFFERENTIALLY SHAPES STRIATAL-CORTICAL BRAIN CIRCUITS IN SMOKERS VS. NONSMOKERS  
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Genetic variations in CYP2A6 determine the rate of nicotine metabolism and are associated with smoking behaviors. A functional brain imaging study showed that genetic variation in CYP2A6 modulates neural reactivity to smoking cues. However, whether the CYP2A6 genotype directly shapes the intrinsic functional connectivity of brain circuits and how such genotype effects, if any, interact with smoking remains unknown. We addressed these issues using resting-state fMRI and network analysis. 48 smokers (Normal: Slow = 2:25:23) and 71 non-smokers (Normal: Slow = 2:28:43) were included in the analysis. Subjects underwent a 6 min resting-state fMRI scan. Functional connectivity strength (FCS), defined as the average functional connectivity between one voxel and all gray matter voxels in the brain, was computed for each subject. Genomic DNA was assayed from blood samples using standard protocols. A 2 (Genotype: Normal, Slow) × 2 (Status: Smokers, Nonsmokers) ANCOVA was performed on the FCS, including age, gender, IQ and years of education as covariance. Significant CYP2A6 Genotype × Smoking Status interactions were found in the dorsal anterior cingulate cortex (dACC), bilateral striatum, bilateral insula, dorsal lateral prefrontal cortex, and middle frontal gyrus (p < 0.05, corrected). Post-hoc analysis revealed that smokers with normal metabolizer genotype have higher FCS than slow metabolizer genotype group in all regions; no CYP2A6 genotype effect was found in nonsmokers. This is the first study to reveal interactions of the CYP2A6 genotype and nicotine use on brain functional connectivity. The interactions were mainly located in structures within mesocorticolimbic circuits, which have been implicated in drug addiction. Since the rate of nicotine metabolism is slower in individuals with the slow CYP2A6 genotype, these results suggest that a greater amplitude and/or longer duration of nicotine may reduce the FCS in mesocorticolimbic circuits. It is consistent with a previous study showing lower cue reactivity associated with the slow CYP2A6 genotype in smokers and suggests that that CYP2A6 genotype can shape brain circuits differentially in smokers and nonsmokers.  
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POS2-20  
A TEST OF THE ROLE OF MOTIVATION IN SMOKERS’ SUBJECTIVE RESPONSES TO PLACEBO CIGARETTES  
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It is believed that a variety of psychological mechanisms play a role in producing placebo effects, including but not limited to expectations, conditioning, and motivation. Most research to date has focused on classical conditioning and expectancy explanations, but few studies have examined how motivation to respond to a placebo contributes to the placebo effect. This study attempted to manipulate the motivation to respond to a placebo (denicotinized) cigarette in regular smokers. Participants were randomly assigned to an instructional set manipulation intended to induce low motivation to experience placebo effects (n=40) or high motivation to experience placebo effects (n=40) before they knowingly smoked a placebo cigarette. Motivation was manipulated via scripts that described people who like placebo cigarettes as either possessing desirable (e.g., educated) or undesirable characteristics. Urge to smoke, mood, nicotine withdrawal, and smoking satisfaction were assessed before and after the manipulation. Smokers in the high motivation group reported significantly greater reduction in urge and withdrawal, and greater smoking satisfaction and reward than those in the low motivation group, even after controlling for socially desirable responding. These results are among the first to empirically demonstrate that motivation may play a role in placebo responding and could have implications for the use of open-label placebos as therapeutic agents.  
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POS2-21
THE CONTRIBUTION OF RARE AND COMMON VARIANTS IN 30 GENES TO RISK NICOTINE DEPENDENCE
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Genetic and functional studies have revealed that both common and rare variants of several nicotinic acetylcholine receptor (nAChR) subunits are associated with nicotine dependence (ND). In this study, we identified variants in 30 candidate genes including nicotinic receptors in 200 sib pairs selected from the Mid-South Tobacco Family (MSTF) population with equal numbers of African Americans (AA) and European Americans (EA). We selected 135 of the rare and common variants and genotyped them in the Mid-South Tobacco Case-Control (MSTCC) population, which consists of 3088 AAs and 1430 EAs. None of the genotyped common variants showed significant association with smoking status (smokers vs. non-smokers), Fagerström Test for Nicotine Dependence (FTND) scores, or indexed cigarettes per day (CPD) after Bonferroni correction. Rare variants in NRXN1, CHRNA9, CHRNA2, NTRK2, GABBR2, GRIN3A, DNM1, NRXN2, NRXN3, and ARRB2 were significantly associated with smoking status in the MSTCC AA sample, with Weighted Sum Statistic (WSS) P values ranging from 0.0024 to 0.00013 after 1,000,000 phenotype rearrangements. We also observed a significant excess of rare nonsynonymous variants exclusive to EA smokers in NRXN1, CHRNA9, TAS2R38, GRIN3A, DBH, ANKK1/DRD2, NRXN9, and CDH13 with WSS P values between 0.000035 and 0.000001. Variants rs142607401(AA432T) and rs139982841(AA452V) in CHRNA9 and variants V132L, V389L, rs34755188(R480H), and rs75981117 (N549S) in GRIN3A are of particular interest because they are found in both the AA and EA samples. A significant aggregate contribution of rare and common coding variants in CHRNA9 to the risk for ND (SKAT-C: P = 0.0012) was detected by applying the combined sum test in MSTCC EAs. Together, our results indicate that rare variants alone or combined with common variants in a subset of 30 biological candidate genes contribute substantially to the risk of ND.

FUNDING: NIDA012844
JUSTIFICATION: Genetics play an important role in smoking addiction.

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POS2-22
TOXICITY OF INHALED NICOTINE AND PYRUVIC ACID AEROSOLS (SEPARATELY AND COMBINED) IN SPRAGUE-DAWLEY RATS IN A 28-DAY OECD TG412 INHALATION STUDY
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The toxicity of a nebulized mixture of nicotine and pyruvic acid, nicotine, and sodium pyruvate, was characterized in a repeated dose inhalation study. Sprague-Dawley rats were nose-only exposed for 6 hours per day, 5 days per week in a 28-day study to either filtered air, PBS (solvent control), nicotine (50 microgram/liter), sodium pyruvate (33.9 microgram/liter), or three concentrations of the nicotine-pyruvic acid mixture (nicotine concentrations were 18, 25, and 50 microgram/liter, with equimolar concentrations of pyruvic acid). The test aerosols were produced using jet collision nebulizers and were in the respirable particle size range.

Compared to the air control, the PBS and pyruvate groups showed no treatment-related effects. Effects in the rats exposed to the test atmospheres containing nicotine were as follows: In life observation showed a reduced weight gain. However, food consumption was not significantly reduced over the study duration. No exposure-related mortality or abnormal gross pathological findings were observed. Organ weight changes were noted in liver (increase) and spleen (decrease). Clinical pathology evaluation showed slightly higher erythrocyte and hemoglobin values in nicotine-exposed females relative to control. In addition the neutrophil count was higher whereas the lymphocyte count was lower in all animals exposed to nicotine. For the clinical chemistry, blood alkaline phosphatase and alanine aminotransferase activities were higher; cholesterol and glucose concentrations were lower than in the control rats. Histopathological findings in the non-respiratory tract consisted of an the appearance of vacuolization in the liver. In the respiratory tract, mild laryngeal epithelial hyperplasia and squamous metaplasia was observed, as well as an increased epithelial thickness. A low level of lung inflammation was found in the nicotine-exposed rats. Most of the effects were nicotine exposure concentration-dependent.

In conclusion, minor biological effects related to inhalation of nicotine either alone or in combination with pyruvic acid were observed in a 28-day inhalation study. The nicotine-related effects were not modulated by pyruvic acid.

FUNDING: Funded by Philip Morris International
JUSTIFICATION: Safety of inhaled nicotine and nicotine salts.

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POS2-23
INTERACTION OF WILLINGNESS TO PAY FOR CIGARETTES, QUITTING MOTIVATION AND NICOTINE DEPENDENCE
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There is a rapidly growing interest in the incorporation of behavioral economic measures, such as delay discounting or loss aversion, into the study of addictive processes (e.g. Bickel, Johnson, Koffarnus, MacKillop, & Murphy, 2014). Eliciting an individual's willingness to pay (WTP) for an opportunity to smoke is a relatively quick and intuitive way to explore how the economic valuation of nicotine is related to smoking behavior, and is being used increasingly in smoking cessation research (e.g. Stavem, Røgeberg, Olsen, & Boe, 2008). However, there has been a paucity of literature describing the general distribution of WTP for cigarettes and how it interacts with other variables important to abstaining. The current study addressed this gap by utilizing behavioral data from 281 participants to explore how a free-response WTP item is distributed and related to nicotine-dependence and the motivation to quit smoking.

The sample was composed of 18-45 year olds (70% male, 62% Caucasian). Participants’ WTP for a single cigarette ranged from $0 to $10,000, which included three outliers that fell more than 3 standard deviations above the sample mean. After removing outliers, the mean WTP was $6.03 with a standard deviation of $31.37; the distribution was positively skewed, with the majority of responders in the $0 to $1 range. WTP did not differ significantly across sex or ethnicity and did not covary significantly with age, education or income. For active smokers with no expressed interest in quitting (n = 83), WTP was positively correlated with nicotine dependence (r = 0.220, p = 0.042), but for participants with an interest in quitting (n = 196), there was a non-significant negative association between WTP and nicotine dependence (r = - 0.23, p = 0.751). Understanding precisely how, and for whom, economic indicators predict smoking behavior will allow researchers to determine the optimal way to incorporate these measures into clinical and empirical settings. Future studies should examine if, as these data suggest, WTP is a particularly meaningful predictor for smokers who are not currently motivated to quit.

FUNDING: This study was conducted while the third author was at the University of Pittsburgh. Supported by NIH Grant R01 DA02463.
JUSTIFICATION: This study will enable other clinical researchers to incorporate willingness to pay more confidently into their work, hopefully progressing understanding of smoking behavior and smoking cessation.

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POS2-24
IMPACT OF NICOTINE WITHDRAWAL ON FLEXIBLE DECISION-MAKING AND FRONTOSTRIATAL BDNF
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Nicotine addiction is a global health problem and smoking-related illness is the largest preventable cause of death. Although, the smoking cessation produces various somatic and affective signs of withdrawal during first few days of abstinence, withdrawal-related cognitive deficits are considered to be the most critical symptoms that predict relapse. The present study was designed to examine the effects of nicotine withdrawal on cognitive control processes in mice. Because the integrity of frontostriatal circuits is critical for executive processes, and brain-derived neurotrophic factor (BDNF) modulates plasticity in these circuits, we also assessed the effects of nicotine withdrawal on prefrontal and striatal BDNF expression. Male C57BL/6J mice were trained in an operant cognitive flexibility task that required the animals to switch from a visual cue-based discrimination strategy to an egocentric spatial response strategy to obtain a reward. Osmonc minibumps were implanted subcutaneously to deliver either saline or nicotine (18mg/kg/day; base) for 4 weeks. Precipitated withdrawal was induced via a subcutaneous injection of mecamylamine, a non-specific nicotinic receptor antagonist (3mg/kg), 20 min. prior to testing. Animals undergoing precipitated withdrawal required more trials to reach criterion (p=0.01). Subsequent error analyses indicated that slower acquisition was mostly related to these animals’ inability to maintain a new learning strategy (learning errors: 17.5±2.14 vs 9.6±2.22 in controls, p=0.005). Moreover, the ratio of striatal to prefrontal BDNF levels robustly increased following mecamylamine-precipitated withdrawal as compared to the saline/nicotine-treated animals that were challenged with saline (both p<0.01). These findings suggest that the ability to shift strategies in order to maintain goal directed behavior is disrupted during nicotine abstinence and may possibly involve perturbations in corticostratial BDNF signaling. As cognitive changes during nicotine abstinence predict relapse, therapeutic strategies aimed at normalizing BDNF imbalance and restoring executive functions may be considered for smoking cessation.

FUNDING: Brain and Behavior Research Foundation; NIH Grant CA143187
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POS2-25
THE COMPARATIVE EFFICACY OF 1ST VS. 2ND GENERATION ELECTRONIC CIGARETTES IN REDUCING SYMPTOMS OF NICOTINE WITHDRAWAL
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Aims: To examine the comparative efficacy of 1st and 2nd generation e-cigarettes in reducing nicotine withdrawal symptoms in a sample of current smokers with little or no experience using e-cigarettes.

Background: Presently, electronic cigarettes (e-cigarettes) are studied as though they are a homogeneous category. However, there are several noteworthy differences in the products that fall under this name including potential differences in the efficacy of these products as smoking cessation aids.

Design and Setting: Twenty-two mildly to moderately nicotine dependent individuals were randomized to a crossover design in which they used 1st and 2nd generation e-cigarettes on separate days. Participant's mean age was 28.6 (SD = 12.9), the majority were male (56.5%), Caucasian (91.3%), reported smoking an average of 15.2 (SD = 9.6) tobacco cigarettes per day, and a mean baseline Carbon Monoxide (CO) level of 18.7 ppm.

Findings: Analysis of changes in withdrawal symptoms revealed a significant time by product interaction (p = .036, n2p = .202). Participants experienced a larger reduction in symptoms of nicotine withdrawal after using 2nd generation e-cigarettes as compared to 1st generation e-cigarettes.

Conclusions: This study aimed to examine potential differences in the comparative efficacy of 1st and 2nd generation e-cigarettes in reducing symptoms of nicotine withdrawal within a sample of nicotine dependent individuals naïve to e-cigarette use. Results indicate that 2nd generation e-cigarettes produced greater reductions in withdrawal symptoms as compared to 1st generation e-cigarettes. Changes in reported importance and confidence in quitting smoking after using each product were also examined, however no significant changes were observed. The current results provide preliminary support for the hypothesis that products within the broad category of e-cigarettes may differ in their effectiveness as smoking cessation aids by demonstrating difference among these products in their ability to reduce withdrawal symptoms which is a critical component of successful smoking cessation.

FUNDING: This study was funded by the Department of Marketing at Oklahoma State University.
JUSTIFICATION: Current results may impact views on potential effectiveness of e-cigarettes as smoking cessation aids.

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POS2-26
CRAVING-RELATED BEHAVIORAL RESPONSES TO REDUCED NICOTINE CIGARETTES: PRELIMINARY FINDINGS
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Smoking contributes to more than 480,000 deaths each year in the United States alone, costing the US government more than $133 billion per year in direct medical costs. In order to affect an improvement in public health, the FDA aims to better understand the behavioral and neural effects of regulating levels of nicotine, the key addictive agent in cigarettes. This ongoing study examines the effects of reduced nicotine cigarettes (RNCs) upon craving, withdrawal and mood, as well as the liking and drug effects of each cigarette. Six participants each attended five testing sessions, in which they completed a series of questionnaires and a cigarette-craving task while undergoing fMRI scanning, in which they observed videos of people smoking or not smoking and rated their subjective craving levels. Participants completed these measures both after overnight abstinence from smoking and after smoking one of four RNCs with different nicotine contents (0.763, 0.231, 0.110, 0.027 mg), or their own brand of cigarette. Participants reported both an increased liking and drug-effect after smoking their own brand cigarette, although this was not significant. Smoking their own brand and all but one of the RNCs reduced craving, but there was no significant difference in craving reduction across cigarettes. Further, there was no effect of smoking upon either positive or negative mood. Results of the craving task revealed decreased craving after smoking a cigarette. Further, there was a trend towards increased craving after viewing videos of people smoking compared to videos of people not smoking. In contrast (smoking vs. non-smoking cues), there was greater fMRI activation in medial prefrontal cortex, right anterior insula, right inferior frontal cortex, bilateral ventral striatum, right amygdala, and thalamus. Analyses indicated decreases in activation in rostral anterior cingulate, posterior cingulate, precuneus, and thalamus for participants’ preferred-brand cigarette. These preliminary results, despite a very limited sample size, highlight the usefulness of examining the effects of cigarettes with varying nicotine content on behavioral and neural measures of craving.

FUNDING: R01 from the National Institute of Health
JUSTIFICATION: This study may provide results that will help the FDA to regulate the amount of nicotine in cigarettes and subsequently improve public health.

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POS2-27

ACUTE NEUROCOGNITIVE ALTERATIONS PRODUCED BY SMOKELESS TOBACCO PRODUCTS

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Despite an increase in the prevalence of a variety of smokeless tobacco products being used, the neurocognitive effects of these products and their potential for abuse remains unclear. The use of traditional cigarettes is associated with an acute impact on neurocognitive processing which can be detected using event-related potentials (ERPs), a sensitive measure of transient brain activity. Specifically, an acute "boost" to attentional processes has been observed following cigarette use, a phenomenon that may be linked to abuse liability. However, it remains unknown whether comparable attentional enhancement is produced by smokeless tobacco products. In the present study, this question was investigated by comparing ERP indices of attentional amplification following exposure to a number of smokeless tobacco products as compared to a control product. During five separate laboratory visits, smokeless tobacco users used Verve, Ariva, Skoal, Camel Snus, or medicinal nicotine (control product) in a Latin square order. During experimental sessions, ERPs were recorded while participants performed a two-stimulus oddball task. ERPs were recorded immediately before and after 30 minutes of product use, as well as subjective measures (relief of craving/withdrawal). In addition, EEG data were recorded immediately prior to product use as well as during the 30-minute period of product usage. An ERP component associated with attentional amplification, the lateral-occipital N2, was differentially affected as a function of product type. Only Skoal and Camel Snus produced an increase in amplitude of the N2 component. None of the products tested resulted in enhancement of the P3 component. The findings for Skoal and Camel Snus are consistent with our previous work examining the neurocognitive effects of traditional cigarettes. These preliminary results support the notion that some, but not all, smokeless tobacco products produce qualitatively similar neurocognitive effects as compared to cigarettes. We are now examining the relation between neurocognitive boost measures and subjective measures of relief from craving and withdrawal.

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POS2-28

EFFECTS OF VARENICLINE ON THE NICOTINE REINFORCEMENT THRESHOLD AND COMPENSATION IN AN ANIMAL MODEL OF NICOTINE REDUCTION POLICY

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Reducing the nicotine content in tobacco products is being considered by the FDA as an industry-wide policy to reduce the addictiveness of tobacco products. Such a policy could enhance the efficacy of current medications for smoking reduction or cessation. Conversely, medications could augment the efficacy of nicotine reduction policy. For example, via its blockade of nicotinic receptors, the partial-agonist varenicline (VCL) could increase the nicotine reinforcement threshold (the lowest dose needed to maintain smoking). In addition, VCL’s agonist activity could serve as a substitute for nicotine and thereby limit the compensatory smoking that could occur in response to reduced nicotine cigarettes (RNCs). In this study, the ability of VCL to enhance the reinforcing effects of nicotine-paired stimuli in animals suggests such effects could serve to maintain smoking RNCs and limit VCL’s ability to increase the reinforcement threshold. The purpose of the present study was to examine these issues in an animal model of nicotine reduction policy. Eighteen rats were trained to self-administer nicotine (0.06 mg/kg) during daily 2-hr sessions. After NSA stabilized, the unit dose was reduced weekly until extinction levels of responding were achieved. Rats received daily saline or VCL (0.1 or 0.3 mg/kg s.c.) pretreatment throughout the dose reduction protocol. Compared to saline, both VCL doses shifted the nicotine unit dose response curve downward and increased the threshold reinforcing nicotine dose from 4.1 g/kg (saline) to 17.5 g/kg (0.1 VCL, p<0.05) and 23.5 g/kg (0.3 VCL, p<0.05). Both VCL doses completely blocked the compensatory increases in NSA observed in saline-treated rats. These findings suggest that VCL could enhance the efficacy of nicotine reduction policy by raising the nicotine content needed to promote smoking reduction or cessation and limiting the risk of compensatory smoking. Conversely, nicotine reduction policy could enhance the efficacy of VCL.

FUNDING: Supported by NIH/NIDA grant R01-DA026444 (LeSage, PI).

JUSTIFICATION: This study suggests that smoking cessation medications and nicotine reduction policy could act additively or synergistically to improve public health.

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POS2-29

FREQUENCY MATTERS: RELATIONSHIP BETWEEN NUMBER OF BINGE DRINKING DAYS AND CIGARETTE SMOKING AMONG YOUNG ADULT SMokers

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Introduction: High prevalence of tobacco smoking has been reported in individuals who binge drink alcohol. The goal of the current study was to further examine the relationship between frequency of past month binge drinking and characteristics of tobacco use in young adults who smoke cigarettes.

Methods: An anonymous online survey was administered to 1987 young adults (36.7% female, mean age=20.6, SD 2.1) from across the US, who had smoked at least 1 cigarette in the past month. Demographics, tobacco, and alcohol use were assessed. The Timeline Followback (TLFB) method assessed past month drinks and cigarettes smoked, from which number of binge drinking days (4 or more drinks for women, 5 or more drinks for men) was calculated. Participants were divided into four groups based on frequency (0, 1-3, 4-8, or 9+ binge drinking days/month).

Results: More than half (56.6%) of participants reported at least one binge drinking day in the past month. Binge drinkers were more likely to be social smokers (76.4% vs 63.6%; X2=35.5, p<0.001), less likely to smoke within the first 30 mins of waking (33.6% vs 40.6%; X2=11.13, p<0.01), and had more temptation to smoke in positive affect/social situations (F=13.1, p<0.001) than non-binge drinkers; but there were no differences in number of cigarettes smoked or number of smoking days in the past month. In contrast, among individuals with at least 1 past month binge drinking episode (N=1125), there was a significant positive trend between frequency of binge drinking and both number of smoking days (F=45.0, p<0.001), and total cigarettes smoked (F=36.6, p<0.001). Among binge drinkers, there was also a significant positive linear relationship between frequency of binge drinking and temptation to smoke in positive affect/social situations (F=13.1, p<0.001).

Conclusions: Frequency of binge drinking (not just prevalence) is an important factor influencing tobacco smoking in young adults in the US. More frequent binge drinking may also be associated with greater cigarette craving in positive affective/social situations, suggesting that binge drinkers and non-binge drinkers may differ in smoking temptation situations.

FUNDING: Support: This work was supported by NIH NIDA grant K23 DA032578 and in part by a grant from the National Cancer Institute Grant CA-113710.

JUSTIFICATION: The relationship between binge drinking and tobacco use in young adults may help to identify at risk populations and aid in the development of targeted smoking cessation interventions.

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The current study investigated the impact of machine parameters such as puff volume, puff duration and puff profile on the emissions of nicotine, glycerol and water from a disposable e-cigarette. Emissions data obtained in studies of this kind should optimally be generated under conditions reflecting real-world human smoking conditions. However, there are no formal agreed standards for the laboratory testing of e-cigarettes, and a number of puffing regimes have been used to date. This study demonstrates the relative importance of machine puffing parameters on aerosol yields and thereby identifies priorities for future topography studies.

FUNDING: This project was supported by Grant No. R21DA034285 awarded to Joseph W. Ditre by the National Institute on Drug Abuse.

JUSTIFICATION: Considering that pain is highly prevalent among smokers, and amplification of pain may precipitate relapse to smoking. CONCLUSIONS: Abstaining from smoking may increase pain reactivity, possibly via nicotine withdrawal effects. Discussion will address potential mechanisms, pain as a symptom of nicotine withdrawal, and the possibility that abstinence-induced amplification of pain may precipitate relapse to smoking.

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THE IMPACT OF SWITCHING TO PMRTP ON THE DEVELOPMENT OF CIGARETTE SMOKE - INDUCED COPD IN C57BL/6 MICE

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In this study, the impact on the development of emphysema/COPD following inhalation of aerosol from two tobacco products, a reference cigarette (3R4F) and a prototypic modified risk tobacco product (pMRTP), was evaluated in C57Bl/6 mice. The mice were exposed to an aerosol from 3R4F (750 micrograms/liter of total particulate matter - TPM), pMRTP or filtered air for 4 hours per day, 5 days per week, up to 7 months. Aerosols from both tobacco products used had the same nicotine concentration - 34.4 micrograms/liter. After 2 months of exposure to 3R4F, switching and cessation groups were exposed to pMRTP aerosol or filtered air, respectively. To analyze the progression of emphysema, evaluations of inflammation, pulmonary function, and various histopathological and molecular changes (transcriptomics, proteomics and lipidomics) were performed at months 1, 2, 3, 4, 5 and 7. Exposure to 3R4F induced molecular, cellular and physiological modifications in lungs leading to emphysematous changes. Animals exposed to pMRTP exhibited negligible changes in all parameters assessed. Both cessation and switching groups showed a reversal of the inflammatory and functional responses induced by 3R4F smoke. Histopathological evaluation revealed a slowdown in the progression of emphysematous changes in switching and cessation groups. Smoking cessation or switching resulted in the rapid recovery at the transcription level. The lipid and protein profiles in lung similarly showed a clear response to 3R4F aerosol exposure, with minimal changes associated with pMRTP exposure, and recovery near to sham-exposed levels following either switching or cessation. Moreover, majority of 3R4F induced gene expression and protein level changes matched. These data demonstrate that exposure to pMRTP for up to 7 months resulted in a response similar to fresh air-exposed animals using a battery of physiological and molecular measures. Furthermore, following a 2 month 3R4F cigarette smoke exposure period, both cessation and switching to a pMRTP aerosol resulted in the reversal or stabilization of parameters assessed.

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POS2-36

INFLUENCE OF ELECTRONIC CIGARETTES PUFFING REGIMES ON AMOUNT OF VAPORIZED LIQUID—THE LABORATORY STUDY

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Diverse laboratory studies with electronic cigarettes (EC) use different puffing regimes (PR) to generate vapour. To be able to compare the laboratory studies which use different condition of vapour generation, it is important to understand the factors influencing the amount of liquid generation. It is also important according to the necessity to establish laboratory standards, which will allow comparison products between each other.

The aim of this study was to examine how the PR affects the amount of vaporized liquid.

We asked 25 regular e-cigarettes users to use their own EC with smoking topography measure device (CReSS Pocked, Borgwaldt) for one day. We used mean, 1st (Q1) and 3rd quartile (Q3) from these data for puff volume, interval between puffs and puff duration. Vapours were generated using the most popular EC in Poland (eGo3, Vlich) with refil solution consisting of mixture of glycérine, propylene glycol and nicotine (10 mg/ml). The Palaczobt smoking machine was used to generate aerosol from EC. To investigate the influence of each parameter we generated vapour (6 reps) using mean, Q1 and Q3 of examined parameter using two other parameters (from mean Q1 and Q3) chosen randomly.

The amount of vaporized liquid was defined by cartridge weight loss after each series (50 puffs) of aerosol generation. The mean (average value, interquartile range) values of PR were 65 ml (41-76), 9 s (5-16) and 2.6 s (1.8-3.7) for volume, interval between puffs and puff duration respectively. The results of influence of tested parameters on amount of vaporized liquid are presented in mg as mean ±SD in sequence: Q1; mean: Q3 for test of each parameter: Influence of puff duration: 96±20; 189±30; 251±33. Influence of intervals between puffs: 136±19; 115±27; 96±20. Influence of puff volume: 113±12; 118±5; 115±27. We found that puff duration has a major influence on the amount of vaporized liquid (p<0.00001). The interval between puffs has a minor impact on the amount of vaporized liquid (p=0.018). The puff volume has no statistically significant influence on aerosol generation from EC.

FUNDING: The study was supported by the Institute of Occupational Medicine and Environmental Health grants: ZSChTG-9 and ZSChTG-5.

JUSTIFICATION: This research helps to understand the variables in aerosol generation in different laboratory settings.

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POS2-37

ANALYSIS OF HARMAN AND NORHARMAN IN TOBACCO PRODUCTS BY LIQUID CHROMATOGRAPHY-TANDEM MASS SPECTROMETRY

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Harman and norharman are heterocyclic beta-carboline alkaloids that can be formed naturally in plants and during pyrolysis of amino acids and proteins. Presence of substantial amounts of harman and norharman in cigarette smoke has been documented; however there is no information on the levels of these constituents in other types of tobacco products. The potential importance of harman and norharman in tobacco products is two-fold: First, psychopharmacologic investigations in laboratory animals have shown that these compounds bind with high affinity to several receptors in the brain and are potentially associated with addiction. Harman and norharman also inhibit monoamine oxidase (MOA) enzymes, and studies in rats have shown that various MAO inhibitors enhance several behavioral effects of nicotine. Thus, it is possible that harman and norharman contribute to abuse liability of tobacco products. Second, these compounds have been shown to increase the genotoxicity of a range of chemicals, including nitrosamines and benzo(a)pyrene. Therefore, it is also possible that harman and norharman enhance toxicity and carcinogenicity of tobacco products. In this study we developed a sensitive and robust liquid chromatography-tandem mass spectrometry (LC-MS/MS) assay for the analysis of harman and norharman in tobacco products. The method produced high accuracy, recovery, and precision, with the limit of detection for harman being 5 pg/g product and for norharman 4 pg/g product. The method was applied to the analysis of a range of products including moist snuff, snus, and e-cigarette liquids. The levels of these constituents varied substantially by product type. Furthermore, harman to norharman ratio was different in moist snuff and in snus, suggesting different sources. Nicotine and minor alkaloids were analyzed in these products by an optimized LC-MS/MS method. Tobacco-specific N-nitrosamines (TSNA) were also measured. The distribution of harman, norharman, tobacco alkaloids, and TSNA in the studied products and the potential implications for the relative addictiveness and toxicity of different tobacco product types will be presented and discussed.

FUNDING: This research was supported by NCI grants U19-CA157345 and R01-CA180880.

JUSTIFICATION: Harman and norharman are potential modulators of tobacco addiction and toxicity; variability of these constituents’ levels among different product types and brands may help to better understand the addictive and toxic potential of various tobacco products.

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POS2-38

ASSESSING BIOMARKERS OF COMPLIANCE TO SPECTRUM CIGARETTES USING A HOTEL-BASED STUDY PROTOCOL

Rachel L. Denlinger, BS1*, Neal L. Benowitz, MD, Sharon E. Murphy, PhD2, Dorothy K. Hatushaki, PhD3, Tracy T. Smith, MS1, Samantha N. Cwalina1, Lee Bennett, BS1, Erin C. Goldstein, BS1, Catherine L. Scott, BS1, Lauren R. Pacek, PhD3, Cinelle M. Colino, BA, Eric C. Donny, PhD1, 1University of Pittsburgh, 2University of California San Francisco, 3University of Minnesota, 4Johns Hopkins University School of Medicine.

Studies that model a reduced-nicotine standard for cigarettes are critically important for establishing the empirical basis for regulatory decisions that will be made by the FDA. Because alternative products are widely available, compliance with experimental product use is a significant challenge for research. Tools that might increase compliance (e.g., incentives) and statistical approaches to examining the impact of non-compliance rely on validated biomarkers of nicotine and smoke exposure. These biomarkers require data derived from subjects whose product use is known and who are smoking under as naturalistic conditions as possible. Subjects stayed for five days and four nights in a hotel that permitted smoking. Twelve subjects were provided with two packs of 0.03 mg nicotine yield (FTC) Spectrum cigarettes each day and did not have access to alternative tobacco products. Twenty-four hour urine samples were collected. All subjects completed the protocol and reported only using SPECTRUM cigarettes. After four days of exclusive use, urinary total nicotine equivalents (TNE) were consistent with the self-reported compliance for 11 of the 12 subjects. One subject's data was excluded due to suspected contraband nicotine use. At the final urine collection point, the mean TNE was 2.43 nmol/ml (SD=1.13) and the highest TNE was 3.97 nmol/ml. Semi-quantitative (NicAlert) measures of cotinine were conducted with the same samples and readings ranged between 10-500 ng/ml (1-4). Seven additional subjects were tested under similar conditions except they were permitted to smoke 1-2 usual brand cigarettes each day (approximately 10% of baseline smoking rate). After four days, the NicAlert readings ranged from 100 to >1000 ng/ml (3-6). Future studies of Spectrum cigarettes can use the biomarker data described here to establish criteria for biochemical verification of product compliance. Data indicate that 4-6 nmol/ml might be an appropriate cut off for determining compliance. Overlap in NicAlert ranges suggest current semi-quantitative measures are not a viable option for assessing compliance.

FUNDING: S54DA031659-04

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POS2-39
INVESTIGATING THE ROLE OF THE CHOLINERGIC MODULATOR, LYNX2, ON NICOTINE-MEDIATED ANXIOLYTIC MECHANISMS

Kristin R. Anderson*, Huaxing Wang, PhD, Julie M. Miwa, PhD, Lehigh University

Tobacco use takes a huge toll on society, and is responsible for about one in five US deaths annually with a cost of $193 billion (CDC). Understanding the reasons why individuals smoke can aid the development of effective cessation strategies. Smokers often report relief from anxiety as a reason for smoking. Although temporary, reduction in anxiety which accompany smoking can make smokers susceptible to relapse. An understanding of the biological underpinnings of nicotine-mediated anxiolysis could help to separate out the contributions of anxiety to addiction. Several brain structures (e.g. the amygdala), have been implicated in anxiety, but the molecular mechanisms contributing to the effects of nicotine on anxiety are poorly understood.

We are investigating the role of a cholinergic modulator, lynx2, highly enriched in the amygdala, which has been shown to be involved in anxiolytic phenomena. The lynx2 protein can bind to nAChRs, dampening their activity. Further, mice lacking lynx2 (lynx2KO), demonstrate elevated anxiety levels across several assays (light-dark, open-field, etc.). This indicates that lynx2 has an instrumental role in anxiety abatement by adjusting cholinergic activity- or cholinergic tone- in the amygdala.

To further explore the relationship between lynx2, nicotine, and anxiety, we are performing behavioral pharmacological analyses in lynx2KO mice to measure nicotine-mediated anxiety. Nicotine-injected lynx2KO mice are being tested in the light-dark assay to measure sensitivity to cholinergic agents. Further investigations into the specific nAChR subtypes are being conducted with several specific inhibitors. We are uncovering a differential sensitivity to cholinergic agents in lynx2KO over wild-type, which could help to explain the augmented anxiety levels seen due to lynx2 abrogation. Understanding how amygdala output can be fine-tuned by lynx2 and nAChR pharmacology may shed light on the complex interactions between nicotine consumption and anxiety. This could result in the development of fine-tuned molecular controls over anxiety, thus potentially vanishing an important process responsible for relapse in smokers attempting to quit.

FUNDING: National Institutes of Health grant #R21DA033831 and HHMI BDSI
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POS2-42
MENTHOL CONTENT IN U.S. MARKETED CIGARETTES

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Menthol cigarettes account for one quarter of cigarette sales in the United States, but there is limited reported information that provides measured menthol quantities in commercial cigarettes. Therefore, the menthol levels in U.S. cigarettes was determined in order to understand current applications for both menthol flavor and non-flavor labeled products. Menthol content has been measured for the whole cigarette (rod, filter, and paper) using a validated gas chromatography/mass spectrometry (GCMS) method. Among the 23 menthol-labeled cigarette examined, typical menthol levels range from 2.88 to 7.20 mg/cigarette, although three products had significantly higher menthol levels up to 19.6 mg/cigarette. The menthol levels of 13 cigarette products that are not labeled to contain menthol range from 0.0018 to 0.0735 mg/cigarette. Therefore, the menthol levels in non-labeled cigarette products appear to be significantly higher than those in cigarette products not indicated to contain menthol. The type of packaging for a given cigarette product does not appear to affect menthol levels based on the products examined. A manufacturer brand comparison with the reported menthol levels in reviewed literature suggests that currently marketed menthol cigarettes may contain more menthol than comparable counterpart products from 5 to 10 years ago. This is the first study to measure and compare menthol amounts in whole cigarettes that may or not be labeled to contain this particular characterizing flavor.

FUNDING: Not Applicable
JUSTIFICATION: This study has significance to understanding menthol application in cigarettes.
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POS2-41
RECENT SMOKING VERSUS OVERNIGHT ABSTINENCE ALTERS DOPAMINE TRANSPORTER AVAILABILITY

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Neuromodulatory control of dopaminergic signaling is primarily under the control of the dopamine transporter (DAT). Following stimulus-induced dopamine (DA) release, the plasma membrane-docked DAT rapidly sweeps the DA back into the neuron to ensure its availability for the next stimulus. DAT trafficking - movement of the DAT between the membrane surface and its intracellular home, where it is inactive - is the primary method for regulating neurochemical messages in the dopaminergic system. Through activation of nicotinic acetylcholine receptors, nicotine indirectly elevates DA, nudging the DAT to migrate to the cell surface and sweep up the excess DA. Nicotine-provoked trafficking has not been shown in vivo in humans. In line with preclinical evidence, we predicted that nicotine would increase DAT availability in humans. To test this hypothesis, we used single photon emission computed tomography (SPECT) and the DAT radioligand, Tc-99m TRODAT. Brain scans were evaluated in cigarette smokers (N = 5) on two occasions: one after having recently smoked to satiety and the other after overnight abstinence. Scans were acquired 4 hours after IV administration of 740 MBq of Tc-99m TRODAT and were reconstructed with a simple bandpass filter.

Volumes of interest (VOIs) were placed manually on subregions of the striatum and the medial orbitofrontal cortex (mOFC), as well as the right parietal cortex, used as background due to the absence of DAT expression in this region. Radioligand uptake was quantified using distribution volume ratios (DVRs = [VOI - reference region] / reference region) were compared across conditions. DAT binding was greater in the sated condition in the caudate nuclei bilaterally and in the left ventral striatum and right mOFC (p < 0.05). SPECT and PET DAT ligand studies are used to elucidate mechanisms in diseased populations in whom smoking prevalence rates vary considerably. Inconsistencies in the extant DAT/neuroimaging literature may be partially related to differences across studies in smoking status and/or time since last smoked.

FUNDING: The Charles Dana Foundation, NIH/NIDA R01DA029845 and NIH/ NIDA R01DA03039
JUSTIFICATION: Studies examining DAT availability in diseased populations (e.g., ADHD, schizophrenia, Parkinson's, addiction) must adequately control for differences in cigarette smoking behavior if we are to gain accurate knowledge on the mechanisms underlying such disorders.
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Poster Session 2 • Thursday, February 26, 2015 • 4:15 p.m.–5:45 p.m.
CHARACTERIZING THE EFFECTS OF CLASSIC TOBACCO FLAVORED ELECTRONIC CIGARETTE VAPOR ON RAT ALVEOLAR TYPE II LUNG CELLS

Catherine W. Bennett*, Karen K. Bernd, Department of Biology, Davidson College, Davidson, NC

Increased commercial production and use of electronic cigarettes (e-cigarettes) without deep investigation of negative or positive health outcomes has led regulatory agencies, including the WHO and FDA, to call for expanded research regarding the safety of e-cigarette use. Studies have been conducted to determine the chemical composition of e-cigarettes, but gaps exist in data exploring the effects of e-cigarette vapor on lung cell health. In this study, we developed an apparatus to expose rat alveolar type II (L2) cell cultures to e-cigarette vapor and adapted international standard (ISO/NIH) tobacco cigarette testing protocols for use in e-cigarette research. Cytoxicity reported here was determined according to ISO/NIH standards, namely endocytic activity measured by neutral red dye (NRD) uptake. Adopting ISO/NIH tobacco research standards will provide steps toward standardization within e-cigarette vapor research and allow comparison with the vast literature of tobacco smoke research. Pilot data from 1,800 milliliter (NRD) uptake. Adopting ISO/NIH tobacco research standards will provide steps toward standardization within e-cigarette vapor research and allow comparison with the vast literature of tobacco smoke research. Pilot data from 1,800 milliliter

IDENTIFYING THERMAL BREAKDOWN AND REACTION PRODUCTS IN E-CIGARETTE FLAVOURS

Pete Davis1, Stuart Martin1, Christopher Wright, PhD1, Sandra C. Costigan, PhD2*, 1British American Tobacco, 2Nicoventures

The popularity of flavoured electronic cigarettes (e-cigarettes) is increasing. To our knowledge, we are the first to report on the potential formation of thermal breakdown and reaction products from the flavour ingredients normal e-cigarette use. Due to the breadth of flavouring compounds and their potential breakdown and reaction products, a non-targeted, broad scan method has been employed.

We investigated two flavour variants, one composed exclusively from aroma chemicals to minimise the formation of potentially toxic thermal breakdown products.

Heating of the cocoa shell extract at 300°C generated a wide variety of thermal breakdown products. In contrast, similar treatment of the flavour composed exclusively of aroma chemicals produced few thermal breakdown products. The SPME-GC MS scan of the e-cigarette aerosol containing the cocoa shell extract also contained several of the same thermal breakdown products, although the chemical changes were less complex than for the flavour heated for 5 minutes. No flavour related thermal breakdown products were identified in the e-cigarette aerosol flavoured exclusively with aroma chemicals.

Our results demonstrate that attempting to model thermal breakdown of e-liquid components by heating at coil-relevant temperatures overestimates thermal breakdown effects. For a realistic insight into consumer exposure, analysis of the e-cigarette aerosol is the most appropriate approach. Additionally, it is suggested that flavours for e-cigarettes should preferentially be formulated from aroma chemicals to minimise the formation of potentially toxic thermal breakdown products.

FUNDING: No funding.  

JUSTIFICATION: This new insight on relative risk profiles from different types of flavours can help inform policy on e-cigarette flavours.

ALPHA7 NICOTINIC ACETYLCHOLINE RECEPTOR POSITIVE ALLOSTERIC MODULATOR, JNJ-39393406, REDUCES NICOTINE SELF-ADMINISTRATION IN RATS

Jennifer M. Lee1, Claire I. Dixon1 K.N. Roy Chengappa1, Kenneth A. Perkins2, Darlene H. Brunzell1*, 1Department of Pharmacology and Toxicology, Virginia Commonwealth University, Richmond VA; 2Department of Psychiatry, University of Pittsburgh, Pittsburgh PA

Previous work from our laboratory has shown that local administration of a selective alpha7 nAChR agonist into the nucleus accumbens shell significantly attenuates nicotine self-administration, an animal model with good predictive validity for smoking cessation therapeutic efficacy. In these preclinical feasibility studies we tested if systemic administration of a selective alpha7 nAChR positive allosteric modulator, JNJ-39393406, would similarly decrease nicotine self-administration in Long Evans rats. Rats were first trained under a fixed ratio (FR) schedule of reinforcement; responding on an active lever resulted in i.v. delivery of 0.03mg/kg nicotine plus light/tone cues (NIC) and inactive lever presses had no consequence. A separate group of control rats were reinforced with the same volume of saline and light/tone cues (CUEonly). Animals that reached criteria of 70% active lever response accuracy and at least ten infusions/session for 3 consecutive sessions were advanced to FR 5 until stable responding within 10% of each rat’s average was achieved. Using a double-blinded, within-subject Latin square design, rats received i.g. gavage of vehicle, 0.3, 1.0, 3.0 or 10 mg/kg of JNJ-39393406 compound diluted in a 20% solution of (2-hydroxypropyl)-beta-cyclohexdin (ph 3.0-3.5) 15 min prior to testing. JNJ-39393406 pretreatment resulted in a dose-associated decrease in active lever presses and number of infusions earned in NIC but not CUEonly rats. A separate cohort of rats showed no effect of JNJ-39393406 on food self-administration, demonstrating that reductions in responding were specific to nicotine in these studies. These findings support previous rodent data showing that stimulation of alpha7 nAChRs reduces nicotine self-administration and nicotine reward. As the JNJ-39393406 allosteric modulator does not directly stimulate alpha7 nAChRs but rather enhances agonist activity at these receptors, these data suggest that nicotine or ACh stimulation of alpha7 nAChRs attenuates nicotine reinforcement. These data further suggest that JNJ-39393406 may have potential therapeutic efficacy for smoking cessation.

FUNDING: This work was supported by NIH/NICATS grant TR000956 to D.H. Brunzell and K.A. Perkins. Janssen Research and Development L.L.C. provided JNJ-39393406 for these studies.

JUSTIFICATION: This study provides information relevant to the development of target therapies for tobacco dependence.
POS2-46
THE INTER AND TRANSGENERATIONAL CONSEQUENCES OF STRESS AND NICOTINE EXPOSURE IN MICE
Nicole L. Yohn*1, Julie A. Blendy, PhD1, Chris Krapp2, Marisa S. Bartolomei, PhD2, Department of Pharmacology, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA. 1Department Cell and Developmental Biology, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA

Stress increases anxiety and stress response as well as exacerbates drug use and relapse within a generation. However, it is unknown if stress and drugs interact across generations to influence these behaviors.

Male C57Bl/6 mice (F0) were administered chronic saline or nicotine for four weeks starting at 4 weeks of age. Following 1 month of nicotine administration, minipumps were removed and males were mated to produce F1 offspring. Half of the F1 males and females underwent chronic unpredictable stress (CUS) for 2 weeks starting at 4 weeks of age. Following CUS, male and female mice were mated with naïve partners to produce the F2 generation and these offspring were used to produce the F3 generation. A series of tests for anxiety-like phenotypes and stress response between 10-14 weeks of age were administered in offspring. Drug response to nicotine and cocaine was also assayed in the F1 female offspring of parents exposed to stress. A candidate gene approach was employed to determine the molecular changes in subsequent generations of offspring following parental nicotine and stress exposure.

Adolescent stress increased anxiety-like behavior in the marble burying and elevated zero maze (EZM) assays in F1 and F2 males. In addition, stress and nicotine exposed parents produced male offspring that show decreased startle amplitude in ASR. Preliminary evidence suggests stress in the F1 generation influenced male F3 behavior. In addition, F2 male mice derived from stress and/or nicotine showed altered expression of CRFR1 and GR in the hypothalamus and amygdala in a region-specific manner.

Adolescent stress increased anxiety-like behavior in the EZM in F1 females, however this phenotype was not transmitted to additional generations. Instead, F0 nicotine exposure increased startle amplitude in ASR by F1 and F2 female mice. F1 female offspring of stress-exposed fathers have increased sensitization to nicotine while F1 female offspring of stress exposed mothers show decreased nicotine sensitization. In addition, female offspring of stress-exposed fathers have increased cross-sensitization to cocaine following exposure to nicotine.

FUNDING: This work was supported by T32 DA28874 and R01 DA033646.

JUSTIFICATION: Nicotine use in parents changes response to stress in subsequent generations of offspring.

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POS2-47
DEVELOPMENT OF EXPOSURE SYSTEMS FOR THE IN VITRO ASSESSMENT OF HEATED TOBACCO AND ELECTRONIC NICOTINE DELIVERY DEVICES
Harry Green, David Azzopardi, Oscar M. Camacho, Ian M. Fearon1, Kevin McAdam, Christopher Proctor, British American Tobacco, Group Research and Development, Southampton, UK

Cigarette smoke exposure is a causative factor in the development of many smoking-related diseases including lung disease, heart disease and cancer. Cigarette whole smoke is a complex aerosol comprising more than 6,000 identified constituents distributed in the particulate and vapour phases. However, the role of each component of cigarette smoke in the development of smoking-related diseases is largely unknown. As part of a harm reduction approach we are developing a range of potentially lower risk products including e-cigarettes and heated tobacco devices which yield lower levels of toxicants in both phases.

To evaluate these products, exposure systems typically used to generate, dilute and deliver whole smoke to in vitro cell cultures at the air-liquid interface must be adapted. Traditional product comparison studies generate cigarette smoke at defined regimes such as ISO (35ml puff over 2 seconds every 60 seconds (35/2/60)) and Health Canada Intense (HCI, 55/2/30). With the emergence of novel heated tobacco products and e-cigarettes, traditional smoking machine engineering and regimes may not be suitable.

We report work undertaken to adapt a Borgwaldt RM20S smoking machine to deliver aerosols generated from a 3R4F reference cigarette, a heated tobacco system and an e-cigarette. Delivery was quantified as particulate mass using quartz crystal microbalances fitted into exposure chambers. Data indicated deposited particulate mass could be detected during 30 minute exposures at low dilutions of the aerosols (generated under ISO conditions) of 3R4F (~88 µg/cm2), a glycerol-based heated tobacco (~36 µg/cm2) and an e-cigarette (~19 µg/cm2). An in vitro human bronchial epithelial cell cytotoxicity assay was then utilised to evaluate the effects of e-cigarette and heated tobacco aerosols compared to whole smoke from a commercially available cigarette.

Our adaptations facilitated the delivery of quantifiable particulate matter from novel products as well as providing a source of material for preliminary toxicological assessment. Further work is required to ensure the robustness and reproducibility of aerosol delivery using this approach.

FUNDING: This work was funded by British American Tobacco.

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POS2-48
HUMAN 3D ORGANOTYPIC NASAL EPITHELIAL TISSUE CULTURE AS AN IN VITRO MODEL TO EVALUATE EFFECTS OF CIGARETTE SMOKE OF A CANDIDATE MODIFIED RISK TOBACCO PRODUCT: THE TOBACCO HEATING SYSTEM 2.2

Exposure to cigarette smoke (CS) is a major risk of developing serious diseases such as lung cancer, COPD or cardiovascular disease. The development of new tobacco products that could reduce such health impact is ongoing and requires a careful safety assessment strategy.

To investigate the effect of the aerosol generated by Philip Morris International's candidate Modified Risk Tobacco Product (MRTP), named Tobacco Heating System 2.2 (THS 2.2), an in vitro model mimicking the human nasal epithelium was exposed for 28 min at the air-liquid interface to various doses. In parallel, exposure to fresh air (sham control) or to mainstream smoke from conventional cigarette (at doses where nicotine level within the aerosol are matching those of THS 2.2 product) was performed. Various endpoints (cytotoxicity, CYP1A1/1B1 enzyme activity, inflammatory mediators release, morphological and transcriptomic changes) were collected at different times following exposure (4h, 24h, 48h and 72h) to identify and compare the dose- and time-dependent effect of each exposure conditions.

By using systems toxicology-based risk assessment approaches combining computable biological network models and gene expression changes, we compared the molecular perturbations in both conventional combustible cigarettes and MRTP exposure conditions. While significant effect was quantified over different post-exposure time points in the networks representing cell death, inflammation, proliferation and cellular stress after CS exposure, the impact of THS 2.2 exposure (at similar nicotine dose) was closer to sham controls and mostly limited at the earliest time point (4h). The results of all additional endpoints measured during this study support a reduced impact of THS 2.2 exposure on the nasal epithelial tissue culture compared to conventional CS.

In conclusion, the side-by-side evaluation of the biological impact of comparable doses of THS 2.2 aerosol and conventional CS shows a reduced exposure effect of this new tobacco product on human nasal epithelial tissue culture.

FUNDING: Funded by Philip Morris International Research and Development, Philip Morris Product SA, Quai Jeanneaux 5, CH-2000 Neuchâtel, Switzerland
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POS2-49
CHRONIC INFUSION OF THE NICOTINIC α4β2 DESENSITIZING AGENT VMY-2-95 SIGNIFICANTLY REDUCES NICOTINE SELF- ADMINISTRATION IN FEMALE RATS

Edward D. Levin, PhD*, Susan Slade1, Corinne Wells1, Amir H. Rezvani, PhD 1, V.M. Yenugonda, PhD2, Yong Liu, PhD2, Yingxian Xiao3, PhD3, Milton L. Brown, MD4, Kenneth J. Kellar, PhD5, Department of Psychiatry and Behavioral Sciences, Duke University Medical Center, Center for Drug Discovery, Georgetown University School of Medicine, Department of Pharmacology and Physiology, Georgetown University School of Medicine

Desensitization of α4β2 nicotinic receptors has shown promise in preclinical rat models as a potential novel line of treatment to aid smoking cessation. Acute injection and chronic infusions of sazetidine-A, an α4β2 desensitizing agent, were found in our previous studies to significantly reduce nicotine self-administration in rats. Acute injections of two other nicotinic α4β2 receptor desensitizing agents, VMY-2-95 and YL-2-203, were also found in our studies to decrease nicotine self-administration. The current study tested, in a dose-response manner, whether VMY-2-95 and YL-2-203 would also reduce nicotine self-administration during chronic administration. In addition, we tested whether these drugs would show continued efficacy during the 2-week treatment, as well as after one week of enforced abstinence, modeling a cessation attempt. Young adult female Sprague-Dawley rats (N=9-15/treatment group) were trained to self-administer nicotine IV in 45-minute sessions (FR1, 0.03 mg/kg/infusion) for ten sessions. They were then tested for the effects of chronic doses of YL-2-203 or VMY-2-95 (2 or 6 mg/kg/day of each drug delivered by 2ML4 Alzet osmotic minipumps with a saline vehicle control group) on IV nicotine self-administration. There was a significant (p<0.005) main effect of VMY-2-95 at both doses on nicotine self-administration, each significantly decreasing nicotine self-administration relative to the control (p<0.05), with greater than a 60% decrease after chronic administration of either dose. The decreases in nicotine self-administration caused by VMY-2-95 did not diminish with chronic dosing or during the resumption period after enforced abstinence. Neither dose of YL-2-203 appeared to affect nicotine self-administration. These studies provide evidence for an additional line of α4β2 nicotinic receptor desensitizing agents for decreasing nicotine self-administration, and further suggest that α4β2 nicotinic receptor desensitizing agents may potentially be effective treatments for smoking cessation.

FUNDING: This project was supported by Grant DA027990 from NIDA, Georgetown and Duke Universities hold patents on VMY-2-95 and YL-2-203. The inventors of these drugs are MLB, VMY, YY, YL, YX, EDL, AR and KJK.

POS2-50
A PLACEBO CONTROLLED STUDY ON THE EFFECTS OF SNUS ON FATIGUE PERCEPTION AND DECISION-MAKING IN ATHLETES

Thomas Zandonai1*, Alberto Mancabello2, Danilo Falconieri 3, Marco Diana 4, Christian Chiambure1, 1Neuropsychopharmacology Lab., Public Health and Community Medicine Dept., University of Verona, Verona, Italy, 2School of Sport and Exercise Science, University of Verona, Verona, Italy, 3Department of Animal Biology and Ecology, University of Cagliari, Cagliari, Italy, 4G. Minardi Laboratory of Cognitive Neuroscience Dept. of Chemistry and Pharmacy, University of Sassari, Italy, 5Neuropsychopharmacology Lab., Public Health and Community Medicine Dept., University of Verona, Verona, Italy

The World Anti-doping Agency placed nicotine on monitoring due to anecdotal reports of snus use in sport. However, little is known regarding snus potential performance-enhancing effects, especially on fatigue perception during endurance performance and cognitive tasks. The aim of this research was to assess snus effects on exercise until exhaustion and on the Iowa Gambling Task (IGT) test for decision-making processing.

Method. Study 1. A double-blind placebo (SP) controlled investigation of snus (SS) effects on fatigue perception during an endurance exercise. Fourteen non-smoker athletes were tested during 3 sessions on cycle-ergometer: Session 1 consisted of an incremental exercise test to determine maximal aerobic power output (Wmax); Session 2 and 3 consisted of a cross-over SS or SP design session followed by an exercise at 65% Wmax until exhaustion. Study 2. Forty male non-smokers were tested with IGT under SS/SP randomized administration according to a cross-over design.

Results. Study 1. Seven out 13 subjects cycled longer during SS vs. SP session, with time to exhaustion respectively of 60.4±41.5 min and 48.8±19.4 min; paired Student's t-test showed a not significant 18.6% increase. Rating of
Perceived Exertion at 25, 50, 75 and 100% of exhaustion time increased during both sessions with no significant differences between the two conditions. Study 2. No differences were observed in overall net score (SP vs. SS). A significant difference was observed for net scores during the first test phase (first twenty choices) between SS and SP condition (p = 0.0499; paired Student’s t-test). Twenty-three subjects reported adverse events at the end of SS session. Four subjects reported serious nausea, dizziness, increase body temperature, anxiety, and one of them reported hands tremors.

These findings showed that SS did not modify fatigue perception during endurance exercise until exhaustion, suggesting no doping liability for this parameter. Similarly, a temporary effect of snus on decision-making suggests a limited or null cognitive potentiation. However, adverse snus reactions could have detrimental effects on performance in naïve users.

FUNDING: no funding

JUSTIFICATION: Under our experimental conditions in non-smokers non-snus healthy male users, snus did not improve psycho-physiological and cognitive performance, suggesting low or null doping liability.

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POS2-52
NOVEL ANTI-NICOTINE VACCINE USING A TRIMERIC COILED COIL HAPTEN CARRIER, TRIA BIOSCIENCE CORP

Christopher H. Clegg, PhD*, Keith D. Miller, Richard Roque

Anti-addiction vaccines induce antibodies (Abs) that neutralize the pharmacological effects of drugs like nicotine. Vaccines for smoking cessation have shown considerable promise in preclinical models, although functional antibody responses induced in humans are only modestly effective in preventing nicotine entry into the brain. Nicotine and other drugs of abuse are non-immunogenic and must be conjugated to a protein carrier to facilitate antigen presentation and the induction of T cell help. Most hapten carriers are derived from microbial sources like keyhole limpet hemocyanin (KLH), tetanus toxoid, diphtheria toxoid, and pseudomonas exotoxin A. However, their activity may be limited in important ways including epitope density, which is a critical factor influencing the magnitude and quality of the immune response. Also, hapten stoichiometry and spacing likely varies within each carrier and uncertainty remains about which linkages within the protein present the best epitope for stimulating high affinity Ab titters. To circumvent these problems, we have produced a synthetic hapten carrier using a short trimeric coiled-coil peptide (TCC) comprising three amphipathic alpha-helices, which creates a series of B and T cell epitopes with uniform stoichiometry and high density. Here we compared the relative activities of a TCC-nic vaccine and a KLH-nic vaccine using two adjuvants; Alum and GLA-SE, which contains a synthetic TLR4 agonist formulated in a stable oil-in-water emulsion. The results demonstrated that the adjuvanted TCC hapten carrier induces a superior immune response in mice as measured by anti-nicotine Ab titter, specificity, and affinity. The Ab responses achieved with this synthetic vaccine resulted in a nicotine binding capacity in serum that could prevent >90% of a nicotine dose equivalent to three smoked cigarettes (0.05 mg/kg) from reaching the brain.

FUNDING: This work was funded by the National Institute of Drug Abuse, National Institutes of Health, Grant R43DA033845

JUSTIFICATION: TRIA Bioscience is developing a vaccine for smoking cessation that will neutralize nicotine and the addictive properties associated with tobacco products.

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POS2-53
MODELING TRANSPORT AND EVOLUTION OF AEROSOLS FOR ACCURATE PREDICTIONS OF LOCAL DEPOSITION IN AN IN-VITRO EXPOSURE SYSTEM

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Humans are continuously exposed to aerosols and depending on the physical and chemical properties of them, the exposure can be neutral, therapeutic or pose a potential health hazard. Understanding physical conditions that govern deposition of aerosol droplets and its influence on the cell function is a key step towards the ultimate goal to relate the exposure of inhaled and deposited aerosols to health outcomes. We present here our approach to model the transport and evolution of aerosols that undergo dynamic changes due to simultaneously altered physical conditions along the flow path in a geometry frequently used in in-vitro exposure systems. The acquired knowledge will further strengthen the non-animal safety testing approaches for consumer safety risk assessments related to aerosols, which are aligned with the new directions of the Toxicity Testing in the 21st Century guidelines.

Deposition of aerosol is governed by the various physical mechanisms (i.e., diffusion, impaction, interception, sedimentation), and implicitly is also dependent on the flow and surrounding aerosol particles' thermal conditions. This is in particular important when considering that aerosols consisting of liquid droplets are being dispersed with air as they may still evolve. Using Computational Fluid Dynamics, a computational model of an in-vitro system was constructed, in which we considered flow with embedded droplets characterized by its mean size droplet diameter. The simulations took in account fully coupled equations for mass, momentum and energy in the Eulerian-Eulerian framework as well as one-way coupling of gas phase and liquid phase (droplets).

The influence of flow on the transport and evolution of liquid aerosol droplets flowing in an in-vitro exposure system will be addressed. Simultaneously the numerical investigation of impaction and gravitational settling for various flow rates and droplet diameters will be presented. Aerosol aging and stability will be assessed, which has a particular importance for the uniformity of aerosol deposition at consecutive wells where cell cultures inserts are present and exposed to substances of interest.

FUNDING: Funded by Philip Morris International Research and Development, Philip Morris Product S.A., Quai Jeanneaun 5, CH-2000 Neuchâtel, Switzerland

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POS2-54
REAL-TIME ANALYSIS OF INHALED AND EXHALED E-CIGARETTE AEROSOL CONSTITUENTS USING PTR-MS

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E-cigarettes are gaining acceptance as potential alternatives to traditional tobacco products. When an e-cigarette user takes a puff, the e-liquid solution is heated and the aerosol, consisting of propylene glycol (PG) and/or glycerol (G), water, flavorings and nicotine, is inhaled. We combined an analytical (Gas Chromatography-Mass Spectrometry [GC-MS]) and in vivo study to determine the transfer of e-liquid compounds into the aerosol, their intake during inhalation and their release following exhalation. In vivo measurements were conducted via Proton Transfer Reaction Mass Spectrometry (PTR-MS); a sensitive technique used for real-time monitoring of volatile (organic) compounds in air. Here we employed PTR-MS for the identification and quantification of compounds in the inhaled ‘mainstream’ e-cigarette aerosol (produced via a smoking machine connected to PTR-MS) and the remaining aerosol exhaled by the e-cigarette user. We were able to determine the quantity of nicotine, PG, G as well as selected volatile compounds from the flavorings retained by the e-cigarette user (i.e. the fraction not exhaled into the ambient air). The ‘retention rate’ data revealed large
inter-subject variations which may be explained by differences in e-cigarette user topography (e.g., inhalers versus puffers). Whereas “inhalers” retain the majority of the nicotine they inhale, “puffers” exhale differing levels of nicotine depending on the time the aerosol is held in the mouth before exhalation. The retention rates of PG, G and volatiles investigated were lower than nicotine and released at subject and compound specific levels via the exhaled air.

This study shows for the first time the application of PTR-MS for identification and quantification of volatile (organic) compounds in e-cigarette aerosols. PTR-MS may be useful for understanding differences in nicotine delivery and uptake between different e-cigarette user topographies. As regulators and public health organizations are beginning to examine potential implications that exposure to exhaled e-cigarette aerosol constituents may have on bystanders and non-users, our approach may also be useful for investigating these concerns.

FUNDING: No funding.

JUSTIFICATION: The methodology applied and data obtained is useful for the assessment of retention of e-cigarette aerosol constituents by the e-cigarette user and potential implications that exposure to exhaled e-cigarette constituents may have on bystanders.

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POS2-55
LEPTIN, NICOTINE DEPENDENCE AND RELAPSE
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Leptin has been linked to tobacco craving and withdrawal symptoms. Few studies have prospectively examined the extent to which leptin concentrations are associated with withdrawal severity and smoking relapse. We conducted a prospective smoking cessation study comparing habitual smokers with nonsmokers across time. The goal of the study was to assess the relationship between leptin across time and craving, withdrawal symptoms, distress and smoking relapse. The factors included gender, smoking and relapse status, and two time points (ad lib smoking, the first 48 hours post quit). Plasma samples for the measurement of leptin, self-report measures of craving and mood, and anthropomorphic and biochemical measures (cotinine, exhaled carbon monoxide) were collected at the two time points. Smokers were stratified at 28 days post quit as abstinent or relapsed defined as having smoked daily for 7 consecutive days (biochemically verified). Results showed that leptin concentration (square root transformed ng/ml) increased over the 48-hour abstinence, but only in abstainers (p < .01) and in women (p < .05). In contrast, leptin was very stable across time for nonsmokers, relapers and males. Cox regression found that increased leptin across sessions was associated with decreased risk of relapse (p < .01). Leptin was correlated negatively with withdrawal symptoms for abstainers only (r = - .49, p< .01). Females exhibited more leptin than males (p < .05). The current analysis indicates that a leptin increase early in cessation predicts abstinence and may be protective. The negative correlation between leptin increases and a decline in withdrawal symptoms support the protective effect of leptin. The increase in women, but not men, in response to abstinence provides further evidence of important gender differences during nicotine withdrawal. Further research is needed. This research was supported in part by National Institute of Health grants R01DA016351 and R01DA027232.

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JUSTIFICATION: This study will inform smoking cessation treatment.

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POS2-56
BEHAVIORAL EFFECTS OF TOBACCO SMOKE CONSTITUENTS IN NONHUMAN PRIMATES
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Recent preclinical studies in rodents suggest that tobacco constituents other than nicotine (NIC) also exhibit pharmacological properties that may play a role in maintaining tobacco consumption. The present studies were conducted to evaluate, respectively, the NIC-like discriminative-stimulus (Sd) and reinforcing effects of minor tobacco alkaloids [e.g., nornicotine (NOR), anabasine (ANA), anatabine (ANAT), myosmine (MYO), and cotinine (COT)] in nonhuman primates. In drug discrimination (DD) studies, the ability of minor tobacco alkaloids to engender NIC-like Sd effects and, separately, to modify the Sd properties of NIC was determined in squirrel monkeys (n=4) trained to discriminate a highly potent NIC-like agonist [(+-)-epibatidine; EPI] from vehicle. In IV self-administration (SA) studies, second-order fixed interval (SO-FI) schedule procedures in NHP (n=3) were utilized to determine whether selected minor tobacco alkaloids (e.g., ANAT) exhibit NIC-like reinforcing effects. Results from DD studies show that: a) NIC and minor alkaloids engendered full (NOR, ANA, MYO, ANAT), or no (COT) substitution for EPI; b) the Sd effects of ANAT and MYO lasted longer than those of NIC; and c) in interaction studies, combining ED50 doses of NIC and NOR, ANA, MYO, or ANAT resulted in the full expression of EPI-like Sd properties. Results from our SA studies show that NIC (0.0032-0.032 mg/kg/injection) reliably produced dose-related IV SA behavior under the SO-FI schedule; response rates were no greater than for vehicle. Importantly, the highest unit dose of ANAT (0.1 mg/kg/injection) produced observable adverse reactions (e.g., emesis), precluding the study of higher doses. Taken together these findings suggest that non-NIC tobacco constituents may differentially contribute towards maintaining long-term tobacco consumption, and augment NIC’s effects. Interestingly, SA studies in monkeys show that the minor tobacco alkaloid ANAT likely does not play a major role in tobacco addiction.

FUNDING: National Institutes of Health/National Institute on Drug Abuse

JUSTIFICATION: This is fundamental research. The translational potential is not yet obvious.

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POS2-57
THE RELATIONSHIP BETWEEN CRAVING AND TOBACCO-USE BEHAVIORS MEASURED DURING A LABORATORY CHOICE PROCEDURE: THE DEVELOPMENT AND INITIAL VALIDATION OF THE NOVEL CHOICE BEHAVIOR UNDER CUED CONDITIONS (CBUCC) PROCEDURE
Julie C. Gass, MA*, Stephen T. Tiffany, PhD, University at Buffalo, The State University of New York

Many theories of addiction suggest that craving regulates smoking behavior. Research on the relationship between craving and smoking has yielded mixed results. Meta-analytic findings from the lab distinguishes several types of tobacco-use behaviors: seeking (any attempt to obtain access to a cigarette) and consumption (actually smoking a cigarette; e.g., puff topography). Tobacco-seeking behavior could be further divided into behaviors that reflect either automatic or nonautomatic cognitive processes. Results across the literature show that craving has differential relationships with each of these, with the strongest relationship being between craving and nonautomatic seeking. We developed a new laboratory procedure to systematically study the relationships between craving and multiple indices of use. This procedure (Choice Behavior Under Cued Conditions; CBUCC) exposed smokers to either a lit cigarette or a cup of water over the course of 40 trials (20 of each type). These stimuli were located behind a movable glass door. On each trial, smokers were asked to rate their craving and then indicate the amount of real money ($0.1 – $2.5) they were willing to spend to gain access to the cue. The amount spent determined the probability that the door would be unlocked. If unlocked, they could sample the cigarette or water.
POS2-58 DEPRESSIVE SYMPTOMS AND CIGARETTE DEMAND AS A FUNCTION OF INDUCED STRESS

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Background: Across development, depressive symptoms and negative mood are risk factors for tobacco use. Cigarette demand may be an especially useful construct for understanding the complex relationship between depression and cigarette smoking as smokers with elevated depressive symptoms may place greater value on cigarettes under conditions of negative mood. The aim of the current study was to examine the relationship between depressive symptoms and cigarette demand as a function of induced mood.

Methods: Participants included 73 daily smokers (38.4% female, 65.8% White, Age M(SD)=19.8(1.2), CPSD M(SD)=7.4(4.7) who attended two counterbalanced sessions; a social stress session and one neutral session. With the exception of video content, the sessions followed identical procedures. Session order was as follows: 1) smoke a cigarette through a portable smoking topography device, 2) complete self-report measures and the Timeline Followback, 3) watch either a neutral video or a video modification of the Trier Social Stress Task (TSST), 4) complete the Cigarette Purchase Task (CPT), 5) smoke a cigarette through a portable smoking topography device.

Results: We used hierarchical multiple regression to examine the predictive utility of depression for CPT demand indices (intensity, breakpoint, Omax, Pmax, and elasticity) above and beyond CPSD. Depressive symptoms on the day of the stress session did not significantly predict any of the demand indices. However, results indicated that depressive symptoms on the day of the stress session significantly predicted intensity (ΔR²=0.04, p=0.01), breakpoint (ΔR²=0.09, p=0.01), (F(1, 67)=6.46, p=0.01), Omax (ΔR²=0.08, p=0.01), and Pmax (ΔR²=0.02, p=0.05), but not elasticity (ΔR²=0.02, p=0.23).

Conclusion: Depressive symptoms significantly predicted cigarette demand, but only in the context of induced stress. Thus, when experiencing negative mood, cigarette use may become more valuable for individuals with depressive symptoms. As such, for prevention and cessation, it may be important to continue to address contextual factors such as negative mood that may influence cigarette value.

FUNDING: 1F31DA034999

POS2-59 DYSREGULATION OF CIGARETTE SMOKE EXPOSURE-ASSOCIATED PLACENTAL MiRNA AND EFFECTS ON PLACENTAL CELL PROCESSES

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Exposure of the developing fetus to harmful chemicals, such as cigarette smoke, is associated with poor fetal and developmental outcomes, and it has been hypothesized that epigenetic mechanisms in the placenta may link hazardous prenatal exposures with postnatal outcomes. Previous work in our lab has shown that maternal cigarette smoking during pregnancy is associated with aberrant expression of miRNA in the placenta, namely mir-16, miR-21, and miR-146a, and exposure of human placenta cells to nicotine and benzo(a) pyrene in vitro resulted in differential expression of miR-146a. Since miRNA are known to post-transcriptionally regulate gene expression and their activity can impact a variety of downstream cellular processes, we aimed to investigate the effects of dysregulated cigarette smoke exposure-associated placental miRNA on key cell processes in placental cell lines. Using HTTR6, 3A, and T1-1 placental cell lines, representing early and later stages of placental development, we sought to characterize effects of dysregulation of miR-16, miR-21, and miR-146a on placental cell viability, growth, proliferation, invasion, and migration. We empirically validated bioinformatically-predicted miRNA targets using Western blot, specifically PTEN for miR-21 and STAT-1 for miR-146a. Data suggested that growth, proliferation, viability, and invasion were not altered by overexpression of miR-16, miR-21, or miR-146a in HTTR6, 3A, and T1-1 cells compared to negative control. Overexpression of miR-21 in 3A cells resulted in a trend to increased cell migration (p<0.08). Western blots showed that T1-1 cells overexpressing miR-21 exhibited a 50% reduction in protein levels of PTEN (p<0.05), and 3A cells overexpressing miR-146a exhibited a 25% reduction in STAT-1 protein levels (p<0.05). Collectively, these observations contribute to the better understanding of the effects of aberrant miRNA expression on the placental cell level. These effects may have further downstream consequences for both placenta and fetus, and studies are ongoing to further characterize epigenetic links between hazardous prenatal exposures and adverse postnatal outcomes.

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POS2-60 CYP2A6 SLOW NICOTINE METABOLISM INCREASES THE RISK FOR TOBACCO DEPENDENCE ACQUISITION IN ADOLESCENT SMOKERS

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Adolescence is a critical period for smoking acquisition. Twin studies indicate a substantial proportion of smoking behaviour, including acquisition, is attributable to genetic factors. One such example is genetic variation in CYP2A6, the enzyme that inactivates nicotine. In early adolescence (ages 12 to 16 years), CYP2A6 slow nicotine metabolism is associated with an increased risk of tobacco dependence acquisition, but slower escalation in dependence and lower cigarette consumption. Here we extend this work by examining the association between CYP2A6 and tobacco dependence acquisition in a larger sample of White smokers (n=421) followed until age 18 years. Participants were from the Nicotine Dependence
in Teens cohort study. We used Cox's proportional hazards models to compare the risk of acquiring ICD-10 tobacco dependence (score ≥ 3) between CYP2A6 normal and slow metabolizers. In all smokers, and in smokers who initiated smoking during follow-up, CYP2A6 slow metabolizers were more likely to acquire ICD-10 tobacco dependence relative to normal metabolizers, with hazards ratios (95% confidence intervals) of 1.8 (1.0, 3.3) and 2.3 (1.1, 4.7), respectively. We also assessed the concordance between CYP2A6 genotype-predicted metabolism groups and CYP2A6 activity, using the nicotine metabolite ratio (NMR; 3'-hydroxycoctinine/cotinine), available for n=158 participants at age 24. Using linear regression, CYP2A6 genotype group (normal vs. intermediate vs. slow) significantly predicted NMR (B=-0.12; P=0.001). Finally, we examined the construct-related validity of self-reported cigarette consumption against salivary cotinine, a biomarker of tobacco exposure, at age 24. Self-reported cigarette consumption was a strong predictor of salivary cotinine level (B=0.36; P<0.001), suggesting that smoking behaviours were accurately reported. Together, our findings extend previous work indicating that CYP2A6 slow nicotine metabolism confers biological vulnerability to tobacco dependence throughout adolescence.

FUNDING: We acknowledge the support of the Endowed Chair in Addictions for the Department of Psychiatry (R.F. Tyndale), a Canada Research Chair in the Early Determinants of Adult Chronic Disease (J. O’Loughlin), CIHR-CCSU and Ontario Graduate Scholarship (M.J. Chenoweth), CIHR grants MOP86471 (R.F. Tyndale) and TMH-109787 (R. F. Tyndale), Canadian Cancer Society grants 010271 (J. O’Loughlin) and 017435 (J. O’Loughlin), the Campbell Family Mental Health Research Institute of CAMH, the CAMH Foundation, the Canada Foundation for Innovation (#20289 and #16014 to R.F. Tyndale) and the Ontario Ministry of Research and Innovation. The authors thank the NDT research team and study participants.

JUSTIFICATION: Identifying genetic sources of variability in the risk for the development of nicotine addiction in adolescent smokers may help inform tobacco control strategies aimed at preventing the progression to regular, dependent smoking.

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POS2-60
EFFECTS OF THE NEUTRAL CB1 ANTAGONIST AM4113 ON NICOTINE TAKING AND REINSTATEMENT OF NICOTINE-SEEKING IN RATS

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The mechanisms underlying tobacco addiction are of wide interest and clearly there is still a need for more effective medications to help in smoking cessation and relapse prevention. In this study we explored the effects of AM4113 on the reinstatement of nicotine-seeking using different types of stimuli (presentation of cues, nicotine priming or stress induced by Yohimbine).

Long Evans rats were initially trained to self-administer nicotine (0.03 mg/kg/infusion). Once the response was stable, the effects of the acute (0, 0.3, 1, 3 or 10 mg/kg, i.p.) or chronic (10 mg/kg during 10 days) AM4113 were tested under FR or PR. In a separate group of Sprague Dawley rats, the effects of AM4113 (10 mg/kg) were tested during reinstatement of nicotine-seeking using nicotine priming (0.15 mg/kg, s.c.), presentation of nicotine-associated cues, or the pharmacological stressor yohimbine (2.5mg/kg, s.c.).

Acute treatment with AM4113 (0-10 mg/kg) dose-dependently reduced the number of nicotine infusions earned under FR [F(4,7) = 13.68, p < 0.0001] and PR [F(5,8) = 10.77, p < 0.0001] schedules of reinforcement. Chronic AM4113 (10 mg/kg) significantly attenuated nicotine-taking during the ten days treatment period under FR [F(24,6) = 15.78, p < 0.0001] and PR [F(24,6) = 10.43, p < 0.001]. Following extinction all, cues previously paired with nicotine infusion, a priming injection of nicotine (0.15 mg/kg, s.c.) or stress induced by yohimbine, reinstated nicotine-seeking behavior (p < 0.001 vs. baseline). AM4113 (0-10 mg/kg) dose-dependently decreased cue, priming, and stress induced reinstatement (p = 0.05 - 0.001).

In conclusion, neutral CB1 antagonist AM4113 seems to reduce both nicotine intake and nicotine's motivational properties under both acute and chronic regimens. Indeed, AM4113 might modify the relapsing capabilities of different stimuli to nicotine-seeking behavior. These results point to promising capabilities of AM4113 as a therapy for nicotine dependence.

FUNDING: No funding has been received for this project.

JUSTIFICATION: The results of these studies may help explain why menthol is a popular additive to tobacco in cigarettes, especially among young smokers.

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POS2-62
MENTHOL PROMOTES DESENSITIZATION AND THUS DECREASES FUNCTION OF HUMAN ALPHA3/BETA4 NICOTINIC ACETYLCHOLINE RECEPTORS

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The alpha3/beta4 nicotinic receptor subtype is widely expressed in the peripheral and central nervous systems, including in airway sensory nerves that may transduce irritant effects of nicotine in tobacco smoke and in certain brain areas that may be involved in nicotine addiction and/or withdrawal. Menthol, a widely used additive in cigarettes is a potential counterirritant at sensory nerves and may also influence nicotine's actions in brain. We examined menthol's effects on alpha3/beta4 nicotinic receptors by measuring the agonist induced increase in intracellular calcium via imaging, whole-cell voltage-clamp recording, and [3H]-epibatidine binding in HEK cells stably expressing human alpha3/beta4 nACHRs. Menthol markedly decreased the acetylcholine-stimulated rise in intracellular calcium in these cells, and it decreased the agonist-stimulated current measured in whole cell patch clamp assays. Co-application of menthol with acetylcholine or nicotine inhibited the function of alpha3/beta4 nACHRs by increasing desensitization, which was demonstrated by a reduction of the current integral as well as an increase in the rate and magnitude of the current decay. Interestingly, pretreatment with menthol followed by its washout did not appear to increase agonist-induced desensitization, suggesting that menthol should be present during the administration of agonist. Importantly, consistent with desensitization, the effects of menthol were more pronounced in the presence of higher concentrations of agonist than in the presence of lower concentrations, indicating that menthol does not act as a typical competitive antagonist or channel blocker. Moreover, menthol at concentrations up to 1 mM does not compete for the orthosteric nACH binding site labeled by [3H]-epibatidine. Taken together, these data indicate that menthol probably promotes desensitization of alpha3/beta4 nicotinic receptors by an allosteric action.

FUNDING: No funding has been received for this project.

JUSTIFICATION: The results of these studies may help explain why menthol is a popular additive to tobacco in cigarettes, especially among young smokers.

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FUNCTIONAL CONNECTIVITY IN AN INSULA-BASED NETWORK IS ASSOCIATED WITH SMOKING CESSATION OUTCOMES

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The insula has been shown to play a critical role in addiction; in particular, the insula may function in the recall of interoceptive drug effects during craving, motivational processes, or control of addictive behavior. Diminished functional connectivity within an insula-based salience network was recently shown to predict initial lapse in a small sample of women. In the present study we sought to extend these findings by examining whether functional connectivity with the insula can predict relapse in a large sample of both men and women. Eighty-five adult (46 women), treatment-seeking smokers were scanned with functional magnetic resonance imaging after smoking as usual. Then, smokers were randomly assigned to one of two treatment groups for 1 month leading up to their quit date. Following the quit date, subjects received standard nicotine replacement treatment. Subjects' smoking behavior was tracked using smoking diaries, timeline follow-back methods, and biweekly CO monitoring for 10 weeks. Relapse was defined as seven consecutive days of smoking. Forty-four subjects (52%) maintained abstinence until the end of the study. Forty-one subjects (48%) relapsed (n = 25) or were lost to contact (n = 16) and presumed to have relapsed. Resting-state functional connectivity maps were created using left and right insula (Brodman's Area 13) as seed regions of interest (ROI). Independent sample t-tests were performed to compare abstainers and relapsers (controlling for treatment group and sex). Compared with those who relapsed, abstainers exhibited greater connectivity with the right insula in regions previously implicated in the salience network, including bilateral putamen, bilateral pre/postcentral gyril, bilateral insula, and dorsal anterior cingulate; and greater connectivity with the left insula in the bilateral pre/post-central gyril, left putamen and left insula (cluster corrected p < 0.005). In contrast, there was greater connectivity in the posterior cingulate in relapsers compared to abstainers. Consistent with previous research, these results suggest that smoking relapse vulnerability is associated with reduced connectivity in an insula-based network.

FUNDING: This research was supported by R01 DA025876 (FJM) and K01 DA033347 (MAA).

JUSTIFICATION: Functional connectivity may help identify smokers who are at increased risk of relapse during a quit attempt.

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GENETIC INFLUENCES BY CHRNA4, ANKK1, AND BDNF ON BETA2^-NICOTINIC ACETYLCHOLINE RECEPTOR AVAILABILITY IN SMOKERS AND NONSMOKERS

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Background: Extensive studies demonstrate that beta2 subunit-containing nicotinic acetylcholine receptors (nAChRs) are upregulated during tobacco smoking, with receptor levels returning to nonsmoker levels following prolonged abstinence. The extent to which this receptor upregulation and recovery is influenced by genetic factors has important implications for treatment strategies and identification of at-risk individuals. In this study we evaluated beta2-nAChR availability in vivo using [5-123I]A-B5380 (5IA) single photon emission tomography (SPECT) in conjunction with single nucleotide polymorphism (SNP) data for three different genes implicated in tobacco dependence (CHRNA4, ANKK1, and BDNF) to assess genotype differences in receptor availability for smokers and nonsmokers.

Methods: Genotype and 5IA SPECT data were acquired for 113 individuals of European-American descent, including 55 nonsmokers and 58 tobacco smokers. Smokers were imaged a second time after 6-8 weeks of abstinence. Beta2-nAChR availability (VT/tp) was measured in the thalamus, striatum, cerebellum, and cortical regions. Blood-extracted DNA samples were acquired to determine genotypes with TaqMan for 3 CHRNA4 SNPs (rs2273502, rs2273504, rs2236196), and SNPs from the genes ANKK1 (rs4938015), and BDNF (rs6265). MANOVA models with multiple-comparison corrections were used for statistical analysis.

Results: Significant genotype by smoking interactions with beta2-nAChR availability were observed for SNPs mapped to CHRNA4 (rs2273504), ANKK1 (rs4938015), and BDNF (rs6265). Furthermore, CHRNA4 SNP rs2273504 was significantly associated with the change in beta2-nAChR availability in over 6-8 weeks tobacco abstinence.

Discussion: These preliminary results demonstrate genetic influences on beta2-nAChR receptor availability. These findings underscore the possibility of individualized treatment strategies for smokers based on their genetic variants.

FUNDING: Funding support was provided by NIH grants R01-DA015577, K01-MH092681, K02-DA031750, T32-DA022975.

JUSTIFICATION: This study synthesizes neuroimaging data examining nicotinic acetylcholine receptors with genotype data to provide neurochemical data identifying possible individualized treatment strategies based on genetic variants.

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META-ANALYSIS REVEALS SIGNIFICANT ASSOCIATION OF 3'-UTR VNTR IN SLC6A3 WITH SMOKING CESSATION IN CAUCASIAN POPULATIONS

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Backgrounds: Many studies have examined the association between SLC6A3 3'-UTR VNTR polymorphism and smoking cessation; however, the results are inconclusive, primarily because of the small to moderate-size samples. The primary goal of this study was to determine whether this polymorphism has any effect on smoking cessation by a meta-analysis of all reported studies.

Methods: We adopted a 9-repeat dominant model that considers 9-repeat and non 9-repeat as two genotypes and compared their frequencies in former vs. current smokers. Eleven studies with 5480 participants were included. Considering the presence of study heterogeneity and differences in the availability of information in each study, three separate meta-analyses were performed with the Comprehensive Meta-Analysis statistical software (v. 2.0).

Results: The first meta-analysis provided evidence of association between the 9-repeat genotype and smoking cessation only under the fixed-effects model (pooled OR 1.14; 95% CI 1.01, 1.27; P = 0.029) but not in the random-effects model (pooled OR 1.11; 95% CI 0.95, 1.29; P = 0.192). Given the marginal evidence of heterogeneity among studies (P = 0.07; I2 = 41.8%), which was likely caused by an Asian-based treatment study with an opposite effect of the polymorphism on smoking cessation, we excluded these data, revealing a significant association between the 9-repeat genotype and smoking cessation under both the fixed-effects (pooled OR 1.15; 95% CI 1.03, 1.29; P = 0.015) and random-effects (pooled OR 1.15, 95% CI 1.02, 1.29; P = 0.021) models. By analyzing adjusted and unadjusted results, we performed the third meta-analysis, which showed consistently that the 9-repeat genotype was significantly associated with smoking cessation under the both fixed- and random-effects models (pooled OR 1.17; 95% CI 1.05, 1.32; P = 0.007 for both models).

Conclusion: Meta-analyses of 11 studies provided evidence that the 3'-UTR VNTR polymorphism is significantly associated with smoking cessation, and smokers with one or more 9-repeat alleles have a 17% higher probability of smoking cessation than smokers carrying no such 9-repeat allele.

FUNDING: Supported by the Research Center for Air Pollution and Health of Zhejiang University, Ministry of Science and Technology of China (2012AA020405), and NIH grant DA012944.
Poster Session 2 • Thursday, February 26, 2015 • 4:15 p.m.–5:45 p.m.

POS2-66
ALPHA7 NICOTINIC ACETYLCHOLINE RECEPTORS DO NOT APPEAR TO REGULATE ORAL OPERANT ETHANOL SELF-ADMINISTRATION IN FEMALE MICE
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There is a high prevalence of comorbid nicotine and ethanol (EtOH) use. Nicotinic acetylcholine receptors (nAChRs), including alpha7 (α7) nAChRs, have been implicated in the behavioral and biological effects of EtOH. Mice lacking the α7 subunit (α7KO) are more sensitive to EtOH-induced locomotor activation, hypothermia, and loss of righting reflex, are less sensitive to EtOH-induced memory impairment, and consume less EtOH. α7KO mice show no changes in EtOH metabolism, showing that α7 nAChR regulation of EtOH effects is not due to altered metabolism. In addition to nAChR contributions to the effects of EtOH, it is also important to consider that EtOH effects vary depending on sex. While a number of EtOH effects have been linked to α7 nAChR activity in male mice, no known studies have investigated α7 nAChR contributions to EtOH self-administration (SA) in male or female mice. Thus, the goal of the present study was to determine if α7 nAChRs regulate oral operant EtOH SA in female mice. WT mice, α7KO mice and α7 heterozygous mice that have a 50% reduction of the α7 subunit (α7HT) were trained to orally self-administer EtOH during 16 hr overnight binge SA sessions once every 7 days for 9 weeks. Active lever pressing, reinforcers earned, and EtOH consumed (g/kg) were measured. A main effect of EtOH concentration and a session x EtOH concentration interaction was found for active lever presses, reinforcers earned, and EtOH consumed, revealing that EtOH reinforcement was concentration-dependent and EtOH intake increased across sessions. There was no effect of genotype detected for any measure. This data suggests that α7 nAChRs in female mice do not regulate oral operant EtOH SA; rather, it is likely that other nAChR subunits regulate EtOH reinforcement in female mice. Further studies are needed to determine if α7 nAChRs regulate EtOH SA in males. Overall, this study contributes to knowledge regarding nAChR regulation of EtOH reinforcement, which is important for the development of targeted therapies for alcohol use disorders.

FUNDING: This work was supported in part by NIH/NIDA grant R01 DA031289 to Darlene H. Brunzell and a Virginia Commonwealth University Alcohol Research Center pilot grant to DHB supported by NIH/NIAAA P20 AA07628 to Michael F. Miles. Alexandra M. Stafford is supported by an NIH/NIDA training grant T32 DA007027 to William L. Dewey.

JUSTIFICATION: This study provide information relevant to the development of targeted therapies for alcohol use disorders.

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POS2-67
USING SYSTEMS BIOLOGY COUPLED WITH TOXICOLOGY ASSAYS TO IDENTIFY BIOMARKERS OF POTENTIAL HARM ASSOCIATED WITH TOBACCO SMOKE EXPOSURE
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Introduction: Some adverse health outcomes from tobacco use may take decades to develop. Therefore, there is a need to identify relevant and quantitatively valid biomarkers that predict long-term adverse health outcomes produced by exposure to tobacco smoke.

Objectives: Identify novel biomarkers of potential harm using “omics” technologies in in vitro cell models.

Method: Three different human lung cell types were cultured in normal media with or without cigarette smoke condensate (CSC) for up to 30 days. Lactate dehydrogenase (LDH) and ATP concentration were used to assess phenotypic changes. To identify potential biomarkers of harm, corresponding “omics” changes (mRNA and microRNA expression analysis using next-generation sequencing (RNA-Seq), proteomics, and metabolomics) were compared between different types of smoke condensate generated from cigarettes with different blend of tobacco and under different smoking conditions.

Results: The study found that, for a given CSC at a given time point, cytotoxicity increases as the CSC concentration increases. Cytotoxicity also increases over time. Highly differentially regulated genes/proteins identified in the study are potential candidates of novel biomarkers. Based on RNA-Seq expression analysis, DNA damage, cell cycle control, cell signaling, and protein biosynthesis are the major pathways modulated by tobacco smoke exposure. Cell adhesion ECM remodeling, FGF-family signaling, EGFR signaling, immune response IL-18 signaling, and TGF-beta signaling are the top 5 affected signaling pathways revealed from this proteomic analysis. Biomarkers identified through different “omics” platforms were compared to each other for cross validation. Proteomics analysis found that correspondent protein profiling is also modulated for some of the dysregulated genes found in RNA-Seq analysis. The biomarkers identified through these in vitro studies should be validated in clinical studies.

FUNDING: FDA

JUSTIFICATION: Identify biomarkers is useful for clinical and epidemiological research

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POS2-68
ABSENCE OF A SEX DIFFERENCE IN ADOLESCENT AND ADULT RAT NICOTINE SELF-ADMINISTRATION
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Approximately 90% of the millions of adult daily smokers in the US initiated tobacco product use during adolescence. Preclinical studies comparing nicotine (NIC) self-administration (SA) behavior of adolescent and adult rats generally find that adolescent rats acquire SA at lower doses of NIC than adults. Additionally, sex differences were shown to impact NIC SA by adults, with adult female rats self-administering more NIC and across a wider range of doses than adult males. However, the effect of sex on adolescent NIC SA is less clear. The present study sought to determine the effects of sex and developmental stage on SA across a range of NIC doses. Sprague-Dawley rats arrived on postnatal day (P) 22 or 82, were implanted with jugular vein catheters on P24-25 or P94-95, and began NIC SA on P30 or P90. Food and water were available ad libitum, except during 1-h SA sessions. Rats were allowed to respond (nose poke) for intravenous infusions of one dose of NIC (3, 10, 30, or 100 ug/kg/infusion) on a fixed ratio 2 schedule of reinforcement for 16 daily sessions. NIC infusions were paired with an initially neutral light stimulus (CS, 15-s white cue light). We found that at a dose of 3 ug/kg/infusion, rats of neither age acquired NIC SA. At a dose of 10 ug/kg infusion, adults acquired SA (p<0.05), whereas adolescents did not. At doses of
NIC 30 ug/kg/infusion or greater, all groups acquired SA (p<0.05) and earned a similar number of infusions. However, contrary to expectations, we found no sex differences in SA by adolescents or adults at any NIC dose tested. These results demonstrate that under the response requirements examined here there is not a reliable sex difference in responding for infusions of a range of NIC doses by ad libitum fed adolescent and adult rats. Moreover, the dose threshold for SA is lower for adults than for adolescents. These results indicate there is no evidence of a sex difference during either developmental stage in the primary reinforcing properties of NIC. Future research will investigate the role of other, moderately reinforcing environmental cues associated with NIC on SA behavior by male and female adolescent and adult rats.

FUNDING: U54 DA031659 (ECD)
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POS2-69
CHRNA5 REGULATES AVERSION TO NICOTINE IN SMOKERS

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Genomewide association studies of tobacco use disorders (TUD) have implicated CHRNA5 in several smoking-related behaviors, including nicotine dependence and lung cancer. Pre-clinical studies have emphasized variable nicotine aversion via CHRNA5 rs16969968 as a potential risk mechanism. Modulation of attention circuitry might also contribute to risk effects. There is limited direct evidence to support these risk mechanisms in humans. The goal of this study was to evaluate the effects of rs16969968 on the acute response to nicotine in a population of European American (EA) and African American (AA) smokers (n=185; 51% AA; 72% male) in a laboratory setting. Following overnight abstinence from nicotine, participants completed an intravenous (IV) administration paradigm that included a dose of saline and two escalating doses of nicotine. The primary outcomes evaluated were the aversive, pleasurable, and stimulatory properties of NIC. Future research will investigate the role of other, moderately reinforcing environmental cues associated with NIC on SA behavior by male and female adolescent and adult rats.

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POS2-70
ATTENUATION OF MOUSE NICOTINE DRINKING BY JNJ-39393406, A NOVEL ALPHANACHR POSITIVE ALLOSTERIC MODULATOR

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Individuals with schizophrenia diagnosis have a significant reduction of alpha7 nicotinic acetylcholine receptors (nAChR) in brain and recent reports link genetic variations in the CHRNA7 gene with tobacco dependence in this population. Our previous studies show that local administration of a selective alpha7 nAChR antagonist into the nucleus accumbens shell or anterior cingulate cortex significantly increases nicotine self-administration, suggesting that a poverty of alpha7 nAChR function promotes nicotine use. Hence, these preclinical feasibility trials assessed if an alpha7-selective positive allosteric modulator, JNJ-39393406, would inhibit oral nicotine self-administration in mice. These studies further determined JNJ-39393406 mechanism of action by comparing nicotine ingestion behavior of C57BL/6J wild type (WT) and alpha7 nAChR subunit knockout (a7KO) mice, and assessed if JNJ-39393406 effects on self-administration are shifted in heterozygous knockout mice (a7HET), which have a 50% reduction in alpha7 nAChR expression, to suggest that dosing be adjusted for individuals with schizophrenia who share this phenotype. Mice (n = 10/genotype) were given 24hr access to 0, 50, 100, and 200 ugm/nl nicotine in 2% saccharin solution in their homecages. Upon stable nicotine drinking, JNJ-39393406 (0, 0.3, 1, 3 and 10 mg/kg in 2% 2-hydroxypropl-beta-cyclodextrin solution) was administered using a Latin-square, within-subject design via intra-gastric gavage prior to the dark cycle when mice are active. Experimenters were blinded to dosing. JNJ-39393406 significantly reduced mg of nicotine consumed and nicotine preference in WT mice. There was no shift in the dose-effect curve of a7HET mice to suggest that clinical doses be adjusted for smokers with schizophrenia. There was no effect of JNJ-39393406 evident in a7KO mice, suggesting that JNJ-39393406-associated reductions in nicotine intake were mediated via alpha7 nAChRs. These data suggest that positive allosteric modulation of alpha7 nAChRs is sufficient to reduce nicotine consumption and provide preclinical evidence to support JNJ-39393406 for smoking cessation in healthy individuals and those with schizophrenia.

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JUSTIFICATION: These data suggest that positive allosteric modulation of alpha7 nAChRs is sufficient to reduce nicotine consumption and provides evidence that alpha7-mediated nicotinic transmission may have therapeutic implications for tobacco dependence in healthy individuals and those suffering with schizophrenia.

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POS2-71
MENTHOL FACILITATES THE INTRAVENOUS SELF-ADMINISTRATION OF NICOTINE IN RATS

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Menthol is preferred by approximately 25% of smokers and is the most common flavoring additive in tobacco and electronic cigarettes. Although some clinical studies have suggested that menthol facilitates the initiation of smoking and enhances the dependence on nicotine, many controversies remain. Using licking as the operant behavior, we found that adolescent rats self-administering nicotine (30 ug/kg/infusion, free base, i.v.) with contingent oral menthol (60 ul, 0.01% w/v) obtained significantly more infusions than rats receiving a vehicle cue or rats self-administering i.v. saline with a menthol cue. Rats yoked to their menthol-nicotine masters emitted significantly fewer licks on the active spouts, indicating that contingent pairing between nicotine and menthol is required for sustained nicotine intake. Rats that self-administer nicotine with a menthol cue also exhibited a long-lasting extinction burst and robust reinstatement behavior,
neither of which were observed in rats that self-administered saline with a menthol cue. The cooling sensation of menthol is induced by activating the transient receptor potential M8 (TRPM8) channel. When WS-23, an odorless agonist of the TRPM8 channel, was used as a contingent cue for nicotine, the rats obtained a similar number of nicotine infusions as the rats that were provided a menthol cue and exhibited a strong preference for the active spot. In contrast, highly appetitive taste and odor cues failed to support the self-administration of nicotine. These data indicated that menthol, likely by inducing a cooling sensation, becomes a potent conditioned reinforcer when it is contingently delivered with nicotine. Together, these results provide a key behavioral mechanism by which menthol promotes the use of tobacco products or electronic cigarettes.

FUNDING: University of Tennessee Health Science Center, NIDA (DA-026894)
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POS2-72
FDA PERFORMANCE STANDARDS FOR ELECTRONIC NICOTINE DELIVERY SYSTEMS: PERSPECTIVES FROM THE FDA 2013 DRAFT GUIDANCE FOR ABUSE-DETERRENT OPIOIDS

The major public health benefit of electronic nicotine delivery systems (ENDS) is the extent to which they enable cigarette smokers to eliminate exposure to tobacco smoke. Although ENDS are far lower in their content and emissions of toxicants than combustion tobacco products, they vary widely in design and performance. Furthermore, some products allow manipulations that may alter their emissions, as well as lend themselves to the administration of cannabinoid extracts, cocaine, and opioids. FDA is charged with developing tobacco product performance standards “as appropriate to protect the public health”. This challenge is not unique to tobacco products. In 2013, FDA issued a draft guidance on abuse deterrent opioids that discusses potential test methods and labeling implications for new formulations. The opioid guidance addresses possible manipulations of products that impact safety of use and misuse.

ENDS pose challenges beyond abuse deterrent opioids; however, some of what FDA describes as its “flexible” and “evolutionary” approach to opioid drug product evaluation is applicable to rapidly evolving ENDS. The opioid guidance provides a framework for evaluating drug products for resistance to modifications that increase the amount and speed of drug delivery by physical, chemical, and other means of manipulation in its Category 1 in vitro laboratory assessments. Category 2 and 3 assessments in the AB guidance provide approaches for evaluating the pharmacokinetics and addiction risk posed by the products as a function of their susceptibility to manipulation.

FDA's approach has had rapid and striking consequences. The reformulated OxyContin® carries a lower risk of tampering, abuse, and overdose, leading the FDA to prohibit the marketing of potential competitor products that do not meet similar “standards.” Equally importantly the approach is achieving FDA’s goal of incentivizing companies to invest in the development of increasingly safer AD products. This presentation will discuss a parallel approach for drug product evaluation that may be adapted to assessing ENDS with respect to their performance and resistance to manipulation that may harm users.

FUNDING: No funding.
JUSTIFICATION: Laboratory evaluation of electronic nicotine delivery systems will inform potential FDA regulation, public health impact, and product design.
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POS2-74
MOVING FROM RESEARCH TO ACTION: RESULTS OF A YOUTH-LED TOBACCO PREVENTION PROJECT
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In an on-going youth-participatory action research project, participants in SEAYL, a Southeast Asian American youth development program, conducted research on the tobacco environment for youth in their community. Over two years the youth and project staff collectively: (1) reviewed information on tobacco, health disparities and local tobacco control policies; (2) collected and analyzed primary data on the tobacco environment including community surveys, tobacco outlets assessments, and PhotoVoice, and (3) developed a plan for disseminating the results of this research to reduce tobacco influences. A second phase of data collection included letters to local policy makers, interviews with staff at their high school, and assessments of tobacco-related litter at and around their high school. Although the project design originally targeted the entire city, the youth participants identified the school environment as the primary sphere of influence on which to focus. Based on their analyses, the youths proposed a three-part campaign at their high school to (1) raise awareness among students and staff of smoking risks and regulatory policies; (2) improve student morale through litter-reduction actions and motivational activities and (3) support enforcement of smokefree policies within and near the school grounds. The youths were able to parlay their insider knowledge of the school system and their student status to strategize the intervention activities, identify and leverage assets, and gain access to key stakeholders within the school system. Youth-led participatory research on the tobacco environment can foster youth leadership to reduce and counter the harmful influences of the tobacco industry. Goals for tobacco prevention for youth and the appropriate scale of intervention activities may differ from those for adults. Youths have privileged access within and knowledge of their own environments which can benefit intervention campaigns. Our study allowed youth to gain useful experience in community organizing and to disseminate the results of their research to their peers in age- and culturally-appropriate forms.

FUNDING: This study was supported by California Tobacco-Related Disease Research Program grant 21AT-0012.
JUSTIFICATION: By identifying and deploying age- and culturally-appropriate strategies, youth-led action research on the tobacco environment can effectively mobilize community support of policies to reduce and prevent harmful tobacco influences on youth.
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POS2-75
MARKETING ALCOHOL AND TOBACCO PRODUCTS AT THE POINT-OF-SALE: A COMPARISON BETWEEN RETAILERS IN LONDON, ENGLAND (UK) AND WAKE COUNTY, NC (USA)
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Background and Aims: Tobacco and alcohol industries invest substantial resources marketing at the point of sale (POS), and such marketing has been shown to contribute to youth initiation and consumption of alcohol and tobacco products. Limited data are available on how POS marketing of tobacco and alcohol products compare to each other, and between countries with differing retail and product regulations.

Methods: Observational audits were conducted in 2013 at retailers selling both tobacco and alcohol products in London, England (UK) and Wake County, NC (USA) using a standardized web-based mobile data collection system. Data
collected included retailer characteristics, presence of exterior and interior POS marketing (i.e., branded signs, price discounts, multibuy offerings, contests) for alcohol and tobacco products, and availability of tobacco products.

Results: POS marketing for tobacco products was very high in Wake County (99%) and slightly higher than POS marketing for alcohol products (91%). By contrast, POS marketing for tobacco products in London were low (5%), with alcohol marketing far more common (83%) and similar to that in Wake County (p=0.11). Further, sales of individually packaged cigarillos or flavored cigarette products were rarely found in London retailers (8% and 3%, respectively), while each appeared in >90% of Wake County retailers. In Wake County, exterior tobacco POS marketing was more common, compared to exterior alcohol POS marketing (p<0.01), however, no significant difference was found between interior alcohol and tobacco POS marketing (p=0.53). In addition, greater levels of branded signs (p<0.01), multibuy (p<0.01), and discounts (p<0.01) were observed for tobacco products in Wake County, compared to alcohol products. Conversely, significantly more retailers marketed contests for alcohol products (p<0.01) in Wake County, compared to tobacco products.

Conclusions: Policy interventions that protect youth from industry marketing strategies, such as POS marketing, are needed as part of comprehensive public health efforts to help combat alcohol and tobacco abuse.

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POS2-76
OVERLOOKED SECONDHAND SMOKE EXPOSURES

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Background: Secondhand smoke (SHS) exposure is known to be dangerous indoors and increasingly is banned everywhere indoors. Several locations where people congregate also provide settings for dangerous exposures but are often neglected since exposures are transient. Research shows that there is no safe level of SHS exposure.

Methods: An investigation was made of some locations heavily-frequented by smokers in Thailand and showed that even outdoor locations provide high exposures. Though smoking is banned indoors and in parks and open markets in Thailand, other places including international airports, hotel rooms, beaches and al fresco dining areas still need to be included in the smoke free law in Thailand.

Results: International airports still have designated smoking rooms which have been shown to pollute adjacent areas, many hotels are not fully smoke free with smoke circulating throughout the hotel, beaches are not smoke free despite very crowded conditions at those most popular, and crowded al fresco dining is still not smoke-free.

Conclusions: In addition to further study of these overlooked sites of exposure, policy makers need to be made aware of the need to protect the public in locations where the density of smokers is high or unacceptable levels of smoke contaminants may circulate continuously. Additional regulation for public health safety is required given the known short term dangers of unsuspected exposures to secondhand smoke.

FUNDING: No Funding

POS2-77
COLLEGE STUDENTS’ OPINIONS OF CAMPUS TOBACCO CONTROL POLICIES

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Tobacco-free policies on college campuses play an important role in deterring tobacco use, and an increasing number of colleges have implemented such policies. However, there is limited research evaluating college students’ opinions of campus tobacco-free policies. This study assessed college students’ support of college tobacco control policies and examined differences between current smokers and non-smokers on level of support. Participants were 2976 college students (M age = 27.64 SD= 10.59; 68.6% female; 75.8% White) from six 4-year universities in Texas who completed an online survey in summer 2014. Questions were modeled after items from the Bacchus Network Tobacco Use and Attitudes Survey and assessed level of support (1= strongly support; 4= strongly oppose) for campus policies regarding cigarettes and non-cigarette alternatives. Of the 2976 students, 73% supported (i.e., strongly or very strongly) prohibition of cigarette use on campus, 67% supported prohibition of e-cigarette use on campus, and 68% supported prohibition of all tobacco and alternative products on campus. One Analysis of Variance indicated that current smokers were significantly less likely than current non-smokers to support prohibition of cigarettes [F(1,2949)=371.04, p<.001], e-cigarettes [F(1,2947)=303.53, p<.001], and all tobacco and alternative tobacco products on campus [F(1,2986)=351.00, p<.001]. Findings indicate that there is stronger support for campus policies on cigarettes than for non-cigarette alternative products. Still, fewer than three quarters of students supported these tobacco-control policies, suggesting that additional efforts by college officials and tobacco control advocates are needed to change student attitudes. Not surprisingly, we also found that support for tobacco-control policies was stronger among non-smokers than it was among current smokers, suggesting that non-smokers should be rallied to change campus-based policies. Given limited research, future studies should examine why the complete prohibition of cigarettes and non-cigarette alternatives is not an even higher priority for college students.

FUNDING: Research funded by Texas Department of State Health Services

JUSTIFICATION: The current study examines students’ opinions towards tobacco-free policies on college campuses, setting the direction for future research and suggesting the need for additional efforts by officials and tobacco control advocates to change students’ attitudes.

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POS2-78
VARIATIONS IN LABEL INFORMATION AND NICOTINE LEVELS IN ELECTRONIC CIGARETTE REFILL LIQUIDS OF SOUTH KOREA: REGULATION CHALLENGES

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Background. In South Korea, the consumption of the liquid nicotine used in e-cigarettes dramatically increased from 4,310 L in 2012 to 7,220 L in 2013, while traditional cigarette consumption slightly decreased from 4,477,000,000 packs in 2010 to 4,335,000,000 packs in 2013. To minimize potential health impact of the consumption of the liquids used for e-cigarettes, we examined label information and the discrepancy between the amount of nicotine indicated on the labels and the actual measured values.

Methods. We purchased thirty-two liquid refill products and one pure nicotine product at six different e-cig retail stores in Seoul and Asan, South Korea. Label information was summarized, including product names, manufacturing countries,
nicotine content, manufacture dates, expiration dates, and health warning statements. The actual nicotine concentrations of each product were measured by a blinded analyst at Roswell Park Cancer Institute, NY, U.S.

Results. Three out of fifteen imported products provided manufacturing dates, while expiration dates were available on eight ones. The range of nicotine concentration was from 2.1 to 17.5 mg/mL. Labeling discrepancies ranged from -32.2\% to 30.6\% among e-cig fluid samples. The highest concentration (148 ± 14.7) was found in a sample labeled as “pure nicotine.”

Conclusion. There is not yet any standardization of labels among liquid e-cig products. One product labeled “pure nicotine” raises concerns, since it may be poisonous to consumers, especially to children who may accidently ingest the product. This study revealed the urgent need for the development of product regulations in South Korea.

FUNDING: No funding

JUSTIFICATION: This study revealed the urgent need for the development of product regulations in South Korea.

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**POS2-79**

**SINGLE CIGARETTE SALES: STATE DIFFERENCES IN FDA ADVERTISING & LABELING VIOLATIONS, 2014**

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Background: The Family Smoking Prevention and Tobacco Control Act of 2009 (FSPPTCA) prohibits the sale of single cigarettes (“loosies”) in the U.S. The FDA is charged with enforcing this provision among others of the FSPPTCA, and each year contracts with state governments and private contractors to conduct thousands of Advertising and Labeling (A&L) inspections of retailers to ensure compliance.

Methods: We downloaded publically available inspection results, examining warning letters issued to retailers from 1/1/14 to 7/31/14 for A&L violations. We excluded warning letters that were issued for sales to a minor, then coded the remaining warning letters for type of violation reported. We compared proportions of warning letters issued for single cigarettes between states, used 3D graphs and choropleth maps to visually inspect the data.

Results: FDA contractors completed 33,543 A&L inspections in the 50 states and District of Columbia during the seven-month time period. A warning letter for an A&L violation was issued in 2.32\% of inspections (n=779). The number of warning letters issued per state ranged from 0 (11 states including DC) to 111 in North Carolina (M=15.3, SD=24.7). Of the 40 states with warning letters issued, the percentage of total warning letters issued for single cigarette violations ranged from 0 in 27 states to 58.6 in NC (M=6.3, SD=12.5). No regional trends emerged.

Discussion: Substantial variation exists not only in A&L warning letters, but also in specific violations. Unexplained variation in rates of single cigarette warning letters suggests that there may be differences in the way inspection protocols are implemented, and A&L inspections in some states likely overlook or miss some FSPPTCA violations, specifically single cigarette sales. Other reasons could account for differences, including characteristics of FDA inspectors, training protocols, implementation of FDA procedures, and differences in proportion of retailers selling single cigarettes. This research suggests the need for quality monitoring processes across states in reporting rates of A&L violations.

FUNDING: No funding

JUSTIFICATION: The FDA invests large amounts of resources in tobacco retailer inspections (having conducted over 324,858 inspections between 2010 and July 31, 2014). Differences between states suggest that inspections may not be implemented in a standard format. Identifying these discrepancies allows for improvement of the inspections process and, thus, improves the potential for improved population health impact.

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**POS2-80**

**EVALUATION OF THE IMPACT OF THE TOBACCO-FREE PHARMACY INITIATIVE IN CALIFORNIA**

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Background: California and Massachusetts are the only two U.S. states with towns or municipalities that have local ordinances requiring tobacco-free pharmacies. In California, tobacco sales in pharmacies were prohibited in San Francisco and Richmond in 2008 and 2010, respectively. To date, these two cities are the only two cities that have such laws in California.

Objective: The impact of tobacco-free pharmacy laws remains understudied. This study aims to fill this gap by performing an evaluation of the impact of such laws on the density of licensed tobacco retailers in California.

Methods: Tobacco retail license data through December of 2013 were obtained from the California Board of Equalization. Quarterly license data starting in January 2005, which is 3 years prior to when the first city that implemented a tobacco-free pharmacy law, were analyzed. A longitudinal mixed effect negative binomial model with a random intercept was used in this study. The population size for each city was included as an offset in the model. Thus, the outcome measure can be interpreted as quarterly licensed tobacco retailer density (tobacco retailers per person) at the city level. A dichotomous indicator was created to measure different law implementation time for the two cities.

Results: From 2005 to 2013, the overall density of licensed tobacco retailers in California decreased from 18 to 10 retailers per 10,000 persons. After adjusting for other local tobacco control policies, demographic and economic characteristics at the city level, the tobacco retailer density among cities without tobacco-free pharmacy laws decreased by 2.2\% (95\% CI [2.1\%, 2.2\%]) for each quarter; the density among cities with such laws decreased by 3.5\% (95\%CI [3.3\%, 3.7\%]) for each quarter. For the two cities with laws prohibiting pharmacy tobacco sales, the rate of decrease was 1.62 times as great as the decrease among cities without such a law (p<0.001).

Conclusion: There is evidence that tobacco-free pharmacy policies have a significant impact on reducing tobacco retailer density in California. Based on previous studies, the reduced retailer density may further lead to lower tobacco consumption.

FUNDING: No funding

JUSTIFICATION: This is the first study focused on the impact of the tobacco-free pharmacy laws; the results shows that the tobacco-free pharmacy policies have a positive influence to reduce tobacco retailer density, which may further lead to reduced tobacco consumption or tobacco use prevalence. The results of this study provided important supportive evidence for other cities and states on adopting the laws.

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**POS2-81**

**ASSESSMENT OF COLLEGE CAMPUS TOBACCO-FREE POLICIES IN OHIO**

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Objective: To assess prevalence and strength of university campus tobacco related policies in Ohio.

Methods: A complete list of degree granting Ohio colleges was identified through the US Department of Education Institute of Education Services from year 2013 to 2014. Inclusion criteria for this sample were institutions of higher education that
were degree granting and provide housing services to their students. 73 campuses met study criteria. Two independent reviewers searched the Web sites and student handbooks of identified colleges regarding to their tobacco-free policy and coded each college based on a college tobacco-free policy scoring tool, which uses a 13-point index (a higher score indicates a more comprehensive campus tobacco-free policy) that evaluates campus smoking and tobacco use policies for both indoor and outdoor environments, as well as tobacco sales and advertisement on campus.

Results: Among the 68 campuses which published tobacco policy information, 92% and 75% of the college campuses in Ohio implemented smoke-free policy and tobacco-free policy in all building interiors including both residential halls and campus indoor areas, respectively. About 57% of the campuses have at least some restrictions on smoking on campus grounds. Over half of the universities have policies that ban cigarette smoking and/or tobacco use in campus-owned vehicles. Only minority of universities had sponsorship (4%), sales (16%) or marketing (7%) prohibitions. The average score is 6.3 (SD=2.9), with a range from 1 to 13. The scores were significantly different by college type and enrollment size. Public universities had higher scores compared to private universities (9.3 vs. 5.8, p<0.01), and the larger enrollment size is associated with higher tobacco policy score (p<0.05).

Conclusion: Most of the Ohio college campuses have implemented clean indoor air policies, and majority of the campuses have at least some restrictions in outdoor areas to protect students, faculty, and staff against secondhand smoke exposure. However, few Ohio universities have adopted additional policy elements that restrict tobacco sales and advertising on campus.

FUNDING: No Funding

JUSTIFICATION: This study provides a comprehensive assessment on university campus tobacco related policies in Ohio, which indicates the efforts to protect students, faculty, and staff against secondhand smoke exposure; it will give important information to college administrators to understand how their campus tobacco control policy compares to other campus and even encourage them to adopt a more comprehensive policy.

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POS2-82
ANALYSIS OF INDOOR AIR QUALITY FOLLOWING USE OF AN EVAPOUR PRODUCT
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EvaPur products are gaining acceptance with consumers as potential alternatives to traditional tobacco products. Both regulators and public health organisations are beginning to examine potential implications that exposure to eVapour exhale (exhaled vapour) may have on non-users in workplaces and enclosed public spaces. A critical review of the current scientific literature reveals that there is insufficient evidence from which to assess the impact of exhale on indoor air quality and thus the air breathed by non-users.

In the few studies that have considered this issue, a number of methodological issues have been identified and are discussed. Despite an absence of robust scientific evidence on this issue, there are calls, including some by government bodies, to prohibit the use of eVapour products in workplaces and enclosed public spaces.

There are few published scientific studies that adequately assess the indoor air quality in an environment encountered in everyday life (e.g. car, home, office) during and after eVapour product use. In order to provide evidence from which robust conclusions may be drawn, we present an experimental study which could be employed to evaluate indoor air quality in ‘real-life’ conditions following use of eVapour products.

Physiochemical characterisations are proposed for air quality assessment before, during and after use of an eVapour product in a typical meeting room. Chemical analyses of indoor air have been considered including screening for volatile organic compounds, carbonyl compounds, heavy metals, polyaromatic hydrocarbons, nicotine and nitrosamines. Monitoring techniques for the mass of particles in the air and their size distribution have also been considered. Studies conducted in this manner may be useful in the development of evidence based regulation.

FUNDING: Project funded by Imperial Tobacco Group

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POS2-83
PERCEPTIONS AND EXPERIENCES OF A SMOKE-FREE CAMPUS
Janet Hoek, PhD*, Robin Quigg, PhD, Louise Marsh, PhD, University of Otago

Smokefree campus policies recognise that social environments influence smoking uptake, particularly among young adults, many of whom start using tobacco regularly after leaving home. While many NZ universities have adopted smokefree policies, little is known about how smokers perceive, experience, or comply with these. We undertook pre-post in-depth interviews with staff and student smokers (N=19; N=16), and an observational study, to assess perceptions of, and experiences and compliance with, the new policy.

Using grounded thematic analysis, we identified three themes in initial interviews that we explored further in post-implementation interviews: aggrievement; fears of stigma, and adaptation. As participants believed they were thoughtful and avoided exposing others to smoke, they resented measures they felt did not recognise their consideration. Many reported smoking discreetly in quiet spaces to avoid the stigma of smoking and were concerned they would be forced onto pavements and exposed to non-smokers’ overt disapproval. They anticipated adapting to the policy by relocating to new spaces or reducing their on-campus smoking; only a very small minority proposed defy the policy.

Post-implementation interviews revealed a grudging acceptance of the policy, but concerns relocation of smoking to the campus perimeter had created a negative “look” for the campus. Most participants reported smoking less on campus and a minority had or were trying to quit. Continuing smokers had attempted to find new private spaces, though these were less convenient, reduced the time available to smoke, and often had to be shared with other smokers. Some had adapted by forming new social groups with other “outcast” smokers and found this camaraderie reduced feelings of stigma, but others missed the solitude of smoking alone. Observational studies showed high compliance with the policy, but an increase in butt litter at campus margins.

Smokefree campus policies disrupt smokers’ relationships with specific settings and threaten their fragile identity as covert smokers. Even new social contacts did not ameliorate the additional dissonance created, which some resolved by trying to quit.

FUNDING: This work was funded by the University of Otago Vice Chancellor’s Strategic Research fund; no external funding was received.

JUSTIFICATION: Many tertiary institutions are implementing smokefree campus policies; findings from this study identify likely concerns among affected smokers and explore how these could be addressed.

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Point-of-Sale (POS) tobacco advertising likely exerts a potent effect on adolescent and adult tobacco use. However, an outright ban of POS tobacco advertising seems unlikely due to tobacco industry assertions that such advertising is protected by the 1st Amendment. Thus, regulation will likely involve incremental steps aimed at changing the "time, place, and manner" of POS tobacco advertising (i.e., regulating how tobacco products are advertised at POS; e.g., changing the number of tobacco posters that are allowed). Unfortunately, there is a lack of ecologically valid data on what time, place, and manner regulations would most effectively reduce the impact of tobacco advertising at POS. The Rand StoreLab (RSL) was constructed to experimentally evaluate how to best regulate tobacco advertising at POS; it permits "real life" manipulation of key POS advertising ingredients (e.g., location of the tobacco powerwall) in a highly controlled, but externally and ecologically valid way. The RSL was constructed to resemble a traditional convenience store. The facade of the RSL consists of a double glass door and window where various product posters hang. Inside of the RSL, long shelving units, endcaps, refrigerators, and freezers display various name brand food and small household items. Overall, the RSL stocks over 650 unique, brand name products and the products are stocked directly in proportion to industry guidelines. Posters for many different types of products adorn the walls and shelves of the RSL. Posters and signs (including pricing) for tobacco products appear on the RSL doors and windows, and on the tobacco powerwall. Feedback from an initial set of focus groups with adolescents and adults (n=10) was used to heighten the realism of the RSL and results from a second series of focus groups (n=13) confirmed that the RSL was highly realistic and consistent with participants' real world experiences. For all intents and purposes, the RSL looks, functions, and feels like a "real" convenience store and is a sustainable resource that can be used to experimentally test different regulatory actions that concern tobacco advertising at retail POS locations.

FUNDING: R01CA175209 from the National Cancer Institute and FDA Center for Tobacco Products

JUSTIFICATION: This program of work will inform the FDA’s position on regulating tobacco advertising at point-of-sale.

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EVALUATION
NEW YORK CITY FLAVORED TOBACCO PRODUCT SALES BAN EVALUATION
Shannon M. Farley, MPH*, Michael Johns, PhD

Background: Flavored tobacco products are a national concern due to their association with increased youth smoking and initiation. Certain flavored products, such as smokeless tobacco and some cigars, are taxed at lower levels than cigarettes, which could increase their appeal among price-sensitive teens. In January 2011, New York City (NYC) began enforcing a law prohibiting sales of flavored tobacco products, excluding menthol. We evaluated the impact of this law on the use of such products among NYC youth.

Methods: Data on teen tobacco use behaviors were obtained from the 2010 NYC Special Communities Putting Prevention to Work Youth Risk Behavior Survey (N=1,800) and data from the 2013 NYC YRBS (N=9,439). The YRBS is an anonymous, cross-sectional survey of public high school students. It uses a multi-stage cluster sample and post-stratification weighting to create a representative sample of public high school students. In both years teens were asked if they had ever used any flavored tobacco products, such as cigarettes or cigars. Multivariable logistic regression was used to estimate the change in flavored tobacco product use between 2010 and 2013, controlling for sex, race/ethnicity, age, current cigarette use, current cigar use, current smokeless tobacco use, and ever use of menthol cigarettes.

Results: The percent of teens reporting ever use of flavored tobacco products showed a decline between 2010 and 2013 (19.6% vs. 15.6%, p=0.054). Teens who had tried flavored tobacco products were marginally less likely to be current smokers in 2013 than in 2010 (47.9% vs. 58.1%, p=0.0854). In the adjusted model, teens in 2013 had 37% lower odds of ever trying flavored tobacco products than teens in 2010 (Odds Ratio: 0.63, 95%CI: (0.52, 0.77)).

Conclusion: Declines in ever use of flavored tobacco products among teens suggests that the ban on sales of flavored tobacco products was successful in reducing use among this vulnerable group. Additional research is needed to assess if the absence of flavored tobacco products in retail stores is associated with reductions in the uptake of smoking among adolescents.

FUNDING: This work was partially funded by Cooperative Agreement Number 5U58DP002419-01S1 from The Centers for Disease Control and Prevention-Communities Putting Prevention to Work.
JUSTIFICATION: Our findings suggest that bans on sales of flavored tobacco products in other jurisdictions could also lead to reduced use among youth in those areas as well.

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POS2-87 ANALYSIS OF FREEDOM-BASED ADVERTISEMENTS BY ELECTRONIC CIGARETTE BRANDS

Diiva Ramamurthi, MS*, Aaron Goodwin, Robert K. Jackler, MD, Stanford Research into the Impact of Tobacco Advertising

Purpose: Electronic cigarettes (eCigs) use has tripled among adolescents in the past 3 years. Coinciding with the increased use, there has been more than a 15-fold increase in eCig advertising expenditure in 2013. The tobacco industry has long used freedom themes in its advertising, but they have been especially prevalent in eCig advertising. Advertisements containing messages of rebellion, liberation, and lack of rules are likely of differential appeal to youth. The goal of the present study is to characterize freedom-based themes in major eCig brand advertising.

Methods: A content analysis of advertising by Blu, NJOY, and FIN eCigs between 1/1/2014 and 6/30/2014. Print, online, and social media channels were analyzed. Articles were coded for the presence or absence of freedom-based themes in 9 thematic categories: freedom from rules, freedom from social consequences, cultural freedom, freedom from fear, and patriotism. Each major theme was further divided into subthemes. A coding book was developed and validated by inter-coder reliability.

Results: In the social media category, 398 Facebook posts were analyzed: Blu 231, NJOY 112, and FIN 55. The most common themes across the brands were Freedom from Rules (26%-57%), Cultural Freedom (19%-27%), and Freedom from Health Consequences (4%-18%). Blu aggressively encouraged consumers to actively oppose indoor smoke-free regulations (29%), FIN advertisements (19%) referenced freedom to “vape anywhere” with the slogan “Rewrite the Rules.” Coding reliability of the pilot sample calculated using Krippendorff’s Alpha ranged from 0.795 to 1. Freedom-based advertising in magazine and brand websites, while less numerous than social media outlets, were similar in message content.

Conclusion: Utilization of freedom-themed advertising, in many variations, is highly prevalent among major eCig brands. Such advertisements are likely to have preferential appeal to the young.

FUNDING: No Funding.

CORRESPONDING AUTHOR: Diiva Ramamurthi, Stanford Research Into the Impact of Tobacco Advertising

POS2-89 SMOKE-FREE POLICIES IN MULTIUNIT HOUSING: CORRELATIONS WITH SMOKING BEHAVIOR AND REACTIONS TO MESSAGING STRATEGIES IN SUPPORT AND OPPOSITION

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This study examined correlates of having smoke-free policies in multiunit housing (MUH) among U.S. adults and reactions to messaging regarding their implementation. In 2013, 2,500 U.S. adults were recruited through an online survey panel to complete a cross-sectional survey assessing tobacco use, personal smoke-free policies in homes and cars, and smoke-free MUH policies. We also assessed reactions to messaging in relation to smoke-free MUH policies using messaging frames of: health, economy, youth prevention, individual rights/responsibility, religion/morality, and hospitality. Overall, 762 (30.1%) lived in MUH; 423 (56.3%) had no smoke-free MUH policies; 207 (27.5%) had partial MUH policies (i.e., some smoke-free areas); 122 (16.2%) had complete smoke-free MUH policies (i.e., smoke-free in all indoor areas). Multivariate regression indicated that correlates of less restrictive MUH policies included younger age, lower education and income (p<.01). After controlling for sociodemographics and smoking-related factors, more restrictive smoke-free MUH policies were associated with fewer smoking days in the past month, recent quit attempts, and readiness to quit among current smokers (p<.05). More restrictive MUH policies were associated with greater private restrictions in homes and cars (p<.001). In terms of messaging strategies, “People have the right to smoke in their own homes” (rights/responsibility; M=6.8 on a scale of 1 to 9, being most persuasive) and “Property owners, not the government, should decide whether to permit smoking in their properties” (rights/responsibility; M=5.8) were the most persuasive messages opposing smoke-free MUH policies. The most persuasive messages in support were “You have the right to breathe clean air in your home” (rights/responsibility; M=7.7) and “Your loved ones have the right to breath clean air in your home” (youth; M=7.0). Smoke-free MUH policies may increase health in mental health and addictions settings was expected to create staff resistance to this change. Appreciating this long history, the implementation of this critical change included a strong focus on education, engagement, culture, and program changes. To understand the impact of this change, staff and patients were invited to voluntarily respond to a 5-point Likert scale attitudinal survey containing 15 questions. Surveys were launched pre-and post-launch of this initiative in order to understand culture and attitudinal shifts associated with this policy implementation. Response rate by staff was approximately 15% (n=454). Of those staff respondents, 8% self-identified as tobacco users. Of patient respondents (n=123), 42% self-identified as tobacco users. Despite our assumptions that staff and patients would not be supportive of this policy, pre-launch results indicated a high degree of support from both staff (71%) and patients (59%). However, survey results also indicated that despite support for the policy, both staff and patients expressed concern that a tobacco free policy may lead to stigmatization of tobacco users, (46% and 44%, respectively). Both groups also reported a lack of confidence in the hospital’s ability to implement this change (59% of staff, 52% of patients). Post launch responses demonstrated favorable shifts in confidence by staff (10% increase, p=.002) and reductions in concerns over exacerbation of patient symptoms (43% pre-launch vs. 37% post-launch, p=.001), however, no significant difference was observed in concerns over stigmatization (p=.93). Full comparisons between pre and post launch will be presented along with policy implementation resources and supports.

FUNDING: No Funding.

JUSTIFICATION: This work can support health care agencies in understanding the impact of implementing a tobacco free policy on staff and patient attitudes, along with gaining a pulse on staff concerns and facilitators for success.

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POS2-88 IMPLEMENTING A TOBACCO FREE POLICY IN A PSYCHIATRIC HOSPITAL: CHANGING CULTURE, ATTITUDES, AND BUILDING SUPPORTS

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The Centre for Addiction and Mental Health, a leading psychiatric hospital in Toronto, Canada, launched a tobacco free policy on hospital property in April 2014. This change was launched in response to staff and patient concerns around exposure to second hand smoke and risk of fire. However, despite the evidence-base that tobacco free organizations are safer and offer improved mental health and recovery outcomes; a long history of tobacco use as a positive reinforcer

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disparities; they are less common in lower SES groups but are associated with actions toward cessation among smokers. Messaging in favor of vs. against MUH policies was more persuasive, indicating the potential for using these approaches.

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JUSTIFICATION: Smoke-free MUH policies are less likely among lower socio-economic status groups, which may increase health disparities, given that MUH smoke-free policies are associated with actions toward cessation among smokers. Messaging in favor of versus against MUH policies was more persuasive; further work must determine how to garner support for MUH smoke-free policies.

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**POS2-91**

**GEOGRAPHICAL PROXIMITY OF COMMERCIAL WATERPIPE ESTABLISHMENTS (HOOKAH BARS & LOUNGE) AND COLLEGES/UNIVERSITIES IN THE UNITED STATES**

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Rationale: Waterpipe tobacco smoking (WTS) in the U.S. is most prevalent among young adults (ages 18-24) with some college education. The rapid diffusion of WTS establishments (hookah bars) has been accelerated by Internet promotion and the perception that WTS is less harmful than smoking cigarettes. WTS establishments are almost completely unregulated and limited information exists about the actual number of establishments in the U.S.

Objectives: To survey WTS establishments and assess their proximity to U.S. colleges.

Methods: We captured WTS establishments listed in the online Yellow Pages, Hookah-Hookah directory, Better Business Bureau database and Hoovers databases in all 50 states. Business addresses were geocoded into GIS and overlaid on a map of all accredited colleges with dorm residences greater than 250 students, greater than 500 students and greater than 1000 students. The proximity of colleges to the WTS establishments was then measured in 3-mile increments.

Results: There were 1152 WTS establishments found across all databases. The distance between 1458 colleges and the nearest WTS location was distributed as follows: dorm capacity 250+, 0 - 3 miles = 507 (34.8%), 3 - 6 miles = 137 (9.4%), 6 - 9 miles = 70 (4.8%), 9+ miles = 744 (51.0%), dorm capacity 500+, 0 - 3 miles = 435 (35.3%), 3 - 6 miles = 107 (8.7%), 6 - 9 miles = 55 (4.5%), 9+ miles = 636 (51.8%) and dorm capacity 1000+, 0 - 3 miles = 318 (35.8%), 3 - 6 miles = 66 (8.0%), 6 - 9 miles = 34 (4.1%), 9+ miles = 405 (49.2%). As the capacity increases the percentage of colleges with a WTS establishment within 3 miles increases 250+ = 34.8%, 500+ = 35.3%, and 1000+ = 38.6% indicating WTS establishments are locating near larger colleges.

Conclusions: Advocates for tobacco-free campuses need to be aware of this trend in tobacco consumption. This study could influence health policy initiatives aimed at reducing retail tobacco establishment exemptions that makes it possible for many of these WTS establishments to open even in states with strict smoke-free laws. Effective intervention is needed to protect this vulnerable population from experimenting with WTS as part of their college experience.

FUNDING: No Funding

JUSTIFICATION: This study provides public health policymakers a current baseline of the number of commercial waterpipe tobacco smoking establishments in the U.S. and supporting evidence these establishments are locating near large colleges to market to college students.

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**POS2-92**

**THE ROLE OF LITIGATION IN TOBACCO CONTROL**


Background: This presentation reviews the history of tobacco litigation in the United States.

Methods: Data for this study comes from industry business records available online through the UCSF Legacy Tobacco Documents Library, transcripts of court proceedings, and news and stock analyst reports on tobacco litigation.

Results: Litigation against the tobacco industry began in 1954, corresponding to the emerging evidence linking smoking and disease. A total of 109 lawsuits were filed between 1954 and 1970, but only 8 were tried and all ended in defense verdicts. Another 150 cases were filed between 1970 and 1985, but none went to trial. There was a second wave of cases filed during the mid-1980s that led to jury trials, but only one, Cipollone v. Liggett Group, was a plaintiff verdict. A third wave of litigation followed in the early 1990s, with several plaintiffs’ verdicts. By 1999, juries were awarding punitive damages against the defendants. The state Attorney General cases against cigarette manufacturers resulted in the Master Settlement Agreement in 1998 resulting in the release millions of pages of company business records. These documents have played a key role in fueling subsequent litigation and winning cases. The Engle v. Liggett Group class action verdict on behalf of injured smokers in Florida in the late 1990s helped to change the industry’s long held position that smoking was unproven as a cause of disease and that nicotine was not addictive. Decertification of the Engle class action lawsuit spawned several thousand individual lawsuits against the cigarette industry in Florida, which have resulted in dozens of verdicts favoring plaintiffs since 2009. Additional litigation against the tobacco industry continues nationwide on the “light” cigarettes fraud and on individual personal injury cases that have resulted in notable plaintiffs’ verdicts.

Conclusion: Litigation has proven to be a powerful tool for tobacco control efforts helping to change public sentiment about the industry and its products, increasing the costs of cigarettes, and forcing the industry to accept responsibility for its deceptive practices.

FUNDING: Flight Attendant Medical Research Foundation

JUSTIFICATION: Litigation has proven to be a powerful tool for tobacco control efforts helping to change public sentiment about the industry and its products, increasing the costs of cigarettes, and forcing the industry to accept responsibility, in front of a jury, for its deceptive practices.

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Introduction: Limited research has been conducted to assess the role of health literacy in the processing of graphic health warning labels (GWLS). Analyses of data from rural adult current smokers aim to evaluate the influence of health literacy on attention to pictorial elements of FDA proposed graphic health warning labels.

Methods: Rural daily smokers (n=180) were randomly assigned to view a cigarette advertisement with one of 9 warning labels from two of three study conditions: two intervention conditions with GWL comprising 20% or 33% of the advertisement area, or a text-only control (n=118; excluded due to lack of exposure to a pictorial image). Eye-tracking software measured attention to areas of interest within the cigarette advertisement. For each participant, the time spent on the GWL was divided into the proportion of time viewing the pictorial (graphic) imagery, and then multiplied by one-hundred. Participants’ health literacy was evaluated using the Short Test of Functional Health Literacy in Adults (S-TOFHLA). Linear regression analysis was used to evaluate the association between S-TOFHLA scores and the percentage of time spent on pictorial imagery within the GWL.

Results: Results indicate for every one unit increase in health literacy, the percentage of time viewing pictorial elements of the GWL decreased by 1.26 percentage points. A separate analysis, only including individuals identified as having Adequate Functional Health Literacy, revealed that for every one unit increase in health literacy the percentage of time viewing pictorial elements of the GWL decreased by 1.73 percentage points.

Conclusions: Results suggest that the addition of GWLs may increase awareness concerning the health effects of cigarettes among low health literate individuals and the general public. Further, the health literacy of consumers should be taken into consideration in the design of new GWLS for tobacco products in order to optimize their use as a tobacco control tool in the United States.

FUNDING: This work was supported by the National Cancer Institute/Center for Tobacco Products (R01CA1219711). JUSTIFICATION: Results will be directly informative to tobacco control policies for the design of new graphic warning labels for cigarettes, and may be applicable to other tobacco products as well.

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We tested our hypotheses by computing multiple linear regressions relating the percentage of smokers who attempted to quit in the past 12 months, and the number of cigarettes smoked to smoking prevalence. We also investigated changes in these relationships over time.

Regression analysis shows clear evidence of a stable relationship of smoking prevalence and both outcomes over time, pointing towards softening rather than hardening of the smoking population. For each percent drop in prevalence quit attempts increase by .56 ± .08 (SE), p<0.001 in the US and by .22 ± .05, p<0.001 in the EU. The slopes and intercepts of these regressions were stable over time (p>0.30).

These population level results reject the hypothesis of hardening as smoking prevalence drops and, instead, support softening of the smoking population as prevalence declines, which is inconsistent with the fundamental assumption of harm reduction.

JUSTIFICATION: Results will be directly informative to tobacco control policies for the design of new graphic warning labels for cigarettes, and may be applicable to other tobacco products as well.

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**POS2-94**
DOES THE HARD CORE SMOKER REALLY EXIST? THE SMOKING POPULATION IS SOFTENING RATHER THAN HARDENING
Margaret C. Kulik*, Stanton A. Glantz, Center for Tobacco Control Research and Education, University of California, San Francisco

Smokeless tobacco and, more recently, e-cigarettes have been promoted as a strategy to deal with hard core smokers who are not able or not willing to quit. We hypothesize that if hardening is occurring there would be a positive relationship between smoking prevalence and quitting, with less quitting at lower prevalence. In addition, there would be a neutral or negative relationship between prevalence and the number of cigarettes smoked by each remaining smoker, with the same or more cigarettes being smoked at lower prevalence.

We examined these relationships in 18 years of observations from the US Tobacco Use Supplement of the Current Population Survey (1992/3-2010/11) and 3 and 6 years from Eurobarometer surveys for Europe (2006-2009-2012) for 51 states in the US and 29 countries in Europe.

At the first post-ban survey wave (in 2006) over 90% of smokers in Thailand were aware of the display ban policy and supported it, and about three-quarters of smokers thought the ban was effective. Noticing cigarette displays in stores was only asked from Wave 2 (2006), and was lowest (17%) in 2006 in Thailand shortly after the ban came in, but increased at later survey waves (p<0.01); but the levels were consistently lower than those in Malaysia (where over 83% noticed displays across the waves). In both countries younger smokers were more likely than older ones to notice displays. For noticing tobacco advertising at POS, smokers in Thailand consistently reported lower levels (less than 10%, either in stores or around street vendors) than those reported in Malaysia (at least 27% in stores and over 16% around street vendors). Overall, in both countries smokers in rural areas were more likely to notice advertising at POS than their urban counterparts.

The ban on POS cigarette displays has reduced exposure at POS. The higher level of noticing POS displays than advertising suggests it is generally more salient to smokers. Findings are consistent with those from western countries. It is not clear whether the trend to greater noticing from a low point immediately after...
the ban reflects problems with sustaining implementation or is due to increased sensitivity of ban violations or of times when cupboards are opened to display their contents.

FUNDING: The research reported in this paper was supported by grants P50 CA111236 and R01 CA100362 (Roswell Park Transdisciplinary Tobacco Use Research Center) from the US National Cancer Institute, Canadian Institutes for Health Research (57897 and 79551), Thai Health Promotion Foundation and the Malaysian Ministry of Health.

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POS2-96 QUALITY OF PROVISION OF SMOKING CESSATION CARE IN A SMOKE-FREE INPATIENT PSYCHIATRIC FACILITY

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Objective: The quality of implementation of smoke-free policies in inpatient psychiatric facilities, including patient adherence, staff support and provision of nicotine dependence treatment, has been reported to be poor. The extent to which these quality indicators are associated with patient support for such policies, has not been examined.

Aims: To examine patients': 1) adherence to a smoke-free policy; 2) perception of staff support for the policy; 3) receipt of nicotine dependence treatment; and 4) acceptability of the smoke-free policy, and its association with these factors.

Method: Cross-sectional survey of patients in an inpatient psychiatric facility with a total smoke-free policy.

Results: A total of 181 participants (53.6%; n = 97 smokers and 46.4%; n = 84 non-smokers) completed the survey (90.9% response rate). Smokers' adherence to the policy was poor (63.5% smoked). Only half (53.6%) perceived staff to be supportive of the policy. Most smokers used nicotine replacement therapy (75.3%); although receipt of advice to quit was low (36.1%) and few received optimal treatment (19.6%). Overall, 45.9% of patients viewed the smoke-free policy in the unit as positive (29.9% smokers; 64.3% non-smokers). For smokers, perceiving staff to be supportive of the policy and adhering to the smoke-free policy were associated with a more positive view towards the smoke-free policy.

Conclusions: Strategies to increase patient adherence, staff support, and provision of adequate nicotine dependence treatment may improve patient support for smoke-free policies.

FUNDING: This work was supported by Australian Rotary Health, the Hunter Medical Research Institute (HMRI), the Commonwealth Department of Health and Ageing (DoHA) and Hunter New England Population Health (HNEPH).

JUSTIFICATION: Nicotine dependence treatment needs to be provided consistently and at a dose-appropriate level to manage nicotine withdrawal in smokers admitted to inpatient psychiatric facilities.

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POS2-97 EXAMINING THE IMPACT OF CHANGES IN SCHOOL TOBACCO CONTROL POLICIES AND PROGRAMS ON CURRENT SMOKING AND SUSCEPTIBILITY TO FUTURE SMOKING AMONG YOUTH IN THE FIRST TWO WAVES OF THE COMPASS STUDY: LOOKING BACK TO MOVE FORWARD

Scott T. Leatherdale, Adam G. Cole*, School of Public Health and Health Systems, University of Waterloo.

Introduction: The school environment represents an equitable avenue for health behaviour change among youth; however, there is little guidance for school-based tobacco control programming within Ontario. Furthermore, it is not known the types of interventions that are used by schools to prevent smoking uptake among students.

Methods: This study evaluated the impact of changes to school-level programs and policies related to tobacco use in 43 secondary schools across Ontario using COMPASS data. Self-reported student behaviours (smoking susceptibility and current smoking) were compared between Year 1 (Y1) and Year 2 (Y2) in control (no change in tobacco control programming or policies) and intervention schools (reported a change in tobacco control programming or policies).

Results: None of the schools ranked tobacco as the top priority (out of 10) in Y1, and one school ranked tobacco as the top priority in Y2. Between Y1 and Y2, 17 schools reported a change in their tobacco control programming or policies. Four out of six schools that implemented interventions had a positive impact on the prevalence of smoking susceptibility between Y1 and Y2 (i.e., an increase in the prevalence of smoking susceptibility), and 5 out of 13 schools that implemented interventions had a positive impact on the prevalence of current smoking between Y1 and Y2 (i.e., a decrease in the prevalence of current smoking).

Discussion: Tobacco prevention was not a priority at any school in Y1 but 40% of schools still did implement new programming between Y1 and Y2. Interventions specific to effective and enforced tobacco control were the most common and consistently had the desired impact on the prevalence of smoking susceptibility and current smoking. Due to the variation in the types of interventions implemented and their effectiveness, additional evaluation evidence is necessary to determine the most successful activities and contexts. Opportunities exist for additional partnerships between COMPASS, the Government of Ontario, and Smoke-Free Ontario stakeholders to help generate the evidence necessary to maximize the potential success of future provincial tobacco control prevention initiatives.

FUNDING: The COMPASS study was supported by a bridge grant from the Canadian Institutes of Health Research (CIHR) Institute of Nutrition, Metabolism and Diabetes (INMD) through the "Obesity - Interventions to Prevent or Treat" priority funding awards (OOP-110786; grant awarded to ST. Leatherdale) and an operating grant from the Canadian Institutes of Health Research (CIHR) Institute of Population and Public Health (IPPH) (MOP-114875; grant awarded to ST. Leatherdale).

JUSTIFICATION: Interventions specific to effective and enforced tobacco control most consistently had the desired impact on the prevalence of smoking susceptibility and current smoking.

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POS2-99
IDENTIFYING PATHWAYS TO TOBACCO POLICY CHANGE USING COMMUNITY BASED PARTICIPATORY RESEARCH: KEY INFORMANT INTERVIEWS WITH CAMBODIAN, PACIFIC ISLANDER AND NATIVE HAWAIIAN COMMUNITIES
Sambo Sak1*, Sovannha Has1, Coral Kenolio2, Tana Lepule BA2, Lillian Lew1, Lola Sablan Santos2, Paula Healanl Palmer, PhD2, Elisa Tong, MD MA2, Emily Makini, BS3, Lisa Fu, MPH2, Rod Lew, MPH2, Families in Good Health/St. Mary's Medical Center, Empowering Pacific Islander Communities, Guam Communications Network, University of California, Davis, Claremont Graduate University, Asian Pacific Partners for Empowerment, Advocacy and Leadership

Introduction: Tobacco control policies have contributed to creating the largest social norm change and the decline of the tobacco use in the country. However, there remains little engagement of Asian American, Native Hawaiian and Pacific Islander (AANHPs) communities in tobacco policy change, while there is also still a high prevalence of tobacco use in these communities. METHODS: Utilizing a community based participatory research approach, the “Community-led Policies and Leadership to Eliminate Asian American and Pacific Islander Tobacco Disparities (COMPLEAT)” project implemented key informant interviews assessing pathways to successful policy change among Cambodians in Long Beach and Native Hawaiians and Pacific Islanders in San Diego. RESULTS: Project staff, scientific partners, and community partners developed and piloted key informant interview questions. Community partners were trained to conduct and analyze key informant interviews (N=21) with a sample of community leaders and advocates that have been involved in policy advocacy work. Results suggested three discourses influencing Cambodian, Native Hawaiian, and Pacific Islander communities to engage in advocacy work: 1) Policy Change (i.e., experience ranges for all communities and there is a strong need for an investment in culturally tailored communication), 2) Intergenerational Dynamics (i.e. refugee and migration experiences contribute to acculturation, that can be seen as a loss and a gain), and 3) Threats (i.e. cultural trauma can contribute to PTSD and also creates the need to talk about fear and cultural resilience). FUNDING: National Institute for Minority Health Disparities, #1R24MD008041-01

POS2-100
MEASURING THE INTEGRATION OF TOBACCO CONTROL POLICY AND TOBACCO DEPENDENCE TREATMENT INTO THE BEHAVIORAL HEALTH CARE DELIVERY SYSTEM: HOW ARE WE DOING?
Bruce A. Christiansen, PhD*, Samantha A. Dunn, Rachel A. Berger, Elizabeth M. Sargent, Michael C. Fiore, MD, MPH, MBA, University of Wisconsin Center for Tobacco Research and Intervention

Introduction: People with a mental illness and/or drug use disorder have a high rate of smoking and experience a very significant burden from tobacco-related diseases. Efforts are underway to integrate the treatment of tobacco dependence into the behavioral health care delivery system. Such efforts need to be informed by assessments of this integration. Currently, such comprehensive assessments do not exist.

Methods: A 63 item internet survey measured integration in three areas: policy addressing the use of tobacco products by staff, patients and volunteers on the premises; providing evidence-based tobacco dependence treatment to patients; and helping employees/volunteers to quit. The survey was distributed to all behavioral health programs in Wisconsin following an announcement e-mail from the Wisconsin Division of Mental Health and Substance Abuse Services and followed by two reminder e-mails. A ten dollar thank you payment was provided.

Results: Response rate was 27.1%. Survey responders did not differ from non-responders on available data. On the average, programs were 40% integrated with 20% of the programs less than 20% integrated and 4.3% exceeding 80% integration. Integration did not vary by size or type of program. Programs were equally integrated regarding tobacco use policy and providing tobacco dependence treatment. Response to attitude questions and an open-ended question indicated the need for staff training and technical assistance. Implications for future integration and study limitations are discussed.

Conclusion: There remains a large need to integrate tobacco policy and treatment into the behavioral health care delivery system. In order to integrate, programs need technical assistance and training about delivering evidence-based tobacco dependence treatment. Integration efforts should emphasize the goal of providing evidence-based interventions that reflect current motivation to quit rather than requiring all patients immediately engage in quit attempts.

FUNDING: This project was funded by the Wisconsin Tobacco Prevention and Control Program and the Division of Mental Health and Substance Abuse Services

JUSTIFICATION: This survey provides the content with which to measure the integration of tobacco policy and tobacco dependence treatment in the behavioral health care delivery system.

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POS2-101
CHANGES IN ATTITUDES TOWARD TOBACCO FREE CAMPUS POLICIES AFTER THE IMPLEMENTATION OF A TOBACCO FREE CAMPUS POLICY IN A U.S./MÉXICO BORDER UNIVERSITY
José A. Cabriales, PhD, Nora Hernandez, M.BA, Annette Torres, BA, Edith Hernandez, Ishmael Lopez, BS, Theodore V. Cooper, PhD

Although tobacco free campus (TFC) policies have increased, few studies have assessed attitudes toward these policies, especially within ethnic minority samples. This study assessed changes in attitudes toward TFC policies after policy implementation on the U.S./Mexico border.

Students, faculty, and staff (Baseline: N=3002; Mage=30.4 (12.58); 63.0% female; 67.7% Hispanic; Posttest [one month after TFC policy implementation]: N=3360; Mage=29.1 (12.04); 57.9% female; 53.9% Hispanic) completed an online survey assessing sociodemographics, tobacco use history, attitudes toward TFC policies, tobacco use risk perception, and perceived problematic campus tobacco use. An unequal variance (for independent samples) t-test assessing changes between data waves indicated significant differences in attitudes toward TFC policies (model 1; Mbaseline=1.77 [.79]; Mposttest=1.84 [.84], t (5923)=3.70 (less positive), tobacco risk perception (model 2; Mbaseline=1.66 [.61]; Mposttest=1.69 [.64]), t (6164)=2.35 (lower risk perception), and perceived problematic tobacco use (model 3; Mbaseline=2.52 [.92]; Mposttest=2.44 [.94], t (5818)=3.33 (fewer problems; all ps < .02). Significant linear regressions assessed correlates of the same outcomes at posttest only. Model 1 correlates were gender B=.09 (males less positive), age B=.06 (greater age less positive), ethnicity (ref. group: Hispanics; whites B=.04 [less positive], Asian Americans B=.03 [more positive]), and current smoking B=.45 (less positive). Model 2 correlates were gender B=.08 (males lower risk perception), and current smoking B=.26 (lower risk perception). Model 3 correlates were gender B=.11 (males fewer problems), while ethnicity B=.09 (fewer problems), and current smoking B=.24 (fewer problems) (all ps < .05).

Two of the changes in these TFC constructs were in an unanticipated direction (attitudes and risk perception), however, were minimal. Gender and ethnic/naturalized posttest differences indicate salient targets for TFC policy enforcement and intervention efforts. Theoretical models positing cultural influences (e.g., collectivistic vs. individualistic) on attitudes and beliefs may warrant exploration.

FUNDING: This project was funded by A Smoke Free Paso del Norte Grant No. 226-6113-63A.
but less is known about how the tobacco industry adjusts prices following a tax increase since 2000. Tax is a known, effective method to decrease nicotine levels in cigarettes (63% ± 5.0%). These measures received strong overall support from all groups in the sample.

Our findings suggest that the public, including most smokers, will support policy makers gradually reducing the nicotine content of tobacco while rapidly expanding community-based cessation access and advice. Supply restrictions that reduce youth access to tobacco, particularly measures that disallow sales near schools, communities, and workplaces, received strong public support. Implementing these measures would further reduce the anomalous ease with which tobacco can currently be accessed, while simultaneously reinforcing smoking as an unacceptable social behavior.

Policy makers have available to them a cornucopia of interventions that received strong public support. Implementing these measures would further reduce the anomalous ease with which tobacco can currently be accessed, while simultaneously reinforcing smoking as an unacceptable social behavior.

We investigated changes in cigarette sales and prices before and after the tax increase using scan data from convenience stores, the primary channel for U.S. cigarette sales.

A.C. Nielsen Scantrack Database included mean price and total packs sold per month for 2012 and 2013, at a panel of 403 stores in the state's largest market area. The database also provided product information including flavor and a "strength" field that pre-dated the descriptors ban on advertising, categorizing cigarettes as "light" or "regular." All prices were adjusted to December 2013 dollars using the consumer price index.

As expected, smokers purchased fewer cigarettes after the tax increase that took effect July 1. Total July-December sales in 2013 were 12.1% lower than the same period in 2012, compared to only a 3.2% reduction in January-June (before the tax increase). Overall mean pack prices rose $1.75 (29.4%), from $5.96 (Jan 2012-Jun 2013) to $7.73 (Jul-Dec 2013). However, changes in individual pack prices varied by starting price, flavor, and marketed "strength" (p<0.05 for all). For example, the mean price of "full strength" menthol cigarettes increased by $1.84 (se=$0.03), while the mean price of "light" menthol cigarettes increased by only $1.62 (se=$0.07), price shifts both significantly different from the nominal tax increase of $1.75 (p<0.05).

We found evidence that Minnesota’s tax increase reduced the number of cigarettes purchased at convenience stores, but also that cigarette price change differed by product characteristics, suggesting differential pricing strategies used by the cigarette industry. Surveillance of industry efforts to blunt that effectiveness, is necessary to inform future policy decisions.

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Strength (e.g. mild, light, silver, white); Flavor (e.g. fresh apple, coffee and tobacco, enriched flavor); Quality (e.g. quality guarantee, class A, superior); Luxury (e.g. diamond cut, silk); Global & travel (e.g. London, international); Tradition & History (e.g. empire edition, since 1907, established 1873); and Technology & Modernity (e.g. switch, HD taste system, Taste).

Conclusion: English is nearly ubiquitous on cigarette packs in this global sample of low and middle income countries. English terminology and phrasing is used to communicate key product features such as size, strength and flavor, and also to convey aspirational qualities of cigarettes including tradition, luxury, quality and modernity.

FUNDING: This work was supported with funds from the Bloomberg Initiative to Reduce Tobacco Use

JUSTIFICATION: This research can serve to support the further development standardized packaging policy in the countries studied, which represent five WHO regions.

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POSTER SESSION 2 • Thursday, February 26, 2015 • 4:15 p.m.–5:45 p.m.

**POS2-105**

YOUTH ACTIVITY SPACES AND DAILY EXPOSURE TO TOBACCO OUTLETS

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We conducted a pilot study to assess whether exposure to tobacco outlets in the broader environment where youths spend their time (i.e., activity spaces) differs from that obtained using traditional measures of tobacco outlet density around homes and schools. We recruited 11 youths (ages 14-18, 4 males) in 3 California cities. Youths completed an initial survey, daily text-prompted surveys, and carried GPS-enabled phones for one week. Five youths reported past year tobacco use on the survey. We geocoded the GPS locations and constructed activity spaces by joining sequential points. Because our tobacco outlet data were limited to city boundaries, we only considered line segments that fell completely within the city boundaries. We calculated the number of tobacco outlets using 50m and 100m buffers around these polylines and around their homes and schools. We adjusted for the proportion of time respondents were within their city of residence (Mean=0.87). On average, there were 18.8 and 22.7 tobacco outlets in the 50m and 100m buffers around activity spaces, respectively. There were only 0.2 and 0.4 outlets within 50m and 100m of youth homes and none around schools. The average number of outlets within 50m and 100m of activity spaces among past year tobacco users was 22 and 26.3, respectively. It was less among non-users (15 and 18.4, respectively). No differences were seen when considering outlets around homes (0.4 and 0.8 among users vs. 0 and 0 among non-users) or schools (0 for all). Using daily data about tobacco use and exposure to tobacco outlets within activity spaces, we compared days of tobacco use (N=13) with days of non-use (N=47). We found greater exposure to tobacco outlets in the 100m activity spaces on days when youths reported tobacco use (M=7.8) compared with days when they did not (M=4.2), t(56) = 2.1, p < .05. Results were similar but marginally significant for the 50m activity spaces. Results suggest that activity spaces may provide a better measure of tobacco outlet exposures than traditional measures, and therefore assessing activity spaces could yield significant information to advance the field.

FUNDING: No Funding

JUSTIFICATION: Results suggest that activity spaces may provide a better measure of tobacco outlet exposures than traditional measures, and therefore assessing activity spaces could yield significant information to advance the field.

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**POS2-106**

COMPLIANCE WITH STATE CIGARETTE MINIMUM PRICING LAWS AND THE IMPACT OF DISCOUNTING IN RETAIL STORES: RESULTS OF A NATIONAL STUDY

Margaret H. Smith*, Shelley D. Golden, PhD, Katherine W. Byerly, Jamie F. Chirqui, PhD, Hillary R. DeLong, JD**, Kurt M. Ribisl, PhD**. *Gilling School of Global Public Health, University of North Carolina, Chapel Hill, NC, **Linberger Comprehensive Cancer Center, University of North Carolina, Chapel Hill, NC, University of Illinois at Chicago, Institute for Health Research and Policy

Introduction: Increasing tobacco prices decreases tobacco consumption and initiation. Although tax policies are widely used to achieve higher tobacco prices, recent studies have shown the need for alternative pricing strategies. Almost two-thirds (62%) of US states have adopted cigarette minimum pricing laws (MPLs) that mandate that cigarettes be sold above a minimum price set by a formula. Previous research, however, finds that cigarette prices are no higher in states with MPLs, perhaps because most state laws have an industry discounting loophole that allows the retailer to sell below the minimum price.

Methods: In this study, we assess the frequency with which consumers were able to purchase cigarettes below the state minimum price, and explore the potential role of discounting in this occurrence. Cigarette purchase prices were derived from data collected in a 2012 nationally representative sample of retail stores in 40 states, half of which had MPLs. Data collectors purchased a single pack of cigarettes in each of the 2,114 stores and recorded the paid price. We compared the recorded price to the expected minimum price that we calculated for each MPL state, and assessed whether below minimum price purchases were more common in MPL states that allow discounts compared to MPL states that do not. We then used multilevel regression models to determine whether having an MPL, with or without a discount ban, was associated with higher paid prices.

Results: Of the 799 packs purchased in states with MPLs, 44% were sold at prices lower than the expected minimum. Below minimum price purchases were more likely in states that allow discounts. Consistent with previous research, we found no difference in cigarette pack prices in states with and without MPLs. However, prices were significantly higher when MPL states prohibited price discounting, compared to MPL states that did not prohibit discounting and states that had no MPLs.

Conclusions: Minimum price laws that restrict the ability of retailers to use discounting to lower the price below the legislated minimum may have a stronger impact on cigarette prices, and may better contribute to tobacco control goals.

FUNDING: Research reported in this presentation was supported by grant number CA154281 from the National Cancer Institute at the National Institutes of Health as part of the ASPIRE study (Advancing Science and Policy in the Retail Environment), and by grant number 1P50CA180907-01 from the National Cancer Institute and FDA Center for Tobacco Products (CTP). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH or the Food and Drug Administration.

JUSTIFICATION: Data in this study show that minimum price laws should be strengthened to restrict the ability of retailers to use discounting to lower the price below the legislated minimum, a practice that may significantly raise prices, thus decreasing tobacco consumption and initiation.

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**POS2-107**

MASTER SETTLEMENT AGREEMENT COMPLIANCE TOBACCO DIRECTORIES: A TOOL TO TRACK TRIBALLY MANUFACTURED CIGARETTES

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Background: Under the Master Settlement Agreement (MSA) of 1998, states won the right to billions of dollars from tobacco companies, which agreed to pay for the financial burden of tobacco-related diseases. In 2003 and 2004, additional legislation was passed that aimed to clarify the terms of the agreement. As part
BEHAVIOR AMONG USERS OF TRADITIONAL CIGARETTES
DIVERSIFYING NICOTINE SOURCES? DUAL USE AND QUITTING
REDUCING HARM, MOVING TOWARD QUITTING, OR JUST
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POS2-108
REDDUCING HARM, MOVING TOWARD QUITTING, OR JUST DIVERSIFYING NICOTINE SOURCES? DUAL USE AND QUITTING BEHAVIOR AMONG USERS OF TRADITIONAL CIGARETTES

Sherry Emery*, Jidong Huang, Yoonsang Kim, Hy Tran, University of Illinois at Chicago.

Introduction: Awareness and use of e-cigarettes and other novel tobacco products (OTPs) has increased significantly in recent years. The use of OTPs is controversial in the argument around cessation and harm reduction. Proponents argue that these products are less harmful and help smokers quit combustible cigarettes, while opponents argue that they prolong the nicotine addiction. The purpose of this study is to examine how often smokers use OTPs to quit combustible cigarettes, and whether and to what extent their dual use is associated with quit intentions and attempts.

Methods: We conducted a national online survey about tobacco use behavior in 2013. Collected was information about tobacco product use and quitting behaviors among cigarette smokers (N=6607). We compute proportions and odds ratios to look at the associations of quitting behaviors with other tobacco products. Survey weights are adjusted for all analyses.

Results: 40% of cigarette smokers currently use OTPs as well and 90% of e-cigarette users use other products including cigarettes. About one third of the cigarette smokers who have tried to quit used e-cigarettes as a cessation aid. 70% of those smokers who used e-cigarettes to quit is (or has become) a regular user of e-cigarettes. Dual users have higher odds of having intention to quit in next month and having made recent quit attempts than cigarette only users. Dual users smoke the same cigarettes as cigarette only users: 13 cigarettes a day (no significant difference, p>0.5).

Discussion: E-cigarettes is one of the top methods smokers use to quit. However, majority of smokers who used e-cigarettes to quit smoking continues to use e-cigarettes regularly along with cigarettes. In addition, the average cigarette consumption of dual users is not smaller than cigarette only users. These suggest that dual users are diversifying products rather than actually moving toward quitting although initial intention might have been different. The second wave of the survey will help to find whether these dual users successfully quit in a longer term.

FUNDING: U01-CA154254 from NCI

JUSTIFICATION: Our study provides important information to regulate the marketing and advertising novel tobacco products.

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POS2-109
EVIDENCE TO SUPPORT TOBACCO ENDGAME MEASURES

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Canada has been a world leader in tobacco control, with Ontario at the forefront of early adopters of many tobacco control measures over the past twenty years. However, the decline in the prevalence of current cigarette smoking in Ontario has stalled at 18%, with no significant change since 2008. Simulation modelling suggests that with the full implementation of the World Health Organization's recommended policy package of six evidence-based measures, also known as MPOWER, adult smoking prevalence will still be above 12% by 2043. Therefore, novel and potentially radical strategies will be needed to put a stop to the tobacco epidemic.

A comprehensive list of potential interventions was drawn from the peer-reviewed and grey literature. Several interventions would be considered evolutionary (akin to what is currently being done in Ontario but may go beyond WHO recommendations) or revolutionary (interventions which may be very different from what is currently being done in Ontario, may be controversial, may have a significant impact on reducing smoking-related behaviours more rapidly than other categories of interventions, and may have a potential role in an endgame for tobacco control). Novel interventions were selected for further discussion in this report, with the objective of reviewing related evidence and assessing their potential impact on tobacco-related behaviours in the Ontario context. These include: plain and standardized packaging; measured to decrease outlet density (including zoning and licensing); dramatic tax increases; banning the sale of cigarettes; novel regulatory models (including designated retail outlets, a regulated market model, a non-profit enterprise model and an independent nicotine regulatory agency.

The evidence from tobacco and non-tobacco experience with each of these interventions is critically reviewed and conclusions drawn as to the state of the evidence and the feasibility of adoption and implementation.

FUNDING: This study was funded under the knowledge and evaluation support function of the Ontario Tobacco Research Unit with funding from the Ontario Ministry of Health and Long-term Care.

JUSTIFICATION: Governmental and non-governmental agencies are now calling for strategies to end the recreational use of tobacco within a generation; evidence from this study will guide decisions on how to move forward.

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POS2-110
DIFFERENTIAL IMPACT OF U.S. SMOKE-FREE LAWS ON HOSPITALITY EMPLOYMENT BY EMPLOYER SIZE, 1990-2012

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A significant gap in the literature on the economic impact of smoke-free air laws is the potential for differential effects on employers of varying size. Prior studies on the economic impact of smoke-free air laws have examined this impact in the aggregate for a given locality or state. This study estimates the relationship
between hospitality employment (NAICS 72 - accommodation and food services) and percentage of U.S. population covered by smoke-free air laws (restaurant, bar, and/or workplace), stratified by employer size, using a dynamic instrumental variables panel model. Hospitality employment totals by employer size were obtained from the Quarterly Census of Employment and Wages. Restaurant smoke-free air law coverage was positively associated with hospitality employment for employers with 20 to 49 employees. Bar smoke-free air law coverage was negatively associated with hospitality employment for employers with <5 employees and 5 to 9 employees. Workplace smoke-free air laws were positively associated with hospitality employment for small and mid-sized employers (10 to 19, 20 to 49 employees) and negatively associated for some larger employer sizes (100 to 249, 500 to 999 employees). These findings suggest that restaurant smoke-free air laws have had, at worst, no impact on overall hospitality employment. Smaller employers (<10 employees) appear to be negatively impacted by bar smoke-free laws; however, the magnitude of the effect is quite small (decline of 0.01-0.04% per additional 1% of population covered). The results for workplace smoke-free laws are mixed, with estimates of a positive effect for some small and mid-sized employers and a negative effect for some larger employers.

FUNDING: No funding to declare for this study.

JUSTIFICATION: This research provides policymakers with evidence on how smoke-free air laws may impact hospitality firms of varying size, allowing them to design legislation that best fits their local community.

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POS2-112
IMPACT OF PRICE CHANGES IN LITTLE CIGARS AND CIGARETTES ON LITTLE CIGAR SALES, UNITED STATES, Q4 2011- Q4 2013

Doris G. Gammon, MS*, Daniel L. Dench, BA, Brett R. Loomis, MS, Todd Rogers, PhD, Brian A. King, PhD

Little cigars are comparable to cigarettes with regard to shape, size, filters, and packaging, and the tobacco industry has promoted little cigars as a lower-cost alternative to cigarettes. Disproportionate tobacco excise taxes may lead consumers to substitute a more expensive pack of cigarettes with a less expensive pack of little cigars; however, few studies have assessed the extent to which little cigar sales are affected by price changes of little cigars and cigarettes. Using quarterly state-level sales data from a customized retail scanner database, we modeled a log-log equation to infer own-price and cross-price elasticity of demand for little cigars with respect to the price of little cigars and cigarettes, respectively, for select states from Quarter 4 2011 through Quarter 4 2013. Data were available for convenience stores (C-stores) (29 states) and food, drug, and mass merchandisers (FDM) (44 states). Little cigar pack sales were regressed on little cigar pack price and cigarette pack price in order to measure the own-price and cross-price elasticity of demand for little cigars with respect to the price of little cigars and cigarettes, respectively. Using this model specification, a negative and significant correlation between little cigar pack price and little cigar pack sales was observed. A positive and significant correlation between cigarette pack price and little cigar pack sales was also observed, suggesting a substitution effect. A 10% increase in the price of little cigars was associated with a 15.7% (p<0.01) decline in little cigar pack sales in C-stores and a 20.0% (p<0.01) decline in FDM stores. Additionally, a 10% increase in the price per pack of cigarettes was associated with a 13.3% (p<0.01) increase in little cigar pack sales in C-stores and a 5.9% (p<0.01) increase in FDM stores. These data suggest that U.S. cigarette smokers may be avoiding the higher cost of cigarettes by switching to little cigars. More in-depth modeling is warranted to understand the interplay of little cigar price and cigarette prices on little cigar sales to help inform tobacco prevention and control policy, planning, and practice.

FUNDING: Support provided by the Centers for Disease Control and Prevention, Office on Smoking and Health. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

JUSTIFICATION: Increasing the price of tobacco significantly reduces consumption, but this decline is lessen if tobacco users have a cheaper alternative; policies to reduce excise tax differentials across tobacco products can help curb tobacco use.

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POS2-113
STOPLIGHT LABELING: THE EFFECTS OF HEURISTICS ON NICOTINE PRODUCT PURCHASE BEHAVIOR IN AN EXPERIMENTAL MARKETPLACE
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Simple heuristics are often used in daily decision-making to moderate the complexity of some tasks. For example, labeling heuristic schemes using a pictorial representation of a stoplight image (i.e. red, yellow, or green illumination) are effective in altering the perception of the nutritional value of food items. Stoplight labeling also provides information when presented with multiple commodity comparisons or in evaluating a single product. In the face of increasing prices of tobacco products, some smokers may choose to increase trial and consumption of alternative reinforcing such as e-cigarette nicotine products. In a recent laboratory study, we showed decreased purchase behavior for cigarettes as a function of price and evidence of substitution with e-cigarettes in an experimental marketplace. With the propagation of these novel nicotine products, warning labels indicating the degree of risk may alter their perception of health consequences. The present study recruited smokers from Amazon Mechanical Turk to participate in an “Amazon”-like online marketplace where conventional cigarettes and e-cigarette nicotine products were available for hypothetical purchase. To examine the effect of stoplight labeling on product purchase behavior, cigarettes were labeled with a red stoplight, whereas stoplight color (i.e. red, yellow, green, none) was manipulated between groups for e-cigarettes (disposable and non-disposable products). Participants were exposed to four cigarette prices while e-cigarette prices remained constant. Cigarette purchases decreased with increases in price. Importantly, greater substitution for e-cigarette products was observed when labeled with green compared to those labeled with red lights. These results suggest that heuristic labeling is a phenomenon and may influence purchase behavior of alternative products. Thus, in an environment of increasing tobacco product prices, labeling schemes should be attended to when developing new policies.
FUNDING: Small grant from (ITC) International Tobacco Control Policy Evaluation Project
JUSTIFICATION: Understanding the influence of simple heuristic labeling of novel nicotine products may inform future policy regarding the impact of warning labels on nicotine product consumption.
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POS2-114
IMPACT OF THE 2009 AMENDMENTS TO THE TOBACCO ACT ON SALES OF AMERICAN-BLEND CIGARETTES IN CANADA
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In 2009, the Parliament of Canada amended the Tobacco Act to prohibit the use of flavours (except menthol) and other additives in cigarettes, little cigars and blunt wraps. Sugars and sweeteners, with the exclusion of starch, were among the other additives that were prohibited from use in the manufacture of these tobacco products. At the time, various groups related to the tobacco growing and manufacturing industry in the US claimed that these amendments would prevent the sale of American-blend cigarettes (blends of Virginia, Burley and Oriental tobaccos) in Canada and, as a result, close a market for US Burley tobacco. An analysis of sales data and ingredient data submitted by tobacco manufacturers to Health Canada under its Tobacco Reporting Regulations indicates that the predicted disappearance of American-blend cigarettes from the Canadian market has not materialized. The data shows that not only were manufacturers able to reformulate these products for sale without the prohibited additives, but that American-blend cigarettes maintained a nearly identical market share before and after the prohibition. In 2008, American-blend cigarettes represented 0.83% of all reported cigarette sales in Canada; in 2013, three years after the prohibition came into force, 0.82% of all cigarettes sold in Canada were American-blend.

The Canadian experience with the prohibition of additives in cigarettes appears to indicate that tobacco manufacturers were able to reformulate American-blend cigarettes with no impact on the existing market.
FUNDING: Federal Tobacco Control Strategy, Government of Canada
JUSTIFICATION: The Canadian experience with prohibitions on the use of sugars and sweeteners in cigarettes may be informative to the development of flavour and additive prohibitions in other jurisdictions.
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POS2-115
WOULD A CIGARETTE BY ANY OTHER NAME TASTE AS GOOD IN CHINA?
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Background: Strategically naming cigarette brand is one of the key marketing strategies of the tobacco industry; brand names serve as tobacco advertisements that directly convey messages to customers and influence cigarette smoking behavior. Objective: To identify the themes of cigarette brand names in China.

Methods: A list of 190 cigarette brands was identified using online search tools in August 2014. The exclusion criteria included: 1) brands of imported cigarettes; 2) brands of other tobacco products such as cigars; 3) brands of cigarettes that are no longer produced. Two researchers independently performed the online search and coded the themes of cigarette brands using consistent methodology.

Results: A total of 146 cigarette brands were included. Eight major themes of the cigarette brands were identified: 1) favorite flowers, plants and animals in China (17%); peony, redwood, panda and Rhinophicus. Panda and Rhinophicus are national treasure of China; 2) province and city names (14%): 5 province and 16 city names were used as cigarette brand names, including Yunyan, Nanjing, Harbin and Hong Kong; 3) popular tourist attractions (11%): Tai Mount, Jiuzhaigou, and West Lake etc.; 4) famous sites (8%): Red Flag Canal and Hongtashan are well-known sites; 5) ceremony, festivals and holidays related themes (5%); Double Happiness, which is a symbol and decoration for marriage in the Chinese culture, and Happy New Year are used as cigarette brands; 6) health-related (4%): Panax Ginseng and Ophiocordyceps Sinensis, which are well-known health promotion plants; 7) politics (3%): Zhongnanhai (an imperial garden in Beijing and the headquarters of China’s central government and Community Party) and the Great Hall of the People; and, 8) war history (3%): Huangguoshu Long March, which is from the famous Long March of the Red Army in mid 1930s in China.

Conclusion: Cigarette brand names are largely unregulated in China. The Trademark Law prohibits the use of government locations, province, and city names as commercial product brands; however, this law has been ignored by the tobacco industry. Given that cigarette brand names act as advertisements, it is critical to better regulate the naming of cigarette brands.
FUNDING: No Funding
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**POS2-116**

**TOBACCO PRODUCT SALES VOLUME AND MARKET SHARE AMONG RETAIL OUTLETS IN THE U.S., 1997 TO 2007**

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**Background:** Retail outlets, such as supermarkets, convenience stores and pharmacies, are the predominant venue for selling tobacco products in the U.S. However, tobacco product sales vary by outlet type and vary over time. We examined changes in the number and type of outlets selling tobacco products, tobacco product sales volume, and the market share of tobacco products at retail outlets in the U.S. between 1997 and 2007.

**Methods:** We conducted a descriptive secondary analysis on the number and types of outlets selling tobacco products and tobacco product sales using the U.S. Economic Census of Retail Trade for 1997, 2002 and 2007.

**Results:** Eight outlet types accounted for 95% to 98% of all tobacco product sales between 1997 and 2007. Gas stations with convenience stores had the largest share of tobacco sales and increased their market share of tobacco products by 31%. Supermarkets and pharmacies Decreased in market share of tobacco products by 43.2% and 37.3%, respectively. The percentage of pharmacies selling tobacco products also declined by 23.1% with tobacco products representing less than 2% of total sales.

**Conclusion:** Between 1997 and 2007, consumers shifted where they purchase tobacco products. Pharmacies showed signs of declining tobacco product sales, lending an economic argument to implementing pharmacy tobacco product sales bans.

**FUNDING:** This research was partially funded by the National Institutes of Health/National Cancer Institute (U01 CA154281) and the UNC Lineberger Comprehensive Cancer Center University Cancer Research Fund.

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**POS2-117**

**WATERPIPE TOBACCO SMOKING AMONG COLLEGE STUDENTS: TESTING POLICY AND PREVENTION TOOLS USING A DISCRETE CHOICE EXPERIMENT**

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**Background:** College students have the highest prevalence of waterpipe tobacco smoking (WTS) in the US. 8.4% during the past 30 days and 30.5% ever. WTS has been associated with nicotine dependence and many of the diseases caused by cigarettes. There is a pressing need to identify effective policy interventions to control the threat of this emerging phenomenon.

**Objectives:** 1) To identify and analyze the characteristics of WTS users among college students in SC; 2) to measure preferences of WTS users and analyze the marginal effects of various product characteristics, including price and warning labels.

**Methods:** An internet-based survey of ever WTS users at UofSC tested the effectiveness of test-only and pictorial health warning labels and their placement on the WTS device. A discrete choice experiment (DCE) examined the effects of flavor, price, nicotine content, and warning labels on WTS demand.

**Results:** “WARNING: Hookah smoking during pregnancy can harm your baby” was most effective among 68.4% of respondents. “WARNING: Protect your children: Don’t let them be exposed to Hookah smoking” and a picture of a child is the most motivational to stop WTS among 60.2%. In terms of warning label placement, 51.0% said a label would be most noticeable at the mouthpiece of the waterpipe. The DCE revealed that WTS users prefer flavored varieties and lower prices. Those presented with a health warning were more likely to choose the opt-out option.

**Conclusion:** This is the first study to use a DCE to examine WTS preferences and test WTS-specific warning messages and placement. Higher prices, restrictions on tobacco flavoring and placement of health warning labels on WTS devices can be effective in reducing WTS.

**FUNDING:** This research is supported by the Office of the Vice President for Research at the University of South Carolina (ASPIRE Program).

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**POS2-118**

**UNDERSTANDING STATE MINIMUM PRICING LAWS AND DISCOUNT MECHANISMS, 2005-2014**

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**Background:** Minimum pricing laws for cigarettes and tobacco products, which were originally intended to promote fair competition, have an added benefit of standardizing consumer prices. However, the power of these pricing laws may be diminished by allowing distributing parties to use trade/cash discounts or competitor price-matching, and/or by permitting consumers to use coupons or purchase bundled products below cost.

**Objective:** In this study, we sought to understand the complexity and variety of states’ minimum pricing schemes across the United States, and to identify areas that increase or reduce the strength of a state's pricing efforts.

**Methods:** Laws were collected for all 50 states plus Washington, D.C. for years 2005-2014. Boolean searches were done in Lexis-Nexis and Westlaw in the following state-level databases: statutes and regulations, case law, Attorney's General opinions, and Dept. of Revenue notices/rulings. General unfair pricing laws that did not specifically reference tobacco/cigarettes, and were not applied either by a state ruling, were excluded. All laws were double-coded by two legal researchers for one year to ensure consistency in the analysis.

**Results:** Minimum pricing laws remained fairly static between 2005 and 2014, with only four states’ markup rates changing between 2005 and 2014. One state, Alaska, actually reduced its markup rates over that time period. As of January 1, 2014: 31 states apply fair pricing schemes (27 of which apply a specific markup ranging from 2% to 25% of the base cost); 25 states regulate prices for at least 2 distribution levels; 26 states allow price-matching; 21 states allow trade discounts when calculating price; and 9 states allow for coupons to reduce prices below the statutory base costs.

**Implications:** The intended strength of minimum pricing laws is diminished where price-reducing mechanisms exist. By disabling these mechanisms, and considering neighboring states’ pricing laws, states may increase retail prices, and ease enforcement with stronger, more straightforward, pricing laws.

**FUNDING:** Funded by grant number SU01-CA154248 from the National Cancer Institute, the National Institutes of Health.

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Background: As many countries implement cigarette package health warning labels in accordance with the FCTC, evidence is needed to guide selection of warning content. Research to date has been conducted mostly in high-income Western nations, and there is little evidence on whether specific message characteristics are equally effective across countries. This analysis assessed perceptions of health warnings among adult smokers and youth in 7 countries that had not implemented pictorial warnings (Bangladesh, China, Germany, India, Mexico, Republic of Korea, and the US).

Methods: Between 2010 and 2012, survey data were collected from ~500 adult smokers (male and female; only males in Asian countries) and ~500 youth smokers and non-smokers (age 16-18, male and female) in each country (total n=8,182). Online surveys were conducted in the US, Germany, and Korea, with computer-assisted face-to-face interviews in all other countries. Respondents were randomized to view and rate the effectiveness of health warnings. Each respondent saw 2 (of 15) sets, with each set featuring 5-7 warnings addressing the same health effect but using different themes: graphic health effects, “lived experience”, testimonial (i.e., personal narrative), and symbolic. Linear mixed effects models (including country, survey mode, age group, gender, smoking status, health effect) were used to examine effectiveness ratings across the 15 health effects by health warning theme.

Findings: Overall, pictorial warnings were rated as more effective on average than text-only (p<0.0001), at 6.5 and 4.6 (out of 10), respectively. Among pictorial warning themes, graphic warnings were rated highest (7.3), followed by graphic and lived content together (6.8), lived experience (6.0), and symbolic (5.8) (p<0.0001 for all comparisons). Warnings featuring a testimonial were rated as more effective than the same image with didactic text (p<0.0001), at 6.7 and 6.3, respectively. Country-level differences in perceived effectiveness were also identified (p<0.0001).

Conclusions: While some country differences were found, the findings highlight general effectiveness of themes in the content of cigarette package health warnings.

FUNDING: This research was funded by the National Institutes of Health (Grant number: P01 CA138-389-01: “Effectiveness of Tobacco Control Policies in High vs. Low Income Countries”). Additional support was provided by the Propel Centre for Population Health Impact, a Canadian Institutes of Health Research New Investigator Award (Hammond), the Canadian Cancer Society Research Institute Junior Investigator Award (Hammond), and the US National Cancer Institute (Thrarer; Grant number: R01 CA167067).

JUSTIFICATION: A growing number of countries are implementing new cigarette package health warning labels, in accordance with the FCTC; there is little evidence to guide regulators in low- and middle-income countries as to whether the content that has been commonly used in mainly high-income nations will be appropriate and effective within their own countries.

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Latino smokers, weighting our analysis per survey directions. All items reported in and then compared English-speaking (n=474) to and Spanish-speaking (n=348) Latinos and non-Latinos; and 2) among Latino smokers by primary language spoken (English or Spanish).

**POS2-123**
**TESTING THE NICOTINE-REDUCTION HYPOTHESIS WITH BEHAVIORAL ECONOMIC PURCHASING TASKS**

Matthew W. Johnson*, Patrick S. Johnson, Olga Rass, Lauren R. PACEK

The Food and Drug Administration has the authority to regulate nicotine levels in tobacco cigarettes. Mandating the reduction of nicotine in tobacco cigarettes has been proposed as a way to reduce tobacco dependence and therefore reduce smoking in the population. However, an important potential unintended consequence of this mandate may be that individuals compensate for reduced nicotine levels by smoking more cigarettes. This may harm public health because smoking, and not nicotine consumption per se, is the primary cause of harms from cigarettes. Behavioral economic demand assessment is an ideal framework to address this issue. From a behavioral economics perspective, reductions in nicotine can be conceptualized as an increase in the unit price of nicotine (i.e., number of puffs required to obtain each unit of nicotine). This study examined the effects of such changes in nicotine unit price on demand for tobacco cigarette and e-cigarettes in a hypothetical purchasing task. Only e-cigarette users who reported experience with using multiple concentrations of nicotine in e-cigarettes were included. While the primary issue regarding public health effects of nicotine reduction is best addressed by examining nicotine unit price in tobacco cigarettes, only those participants with experience with using multiple concentrations of nicotine in e-cigarettes were included to ensure relevant experience for these hypothetical consumption assessments. Nicotine levels were evaluated over a 72-fold range. Results (N=319) revealed orderly demand curves for both tobacco cigarettes and e-cigarettes when fit to an exponential demand model (R-squared = .86 and .89, respectively), with increases in puffs required per mg nicotine (i.e., nicotine unit price) causing a decrease in nicotine consumption. Response output functions indicated that total puffs increased as the puffs required per mg nicotine (i.e., nicotine unit price) increased at the lower unit prices. These data suggest the possibility of compensatory smoking upon nicotine reduction in tobacco cigarettes, and call for laboratory validation of these findings using a behavioral economic framework.

**FUNDING:** This work was supported by NIDA grants R01DA032363 and T32DA07209.

**JUSTIFICATION:** Results of this study suggest that decreasing nicotine levels in cigarettes may increase total puffs smoked, with potential negative impacts on public health.

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POS2-124
NATIONAL AND STATE-SPECIFIC SALES AND PRICES FOR ELECTRONIC CIGARETTES—UNITED STATES, 2012-2013

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While the overall impact of electronic cigarettes (e-cigarettes) on individual and public health is currently unclear, awareness and use of the products have increased markedly since first being introduced into the U.S. marketplace in 2007. Although widely reported in the lay media, very little data exist in the scientific literature documenting sales and prices of e-cigarettes in the U.S., and no data have yet been published on state-specific trends in these measures. We used a customized retailer database to assess total dollar sales and average price per unit for disposable e-cigarettes, starter kits, and cartridge refills for selected states and the total U.S. during 2012-2013. Data were available for convenience stores (C-stores) (29 states) and food, drug, and mass merchandisers (FDM) (44 states). These venues together accounted for nearly three-quarters of U.S. brick-and-mortar e-cigarette sales. As a check on the accuracy of these data, we compared total U.S. sales of e-cigarettes with similar scanner data from a second vendor, and the difference between the two data sources was less than 5%. Sales of all e-cigarette device types grew considerably in C-stores and FDM during 2012-2013. In C-stores, dollar sales increased markedly during 2012-2013: 320.8% for disposables, 72.4% for starter kits, and 82.0% for cartridges. In FDM, dollar sales increased 49.5% for disposable e-cigarettes, 89.4% for starter kits, and 126.2% for cartridges. Average prices across all product categories increased in C-stores and decreased in FDM, but the direction and magnitude of price changes during 2012-2013 varied considerably by state, product category, and retail channel; for example, C-store annual dollar sales of disposable e-cigarettes increased the least in South Carolina (39.7%) and the most in Arkansas (708.5%). These data reveal that the market for e-cigarettes is growing rapidly, resulting in dynamic sales and price changes that vary across the U.S. Ongoing state-specific surveillance of e-cigarette sales is warranted to inform tobacco control policy, planning, and practice at the national, state, and local levels.

FUNDING: Support provided by the Centers for Disease Control and Prevention, Office on Smoking and Health. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention

JUSTIFICATION: Monitoring e-cigarette sales and prices is warranted to inform tobacco control policy, planning, and practice at the national, state, and local levels.

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POS2-125
DISPARITIES IN TOBACCO MARKETING AND PRODUCT AVAILABILITY AT THE POINT OF SALE: RESULTS OF A NATIONAL STUDY

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Objective: To describe tobacco marketing, promotions and product availability in a national sample of retail stores and to examine associations with neighborhood characteristics.

Design, setting, sample: We used a two-stage sampling design to select a random sample of 97 counties in 40 states in the contiguous United States proportionate to county population size, and a random selection of stores within each county. From June-October 2012, data collectors completed audits in 2,231 stores.

Main outcomes and measures: Interior and exterior tobacco marketing, tobacco price promotions, and availability of products (e.g., flavored cigars) and marketing with youth appeal.

Results: POS tobacco marketing materials are ubiquitous, with 95% of stores displaying them (on the interior, exterior, or both) and an average of 29.5 marketing materials per store. In addition, 75.1% of stores displayed at least one tobacco product price promotion, including 87.2% of gas/convenience stores and 85.5% of pharmacies. Although only 16.8% of stores featured marketing below three feet, 81.3% of stores sold flavored cigars, which appeal to youth. The odds that a store displayed a price promotion or sold flavored cigars were 50-100% higher if the store was located in a neighborhood with a higher proportion of African American residents. Price promotions were also more common in stores in neighborhoods with more residents under age 18. Tobacco marketing and product availability were not associated with neighborhood income levels or Hispanic composition.

Conclusions and relevance: Cigarette companies use retail marketing extensively to promote their products to current and future customers. As a result, shoppers, including children, former smokers, and those trying to quit smoking, are unavoidably exposed to pro-smoking messages at stores.

FUNDING: Funded by grant number CA154281 from the National Cancer Institute at the National Institutes of Health

JUSTIFICATION: Surveillance of tobacco product marketing and promotions is an essential step toward crafting tobacco control policy.

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POS2-126
TOBACCO WATCHER: REAL-TIME GLOBAL TOBACCO SURVEILLANCE USING ONLINE NEWS MEDIA

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Monitoring news media can help tobacco control professionals plan strategic advocacy efforts responsive to the changing environment. We developed a first-of-its-kind surveillance system, called Tobacco Watcher, to monitor tobacco media across the globe. Here we examine the types of stories collected.

Tobacco Watcher involves four stages. First, starting August, 2012, news articles are collected daily from the Bing News and Bloomberg News feeds. Second, natural language processing algorithms based on extensive experience with human coding assess stories as tobacco-relevant or not, based on keywords and phrases, with a precision over 95%. Third, the primary tobacco content of each article is categorized according to the MPower-ED framework (Monitor tobacco use; Protect from secondhand smoke; Offer assistance to quit; Warn about dangers of tobacco products; Enforce TAPS bans; Raise tobacco taxes; Emerging products; tobacco in Industry) and the main location of the story. Fourth, processed news articles are displayed on a web interface where users can search by location, MPower-ED, keywords or time (tobaccowatcher.org).

Since August 2012 through September 8 2014, Tobacco Watcher has analyzed 81,807 unique tobacco news articles in 4 languages, English, Chinese, Russian, and Spanish. The most common primary theme is emerging products (21,915), followed by smoking bans/restrictions (19,816), industry (11,226) and tobacco warnings (10,381). The system is also keyword sensitive, eg, 34,420 articles mentioned electronic cigarettes with 5,490 focused on smoking ban/restrictions.
POS2-127
ARE RETAIL PRICES HIGHER FOR LEGAL OR ILLICIT CIGARETTES? AN ANALYSIS IN 14 LOW- AND MIDDLE-INCOME COUNTRIES

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Illicit trade of tobacco products is a global problem that undermines tobacco control policies. In many high-income countries illicit cigarettes cost less than legal ones. We examined differences in mean retail price of legal and illicit cigarettes in 14 low- and middle-income countries (LMICs).

Data were from a surveillance study of packs purchased in 2013. In each of 14 countries we bought one of every unique cigarette pack from a sample of vendors in 36 low, middle, and high socioeconomic areas of 3 major cities. Packs were categorized as "legal" or "illicit" based on the presence of health warning labels (HWL) issued by the country in which the pack was purchased (China, Egypt, Mexico, Philippines) and presence of country's HWL and tax stamp (or other official tax indication) in the other 10 countries. We compared mean retail price by pack legal status, controlling for number of sticks per pack.

Overall, 25% of the 3,055 cigarette packs purchased were deemed to be illicit, ranging from none in Indonesia to 82% in Pakistan. Mean sticks per pack was 18-20, except for India (mean=15). Having the country HWL was correlated very highly (0.97-1.0) with having the country tax stamp. Controlling for sticks per pack, mean retail price of legal cigarettes was higher than for illicit cigarettes in Mexico, Turkey and Ukraine (p<0.05). However, mean retail price of illicit cigarettes was higher than for legal cigarettes in Bangladesh, Egypt, India, Pakistan, Philippines, Thailand and Vietnam (p<0.05); in these countries, the difference in mean retail price, controlling forsticks per pack, ranged from US$0.74 (Philippines) to US$1.55 (Bangladesh).

Mean retail price was higher for illicit than for legal cigarettes in the 6 countries where illicit packs comprised at least 25% of packs purchased, and in Egypt (5% illicit packs). Having the country HWL appears to be a good proxy of pack legal status. Although it has been previously reported that illicit cigarettes are more expensive in Vietnam, this is the first study to systemically assess the relationship between price and pack legal status in 14 LMICs. Further research should confirm these findings using other methods.

FUNDING: This work was supported with funds from the Bloomberg Initiative to Reduce Tobacco Use.

POSTER SESSION 2 • THURSDAY, FEBRUARY 26, 2015 • 4:15 p.m.–5:45 p.m.

POS2-128
ASSOCIATIONS BETWEEN EXPOSURE TO EXISTING SMOKELESS TOBACCO HEALTH WARNING LABELS AND HARM PERCEPTIONS, REGRETS OVER STARTING TOBACCO USE, AND QUIT INTENTIONS AMONG U.S. ADULT SMOKELESS TOBACCO USERS, 2012-2013

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Introduction: US smokeless tobacco (SLT) health warnings exist in four text-only options: "WARNING: This product can cause mouth cancer"; "WARNING: This product can cause gum disease and tooth loss"; "WARNING: This product is not a safe alternative to cigarettes"; or "WARNING: Smokeless tobacco is addictive". We assessed the association between exposure to SLT health warnings and tobacco-related behaviors and perceptions among US SLT users aged ≥18 years.

Methods: Data came from the 2012-2013 National Adult Tobacco Survey (n=60,192). Current SLT users (n=1,642) were persons who had ever used chew tobacco/snuff/dip/snus; or dissolve tobacco, and now used the products daily, some days or rarely. Exposure to SLT health warnings in the past 30 days was defined as having seen warnings on an SLT package "Very often"; "Often"; or "Sometimes" (vs. "Rarely" or "Never"). Those exposed were then asked if they had thought about the health risks of SLT use, and if the warnings had stopped them from using SLT within the past 30 days. Logistic regression was used to measure the relationships between exposure to SLT health warnings and SLT harm perception, regrets over starting tobacco use the past year, attempt to quit all tobacco use, and intentions to quit all tobacco use. Adjustments were made for exposure to other health warnings (on cigarettes, or at points-of-sale), SLT use frequency (daily; some days; or rarely), past 30-day tobacco craving, and socio-demographic characteristics (p<0.05).

Results: Of current SLT users, 76.7% were exposed to SLT health warnings, of whom 74.3% thought about SLT health risks, and 17.3% stopped SLT use because of the warnings at least once in the past 30 days. Exposure to SLT health warnings was not independently associated with SLT harm perception, regretting starting tobacco use, past quit attempts, or intending to quit all tobacco use.

Conclusion: SLT health warnings were not associated with perceptions of harm, regret, quit attempts, or intentions. Large graphic warnings have been shown to be more effective than text-only warnings, and may be an important strategy for enhanced tobacco prevention and control efforts in the US.

FUNDING: There was no source of direct or indirect funding for the reported research.

JUSTIFICATION: This study demonstrates that existing text-only smokeless tobacco health warnings in the US are ineffective in motivating users to quit tobacco use, thus underscoring the need for larger pictorial warnings as part of comprehensive tobacco control and prevention efforts in the US.

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POS2-129
THE HISTORY OF CIGARETTE TAXATION IN OKLAHOMA
Fritz L. Laux, PhD**, Stefanie D. Buckskin1, 2Northeastern State University, 1University of Oklahoma and Cherokee Nation

State taxation of tobacco products in Oklahoma began, and was almost immediately repealed, in 1933. Temporary taxes on cigarettes were then enacted and lifted throughout the 1930’s until 1941, when the state rate was permanently set at 5 cents per pack. From there, state taxation of cigarettes paralleled national trends with increases in the 60’s and 70’s leading to a below average rate in the 90’s partially corrected for with an 80-cent increase to $1.03 per pack in 2005. Oklahoma’s more interesting developments in recent years have been in the area of state taxation of tribally-regulated cigarette sales. This began after the Supreme Court’s 1991 decision in the Citizen Band Potawatomi case, establishing rules for how allowances for a state-tax-free quota of cigarette sales for tribal members could practically be administered for Oklahoma tribes. After the Potawatomi decision, the state negotiated a wave of tax treaties, called “compacts” with the tribes establishing tribal rates at 25% of nontribal rates. At the expiration of this first wave of compacts, a second wave was negotiated beginning in 2003, so as to adapt to an anticipated 80-cent increase in nontribal tax rates. Following enforcement problems with state taxation of tribal cigarettes from 2005 through 2007, a subsequent wave of compacts was negotiated in 2008. A prominent feature of these third-wave compacts is that they, for the first time, specified levels for the taxation of cigarettes by the tribes themselves (in addition to state-level taxation). Finally, a fourth wave of compacts has been negotiated in 2013-2014. The focus of this latest round of compacts has been to consolidate the 5-level variation in state taxation of tribally regulated cigarette sales to one level, ultimately to be standardized at 50% of the nontribal rate. With 36 of Oklahoma’s 39 federally recognized tribal nations having at one time compacted with the state over cigarette taxation, this is a detailed and complex history.

FUNDING: Funding for the participation of both authors was provided by the Oklahoma Tobacco Research Center.

JUSTIFICATION: Taxation is a primary instrument for tobacco control. This study provides the first detailed look at the complex history and issues involved in taxation of tribally-regulated cigarette sales in the state of Oklahoma.

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POS2-130
THE ELASTICITY OF DEMAND FOR CIGARETTE SOLD BY TRIBALLY-REGULATED SMOKE SHOPS IN OKLAHOMA
Fritz L. Laux, PhD*, Northeastern State University

Cigarette taxation is a significant potential source of revenue for many tribal governments. The revenue impact of changes in taxation levels for a given tribe is determined by the price elasticity of demand that the tribe faces. Since tribal markets are subsets of state and national markets, the demand curve facing a tribe will be much flatter than a national or state-level demand curve. This paper presents estimates of the elasticity of demand faced by tribal tax commissioners in Oklahoma. These estimates are constructed by combining estimates of the elasticity of demand for the state (-0.8), with estimates of cross-price elasticity within the state for tribal versus nontribal sales (2.0), and adjusting this result via approximations of what the inter-tribal cross-price elasticity of demand for cigarettes may be (1.7). This yields an estimate that the tribe-level elasticity of demand for a “generic” large tribe may be around -4.5. Actual demand circumstances will, of course, vary from tribe to tribe. Also, in Oklahoma, this elasticity score would likely tend to be higher for smaller tribes. Since tribal tax rates for cigarettes in Oklahoma tend to be below 4% of average purchase price, the implication is that increases in tribal tax rates would dramatically increase revenue collections for most tribes. Data on the nature of competition between tribal and nontribal smoke shops, and how the nature of this competition may change as price differentials narrow, are also discussed.

FUNDING: Oklahoma Tobacco Research Center.
POS3-1
EXPOSURE TO SECONDOHAND SMOKE IN AIRPORTS ACROSS EUROPE AND THE UNITED STATES: AN OBSERVATION-BASED STUDY

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Introduction: Most airports in Europe and the US have smoke-free or smoking-restricted policies. This study evaluated the potential for indoor secondhand smoke (SHS) exposure inside airports across the US and Central/Eastern Europe.

Methods: We conducted a cross-sectional study based on observations. 20 large and mid-sized airports (11 in Europe, 9 in US) were selected on a convenience basis. We used a standardized protocol to observe smoking and smoking signs between March and May 2014. Airports were divided into 4 areas (departures, pre-security, post-security and arrivals). In each area, we collected information on smoking policies, compliance with smoking laws and smoking advertising. We defined evidence of smoking inside the airport as the presence of ≥1 smoker, presence of cigarette butts on the ground, or smell of smoke in indoor areas that were not designated smoking rooms (DSRs). Promotion and advertisements were evaluated by looking for panels and visual messages in the airport areas evaluated.

Results: The median (IQR) duration of the observations per airport was 140 (118-208) minutes. 11 airports had DSRS (3 in the US, 8 in Europe) and 9 were smoke-free. In 15 airports (9 from Europe, 6 from the US; 7 smoke-free airports, 8 airports with DSRS), we found evidence of smoking in ≥1 of the 4 areas, including the presence of ≥1 smoker in 8 airports. Only 10 airports had smoking policy signs in ≥2 of the observed areas. Tobacco products could be bought inside all airports. Tobacco advertisement was mainly found at the point of sale. Among the 11 airports with DSRS, 5 had no posted rules about who could enter them, and in 9 there was no visible signage about keeping the door closed. Several problems related to DSRS malfunctioning were observed including permanent lack of doors closing and holes at the bottom of the door. In one airport we observed a member of the janitorial personnel being exposed to SHS in the DSR.

Conclusions: The presence of smoking and exposure to SHS remains a problem in many airports around Europe and the US, especially among airports with DSRS.

FUNDING: FAMRI

JUSTIFICATION: The presence of smoking and exposure to SHS remains a problem in many airports around Europe and the US

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POS3-2
SMOKING HABITS AMONG PHARMACY STUDENTS AT RIYADH REGION SAUDI ARABIA

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Background: Smoking is a major health problem all over the world, but little information is available about the prevalence of smoking in Saudi Arabia. However, the prevalence rate was in the range of 8%-57. This study examines the prevalence, pattern of smoking, attitudes towards public measures against smoking and teaching the tobacco issues in Pharmacy College. The appraisal of the role of the pharmacist in smoking cessation were also investigated.

Methods: The survey was conducted in February 2004, in college of pharmacy at King Saud University in Riyadh city; students were randomly selected from different college levels. Anonymous self-questionnaire was used for data collection.

Result: The survey revealed that 1304% of the students were current smokers. Religion and hazards to the health were the main reasons for non-smoking, whereas, easing stress and relaxation with friends were given as the main reasons for smoking about 74.5% of the students had unsuccessfully attempted quitting smoking, while mixing with smokers, lack of will power and stress were the main reasons for continuing smoking. In general the students were knowledgeable about risk facing smokers. The students showed positive attitude towards public measures against smoking, and appraised the role of the pharmacists in smoking cessation and inclusion of tobacco issues to the curriculum.

Conclusion: Anti-smoking programs are needed for both university students and primary school levels. In addition, teachers and pharmacists should be role models by not smoking. Legislations are needed to restrict selling of cigarette to the underage and fine those who violate banning of smoking. Pharmacy college should be encouraged to include teaching tobacco issues in their curriculum.

FUNDING: No Funding

JUSTIFICATION: It is very potential to explore the attitudes of students toward smoking because most of smokers start to smoke during their university time.

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POS3-3
DO WE NEED A DESIGNATED SMOKING AREA IN A MARATHON EVENT?

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Background: Running is one of the most popular sports among Japanese. The population of Japanese who participate in running events is increasing. Recently, many Japanese are becoming more aware that secondhand smoke can be as risky as smoking on health. However, few running events in Japan ban smoking in order to protect passive smokers. There are limited data on the smoking habit of Japanese who participate in running events. In this study, we investigated the incidence of smoking in Japanese full- and half-marathoners and how smoking marathoners perceive the effect of smoking on their performance and secondhand smoke on non-smokers.

Study Design and Methods: Questionnaire was mailed to all participants of 2008 Ibigawa Marathon (Gifu, Japan; n=8654) approximately one month before the event. Completed questionnaire was collected on the day of the event. Nineteen hundred marathoners (22.0%) replied to the questionnaire.

Results: The smoking rate of marathoners (male 8.2%, female 3.6%) is significantly less than the rate in the general population (male 39.5%, female 12.9% in 2008). Many past smokers (97.5%, 77% in 2008) and current ones (81%; 117/144) recognize that smoking has bad effects on their running performances. However, one-fourth of the heavier smokers (more than 20 cigarettes a day) do not believe that secondhand smoke affects the performance of passive smokers. Approximately 50% of marathoners suggest that a specified smoking area is needed during running events.

Conclusion: Since 50% of marathoners prefer a specified smoking area in running events, we would not ban smoking completely from these events. We should specify several smoking areas that are away from non-smokers to prevent them from exposure to passive smoking. We believe that one of the reasons runners continue to smoke is that they have few opportunities to obtain correct information about the risks of smoking, including secondhand smoke on non-smokers, on running. It is important to enlighten runners who smoke about the risk of smoking on their health and performance, as well as the undesirable effect of secondhand smoke on passive smokers.

FUNDING: No Funding
POS3-4
TOBACCO SMOKE EXPOSURE AND EUSTACHIAN TUBE DISORDERS IN US CHILDREN AND ADOLESCENTS

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Introduction: Eustachian tube dysfunction (ETD) occurs when the Eustachian tube is obstructed, resulting in the build-up of negative middle ear pressure and associated symptoms of ear pain, pressure and hearing loss. This study evaluates for the first time on a large scale the association between exposure to active smoking or secondhand smoke (SHS) and the prevalence of ETD in the US adolescent population using objective tympanometric data.

Methods: The study population consisted of 3,652 adolescents aged 12 to 19 years with complete tympanometry information and tympanogram adequate for interpretation. ETD was defined as a middle ear pressure under 100 mm H2O. Active smoking was defined as self-reported smoking or serum cotinine concentrations > 10 ng/mL (N=638). SHS was defined as non-active smoking in individuals who reported living with 1 smokers or had serum cotinine concentrations > 10 ng/mL and < 10 ng/mL (N=1559).

Results: Around 5% of the studied population had ETD. After multivariate adjustment for age, sex, body mass index, education level, ethnicity or having a cold, sinus problem or earache during the last 24 hours, a positive association was observed between secondhand smoke exposure and ETD among children with cotinine values >0.43 and <10 ng/mL (Odds Ratio=1.68; 95%CI: 1.04-2.73). However no significant trend between serum cotinine values and ETD in passive or active smokers was observed.

Conclusion: Overall, these results provide some support for an association between high concentrations of secondhand smoke exposure on ETD in US adolescents. Because of a lack of dose-response among those exposed to secondhand smoke, and no association among current smokers, additional studies are needed to confirm the role of tobacco smoke exposure and ETD.

FUNDING: No funding

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POS3-5
BEHAVIORAL PHARMACOLOGY AND DEPENDENCE ASSOCIATED WITH CIGAR SMOKING

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Introduction: Cigar smoking has increased significantly over the past decade, maybe due in part to the perception that cigars are less harmful and addictive than cigarettes. However, less is known about the behavioral pharmacology and levels of nicotine dependence associated with cigars. This information will contribute to our understanding of the health risks associated with cigar smoking.

Objective: Conduct clinical study investigating dependence, topography/use behavior, and biomarkers of exposure in cigar smokers.

Method: Cigar-only smokers who self-reported smoking on 1 day per week were recruited for this study in which all participants smoked their own brand cigar for one hour. Dependence (both objective and perceived) was measured with existing and modified behavioral scales. Furthermore, we investigated smoking topography (including latency to first puff, puff number, interpuff interval, and smoking duration), self-reported inhalation behaviors, and exhaled CO. Biomarkers of nicotine exposure, including plasma nicotine and cotinine, were measured before, during, and after ad libitum cigar smoking.

Results: Our data offer additional information regarding nicotine dependence in cigar smoking that may be useful to inform future tobacco control and regulatory efforts involving cigar tobacco products.

FUNDING: This study is funded by the Center for Tobacco Products (CTP)/FDA.

JUSTIFICATION: Our data offer additional information regarding nicotine dependence in cigar smoking that may be useful to inform future tobacco control and regulatory efforts involving cigar tobacco products.

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POS3-6
THE THEORY OF PLANNED BEHAVIOR APPLIED TO CIGARETTE SMOKING INTENTION AMONG NON-SMOKING HIGH SCHOOL STUDENTS

Mary Jane S. Hanson, PhD, C.RNP.*, University of Scranton

Studies over the past decade have revealed a downward trend in the number of high school students who smoke cigarettes. According to the 2013 Youth Risk Behavior Survey, 15.7 percent of high school students reported smoking during the previous 30 days, as compared with 36.4 percent in 1997. The aim of this study was to evaluate the adequacy of the Theory of Planned Behavior to predict smoking intention in a cohort of current non-smoking high school students who reported that they never smoked. Questionnaires were distributed to a convenience sample of 87 consenting White rural high school students. The responses from the 76 students who reported they never smoked were selected for the study. The sample consisted of 33 male and 43 female students aged 16 to 18 years in grades 11 and 12. The multiple correlation between intention and the three independent variables - attitude, subjective norm, and perceived behavioral control - was significant and in the expected direction. Moreover, all three variables contributed significantly to the prediction of non-smoking accounting for 64 percent of the variance in smoking intention. Specifically, partial correlations showed that perceived behavioral control accounted for 58 percent of the variance in smoking intention, subjective norm 21 percent, and attitude 18 percent. The study demonstrates that the Theory of Planned Behavior can be used successfully in a group of non-smoking high school students to predict their non-smoking intention. Understanding the factors associated with non-smoking behavior in teenagers is important as we plan strategies to reinforce non-smoking. It is of note that the respondents’ perception of self control was the most important predictor of their non-smoking intention. Specifically, as respondents’ confidence
in their ability to control their own smoking increased, smoking intent decreased. These findings may have implications for smoking prevention programs. However, additional study in larger populations and different ethnic groups is warranted.

FUNDING: The study was funded by a Research Grant from the University of Scranton.

JUSTIFICATION: The study suggests that empowering teenagers and increasing their perception of self-control over their current life situation, may prove helpful in decreasing cigarette smoking intention and subsequent behavior.

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POS3-7
PRENATAL SMOKING CESSATION AND POSTPARTUM RELAPSE AMONG NONDAILY SMOKERS PRIOR TO PREGNANCY, PRAMS 2009-2011

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Background: The prevalence of nondaily smoking is increasing in US adult smokers. We compared characteristics and likelihood of prenatal smoking cessation and postpartum relapse in nondaily and daily smokers.

Methods: Data were analyzed from the 2009-2011 Pregnancy Risk Assessment Monitoring System, a population-based survey of women who delivered live-born infants in 32 states. We categorized women who reported smoking <1 cigarette/day before pregnancy as nondaily smokers and those smoking ≥1 cigarette/day as daily smokers. We compared selected characteristics and reported percent who quit by the last 3 months of pregnancy and percent of quitters who reported any smoking after delivery. Chi-square tests were used to assess differences. Multivariate logistic regression, accounting for the complex survey design, was used to calculate adjusted prevalence ratios (APR) and 95% confidence intervals (CI) for prenatal smoking cessation and postpartum relapse for nondaily smokers (with daily smokers as the reference group) adjusting for selected characteristics.

Results: Of 25,088 prepregnancy smokers (23.8% of all women), 11.2% were nondaily and 88.8% were daily smokers. Compared to daily smokers, nondaily smokers were more likely to be older, be Hispanic, have >12 years of education, have >$15,000 annual income, be normal weight, have an intended pregnancy, be nulliparous, be privately insured, and use alcohol or binge drink prepregnancy. Significant differences were seen in prenatal smoking cessation (90.1% vs. 48.9%) and postpartum relapse (21.9% vs. 48.4%) between nondaily and daily smokers, respectively. Compared to daily smokers, nondaily smokers were more likely to quit smoking during pregnancy (APR:1.68; 95% CI:1.61-1.76) and less likely to relapse postpartum (APR:0.54; 95% CI:0.46-0.62).

Conclusion: About 1 in 10 prepregnancy smokers are nondaily smokers. Despite higher cessation and lower relapse, clinicians should screen for nondaily smoking and provide cessation support during pregnancy and beyond. The association between nondaily smoking and prepregnancy binge drinking deserves further attention.

FUNDING: No funding associated with this study.

JUSTIFICATION: This data could be used to target appropriate interventions.

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POS3-8
TOBACCO FREE HOMES: TOWARDS TOBACCO FREE COMMUNITIES

Vijay Bhasker Yetapu*, VChangeU.

Tobacco ruins millions of families every year worldwide. Second-hand smoke (SHS) is responsible for over 600,000 premature deaths annually, one third of these are among children. The rising smoking and smokeless patterns in low and middle income countries (LMICs) is leading to a vicious cycle as youths exposed to SHS in homes are doubly likely to initiate smoking and adopt smokeless form of tobacco.

The WHO- FCTC through its MPOWER strategy supports protecting people from SHS, but its implementation is weak in LMICs.

Tobacco Free Home (TFH) is to provide resources, information, and ideas to stop tobacco usage at home and thus protecting members of family from serious health risks tobacco causes.

The great concern is the health hazard that Tobacco Smoke exposure poses to children who are still developing physically and biologically.

This campaign explores the prevalence and perceptions of SHS in homes and the need to promote tobacco free homes (TFHs) in India.

To drive addicts away from tobacco by illustrating pictorially horrible side effects of tobacco from real life cases and to keep the young generation away from the addictions for lifetime.

We have educated over 9300 families through our creative audio video visuals along with innovative posters on tobacco awareness.

Tobacco free home is certified and labelled with a small display board for creating awareness among others for adopting TFH's tag.

Created and hosted Tobacco Free Home website and social media pages for promotions and awareness.

Data collected from various members of the family, 88% of family members are not having awareness of tobacco smoke pollution, third hand smoke and tobacco impact on environment.

After the awareness drive many have decided not to allow any members of the family and guests to smoke inside home or apartments. Knowledge about tobacco's harmfulness has somewhat increased but is not sufficient, especially on Tobacco Smoke Pollution, Toxic Cigarette Butt and smokeless tobacco plastic pouches waste which are equally affecting the environment apart from health hazards tobacco causes.

Need to spread awareness in rural areas for protecting rural youth.

FUNDING: No Funding.

JUSTIFICATION: This campaign will have high an impact in protecting public health.

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POS3-9
VALIDITY OF SELF-REPORTED SECONDHAND SMOKE EXPOSURE AMONG ADULT PUBLIC HOUSING RESIDENTS
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Background: Secondhand smoke exposure (SHSe) is particularly high among low-income and multiunit housing populations. Little is known however about the validity of self-reported (SR) SHSe in public housing residents.

Methods: We compared SR-SHSe to saliva cotinine using baseline data from a prospective study of the 2012 Boston Housing Authority indoor smoking ban among non-smoking residents. SR-SHSe was assessed with 13 questions determining the presence and frequency of anyone smoking in the home or car (both y/n), and smelling smoke in the home (y/n) and various places outside the home (e.g. work, bus stop) in the past 7 days (0 = never, 1= often).

Results: 189 of 284 participants (66.5%) reported SHSe by at least one question and 161 had measurable cotinine (56.7%). Agreement between the two was low however (kappa=0.06); 59% of those with SR-SHSe demonstrated measurable cotinine and only 47.4% of those with no SR-SHSe showed non-detectable cotinine. Sensitivity was 0.57 and specificity was 0.97. The odds of having detectable cotinine was higher among those who reported smelling smoke in other homes outside the building (often vs never (OR=7.4, 95% CI: 2.6-21.7). However, other SR-SHSe such as any smoking in the car, smelling smoke in the home, workplace, bus stop or train station, public area inside the building, outside the doorway or other outdoor area around the housing authority were not significantly associated with cotinine. Using correlations, however, report of anyone smoking in the car (yes/no) was correlated with cotinine level (point biserial r=0.19, p<0.01), as was anyone smoking in the home (point biserial r=0.25, p<0.01). A revised SR-SHSe index consisting of anyone smoking in the home or car or smelling smoke in other people’s home outside the building yielded an improved kappa of 0.15, but very low sensitivity of 0.26 and high specificity of 0.90.

Conclusion: SR-SHSe is a poor proxy for objectively measured SHSe among public housing residents. While some individual self-report items showed stronger correlations with measurable cotinine than others, a limited set of questions increased the number of individuals falsely categorized as non-exposed.

FUNDING: This work was supported by NIH/National Heart Lung and Blood Institute (R01-HL112212) and the Flight Attendants Medical Research Institute.

JUSTIFICATION: Self-reports are an inexpensive, simple to deploy method of determining secondhand smoke exposure but this research indicates that self-reports are not a good proxy for objectively measured exposure among public housing residents.

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POS3-12
DOES THE SEQUENCE OF INITIATION TO TOBACCO AND MARIJUANA USE DIFFER BETWEEN AFRICAN AMERICAN AND WHITE YOUNG ADULTS?
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Introduction: Marijuana and tobacco use are closely related and marijuana use may increase the risk of nicotine dependence. African American (AA) youth initiate cigarette use at lower rates and later ages than White youth; however, in adulthood, AAs have higher cigarette smoking prevalence than Whites. AA and White youth use marijuana at similar rates. To explore potential reasons why lower AA youth tobacco estimates do not persist into adulthood, this study assessed if sequence of initiation to tobacco and marijuana use differs by race/ethnicity.

Methods: Data were obtained from adults aged 18-25 who participated in the 2005-2012 National Survey on Drug Use and Health. The analysis was restricted to non-Hispanic Black and non-Hispanic White participants who reported ever use of both marijuana and tobacco (cigarette and cigar). Logistic regression models assessed the sequence of use while controlling for sex, education, income, alcohol use, marijuana and tobacco risk perceptions, and current use. We compared 2005 to each subsequent year.

Results: In 2005, 26.6% of AA and 14.3% of White young adults reported using marijuana before tobacco. In 2012, 41.5% of AA and 24.0% of White young adults reported using marijuana before tobacco. From 2005-2012, 31.5%-31.9% AAs and 25.3%-29.6% of Whites first used marijuana and tobacco at the same age. AA young adults were more likely than White young adults to report marijuana use before tobacco use (AOR=1.78;95% CI:1.71, 1.97) and to report first marijuana and tobacco use at the same age (AOR=1.16; 95% CI:1.08, 1.26). AA and White young adults had greater odds of reporting marijuana use before tobacco use in 2012 compared to 2005 (AA:AOR=2.10;95% CI:1.64, 2.70; White:AOR=1.65; 95%CI=1.42, 1.93).

Conclusion: Nearly three quarters of AA young adults and over half of White young adults, who had ever used marijuana and tobacco, report using marijuana first or at the same age as tobacco. As young adults, and AA young adults in particular, are increasingly likely to use marijuana before tobacco, understanding how marijuana initiation interacts with tobacco initiation and how this may impact disparities could inform more effective prevention efforts.

FUNDING: This research was supported in part by an appointment to the Research Participation Program at the Centers for Disease Control and Prevention.

POS3-11
BULLYING AND CIGARETTE USE IN YOUTH: DIFFERENCES BY BULLYING TYPE
Kathleen Case, DrPh, MPH, University of Texas School of Public Health

Previous studies have determined that being a victim of bullying is associated with higher odds of substance use in youth; however, research specifically examining cigarette use behaviors across different types of bullying is limited. The present study examined the associations between being a victim of bullying (at school, electronically, or both) and ever and past 30 day use of cigarettes using data from the 2013 national Youth Risk Behavior Survey. Chi-Square analyses were conducted to determine if there were significant differences in the prevalence of ever and past 30 day cigarette use by gender, grade, race/ethnicity, and type of bullying. Youth who experienced bullying both at school and electronically had a higher prevalence of both ever (56.6 percent) and past 30 day use of cigarettes (25.1 percent), as compared to youth who were not bullied or who experienced only one type of bullying (at school or electronically), p < .001. Multiple logistic regression analyses were conducted to determine the association between type of bullying and ever and past 30 days use of cigarettes, adjusting for grade, depression symptoms, race/ethnicity, ever alcohol use, past 30 day alcohol use, and weight status, and stratifying by gender. Girls who experienced bullying at school only (ORadj=1.31, 95 percent CI, 1.01 1.70) and both at school and electronically (ORadj=1.72, 95 percent CI, 1.23, 2.43) reported significantly higher odds of ever cigarette use compared to girls who were not bullied. Boys who were bullied electronically only (ORadj=1.85, 95 percent CI, 1.03, 3.30) reported significantly higher odds of ever cigarette use compared to boys who were not bullied. Results for the associations between type of bullying and past 30 day use of cigarettes were not statistically significant for girls or boys. Results from this study indicate that the specific type of bullying experienced may differentially influence the odds of cigarette use in high school students. These findings, if confirmed, could inform future interventions aimed at reducing both bullying and cigarette use in high school students.

FUNDING: No funding

JUSTIFICATION: If confirmed, the findings from this study may influence future school-based interventions aimed at reducing both bullying and cigarette use in youth.

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administered by the Oak Ridge Institute for Science and Education through an interagency agreement between the U.S. Department of Energy and CDC.

JUSTIFICATION: As young adults, and African American young adults in particular, are increasingly likely to use marijuana before tobacco, greater understanding of how marijuana initiation interacts with tobacco initiation can inform more effective public health prevention efforts.

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POS3-14
FRAMING SMOKING PREVENTION MESSAGES TO ENHANCE IMPACT IN PEDIATRIC PRIMARY CARE: PRELIMINARY RESULTS OF A RANDOMIZED TRIAL
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Background: Messages emphasizing either the risks of smoking (loss-framed) or the benefits of not smoking (gain-framed) may be differentially effective for preventing youth tobacco use. This study examined the impact of brief, gain- and loss-framed messages for engaging teens with an evidence-based online smoking prevention intervention in the pediatric primary care setting.

Methods: Teens ages 12 to 17 (n = 525, M age 14.9, SD 1.6) presenting for well-checkups at an urban pediatric clinic were recruited for a three-arm trial. Enrolled teens were randomized to receive one of 3 message types: 1) gain-framed, 2) loss-framed, or 3) neutral. All 3 messages introduced teens to an evidence-based online smoking prevention intervention, A Smoking Prevention Interactive Experience (ASPIRE). The primary outcome was teens’ engagement with the intervention at 1-month follow-up.

Results: To date, 357 of 409 eligible patients have enrolled (87% enrollment), 286 were randomized, and 216 completed follow-up (65% female, 43% non-white, M age 15.0 years, SD 1.6, 86% nonsmokers, 56% behaviorally susceptible to smoking). Overall, 26% of teens reported intervention engagement at follow-up. Engagement was greatest among teens exposed to the loss-framed message (34%) and least among teens exposed to the gain-framed message (18%). Teens viewing the loss-framed message were two times more likely to report intervention engagement than teens viewing the gain-framed message (OR=2.35, 95% CI=1.06, 5.19, p = .042) and compared to all other messages combined (gain-framed or neutral, OR 1.90, 95% CI 1.01, 3.57, p = .047). The effect of framing was not moderated by demographics or smoking susceptibility, suggesting a robust effect.

Conclusions: Preliminary evidence supports the use of loss-framed messages with graphic imagery emphasizing the risks of smoking for motivating teens to engage with an online smoking prevention intervention. Similar to the graphic warning labels proposed for US cigarette packs, delivering brief messages conveying the harms of smoking with text and graphic imagery during well check-ups may help to engage teens with evidence-based interventions to prevent youth tobacco use.

FUNDING: This research was supported by National Cancer Institute and the Family Smoking Prevention and Tobacco Control Act under award number CA162839 (PI: Darren Mays). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH or the Food and Drug Administration.

JUSTIFICATION: The smoking prevention model examined in this study provides a new approach for linking teens with evidence-based preventive interventions that can augment and extend the impact of smoking prevention counseling delivered in the pediatric primary care setting.

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POS3-15
ASSOCIATIONS BETWEEN E-CIGARETTE TYPE USED, FREQUENCY OF E-CIGARETTE USE, AND QUITTING SMOKING: FINDINGS FROM A LONGITUDINAL ONLINE PANEL SURVEY IN GREAT BRITAIN
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Background: E-cigarettes can be categorised into two types, (a) ‘cigalikes’, resembling tobacco cigarettes, both disposable or with replaceable cartridges, and (b) ‘tanks’, designed to be refilled with liquid. Little is known about (1) predictors of using the two types, and (2) the relation between using the two types and quitting smoking.

Aims: Examine: (1) differences in demographics, smoking and e-cigarette behavior, among ex-and current smokers using the two e-cigarette types, and (2) the relation between type used, frequency of use (daily vs. non-daily vs. no use), and quitting.

Methods: Data were drawn from an online longitudinal survey of smokers in Great Britain first conducted in Nov-2012. Of 4064 respondents meeting inclusion criteria at baseline, this study included (N=1643) current smokers followed-up with one year later. Among 567 e-cigarette users at follow-up, baseline predictors of e-cigarette type used were examined using logistic regression. Adjusting for demographics, smoking and e-cigarette behavior at baseline, logistic regression was used to assess the relation between e-cigarette use and smoking status at follow-up.

Results: At follow-up, 64% reported no e-cigarette use, 27% used cigalikes, and 9% used tanks. Among e-cigarette users, 40-54 vs. 18-24 year olds, those with low vs. moderate/high education, daily vs. non-daily users, and ex- vs. current smokers were more likely to use tanks vs. cigalikes at follow-up. Compared to no e-cigarette use at follow-up, non-daily cigalike users were less likely to have quit smoking (OR=0.35, 95% CI =0.20-0.60), daily cigalike or non-daily tank users were no more or less likely to have quit (OR=0.74, 95% CI=0.39-1.42; OR=0.70, 95% CI=0.29-1.68 respectively), and daily tank users were more likely to have quit (OR=2.69, 95% CI=1.48-4.89).

Conclusions: Whether e-cigarette use is related with quitting depends on type and frequency of use. Demographics predict type of e-cigarette used. Because e-cigarette type and frequency of use was measured at follow-up conclusions cannot be made about whether use is predictive of later cessation because the direction of causation might be reversed.

FUNDING: No funding.

JUSTIFICATION: Findings presented on the relation between type and frequency of e-cigarette use and quitting smoking may inform e-cigarette regulations.

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POS3-16
CIGARETTE, CIGAR AND ELECTRONIC CIGARETTE BRAND PREFERENCE AMONG YOUNG ADULTS IN THE U.S. FROM 2011-2014
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Previous studies have shown that three top cigarette brands were dominant among adolescent smokers, though few studies have examined the continued appeal of these brands to young adults (YAs). Little is known about the top brands of non-cigarette tobacco products among YAs given rapid changes in the tobacco landscape. This study examined typical brand use of tobacco products among YAs ages 18-34 in the US from 2011-2014 using data from waves 1-6 (merged) of the Legacy Young Adult Cohort Study. Weighted frequencies were calculated for cigarettes, e-cigarettes and cigars (LCCs and large cigars combined). A logistic regression was used to determine differential demographic characteristics associated with premium v. non-premium cigar use. Among current (past 30 day)
cigarette smokers (n=3,723), the top three brands were Marlboro (38%), Newport (19%) and Camel (17%). Newport use was more common among females than males (23% v. 16%; p<.001) and among Blacks than Whites or Hispanics (70% v. 11% and 14%; p<.001). The top three cigar brands were Swisher (13%), Black and Mild (7%) and Dutch Masters (4%). Regression analyses revealed significantly greater odds of premium cigar use among respondents in higher income brackets (OR=46.22; p<.001). Among e-cigarette users (n=574), blu eCigs were the most popular brand reported (28%), followed by NJoy (4%) and V2 Cigs (3%). Use of blu eCigs was more common among 18-24 year olds than 25-34 year olds (33% v. 24%; p=.005) and among Blacks than Whites or Hispanics (45% v. 25% and 28%; p=0.1). The proportion of participants reporting no brand affiliation was higher among those aged 18-24 than those aged 25-34 for all products. Findings demonstrate that the top three cigarette brands remain Marlboro, Newport and Camel. They suggest disparities in use of Newport cigarettes, which are more popular among YAs who are female, Black, less educated and of lower income. Other than for premium cigars, there is little variability in cigar brand preference. More surveillance of e-cigarette brand preference is needed as new products become available, and more in-depth research is needed to determine the factors underlying these brand preferences.

FUNDING: This study was funded by Legacy.

JUSTIFICATION: This analysis can inform smoking prevention efforts as well as tobacco control policies, such as those related to tobacco product advertising.

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POS3-17
EXPLORING THE BELIEFS AND USAGE OF ELECTRONIC CIGARETTES AMONG KOREAN AMERICAN EMERGING ADULTS

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Background: E-cigarettes (EC) have emerged as the new alternative to combustible cigarettes (CC). Recent studies have shown that many CC users believe EC can assist in smoking cessation. Given the novelty of the topic and sparse empirical data, we explored EC use patterns and associated costs among Korean American emerging adults (KAEA) dual users (i.e., those who use CC and EC simultaneously), how they viewed EC use in terms of smoking cessation, and whether their CC use and confidence to quit CC were different compared to CC only users.

Methods: 78 KAEA between the ages of 18 and 25 who smoked more than 4 CC a day were recruited to participate in a 7-day ecological momentary assessment study about their regular CC use. A subset of 21 KAEA participants who indicated they had ever used or were dual users from the parent study involving current CC users (N=78) completed an additional online survey about their EC usage and beliefs.

Results: 90% of EC participants (n=19) indicated they were fairly regular users of EC and used it on average of 14.4 ±10.9 days in the past 28 days. Most participants spent less than $100 (n=16, 76%) to purchase an EC, mostly rechargeable types (n=20, 95%), and spent on average 10.9±10.8 dollars per week to maintain their vaping. Assessed with multiple questions about the reasons for their EC usage, an overwhelming majority replied that their intention was to quit tobacco soon when they started using EC (n=18, 86%), to use EC as an alternative to quitting tobacco altogether (n=17, 81%), and to cut down on CC (n=19, 90%). There was no statistically significant difference in the mean number of CC smoked per day (p=0.40) or in their mean confidence to quit CC (p=0.68) between CC users and dual users.

Conclusion: Our data showed that the majority of KAEA dual users perceived EC as a plausible tool to assist with smoking cessation. Additionlly, there were no differences in CC smoked per day and in their confidence to quit smoking between CC users and dual users showing more research must be done on CC smoking cessation using EC. Despite our small sample, this data provided helpful insight into EC use and related beliefs among KAEA dual users.

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POS3-18
NEIGHBORHOOD-LEVEL DETERMINANTS OF SMOKING CIGARETTES

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Previous studies have demonstrated that where people live is associated with the likelihood of smoking, even when controlling for individual socioeconomic factors. However, much of this research has been focused on the associations between individual perceptions of threatening residential environments and smoking behavior. Our study seeks to add to the literature by investigating these measures and measures of the built environment, such as the presence or absence of parks and community clubs or associations. In order to study neighborhood-level determinants of smoking, we examined the association between multiple measures of the built environment and a lifetime measure of ever smoking at least 100 cigarettes obtained from the National Survey of American Life (NSAL), an in-person household mental health survey of non-institutionalized Blacks residing in the United States. Multivariate logistic regression models run in SAS 9.3 were used to estimate associations. Forty-one percent of (N = 6,082) individuals between the ages of 18 and 64 reported ever smoking 100 cigarettes in their lifetime. After adjusting for age, sex, and education, individuals were less likely to smoke when living in a neighborhood where: check cashing locations (OR: 0.93, 95%CI: 0.69, 0.98), parks (OR = 0.81, 95% CI: 0.68, 0.97), or club associations (OR = 0.82, 95% CI: 0.69, 0.99) were present. Alternatively, individuals were more likely to smoke when the severity of drug problems in the neighborhood was high (OR: 1.22, 95% CI: 1.12, 1.30) and the frequency of crime in the neighborhood was high (OR: 1.23, 95%CI: 1.15, 1.33), but less likely to smoke when satisfied with their life overall (OR: 0.71, 95% CI: 0.63, 0.79). Perceptions of threatening residential environments and aspects of the built environment affect the likelihood of individual having smoked regularly.

FUNDING: This study was conducted while the corresponding author was at Virginia Commonwealth University and supported by the National Institutes of Health's National Center for Advancing Translational Science (award number UL1TR000058) and the National Institutes of Health's National Institute on Drug Abuse (project number 1R01DA025109-01A2: Developmental Genetic Epidemiology of Smoking).

JUSTIFICATION: Smoking prevention and cessation interventions may be more effective if they address neighborhood-level factors.

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POS3-19
THE MARKETING OF MENTHOL FLAVORED CIGARETTES, E-CIGARETTES, AND LITTLE CIGARS/CIGARILLOS IN YOUTUBE VIDEOS: A GATEWAY TO OTHER SOCIAL MEDIA CHANNELS

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Background: Menthol, which masks the bitterness, irritation, pain, and harshness of tobacco/nicotine, is the most commonly used flavored tobacco product among adults aged 18-34. Menthol tobacco products are heavily marketed on YouTube.com, the third most visited social media site in the world. Unlike traditional marketing techniques, YouTube.com is linked to other popular social media websites that could influence smoking rates among young adults.

Purpose: This study is the first to examine specific social marketing techniques used by consumers to promote menthol tobacco products on social media.

Methods: Eight search terms were used to identify the top 20 videos per search term for the content analysis of videos that portrayed menthol in cigarettes, cigars, and electronic cigarettes in June of 2014. We documented the video authors, titles, post date, number of views, duration of video, number of likes/dislikes, number of comments, number of subscribers, category of the posting, number of tobacco related video links per video, and other social media connections to each YouTube video. A total of 133 videos were analyzed.

Results: A total of 88 unique authors who posted the videos were identified. RealReview was the most common author, had the most overall views including the top ranking video (Swisher Sweets Sweet Cigarillo Review; n=99,239), and was more likely than any other author to post links to other tobacco videos and link his videos to other social media. We found a mean of 20.4 video links per video, most of which were links to tobacco advertisements. Menthol YouTube videos were linked to other social media including Facebook, twitter, Vine, Instagram, blogs, other channels that advertised tobacco products, with a mean of 2.4 social media links per video. Of the 9 posting categories identified, People and Blogs, blogs, other channels that advertised tobacco products, had a mean of 2.4 social media links per video.

Conclusion: Menthol marketing on YouTube.com may be a “gateway” to other social media marketing. These results can be used to develop counter-marketing messages on YouTube.com as a strategy to reach young adults on other social media channels as well.

FUNDING: No Funding

JUSTIFICATION: These data can potential inform social media based counter-marketing campaigns

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POS3-20
ADOLESCENTS PERCEIVE SIGNIFICANTLY LESS RISK YET SIMILAR BENEFITS IN E-CIGARETTES VS CIGARETTES

Bonnie Haikern-Felsher*, Maria Leia Roditis, David Cash

Electronic cigarettes (e-cig) are becoming more popular, and the prevalence of e-cig use is increasing sharply. Despite studies describing adolescents’ (mis)perceptions about the risks and benefits of cigarettes and that such perceptions predict cigarette use, there is little data on adolescents’ perceptions of e-cigs. The goal of this study was to examine adolescents’ perceptions of the risks and benefits of e-cigs compared to cigarettes. To date, 94 9th and 12th grade students completed a survey distributed on-line via Qualtrics. On a Likert-type scale, participants provided estimates of the addictive, harm, to one’s own health, friend’s health, and the environment from using cigarettes and e-cigs. Using any number from 0-100%, participants also rated the risks and benefits (e.g., bad cough, trouble catching breath, mouth sores, sports performance, having friends upset, feeling stressed, feeling buzzed, and looking cool and mature) of using cigarettes and e-cigs. Analyses comparing perceptions of cigarettes and e-cigs were calculated using paired samples (within-subject) t-tests. Adolescents believed that e-cigs are significantly less addictive, harmful to their health and their friend’s health, and harmful to the environment than are cigarettes (t-values ranged from 3.47 to 11.81; p < .00). Adolescents also rated the likelihood of experiencing health risks (such as becoming addicted, getting a bad cough, having trouble catching breath, getting mouth sores) as less likely if using e-cigs rather than cigarettes (t-values averaged 9.70, p < .00). However, on average, the adolescents did not report any difference between cigarettes and e-cigs in reducing stress, getting buzzed, or looking cool or mature. Results show that while adolescents perceive the benefits from using e-cigarettes and cigarettes (seeming cool, mature, or having a buzz) as the same, they perceive e-cigarettes as being overall less harmful. These findings suggest that adolescents may initiate use with e-cigarettes, as they perceive these products as conferring the supposed benefits of traditional cigarettes without any of the health risks.

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JUSTIFICATION: These findings suggest that adolescents may initiate use with e-cigarettes, as they perceive these products as conferring the supposed benefits of traditional cigarettes without any of the health risks.

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POS3-21
QUOTILE USE AND EFFECTIVENESS FOR CALLERS WITH MENTAL HEALTH CONDITIONS: EVIDENCE FROM THREE STATES


Individuals with mental health conditions (MHCs) use tobacco at a higher rate than the general population and are more likely to die prematurely, often due to tobacco-related conditions. While recent studies show that counseling effectively decreases cessation among persons with MHCs, more data are needed about the effectiveness of quiting counseling for this population.

We examined 30-day point prevalence quit rates at 7-month follow-up for three state quitlines (MD, NC, NE) that assessed MHCs at registration by asking, “Do you currently have any mental health conditions, such as ADHD, Bipolar, Depression, Drug or Alcohol Use Disorder (SUD), Anxiety Disorder, PTSD, Schizophrenia?” Analyses focused on English or Spanish speaking adult tobacco users who completed 1+ calls in the quiting multiple call program from Aug 2012-May 2013 and were randomly selected for evaluation. The survey response rate was 42% (3132/7459 calliers). Data were weighted to adjust for response bias and subpopulation oversampling.

Nearly half (45.8%) of survey respondents reported 1+ MHCs; the majority (57.4%) of those reporting a MHC reported 2+ comorbid MHCs. Respondents reported the following MHCs: 31.9% Depression, 21.2% Anxiety, 13.6% Bipolar, 8.4% PTSD, 6.7% SUD, 7.4% ADHD, 3.6% Schizophrenia. Respondents with a MHC were more likely to be female, White non-Hispanic, Medicaid-insured, less educated, more tobacco dependent, have a chronic physical health condition, and complete 3+ program calls vs. those who did not report a MHC. The unadjusted quit rate for callers with a MHC was significantly lower than for callers without (22.0% vs. 31.0% 30-day quit rates, p<.001). Multivariable logistic regression analyses confirmed that callers who reported 1+ MHCs were significantly less likely to be quit at follow-up (adjusted OR=0.63, 95% CI=0.51-0.78, p<.001); outcomes for specific MHCs will be discussed. This does not mean quitlines do not benefit persons with MHCs, since research shows that chances of success...
without assistance are lower. However, since half of quitline callers report a MHC, development and testing of more intensive or tailored programs to improve outcomes may be warranted.

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POS3-22
BRIEF FEEDBACK INTERVENTION FOR CURRENT HOOKAH BAR PATRONS

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Hookah use has been on the rise in the US and abroad in recent years. Studies have illustrated the harmful effects of hookah use and users' limited knowledge regarding its negative effects. Given the limited research on hookah cessation, the purpose of the current study was to examine the efficacy of a brief feedback intervention in a sample of current hookah bar patrons. Participants (N = 35) in a Midwestern Metropolitan area were recruited as they entered hookah bars and asked to complete a brief questionnaire and carbon monoxide (CO) testing, and were then randomized into assessment-only control (n = 18) or feedback (n = 17) conditions. Upon exiting the hookah bar, the feedback condition received educational information about the harmful effects of hookah as well as personalized feedback regarding their pre- and post-hookah session CO levels. Both conditions completed a brief exit survey at the end of their ad-lib hookah session assessing their hookah use, perceptions, and knowledge. A 3-month follow-up survey will be conducted in order to assess changes in hookah use. On average, participants spent 1.70 hours in the hookah bar and reported smoking 1 (SD = .42) bowl of shisha among 3.10 (SD = 1.76) people and using 3.84 (SD = 3.29) pieces of charcoal. Participants rated perceptions of absolute harm (1=not at all harmful, 10=extremely harmful) and relative harm (1= less harmful, 2= equally harmful, 3= more harmful). Post intervention, the feedback condition demonstrated higher perceptions of absolute harm caused by hookah (Control: M = 4.94; SD = 2.36; Feedback: M = 8.21; SD = 1.57; t(29) = -4.43, p < .001). Further, participants in the feedback condition were more likely to view hookah as equally or more harmful than cigarettes post feedback (Control=72.2%, Feedback=100%; Chi-square= 10.03, p = .007). This study begins to address the lack of research on hookah cessation interventions. The current research supports the use of educational and personalized feedback as a feasible intervention for correcting misperceptions regarding hookah.

FUNDING: Funding for the current project was provided by the Oklahoma Tobacco Research Center (OTRC) and intramural funds through Dr. Theodore Wagener.

JUSTIFICATION: The brief feedback intervention used in this study has been shown to be an effective method for teaching current users about the negative health impacts of hookah, and could therefore be implemented in a clinical setting or as a public service announcement.

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POS3-23
DOES REACTANCE TO GRAPHIC CIGARETTE PACK WARNINGS WEAKEN THEIR IMPACT?

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Background: Graphic cigarette warnings may encourage people to stop smoking, but they may also elicit reactance, a motivation to resist the warning. We sought to examine experimentally whether reactance weakens the impact of exposure to graphic warnings.

Methods: The experiment randomized a national sample of adult smokers to view 1 of 5 graphic warnings (n=510) or 1 of 5 text-only warnings (n=87) on a mocked-up cigarette pack on a computer screen. We measured reactance to warnings using our newly-developed Reactance to Health Warnings Scale (RaHW). The 27-item scale has high internal consistency across its 9 subscales (mean α=0.81) and robust 3-week test-retest reliability (mean r=0.66). The outcome was perceived effectiveness, assessed using 3-items that asked smokers to evaluate how much having the warning on their cigarette packs would make them want to quit smoking, make them concerned about the health effects of smoking, and discourage non-smokers from starting smoking (α=0.83).

Results: Smokers rated graphic warnings as more effective than text-only warnings (β=0.35, p<.01). However, graphic warnings elicited more reactance on 4 of the scale’s 9 dimensions: anger, perceived exaggeration, government interference and manipulation (all p<.05). Furthermore, mediational analyses showed that these 4 dimensions of reactance each suppressed the overall positive relationship between graphic warning exposure and perceived effectiveness (p<.05).

Conclusion: Smokers perceived graphic cigarette warnings as more effective than text-only warnings, but reactance to the warnings weakened this effect. Future research should confirm these findings in a study with longer-term behavioral outcomes and examine whether graphic warnings that elicit less reactance are more effective.

FUNDING: NIH/FDA grant P30CA16086-38S2

JUSTIFICATION: Policymakers should design graphic cigarette pack warnings that minimize reactance while maximizing the overall benefit to public health.

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POS3-24
ANALYSIS OF E-CIGARETTE CARTRIDGES AND REFILL SOLUTIONS: NICOTINE, TOBACCO ALKALOIDS, PH AND SELECTED FLAVORS

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Electronic cigarettes (e-cigarettes) have become increasingly popular and have experienced an exponential increase in sales since 2008. Despite increased popularity, relatively little is known about the chemical constituents of these products. In this study, we measured pH and the concentrations of nicotine (total and free), minor alkaloids, and flavors in 36 varieties of e-liquids used in e-cigarettes. For 75% of the products tested, measured nicotine concentrations were 6% - 42% lower than the values stated on the product label. As total nicotine concentrations in e-liquids increased, pH also increased. The direct correlation between the total nicotine concentration and pH suggests that the alkalinity of nicotine drives the pH of e-cigarette solutions. Measurements of pH in laboratory made "synthetic" e-liquid confirmed the effect of nicotine concentration on pH. The minor tobacco alkaloids (nomicotine, myosmine, anabasine, anatabine and isonicotione) were found in all nicotine-containing e-liquids and their relative
POS3-25

MOTIVATIONS FOR ELECTRONIC CIGARETTE USE: A CONCEPT MAPPING APPROACH

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Background: Electronic cigarettes (e-cigs) are a growing trend and their use rates may be driven by adults’ desire to quit cigarette smoking. Importantly, cigarette smokers’ reasons related to the purported utility of e-cigs as a cessation aid is rather nuanced and likely confounded by other motives associated with e-cig initiation and maintenance. Conventional survey methods are useful in describing the motivational characteristics of e-cig users, but are limited in capturing and modeling non-discrete or unstructured data that potentially are informative to extant frameworks on e-cig behaviors. The purpose of this study was to use concept mapping (CM)—an integrative mixed method participatory approach that incorporates group-level processes and multivariate analyses—to characterize and describe adults’ motivations for e-cig use.

Method: E-cig users (N=108) recruited from multiple venues including Craigslist, online forums, e-cig stores and vape conventions completed an intensive, online multi-step CM module that involved brainstorming statements in response to “A specific reason why I used an electronic cigarette in the past 30 days is.” Participants also sorted these statements into conceptually similar categories and then rated the importance of each statement.

Results: Multivariate analyses generated a map revealing eleven categories that characterized adults’ reasons for e-cig use: Cessation Methods, Therapeutic Aspects, Pleasurable Effects, Perceived Agency, Hobby Interests, Unanticipated reasons related to the purported utility of e-cigs as a cessation aid, and Network/Social Impacts and Hobby Interests. T-tests revealed significant differences in importance rankings for categories between e-cig users of varying demographics.

Implications: The concept map revealed in this study demonstrates how empirically derived, qualitative data on e-cig users’ motivations can be synthesized and presented in a manner that is informative and meaningful to frameworks on e-cig behaviors.

FUNDING: Research reported in this presentation was supported by the National Institute on Drug Abuse of the National Institutes of Health under Award Number P50DA036105 and the Center for Tobacco Products of the U.S. Food and Drug Administration.

POS3-26

A QUANTITATIVE RISK ASSESSMENT OF U.S. CIGARETTE PRODUCTS

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Quantitative risk assessment, including incremental lifetime cancer risk (ILCR) and hazard index (HI) calculations, was applied to 160 cigarette products marketed in the United States (US) in 2012 and 2013. ILCR and HI values, incorporating both estimates of toxicity and concentration for individual harmful and potentially harmful tobacco constituents (HPHC), were calculated overall and for six cigarette subcategories including three ISO “tar” categories (i.e., <6 mg, 6-13 mg, >13 mg), each with a menthol and non-menthol subcategory. For determination of HPHC yields, cigarettes were machine-smoked using both the ISO regimen and the Health Canada Intense (HCl) regimen. For non-cancer and cancer toxicity estimates, values established by US regulatory authorities or values derived from more recent dose-response data were used. Overall, for cigarettes smoked using the ISO regimen, ILCR values ranged between 4.17E-4 (minimum) and 6.67E-3 (maximum), and HI values ranged between 238 and 3632. For cigarettes smoked using the HCl regimen, ILCR values ranged between 3.37E-3 and 1.33E-2, and HI values ranged between 4720 and 9065. These results provide a range of non-cancer hazard and cancer risk estimates for current market cigarette products overall and by six subcategories. In the context of a toxicological risk assessment, it is suggested that a new cigarette product, with ILCR and HI estimates falling within the overall and/or relevant subcategory ranges for current market products, does not raise different questions of public health.

FUNDING: RAI Services Company

POS3-27

SOURCES AND NUMBER OF COUPONS FOR TOBACCO PRODUCTS RECEIVED AND THEIR ASSOCIATIONS WITH INTENTION TO USE SNUS

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Tobacco companies spent >$200 million in 2011 in the US to provide price discounts to tobacco users through coupons. Many smokers redeem coupons for cigarettes, and redemption of coupons promotes and sustains smoking. Little is known about the sources of these coupons, number of coupons received, and how these coupons influence use of non-cigarette tobacco products. Using data from the Minnesota Adolescent Community Cohort Study collected between 2012-2013 from 2070 young adults (mean age=26) originally from the US Midwest, we found that during the six months prior to the survey, 11% had received coupons for cigarettes, 5% had received coupons for snus, 3% had received coupons for other smokeless tobacco products. The number of coupons received varied greatly by smoking status, with current smokers receiving 13 more cigarette coupons and 15 more snus coupons than nonsmokers during the observation period estimated by Poisson regression models (p<0.05). The most common source of tobacco coupons was direct mail from the tobacco companies for smokers and nonsmokers. Among current and former smokers, packaging of tobacco products and family/friends were also common sources for these coupons. In multivariate regression models, participants without college education were more likely than those who had college education to have received coupons for cigarettes and snus (p<0.05), and received more coupons for both products. Past use of electronic cigarettes was also associated with higher odds of receiving cigarette coupons (adjusted odd ratio[AOR]=1.94, 95% confidence interval[CI]=1.30, 2.90) and receiving more cigarette coupons (2.91 more coupons, p<0.01). Finally, receipt of snus coupon was associated with intention to use snus among those who never used snus (AOR=2.64, 95% CI=1.05, 6.64), but not receipt of cigarette coupons (p=0.40), after adjusting for demographics. In conclusion, tobacco companies are successful in reaching young adults using coupons, particularly those of lower
education. Snus coupons may prompt young adults to try this new tobacco product. Eliminating these coupons may reduce the prevalence of and disparities in tobacco use among young adults.

FUNDING: The study is funded by the National Cancer Institute (grant RO1 CA86191). The data was collected while Dr. Choi was employed at the University of Minnesota. Dr, Choi’s effort on the abstract is supported by the Division of Intramural Research, National Institute on Minority Health and Health Disparities, NIH.

JUSTIFICATION: Findings from this study informs the need for continuous surveillance of tobacco coupons and for policies to regulate tobacco coupons.

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POS3-28
COMPLIANCE WITH ECOLOGICAL MOMENTARY ASSESSMENT PROTOCOLS AND ITS EFFECTS ON STUDY DATA

Isabelle Morris, Mai Frandsen, PhD, Stuart G. Ferguson*, PhD University of Tasmania

Objective: It is commonly noted that non-compliance with ecological momentary assessment (EMA) protocols has the potential to systematically bias study data. The purpose of this study was to document the relationship between three measures of protocol compliance - namely, responding to random prompts, logging events, and daily monitoring duration - and to explore their impact on self-reported affect, arousal and craving.

Methods: Data were taken from a multi-site study interested in the social determinants of smoking. Participants (n=73) used study-issued smartphones to monitor their smoking and activities in real time for up to four weeks (M=27.2 days per participant).

Results: On average participants responded to 77% of random prompts per day, however on a third of all monitoring days fewer than 75% of random prompts were completed; this accounted for less than two thirds of days during which any non-compliant behaviour was observed. Compliance with study protocols did not predict mean daily levels of affect, arousal or craving, but did predict both range and maximum values of these variables.

Conclusions: The assessment of random prompt compliance may not be an adequate proxy measure of other forms of non-compliant behaviour. Researchers should take care to monitor participant compliance with study protocols as poor compliance may impact on data quality.

FUNDING: This work was supported by an internal grant from the University of Tasmania awarded to Dr Ferguson.

JUSTIFICATION: It is important to understand how compliance with study protocols can impact on study data.

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POS3-29
PREDICTORS OF RECENT NICOTINE REPLACEMENT THERAPY USE AMONG SMOKERS IN PUBLIC HOUSING

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Nicotine replacement therapy (NRT) is under-utilized, particularly among minority and low-income smokers. To address the limited research on predictors of NRT use in this population, we analyzed data from baseline questionnaires among participants in a group-randomized cessation study of public housing residents in Boston, an ethnically-diverse, low-income population with minimal financial barriers to NRT due to Medicaid coverage. From a total of 506 residents who had expressed some level of interest in quitting smoking and completed a baseline interview, we analyzed data from 222 residents who had made a quit attempt within the past 12 months. We evaluated self-reported NRT use within the past 12 months by demographics, smoking, health care interactions, awareness of coverage for treatment, and co-morbid conditions, adjusted for confounding variables. We calculated prevalence ratio measures using log-binomial generalized estimating equations to account for clustering related to the group-randomized design. 31% of participants reported using NRT within the past 12 months, and multiple factors were associated with recent NRT use. For example, both black (RR=0.62, 95% CI: 0.40-0.97) and Hispanic (RR=0.67) and Hispanic (RR=0.67) and Hispanic (95% CI: 0.59-1.29) residents were less likely to use NRT than white residents. Participants who reported asking their doctor about methods to quit smoking were much more likely to have used NRT (RR=2.57, 95% CI: 1.61-4.10). 59% of residents were aware that NRT was covered by insurance, and those who were aware had increased use of NRT (RR=1.77, 95% CI: 1.12-2.81). Presence of symptoms such as coughing, wheezing, and shortness of breath were associated with greater likelihood of NRT use, as was knowing someone who had used NRT and had a positive or neutral experience.

Results suggest that ethnic disparities in NRT use also occur within low-income populations even when financial barriers to access are minimized. The results also highlight steps that could be taken to increase utilization, including raising awareness of insurance coverage and encouraging effective dialogue between smokers and medical providers.

FUNDING: National Institutes of Health, National Cancer Institute, Grants 1R01CA141587-05 and 3RO1CA141587-04S2

JUSTIFICATION: This study highlights disparities in nicotine-replacement therapy (NRT) utilization among low-income populations that cannot be explained by lack of access to NRT, suggests that the disparities are not income-related, and offers potential solutions including raising awareness of insurance coverage and promoting more dialogue between smokers and medical providers.

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POS3-30
PILOT IMPLEMENTATION OF A WELLNESS AND TOBACCO CESSATION CURRICULUM IN NORTH CAROLINA GROUP HOMES

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Despite a steady decline in smoking rates in recent decades, individuals with mental illness continue to smoke at disproportionately higher rates than the general population. Smoking rates of adults with mental illness are between 34.3% and 88%; this compares to an 18.3% smoking rate among the general population. Adults with mental illness are motivated to quit and quit with rates comparable to the general population when evidence-based cessation interventions are used. To build an evidence base for a wellness and cessation curriculum aimed at individuals with mental illness, the Breathe Easy Live Well (BELW) program was pilot tested in two group homes in North Carolina in the spring of 2014. Evaluators conducted pre- and post-implementation site visits and interviews with program instructors to assess outcomes as well as barriers and facilitators to implementation. Qualitative analysis of the data indicated that implementation was successful in
both group homes, and the following themes emerged: 1) Training and technical assistance provided throughout implementation was sufficient; 2) Instructors used prior professional experiences and goal setting to facilitate program success and participant engagement; 3) Fostering positive coping strategies reduced smoking; 4) Curriculum length may be a barrier to recruitment. Additional results included group home residents becoming interested in more diligently managing their symptoms of mental illness, an interest in eating healthier (e.g. drinking water in place of coffee and soda, asking for fruits to snack on instead of chips, etc.), and one group home moving their designated smoking area farther away from the home and out of the direct path of the entrance/exit. BELW is a promising strategy for addressing tobacco use in mental health treatment settings. Results of this pilot project suggest that scaling up the program to other group homes across the state could assist group home staff in effectively addressing health and wellness along with smoking cessation among individuals with mental illness.

FUNDING: Funding for this pilot project was provided by the Southern Regional Area Health Education Center.

JUSTIFICATION: A need exists for the implementation of smoking cessation interventions in the mental health treatment setting. This evaluation contributes to that evidence base and supports using the treatment setting to address tobacco use among adults with mental illness.

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POS3-31

ADOLESCENT AND PARENTAL PERCEPTIONS OF HOOKAH IN OREGON

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Hookah tobacco smoking is gaining popularity among youth in the United States. Low perceived harm and relaxed parental attitudes have been associated with youth tobacco use initiation. However, there are few qualitative studies describing youth perception of hookah smoking, particularly among younger than 18-years-old. In addition, no research currently exists on parental perceptions of hookah smoking. We conducted focus groups of youth aged 16-18 years-old to explore hookah awareness, acceptance and use, and additional focus groups of parents of youth 12-18 years-old to assess perceptions of hookah.

In October 2010, four focus groups of 16-18 year-olds and two focus groups of parents of 12-18 year-olds were conducted in Portland, Oregon. A follow-up phone survey of all parent participants was conducted two weeks after the focus group sessions to assess actions taken by parents after learning about hookah.

Adolescents expressed widespread awareness and high peer acceptance of hookah. Adolescent hookah smokers found the practice appealing because hookah tobacco tastes and smells good, and smoking occurs in social settings. Adolescents perceived hookah smoking as less harmful than other tobacco products due to the flavored tobacco, misperceptions that hookah tobacco is tar- and nicotine-free, and lack of information from trusted sources that hookah smoking is harmful to health.

Parents were largely unaware of hookah's rising popularity among youth and young adults and believed hookah smoking to be safer than other forms of tobacco use. Information about the health harms of hookah and its rising popularity among youth prompted parents to talk with their children, friends, and other family members about hookah smoking.

Tobacco control strategies that ban flavored hookah tobacco, include health warning labels on hookah tobacco, specify hookah lounges in indoor clean air laws, and educate youth and parents about the health harms of hookah smoking may reduce the appeal of hookah among youth.

FUNDING: This study was supported by the Oregon Tobacco Prevention and Education Program with Measure 44 tobacco tax revenues.

JUSTIFICATION: This research can be used by tobacco prevention and education programs when messaging the harms of hookah tobacco smoking to youth and parents, as well as guide public health policies needed to reduce youth hookah use.

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POS3-32

CIGARILLO USE AMONG AFRICAN AMERICAN YOUNG ADULT MEN: A QUALITATIVE STUDY

Erika S. Trapl, PhD *, Sarah Koopman Gonzalez, MA, Leslie Cofie, MA

Rates of cigar product use among adolescents are significantly higher than rates of cigar product use among adults, and recent research has revealed that young adult use of cigar products is more similar to adolescents than older adults. However, little is known about tobacco product initiation, purchasing practices and uses of cigar products, and the perceptions of tobacco product characteristics among African-American young adult users. Using data from semi-structured interviews with 18 African American, urban young men (18-29 years old) who had ever used little cigars (such as Black & Milds), this paper presents data on the trajectory of participant tobacco usage. Particular attention is paid to trends in movement between cigarettes and Black & Milds, including age of initiation and reasons for initiation to each product, explanations for switching between these two products, details regarding periods of quitting using tobacco products, as well as current product preferences and habits. Semi-structured interviews used both open-ended questions as well as a card sorting activity where participants ranked tobacco products on characteristics such as “dangerous to my health”, “addictive”, and “taste/flavor”. Interviews were qualitatively coded using NVivo for themes identified in the interview guide as well as themes which emerged from the data. Respondents were equally split between cigarettes and cigarillos as a product of initiation, although most were still currently using cigarillos. Most began using tobacco use while underage and reported use of multiple types of tobacco shortly after initiation. Most (56%) believed that premium cigars were most dangerous and cigarillos were most addictive (78%); 61% believed that cigarillos, such as Black & Milds, had the best flavor. Themes emerged related to cigarillo product manipulation, purchasing habits, and the potential role of community “care” in tobacco use. Ethnographic research is a valuable approach to understanding tobacco use trajectories and trends. Understanding when and why individuals use different products can inform research, interventions, and policy development to reduce tobacco initiation and use.

FUNDING: No funding.

JUSTIFICATION: Understanding cigarillo initiation and use and the interplay of cigarette use among young adults can inform tobacco control policy to reduce youth tobacco initiation.

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POS3-33

PROFILE OF E-CIGARETTE USE AMONG ADOLESCENTS

Grace Kong, PhD*, Meghan E. Morean, PhD, Dana A. Cavallio, PhD, Deepa R. Camenga, PhD, Suchitra Krishnan-Sarin, PhD

Introduction: Despite the popularity of e-cigarettes among adolescents, how adolescents use e-cigarettes remains unknown. Thus, we examined the use patterns among adolescent e-cigarette users who also smoke cigarettes.

Methods: Prior to participating in an e-cigarette experimental study, adolescent e-cigarette users (i.e., using e-cigarettes at least once in the past month) who were also regular smokers (n=21) completed the modified past-month Time Line

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Follow Back (TLFB) interview assessing the frequency of e-cigarette use, number of times it was used per day, and the number of puffs taken each time it was used as well as questions about their e-cigarette and cigarette use.

Results: Participants were 66.7% male, 97.5% White, 17.9 (SD=0.96) years old, and smoked 8.14 (SD=4.42) cigarettes per day. The past-month TLFB data showed that 33.3% used e-cigarettes 2-4 days, 33.3% used 8-27 days and 33.3% used all 28 days. On the days that e-cigarettes were used, 33.3% reported using e-cigarettes < 2 times per day, 33.3% used 2-6 times per day, and 33.3% used 7-50 times per day. Number of puffs taken at each time also varied: 33.3% took <3 puffs each time, 33.3% took 4-11 puffs, and 33.3% took 12-285 puffs. More frequent use was associated with greater number of times used per day (p=0.003) and greater number of puffs taken during each time (p=0.017). The majority (81%) of the sample used e-cigarettes with nicotine, 9.5% used e-cigarettes with and without nicotine, and 9.5% did not know the nicotine content. Most (95.2%) used only rechargeable e-cigarettes, 5% used only disposable e-cigarettes and 14% used both rechargeable and disposable e-cigarettes. The frequency of e-cigarette use, the number of times it was used per day and the number of puffs taken were not associated with the number of cigarettes smoked per day, the nicotine content of the e-cigarette or the e-cigarette type.

Discussion: The pattern of e-cigarette use varied among adolescent e-cigarette users; whereas, the type of e-cigarettes used was consistent. More research should examine the health effects of frequent and heavy e-cigarette use in adolescents to better inform the regulation of e-cigarettes.

FUNDING: P50DA009241; P50DA036151

JUSTIFICATION: Understanding the pattern of adolescent e-cigarette use can inform regulations that restrict e-cigarette access to youth

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POS3-34 ELECTRONIC CIGARETTE AND OTHER SUBSTANCE USE AMONG HIGH SCHOOL STUDENTS IN CONNECTICUT
Meghan E. Morean, PhD∗, Grace Kong, PhD, Deepa R. Camenga, MD, Dana A. Cavallo, PhD, Suchitra Krishnan-Sarin, PhD, Obstetrt College, *Yale University School of Medicine

Introduction. Little is known about adolescents’ concurrent use of electronic cigarettes (e-cigarettes) and other commonly used substances. In a high school sample, we examined 1) lifetime and current use rates of tobacco, marijuana, alcohol, and multi-substance use; 2) lifetime use of e-cigarettes to smoke marijuana; 3) whether substance use rates differed by e-cigarette use status (i.e., never, experimenter, and current); and 4) whether sex, age, race, or the use of the aforementioned substances reliably were associated with e-cigarette use.

Methods. In November 2013, adolescents attending 4 HSs (N = 3614) in CT completed an anonymous survey assessing use of e-cigarettes and other commonly used substances (cigarettes, cigars, smokeless tobacco, hookah, blunts, marijuana, and alcohol). Chi-square analyses evaluated if e-cigarette use (experimentation or current) was associated with lifetime and/or current use of: 1) each substance; 2) multiple substances (1-5 substances); and 3) all possible combinations of the substances assessed. Multinomial logistic regressions evaluated if e-cigarette use was influenced by age, sex, race, and/or the use of other substances.

Results. Experimenters (13.2%) and current e-cigarette users (12%) used all substances at higher rates than never users (74.8%) and were more likely to use multiple substances. Current e-cigarette users used all substances at higher rates than former users except alcohol, and were more likely to report concurrent use of all substances. Many students endorsed using e-cigarettes to smoke marijuana (experimenters [10.5%]; current [23.0%]). Experimenters and current e-cigarette users were more likely than never users to be male, Caucasian, and to report lifetime and/or current use of other substances; C current users were more likely than experimenters to smoke cigarettes and use smokeless tobacco.

Discussion. Most adolescent e-cigarette users used multiple substances or forms of tobacco, and rates of using e-cigarettes to smoke marijuana were high. Longitudinal research will help clarify if e-cigarettes serve as a gateway product for other forms of substance use and inform efforts to regulate e-cigarettes.

FUNDING: This research was supported in part by 1) NIH supplement through NIDA grant P50DA009241, 2) NIAAA grant 5T32AA015496, and 3) NIDA 1K12DA033012-01A1.

JUSTIFICATION: Relevant to the FDA’s efforts to regulate electronic cigarettes, the current study indicates that e-cigarette users are likely to use multiple substances of abuse; future research is needed to determine if e-cigarettes are a “gateway” product for the initiation of other substances.

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POS3-35 MESSAGE FRAMING FOR E-CIGARETTE PREVENTION AMONG ADOLESCENTS AND YOUNG ADULTS
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Introduction: Electronic cigarettes (e-cigarettes) are rapidly gaining popularity among adolescents and young adults; thus, developing effective prevention messages is critical. Framing prevention messages emphasizing the losses or gains of using e-cigarettes may be useful in this endeavor.

Methods: Through the use of focus groups with middle, high school, and college students in CT, we identified message themes that could be used for e-cigarette prevention messages (Cavallo et al., under review). We then developed loss- and gain-frame messages related to money, health risks, addiction, and social label. Using a cross-sectional survey, we assessed the preference for either loss- or gain-framed messages for each of the themes among middle school, high school, and college students in CT (N=9405). We conducted logistic regression analyses to assess whether preference for message framing differed by gender, age, cigarette and e-cigarette use status. We also assessed whether gender moderates the association between e-cigarette use status and message framing preference.

Results: The sample was 53% females, 74.8% Caucasian, 21.4% ever e-cigarette users and 19.9% ever cigarette users. Among never e-cigarette users (n=4206), 29.5% were susceptible to use e-cigarettes in the future. Logistic regression analyses showed that females were more likely than males to prefer loss-framed messages regardless of message content, and e-cigarette users were more likely than never e-cigarette users to prefer gain-framed messages related to health risks and social label. We did not detect gender by e-cigarette use status interaction.

Discussion: E-cigarette prevention messages should consider gender differences and develop messages emphasizing losses for girls. Messages relating health risks and social label for e-cigarettes should be gain-framed.

FUNDING: P50DA009241; P50DA036151

JUSTIFICATION: Loss- and gain-framed e-cigarette prevention messages toward youth should consider gender and e-cigarette use status differences.

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**POS3-36**

**ASSOCIATION BETWEEN DAILY STRESS AND CRAVING WITH CIGARETTE SMOKING DEPENDS ON NICOTINE ADDICTION AMONG KOREAN AMERICAN EMERGING ADULT SMOKERS**

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Background: Previous studies have documented an association between daily stress, craving, nicotine dependence and cigarette smoking. However, the interplay of the factors on smoking is understudied among specific ethnic groups, such as Korean Americans (KA) who are exposed to increased smoking risk. We examined how daily stress and craving affected cigarette smoking and the moderating effect of nicotine dependence among KA emerging adults (KAEA).

Method: Using Ecological Momentary Assessment (EMA), we surveyed 78 KAEA (n=56 males) who smoked at least 4 cigarettes a day for 7 days. Nicotine dependence was measured using the Fagerström Test for Nicotine Dependence (FTND). Prompts assessing stress and craving were recorded throughout the day. Prompt-level scores were averaged to generate daily levels of stress and craving. Separate general linear mixed models were used to explore how daily average craving and stress predicted number of cigarettes smoked each day; we also examined whether these associations were moderated by one's levels of nicotine addiction.

Results: Controlling for covariates, both models showed that within-person variance in daily stress and craving were not associated with number of cigarettes smoked that day (est=0.14, p=0.57, est=0.06, p=0.76, respectively) for participants with less nicotine dependence (N=2.13, SD=1.92). In contrast, for those who showed greater nicotine dependence, within-person daily stress level and craving both predicted significantly increased number of cigarettes smoked that day (est=0.40, p<0.01, est=0.42, p<0.01, respectively).

Discussion: Our results showed that experiencing higher levels of stress and craving than one's usual led to more cigarettes smoked on that day only for those with greater levels of nicotine addiction. This may suggest that internal psychological factors such as stress and craving are less motivating factors for "lighter" KAEA smokers and that smoking cigarettes may be a way to cope with stress and craving among KAEA who are more highly addicted. Cessation programs tailored for this group should account for varying levels of nicotine addiction and its link with psychological cues to smoke.

FUNDING: This study was conducted while the authors were at the University of Southern California. Supported by grant "ACS 124758-MRSG-13-155-01-CPPB, PI (Huh)."

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**POS3-37**

**E-CIGARETTE USE AMONG SMOKERS SEVEN MONTHS FOLLOWING QUITLINE REGISTRATION**

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State quitlines are encountering a high proportion of callers who use electronic cigarettes (ECs), yet consensus is lacking on how to best address EC use during a quit attempt. This study examines EC use at the 7-month follow-up among cigarette smokers who called the Oklahoma Tobacco Helpline from March-December 2013. A random sample of registrants was selected for the evaluation phone survey which assessed program satisfaction and quit outcomes. Respondents were also asked about use of ECs (or other nicotine vapor device) in the past 30 days, reasons for use, and other resources used since receiving Helpline services. Among 551 respondents to the 7-month survey, 24.5% reported using an e-cigarette in the past 30 days. The majority reported using an e-cigarette to help quit tobacco (83.7%) and to reduce tobacco use (84.4%). Participants identified other reasons for using ECs: in places where smoking is not allowed (37.0%), to save money (54.1%), to avoid smelling like smoke (54.1%), and because they are safer than cigarettes (54.1%). When asked what other kinds of assistance smokers used since calling the Helpline, 32.9% reported using an EC, while 26.8% used self-help materials and 22.7% sought help from a health professional. Only 2.0% of respondents reported buying additional NRT since receiving services from the Helpline. Thirty-day point prevalence responder quit rates at the 7-month follow-up were significantly lower among EC users (23.1%) as compared to those not using an EC at follow-up (36.2%, p=0.005). As a result, almost 1 in 5 Helpline participants were dual users of ECs and combustible cigarettes at the 7-month follow-up. Interpretation of these findings is challenged by the fact that current EC use was collected at the 7-month follow-up without any information on when EC use began or the frequency of EC use. It is unclear if the use of ECs after receiving Helpline services represents a method of nicotine replacement and progression toward quitting cigarette smoking, or rather a pattern of sustained nicotine addiction which could undermine cessation attempts.

FUNDING: This research and the Oklahoma Tobacco Helpline are funded by the Oklahoma Tobacco Settlement Endowment Trust.

JUSTIFICATION: The results demonstrate a need for improved messages about electronic cigarettes for smokers calling state quitlines; thus, the findings have implications for state quitline policy and practices.

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**POS3-38**

**COMPARISON OF SUBJECTIVE RESPONSES AND CONTEXTS OF USE BETWEEN CIGARETTES AND ELECTRONIC NICOTINE DELIVERY SYSTEMS (ENDS) AMONG YOUNG ADULT DUAL USERS**

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This study used ecological momentary assessments (EMA) to examine contexts and mood responses to both cigarettes and electronic nicotine delivery devices (e-cigarettes or “ENDS”) among 54 young adult (mean age 23.7 years; 57% male) dual users. Knowing more about differences in patterns and responses to these products may help explain whether cigarette smokers transition to ENDS or how they use ENDS. Participants provided 7 days of EMA data by responding to random prompts (mean of 39.9/person) and recording tobacco use episodes (means of 6.5 cigarette and 7.9 ENDS/person). One month follow-ups were collected to observe changes in patterns of use between products. There were a total of 2153 random, 353 cigarette, and 428 ENDS events. Random effects location scale analyses examined differences in moods before and after use by product and compared to random times. Both cigarettes and ENDS had similar mood effects: Both products were used at times that had significantly lower positive moods and higher negative moods than random times, and both produced similarly strong and significant enhancements in positive mood and relief of negative mood. There were no differences in magnitude of mood change by product. Satisfaction and pleasure ratings were similar and high for both products. However, urge for a cigarette was significantly higher prior to cigarette use (7.5) than before ENDS use (5.7). Contexts and prompts to use differed in notable ways. ENDS use was accompanied by more work-related activities (job, school), computer use, and more simultaneous media watching. Cigarette use was more common with “hanging out”, transit times, or alcohol and marijuana use. ENDS use was more likely to occur when alone, at home, when others were not using tobacco, and where smoking was not allowed. These data suggest that ENDS may serve as a “bridge” when smoking is less welcome. In specific contexts, ENDS bring about similar subjective mood enhancements as cigarettes for dual users.

FUNDING: This work was supported by grant SPO1 CA138279-S1 from the National Cancer Institute.

JUSTIFICATION: Results from this study help to understand contexts of use and affective responses to ENDS among dual users and have implications for continued use of cigarettes and transitions to ENDS.

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POS3-39
ATTITUDES, BELIEFS, AND PERCEIVED SOCIAL NORMS OF E-CIGARETTE USE AMONG ADULT USERS: FINDINGS FROM A QUALITATIVE STUDY
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Background: E-cigarette use in the U.S. is rapidly increasing among adults (Pepper & Brewer, 2014; King, et al., 2013; Pearson et al., 2012). As the landscape of e-cigarette products continues to evolve, understanding how consumers talk about and use e-cigarettes, and what consumers know and believe about e-cigarettes is critical to understanding the public health impact of these products. However, research on consumer perceptions of e-cigarettes remains limited. The purpose of this qualitative study was to explore adult e-cigarette users' attitudes, beliefs, and perceived social norms of these products.

Methods: A series of 14 focus groups (n=116) was conducted with e-cigarette users across five geographic regions in the U.S., including Washington, DC; Richmond, VA; Providence, RI; Orlando, FL; and Los Angeles, CA. Focus groups were segmented by age (young adults aged 18-29 vs. older adults aged 30 years or older), as well as by tobacco use (exclusive e-cigarette use vs. dual use with at least one other tobacco product). All focus group sessions were audio-recorded and transcribed; data were analyzed using NVivo version 9 software.

Results: Across focus groups, participants expressed many positive attitudes towards e-cigarettes, and simultaneously reported a lack of information and knowledge about the products. Many expressed interest in learning more about what was in these products. Among those who are, or have used, e-cigarettes as a strategy to quit smoking, there was consensus in the belief that the ingredients of e-cigarettes were less harmful than conventional cigarettes, even though ingredients were unknown. Participants discussed the lack of stigma around e-cigarettes compared to that of conventional cigarette use. Additionally, many described positive reactions from family and friends, especially when an e-cigarette was used in place of a conventional cigarette.

Conclusions: Understanding consumer attitudes and beliefs about e-cigarettes is important in shaping the potential public health impact of these emerging products. FUNDING: Funding for data collection and analysis was provided by the U.S. Food and Drug Administration (FDA) Center for Tobacco Products (CTP).

POS3-40
PATTERNS OF USE AND PERCEPTIONS OF HARM OF ELECTRONIC CIGARETTES AMONG HOSPITALIZED SMOKERS PLANNING TO QUIT
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Background: Little is known about electronic cigarette (e-cig) use among smokers with medical illness or among those who plan to quit.

Methods: We analyzed data from a cessation trial for smokers admitted to 3 hospitals in MA and PA (12/2012-7/2014). All 1357 enrollees (mean age 49 yrs; 49% female, 73% white, 14% black) planned to quit post-discharge and were asked about e-cig use for 30d before admission; additional questions were asked of 726 smokers enrolled starting in 9/2013.

Results: 21.4% of 1357 smokers used an e-cig in the 30d before admission. In a multivariate analysis, e-cig use was more common among females (OR 1.57, 95% CI 1.20-2.05), younger smokers (OR 1.22, 95% CI 1.10-1.36 per decade) and had a borderline association with prior cessation aid use (OR 1.35, 95% CI 0.97-1.88). Use did not vary by race, education, alcohol/substance use, time to 1st cigarette or hospital site. Among 726 enrollees asked all questions, 382 (52.8%) had ever used an e-cig and 156 (40.8% of ever users) had used one in past month. Past 30-d users used e-cigs on a median of 4 d (IQR, 2-10) and rated future e-cig use as unlikely (median 2.5 [IQR 1-7] on a 0-10 scale). The main reason for use was to aid cessation (80%) rather than for use in smoke-free areas (12%) or to reduce harm (4%). Enrollees were more likely to rate cigarettes as very or somewhat harmful to health compared to e-cigs or NRT (97% vs. 39% vs. 22%, respectively; p<0.001), but many did not know if e-cigs (42%) or NRT (21%) were harmful. Nearly half (48%) rated e-cigs as less harmful than cigarettes, but 31% did not know. Compared to NRT, e-cigs were rated as more harmful (28%), as harmful (20%) or less harmful (19%) and 39% did not know. Compared to never users, e-cig users were more likely to have an opinion about e-cig risk (61% vs 39%, p<0.001) and if so, to rate e-cigs as not harmful (38% vs 23%, p<0.002).

Conclusions: Half of hospitalized smokers who planned to quit had used an e-cig and 21% had used one recently, but use was sporadic and few intended to continue. E-cigs were rated as intermediate in health risk between cigarettes and NRT, but 30-40% of smokers were uncertain about the risk of e-cigs.

FUNDING: Supported by NIH/NHLBI grant #R01-HL111821. Dr. Tindel was on the faculty of the University of Pittsburgh School of Medicine when these data were collected.

JUSTIFICATION: The prevalence of e-cigarette use in this subpopulation of smokers with medical illness is higher than is reported in the overall population, and their pattern of use is not consistent with completely switching to e-cigarettes as a way to quit smoking.

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POS3-42
RISK PERCEPTIONS AND TRIAL USE FOLLOWING EXPOSURE TO COMPARATIVE VERSUS NON-COMPARATIVE PRINT ADS FOR E-CIGARETTE AND SNUS AMONG YOUNG ADULTS

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Although traditional cigarette sales have declined in recent years, the sale of other tobacco products including snus and e-cigarettes has increased. Of great concern to the tobacco control community, these newer tobacco products are being marketed as attractive alternatives to smoking or smokeless tobacco particularly in places where clean indoor air laws have imposed external restrictions on smoking or spitting. Print advertisements that present comparisons and attractive alternatives for cigarette smoking and/or smokeless tobacco use are likely to expand the market for tobacco use. Concerns exist regarding the potential for these marketing efforts to undermine smoking prevention and cessation efforts and renormalize smoking, particularly for youth/young adults. In a 2 (product type: e-cigarette vs. snus) x 2 (ad. framing: comparative vs. non-comparative) fully-crossed factorial within-participants experimental study, we investigated the persuasive appeal of e-cigarette and snus print ads framed as attractive alternatives to traditional tobacco use. Young adults (n=1,051) between the ages of 18-24 years were recruited by an online panel survey company to complete an experimental study online. Among young adults who had never tried e-cigarettes or snus, the results of a series of 2 (e-cigarette/snus) x 2 (comparative/ non-comparative ad. framing) repeated measures analyses of variance (ANOVA) revealed significant main and interaction effects for risk perceptions and intentions to use these tobacco products. Overall, e-cigarette ads were rated as less risky and less likely to help the user quit smoking than snus ads. As well, future product use intentions were higher following exposure to comparative ads as compared to non-comparative ads. The results have (a) policy implications for imposing marketing restrictions on snus and e-cigarettes as attractive alternates to traditional tobacco products, and (b) practical implications for developing counter-marketing interventions that help young adults become more critical of tobacco advertising.

FUNDING: Research reported in this abstract was supported by National Institute of Drug Abuse (1R03DA035242-01) and FDA Center for Tobacco Products (CTP). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH or the Food and Drug Administration.

JUSTIFICATION: The results of this study demonstrate that exposure to comparatively framed (i.e., ads that portray the advertised product to be better than traditional tobacco products such as cigarettes and smokeless tobacco) e-cigarette and snus ads influences future product use intentions among young adults; therefore, inform policy around advertising of these products including claims made by advertisers.

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POS3-43
AVAILABILITY AND MARKETING OF ELECTRONIC CIGARETTES IN CANADA: A PRELIMINARY ENVIRONMENTAL SCAN

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Background: Although electronic cigarettes (e-cigarettes) containing nicotine are prohibited in Canada, e-cigarettes with and without nicotine are widely available for sale. Currently, there are no restrictions on the promotion of these products in Canada. The present study sought to examine the availability and marketing of e-cigarettes in Canada, with a focus on three channels: brick-and-mortar retail stores, internet, and social media.

Methods: E-cigarette availability and marketing was examined through environmental scans in August and September 2014. A total of 58 brick-and-mortar retail outlets (grocery stores, convenience stores, tobacco shops, and vape shops) were examined in Vancouver, Toronto, Montreal and Halifax. Inquiries were made as to whether online e-cigarette manufacturers/retailers (n=23) sold and/or shipped their products to Canada. Twitter, Facebook and YouTube were searched to identify whether major e-cigarette manufacturers/brands had social media accounts. Account content, activity level and number of followers were documented.

Results: Approximately three-quarters of brick-and-mortar retail outlets sold e-cigarettes. All of the retail outlets that sold e-cigarettes offered nicotine-free products. However, in all of the outlets where e-juice refill kits were available, the refills could be purchased with nicotine. The majority of online e-cigarette manufacturers/retailers sold their products both online and in retail stores in Canada. Almost half (48%) of identified manufacturers/retailers sold nicotine-containing products, and all of these indicated they would ship such products to individuals in Canada. The majority of previously identified e-cigarette brands had some form of social media presence. Social media activity was greatest on Facebook, followed by Twitter and YouTube, with respect to accounts, content, and number of followers.

Conclusions: Despite a restriction on nicotine-containing e-cigarette products in Canada, evidence suggests products with and without nicotine are widely available for sale. E-cigarettes are promoted online through websites and social media accounts of e-cigarette manufacturers/retailers.

FUNDING: This research was supported by a Canadian Institutes of Health Research (CIHR) Vanier Canada Graduate Scholarship (Czoli), the Propel Centre for Population Health Impact, a CIHR New Investigator Award (Hammond), and a Canadian Cancer Society Research Institute Junior Investigator Research Award (Hammond).

JUSTIFICATION: The study findings provide the first characterization of the Canadian e-cigarette market.

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POS3-44
SOCIAL REACTIONS TO GRAPHIC CIGARETTE PACK WARNINGS: A PILOT STUDY
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Objective. Graphic warnings on cigarette packs may spark social interactions that in turn influence smokers’ reactions to the warnings. We aimed to describe social interactions about graphic warnings in a longitudinal pilot study of smokers.
Methods. We labeled 33 adult US smokers’ cigarette packs with 1 of 5 graphic warnings for 4 weeks, and smokers completed a survey once per week. Smokers were highly compliant with the study protocol, smoking 93% of their cigarettes from labeled packs. We measured the frequency and content of conversations about the warnings, as well as frequency of talking about the health risks of smoking and quitting smoking.
Results. Nearly all smokers (94%) had at least one conversation about the warnings during the 4 weeks, talking to others about the warning 2.3 times per week. Among participants who had at least one conversation about the warning, 87% talked to a friend, 61% talked to a family member besides a spouse or child, 45% talked to a spouse or significant other, 39% talked to a co-worker, 29% talked to someone they did not previously know, 13% talked to children, and 13% talked to a medical professional. Smokers reported talking about whether the warning would encourage smokers to quit smoking (77%), whether the warning would make the participant want to quit smoking (77%), whether the warning would discourage non-smokers from starting to smoke (71%), and whether graphic warnings should be on cigarette packs (65%). Smokers talked about the health risks of smoking more frequently after one week of exposure to graphic warnings, compared to the week prior to beginning the study as reported at baseline (0.9 vs. 2.8 times per week, p<.05). Similarly, smokers talked about quitting smoking more frequently after one week of exposure compared to the week before beginning the study (1.6 vs. 2.5 times per week, p<.05).
Conclusions. Graphic warnings sparked conversations about the warnings, quitting smoking, and the health risks of smoking. Social reactions to graphic warnings are understudied and should be examined as a potential moderator of behavior change given the high prevalence of conversation found in our study.
FUNDING: FWA/NIH grant 3P30CA16086-38S2.
JUSTIFICATION: Researchers and policymakers should consider how social interactions influence the impact of graphic cigarette pack warnings.
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POS3-45
GRAPHIC WARNING LABELS INFLUENCE OBJECTIVE HEALTH RISK KNOWLEDGE AND SUBJECTIVE PERCEPTIONS OF VULNERABILITY THROUGH DISCRETE PROCESSES
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The Family Smoking Prevention and Control Act gave the Food and Drug Administration authority over the marketing of tobacco products, including cigarette packaging. Applying graphic warning labels to cigarette packaging may serve as an effective way to communicate health risk information to smokers and encourage cessation. However, the mechanisms by which graphic warning labels affect risk knowledge and perceived vulnerability to those risks remain unclear, especially with repeated exposure to warnings. In this experiment, 248 daily smokers received their own brand of cigarettes over 4 weeks in packages that included warning labels featuring text only, graphic image plus text, or graphic image plus elaborated text. The current research compares text-only and graphic-image-plus-text conditions. At the study’s end, smokers who received graphic warning labels recalled more label information (p<.001) and believed the labels were more credible (p<.02) than those who received text-only labels. Mediation analyses revealed that graphic warning labels had a significant indirect effect on health risk knowledge at the end of the experiment and one month later through memory for label content. Specifically, the presence of graphic warning labels facilitated increased memory for label content, which led to greater knowledge of smoking-related risks. However, memory for label content did not influence perceived vulnerability to smoking risks or desire to quit. Instead, mediation analyses revealed that graphic warning labels had a significant indirect effect on smokers’ perceived vulnerability to disease and desire to quit through label credibility. In other words, graphic warning labels (compared to text-only labels) caused smokers to trust the warnings more, resulting in heightened feelings of vulnerability to smoking-related diseases and increased quit intentions. The results suggest that repeated exposure to graphic warnings increases both knowledge of smoking-related risks and feelings of vulnerability to those risks. However, objective knowledge and subjective risk perceptions were influenced by different processes.

FUNDING: This research was supported by a grant from the National Cancer Institute, P50CA180908
JUSTIFICATION: The current research demonstrates that including graphic rather than text-only warning labels on cigarette packages leads to increased risk knowledge, heightened perceptions of vulnerability to disease, and greater quit intentions among current smokers.
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POS3-46
LAYING THE GROUNDWORK FOR CHANGING THE TOBACCO RETAIL ENVIRONMENT THROUGH ASSESSMENT, MAPPING, AND POLLING
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The tobacco industry invests heavily in the retail environment. Retail marketing of tobacco products and tobacco retailer density are associated with increased youth and adult smoking and impulse purchases of tobacco. Policies to curb the tobacco industry’s influence in the retail environment include restrictions on retailer zoning, advertising, price discounts, and availability of flavored tobacco. To inform retail policy directions, the Oregon Public Health Division employed assessments, mapping and public opinion polling.

Oregon’s 36 counties each conducted tobacco retail assessments about tobacco product availability, promotion, placement, and price. Tobacco retailers and public schools in Oregon were mapped using ArcGIS. Public opinion polls were administered in 2010 and 2014 to assess support for retail policies.

Assessments from Douglas County, one of Oregon’s largest counties, found that 97% of tobacco retailers sold little cigars, 74% sold electronic cigarettes, and all sold flavored tobacco. In addition, 65% had exterior tobacco advertising, 35% had interior advertising within 3 feet of the floor, 17% had products within 12 inches of candy or toys, and 47% offered price discounts. The lowest average price for a tobacco product was $0.97 for a single, flavored little cigar. The presentation will highlight aggregate results from all county assessments.

An estimated 3,384 tobacco retailers exist in Oregon. Tobacco retailers were mapped to establish their locations and density, as well as their proximity to schools.

The 2010 opinion poll found that providing equal space to public service messages had the highest support of all policies assessed and prohibiting price discounts had the lowest support. The presentation will contrast these earlier findings with results of a 2014 opinion poll.

Assessments show wide availability of tobacco products, particularly flavored tobacco; GIS mapping provides insight into the effect that density and zoning...
restrictions will have on tobacco retailers; and public opinion polling indicates high support for policies that are not legally feasible and low support for policies that have withstood legal challenge in other states.

FUNDING: This study was supported by the Oregon Tobacco Prevention and Education Program with Measure 44 tobacco tax revenues.

JUSTIFICATION: Methods and results of this multi-component research initiative can inform the planning process of tobacco prevention programs that have not yet engaged in tobacco retail policy work.

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POS3-48

DOES BODY MASS INDEX INFLUENCE SMOKING BEHAVIOUR? A CAUSAL ANALYSIS USING A MENDELIAN RANDOMIZATION APPROACH

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Background: Mendelian randomization provides evidence that smoking causally lowers body mass index (BMI). However, this relationship may be bidirectional if individuals take up smoking or smoke more in order to reduce BMI. Mendelian randomization removes the possibility of reverse causality and minimises bias from confounding.

Methods: Using data from 6,276 mothers in the Avon Longitudinal Study of Parents and Children (ALSPAC), we investigated observational associations between BMI and both smoking initiation and smoking heaviness. We also performed a Mendelian randomization analysis using a genetic risk score based on 32 BMI associated single nucleotide polymorphisms as a proxy for BMI. Analyses were additionally performed stratified by educational attainment.

Results: Observationally, BMI was associated with increased odds of smoking initiation (odds ratio (OR) for being an ever vs never smoker per unit increase in BMI: 1.02, 95% CI: 1.00, 1.03). BMI was also associated with increased smoking heaviness within 1,796 smokers (increase in cigarettes per day smoked per unit increase in BMI: 0.19, 95% CI: 0.09, 0.28). In Mendelian randomization analysis, there was no strong evidence that the BMI genetic risk score was associated with smoking initiation (OR per standard deviation (SD) increase in genetic risk score: 1.04, 95% CI: 0.99, 1.09) or smoking heaviness (change in cigarettes per day smoked per SD increase in genetic risk score: 0.13, 95% CI: -0.18, 0.50). However, effect sizes from Mendelian randomisation analysis were consistent with observational effect sizes. When analyses were stratified by education (degree/ high-school vs other) there was evidence in observational analysis that BMI was only positively associated with smoking initiation in the higher educational attainment group. The results of the Mendelian randomization analysis showed a similar pattern but were not well powered to detect a difference.

Conclusion: Observationally there are strong links between BMI and smoking behaviour. There is suggestive evidence that this may be patterned by education, but this should be followed up in larger samples using the Mendelian randomization approach.

FUNDING: Amy Taylor and Marcus Munafò are members of the UK Centre for Tobacco and Alcohol Studies, a UKCRC Public Health Research: Centre of Excellence. Funding from British Heart Foundation, Cancer Research UK, Economic and Social Research Council, Medical Research Council, and the National Institute for Health Research, under the auspices of the UK Clinical Research Collaboration, is gratefully acknowledged. This work was supported by the Medical Research Council (grant number MC_UU_12013/1, MC_UU_12013/6). Michelle Taylor is funded by a Wellcome Trust PhD Studentship.

JUSTIFICATION: This study seeks to further understanding of the nature of the relationship between smoking and body mass index.

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POS3-49

EDUCATIONAL BOOKLETS FOR THE PREVENTION OF SMOKING RELAPSE: A RANDOMIZED CONTROLLED STUDY

A. Blyth, V. Maskrey, T. Brown, C. Notley, L. Vincent, R. Holland, M.O. Bachmann, G. Barton, P. Aveyard, S. Sutton, J. Leondardi-Bee, T.H. Brandon, F. Song*, Norwich Medical School, University of East Anglia, Norwich, Norfolk, UK

Objectives: Most people who quit smoking successfully for a short-term will return to smoking again in 12 months. A previous exploratory meta-analysis indicated that self-help booklets may be effective for smoking relapse prevention. This study aimed to evaluate the effectiveness of a set of self-help educational booklets to prevent smoking relapse in the NHS Stop Smoking Service.

Methods: This open, randomised controlled trial (ISRCTN36980856) included 1407 participants who stopped smoking at 4 weeks in NHS stop smoking clinics in the UK. Participants in the experimental group received a set of 8 revised ‘Forever Free’ booklets, and participants in the control group received a single leaflet that is currently given to NHS patients. Follow-up telephone interviews were conducted 3 & 12 months after quit date. The primary outcome was prolonged, carbon monoxide verified abstinence from months 4-12.

Results: The main demographic characteristics of participants were comparable at baseline between intervention and control groups. The proportion of prolonged abstinence at 12 months after quit date was 36.9% in the intervention group and 36.6% in the control group. There was no statistically significant difference between the groups (OR 0.93, 95% CI: 0.75 to 1.15). In addition, there were no statistically significant differences between the groups in other secondary smoking outcomes, such as seven day self-reported point smoking prevalence, and verified smoking abstinence at the final follow-up. Subgroup and regression analyses did not reveal direct or moderating effects of any baseline characteristics upon the efficacy of the intervention.

Conclusions: A set of 8 revised Forever Free booklets was no more effective than a single leaflet for the prevention of smoking relapse in quitters who used NHS Stop Smoking Services in the UK. Initially developed for, and validated on, self-quitters, the booklets appear not to provide additional benefit to smokers who already receive a high-quality intensive intervention, such as the NHS stop smoking service.

FUNDING: UK NIHR Health Technology Assessment Programme (Project 09/913/6)

JUSTIFICATION: The study provided high quality evidence on the use of self-help educational materials for the prevention of smoking relapse.

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POS3-50
THE IMPACT OF NEIGHBORHOOD VIOLENCE AND SOCIAL COHESION ON SMOKING BEHAVIORS IN MEXICO
Nancy L. Fleischer**, Paula Lozano¹, Edna Arillo Santillán², Luz Myriam Reynolds Shigematsu², James F. Thrasher¹†, ¹Department of Epidemiology and Biostatistics, Arnold School of Public Health, University of South Carolina, Columbia, SC, USA, ²Department of Investigación sobre Tabaco, Instituto Nacional de Salud Pública, Cuernavaca, México, ³Department of Health Promotion, Education and Behavior, Arnold School of Public Health, University of South Carolina, Columbia, SC, USA

Background: Mexico has recently experienced serious increases in violent crime, which impact a variety of health indicators. We examined the relationship between self-reported neighborhood-level violence and smoking intensity, quit behaviors and relapse among a cohort of smokers in 7 Mexican cities from 2011-2012, and whether the relationships were modified by neighborhood-level social cohesion.

Methods: Data were analyzed from adult smokers and recent ex-smokers who participated in Waves 5-6 of the International Tobacco Control Mexico Survey. Questions on neighborhood violence and social cohesion were asked of Wave 6 survey participants (n=2129 current and former smokers, n=150 neighborhoods). Neighborhood-level averages for violence and social cohesion (possible range 4-16 and 5-25, respectively) were assigned to individuals, based on the neighborhood in which they lived. We used generalized estimating equations to determine associations between neighborhood indicators and smoking intensity (≥6 cigarettes per day), quit attempts, quit success, and relapse.

Results: Higher neighborhood violence was associated with higher smoking intensity [Risk Ratio (RR)=1.06 for a one-unit increase, 95 % Confidence Interval (CI) 1.01-1.11], and fewer quit attempts (RR=0.89 for a one-unit increase, 95 % CI 0.83-0.94). Neighborhood violence was not associated with successful quitting or relapse. Higher neighborhood social cohesion was associated with more quit attempts and more successful quitting. Neighborhood social cohesion also modified the impact of neighborhood violence on smoking intensity: neighborhoods with higher violence had lower intensity of smoking in high social cohesion neighborhoods than in low social cohesion neighborhoods.

Conclusion: Smokers living in neighborhoods with more violence may smoke more cigarettes per day and make fewer quit attempts than their counterparts in less violent neighborhoods. Neighborhood social cohesion may buffer the impact of violence on smoking intensity.

FUNDING: Funding for data collection came from the Mexican Consejo Nacional de Ciencia y Tecnologia (Salud-2007-C01-70032), with additional funding for analysis provided by the National Cancer Institute at the National Institutes of Health grants T32-DA007238 (to AMR). Study drug was provided by Pfizer through an investigator initiated grant (IRI W235256).

JUSTIFICATION: This research was supported in part by National Institutes of Health grants T32-DA007238 (to AMR). Study drug was provided by Pfizer through an investigator initiated grant (IRI W235256).

POS3-53
E-CIGARETTES, E-HOOKAHS, AND VAPE PENS: ADOLESCENTS’ AND YOUNG ADULTS’ PERCEPTIONS OF ELECTRONIC NICOTINE DELIVERY SYSTEMS (ENDS)
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Introduction: In 2007, electronic nicotine delivery systems, ENDS, became available in the US, launching a new category of tobacco products. These products initially resembled cigarettes (cigalikes); however, recently, new varieties have emerged. Little is known about how these products are perceived and whether perceptions vary by sub-type. We sought to understand adolescents’ and young adults’ perceptions of ENDS and identify the language they use for them.

Methods: We conducted 10 focus groups of 77 participants, stratified by age (young adults: 18-24; adolescents: 14-17) and use (user/susceptible non-user) of novel products (cigarillos, hookah, ENDS). Focus groups were transcribed verbatim. Two investigators independently coded transcripts for emergent themes related to participants’ knowledge and perceptions of ENDS.

Results: Participants were 57% female, 56% White, and 26% Black. Most participants were aware of ENDS and perceived them to be less harmful than cigarettes. They had concerns about chemicals in the products, as well as the uncertainty of associated health risks. Participants reported that ENDS users have decreased ability, compared to cigarettes, to regulate nicotine consumption. They initially resembled cigarettes (cigalikes); however, recently, new varieties have emerged. Little is known about how these products are perceived and whether perceptions vary by sub-type. We sought to understand adolescents’ and young adults’ perceptions of ENDS and identify the language they use for them.

Methods: We conducted 10 focus groups of 77 participants, stratified by age (young adults: 18-24; adolescents: 14-17) and use (user/susceptible non-user) of novel products (cigarillos, hookah, ENDS). Focus groups were transcribed verbatim. Two investigators independently coded transcripts for emergent themes related to participants’ knowledge and perceptions of ENDS.

Results: Participants were 57% female, 56% White, and 26% Black. Most participants were aware of ENDS and perceived them to be less harmful than cigarettes. They had concerns about chemicals in the products, as well as the uncertainty of associated health risks. Participants reported that ENDS users have decreased ability, compared to cigarettes, to regulate nicotine consumption. They clearly differentiated e-cigarettes (cigalikes) from other ENDS devices, reporting that e-cigarettes are disposable, unflavored, and contain nicotine. While a variety of terms, such as e-hookah, hookah vapes, shisha pens, and vape pens, were used to describe other sub-types of ENDS, e-hookah was the term most often used. These other products were described as convenient (e.g., can be used in school), flavored, and sometimes without nicotine. Participants perceived e-cigarette users to be older, addicted smokers who are trying to quit. They had more favorable perceptions of e-hookah users as fun people who do smoke tricks and publicize use on social media.
POS3-54
DUAL TRAJECTORIES OF CIGARETTE SMOKING AND SMOKLESS TOBACCO USE FROM ADOLESCENCE TO MIDLIFE AMONG MALES IN A MIDWESTERN U.S. COMMUNITY SAMPLE
Jonathan T. Macy1,*, Jing Li1, Pengcheng Xun1, Clark C. Presson2, Laurie Chassin2, Olivia A. Wackowski, PhD, MPH, Rutgers School of Public Health, Center for Tobacco Studies

Introduction: Identifying trajectories of tobacco use is critical for understanding its natural history and targeting interventions. Several studies have identified multiple cigarette smoking trajectories from adolescence to adulthood, but research on trajectories of smokeless tobacco and dual use of smokeless tobacco and cigarettes is very limited. This study identified trajectories of both cigarette smoking and smokeless tobacco use that started in adolescence and extended into midlife and tested correlates of trajectory group membership.

Methods: This study included all male participants in a longitudinal study who reported cigarette smoking or smokeless tobacco use in 1987, 1993, 1999, 2005, or 2011 (N=2230). Group-based trajectory analyses were conducted with zero-inflated Poisson models. Analysis of variance was used to test adolescent health beliefs associated with trajectory group membership.

Results: Five smoking trajectory groups were identified: (1) consistent abstinence; (2) late onset intermittent, then cessation; (3) early onset regular, then cessation; (4) delayed onset regular, then cessation; and (5) consistent regular. Four smokeless tobacco trajectory groups were identified: (1) early onset, then cessation; (2) consistent abstinence; (3) late onset, escalating; and (4) consistent regular. The most common dual use trajectories indicated consistent regular use of one product and abstinence from the other product. Adolescent beliefs favorable to smoking and smokeless tobacco were associated with membership in consistent regular use groups.

Conclusions: The prevalence of dual use of cigarettes and smokeless tobacco was low, and there was little evidence to suggest switching between tobacco products. The findings support the use of product-specific messaging in prevention and cessation interventions. Participants who held more positive beliefs about smoking and smokeless tobacco as adolescents were more likely to be consistent regular users of cigarettes and smokeless tobacco into adulthood. These beliefs are potentially useful targets in campaigns to prevent adolescents' use of cigarettes and smokeless tobacco.

FUNDING: This work was supported by the National Institute on Drug Abuse at the National Institutes of Health (DA013555).

JUSTIFICATION: Results from this study suggest the use of tobacco product-specific messaging and the targeting of health beliefs about tobacco products in prevention and cessation campaigns.

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POS3-55
EFFECTS OF VARIATION IN MEDIA DOSE AMONG NONSMokers FOR THE 2013 TIPS FROM FORMER SMOKERS CAMPAIGN
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Media campaigns have been shown to be effective at promoting quit attempts and reducing tobacco use but less is known about their impact on nonsmokers. In 2013, CDC launched a second round of ads for its Tips From Former Smokers (Tips) campaign. Tips featured graphic, emotional testimonials to motivate smokers to quit and nonsmokers to encourage loved ones to quit. A national media buy was supplemented with additional local media buys within 67 randomly selected small to mid-sized “heavy-up” designated media markets (DMAs) with a total population of 35 million. We assessed whether variations in media exposure to 2013 Tips affected key outcomes among nonsmokers using a nationally representative sample of 2,843 nonsmokers following the 16-week campaign. We excluded the 20 largest DMAs and compared campaign exposure and behaviors between nonsmokers in the heavy-up and standard dose DMAs. Nonsmokers (83.9% vs. 73.9%, p<0.01) in heavy-up DMAs reported higher awareness of Tips ads than those in standard-dose DMAs. Those in the heavy-up DMAs talked with family and friends about the dangers of smoking (43.1% vs. 35.7%, p<0.01) and encouraged a friend or family member to quit smoking (45.5% vs. 40.0%, p<0.05) at higher rates than those in standard-dose DMAs. This projects to 1.4 million additional nonsmokers educating family and friends about the dangers of smoking and an additional 1.0 million encouraging quitting as a result of the heavy-up advertising. Those in heavy-up DMAs were also significantly more likely to identify COPD or chronic bronchitis (95.4% vs. 88.9%, p<0.01), hole in throat (stoma) (92.0% vs. 85.5%, p<0.01), heart disease (91.0% vs. 86.8%, p<0.05), asthma (89.7% vs. 92.4%, p<0.01), stroke (84.6% vs. 80.4%, p<0.05), and amputations (57.6% vs. 45.6%, p<0.01) as health consequences of smoking. Randomly assigned increases in media dose for the 2013 Tips campaign were associated with increased cessation support behavior and specific disease knowledge related to the health consequences of smoking among nonsmokers. Investment in hard-hitting media campaigns is an important strategy for ending the tobacco epidemic.

FUNDING: Data collection and analysis was supported by the Centers for Disease Control and Prevention (CDC), Department of Health and Human Services.

JUSTIFICATION: Higher mass-media advertising levels can support clinical practice related to smoking cessation by increasing patients' of certain sub-populations interest in quitting as well as increasing nonsmoker's cessation support behavior.

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POS3-56
SMOKERS’ EXPERIENCE WITH AND PERCEPTIONS OF TOBACCO INDUSTRY DIRECT MAIL: FOCUS GROUP RESEARCH
M. Jane Lewis, Dr.P.H., M.A.*, Olivia A. Wackowski, PhD, MPH, Rutgers School of Public Health, Center for Tobacco Studies

Background and Methods: Tobacco industry direct mail marketing is a frequently utilized but understudied form of marketing employed by the tobacco industry. Research in this area has been hampered by the very nature of direct marketing as a non-public source of marketing with limited visibility and the difficult of directly observing its influence on receivers' smoking behaviors. In an effort to increase our understanding of this area, explore the potential impact of direct mail, and inform development of a national survey on direct mail marketing, we conducted seven focus groups with New Jersey smokers who reported receiving direct mail. Questions investigated smokers' experience with and perceptions of direct mail and were based on our experience in monitoring direct mail, content analyses of direct mail, document research on the industry's purposes for direct mail, and marketing literature. Focus groups were conducted with young adult smokers.
Study findings indicate substantial association of ST use with hypertension and significantly higher uptake of nicotine and NNK compared to smokers. ST users had more than four-fold compared to smokers (aOR=4.25, 95%CI: 2.66-6.77). ST users had 3.18 times the adjusted odds of being obese compared to non-tobacco users (aOR=1.59, 95%CI: 1.12-2.24). ST users were more likely to have hypertension compared to smokers when adjusted for other covariates. Similarly, the odds were significantly higher when ST users were compared to non-tobacco users (aOR=1.59, 95%CI: 1.12-2.24). ST users were 1.68 (95%CI: 1.15-2.45) times more likely to have hypertension compared to smokers when adjusted for other covariates. Similarly, the odds were significantly higher when ST users were compared to non-tobacco users (aOR=1.59, 95%CI: 1.12-2.24). ST users were almost twice as likely to be obese compared to non-tobacco users (aOR=1.98, 95%CI: 1.23-3.18) and their adjusted odds of being obese were increased more than four-fold compared to smokers (aOR=4.25, 95%CI: 2.66-6.77). ST users had significantly higher uptake of nicotine and NNK compared to smokers.

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POS3-58

SMOKERS’ PURPOSEFUL, PRE-CESSATION PHYSICAL ACTIVITY OVER 4 WEEKS FACILITATES QUIT DAY REDUCTION OF SMOKING CUE REACTIVITY

Bradley N. Collins*, PhD, Uma S. Nair, PhD, Freda Patterson, PhD, Sean McCormick, MS, Daniel Rodriguez, PhD, Temple University, La Salle University

An emerging area in public health research focuses on testing multiple health behavior change (MHBC) interventions to simultaneously address multiple risk behaviors. Strategies targeting smoking and promoting physical activity (PA) are priority (particularly in underserved populations) due to their synergistic influence on morbidity/mortality risk. However, little is known about mechanisms that may explain how PA facilitates smoking behavior change. Based on evidence that it can attenuate nicotine withdrawal and negative affect, PA may be a potent alternative reinforcer to smoking. Thus, engaging in purposeful PA to manage smoking urges may facilitate the reduction (extinction) of smoking cue reactivity in high-risk situations. We tested this hypothesis in a parent MHBC intervention study that integrated smoking cessation counseling with advice promoting low-to-moderate PA (walking) as the primary urge coping strategy during 4 weeks prior to quit day. Hypothesis: Compared to smokers randomized to receive intensive coping skills training without PA (smoking cessation counseling; SCC-only), smokers receiving MHBC counseling would demonstrate greater reduction in quit day cue reactivity over 4 massed trials. Methods: Abstinent quitters were exposed to 5-minute exposure trials that included handling a lit cigarette. Urge was measured using Ushers’s strength of urge scale. LGCM tested the effect of MHBC counseling on change in cue reactivity while controlling for gender, FTND, CESD, and BMI. Results: N=79 participants completed the study (51% male, 77% African American, mean age=42.1 ± 10.9, FTND=5.3 ± 1.3, BMI=29.9 ± 7.4 and CESD=9.5 ± 5.4.) The LGCM model demonstrated good fit, χ²(24, 69)=21.074, p=.63; CFI=1.00, RMSEA=0.00 (90%CI=0.00, .81), probability RMSEAs.05=.81; WRMR=27. MHBC was associated with a 13% decrease in urge across trials compared to SCC-only (β=−0.13, p<.07). Results suggest that PA may be a more potent urge coping skill than SCC-only strategies in facilitating extinction of quit day cue reactivity (a predictor of smoking outcomes and potential behavioral mechanism through which purposeful PA adoption may promote smoking behavior change.)

FUNDING: Funded by American Heart Association (13CRP14560028; Nair, PI)

POSTER SESSION 3 • FRIDAY, FEBRUARY 27, 2015 • 11:30 A.M.–1:00 P.M.

POS3-57

CARDIOVASCULAR RISK PARAMETERS IN MALE SMOKELESS TOBACCO USERS

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Despite considerable decreases in smoking, smokeless tobacco (ST) use prevalence in the US has not significantly changed in the past several years. Due to aggressive marketing and promotion of ST products and increasing use of ST by current smokers, it is important to evaluate ill health effects of ST use. Cigarette smoking is a well-documented major risk factor for cardiovascular disease (CVD); however, there is inadequate evidence of such an association for ST use. The aim of this study was to evaluate cardiovascular risk parameters in male ST users. ST users were compared to cigarette smokers and non-tobacco users.

Data from 11,614 male adults who participated in the National Health and Nutrition Examination Survey (NHANES) 2003-2010 were used. Tobacco use was defined on the basis of current smoking and recent use of ST products (chewing tobacco or snuff). Associations were examined using univariate and multiple logistic regression with odds ratios (OR) and 95% confidence intervals (CI) reported. The Taylor Series linearization approach was used to account for the complex sample design and to perform weighted analysis of the aggregate data.

The prevalence of exclusive ST use in the study sample was 4.5%; whereas, 25.4% were exclusive smokers. The majority of ST users were Non-Hispanic White (92%). 38.1% of ST users were hypertensive and 26.3% had high cholesterol levels. Most (82.5%) were overweight (32.9%) or obese (49.5%). Multiple logistic regression analysis indicated that ST users were 1.68 (95%CI: 1.15-2.45) times more likely to have hypertension compared to smokers when adjusted for other covariates. Similarly, the odds were significantly higher when ST users were compared to non-tobacco users (aOR=1.59, 95%CI: 1.12-2.24). ST users were almost twice as likely to be obese compared to non-tobacco users (aOR=1.98, 95%CI: 1.23-3.18) and their adjusted odds of being obese were increased more than four-fold compared to smokers (aOR=4.25, 95%CI: 2.66-6.77). ST users had significantly higher uptake of nicotine and NNK compared to smokers.

Study findings indicate substantial association of ST use with hypertension and obesity which are independent risk factors of CVD.

FUNDING: Oklahoma Tobacco Research Center

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risks of smoking-related diseases to reflect the known epidemiologic risks of smoking. We allocate hospitalization days obtained from the 2010 National Hospital Discharge Survey for smoking-related diseases according to the latest relative risks of smoking-attributable mortality presented in the 2014 Surgeon General report on the health consequences of smoking. Based on this approach, we distribute the national estimates of attributable expenditures by age, sex and smoking status. Sensitivity analyses are conducted to assess potential impacts of underlying assumptions, including discharge diagnosis codes used to identify hospital stays, hospital stays vs. hospital days, and disease condition-specific expenditures.

Results: Within each age group, medical expenditures of former smokers are about 70% lower than current smokers. Both current and former smokers ages 75+ have about 12 times smoking-attributable expenditures of those between 35 and 54. The sensitivity analysis revealed that large changes to relative risks might alter these patterns, indicating the importance of developing reliable estimates of relative risks for disease events.

Conclusions: Using a relative risk approach, our analysis shows that smoking cessation can substantially reduce healthcare costs. Enhanced implementation of evidence-based tobacco control interventions that promote intervention-induced quitting may reduce the health burden and economic impact of tobacco-related diseases in the United States.

FUNDING: This project was supported in part by a contract to Centers for Disease Control and Prevention (CDC). The findings and conclusions in this report are those of authors and do not necessarily represent the official positions of the Centers for Disease Control and Prevention.

JUSTIFICATION: Enhanced implementation of evidence-based tobacco control interventions that promote intervention-induced quitting may reduce the health burden and economic impact of tobacco-related diseases in the United States.

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POS3-60

CIGARETTE SMOKING AND THE RISK OF DRUG USE DISORDER RELAPSE AMONG ADULTS IN RECOVERY: A PROSPECTIVE STUDY

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Aims: Individuals in recovery from illicit substance use disorders (SUDs) frequently continue to smoke cigarettes. This study examined the relationship between cigarette smoking status and risk of SUD relapse among adults with a history of remitted SUDs in the United States.

Design: Data were drawn from Wave 1 (2001-2002) and Wave 2 (2004-2005) of the National Epidemiologic Survey on Alcohol and Related Conditions.

Setting: Face-to-face interviews with adult U.S. civilians.

Participants: Analyses included the subsample of respondents who completed both waves of data collection reported a history of drug abuse and/or dependence prior to Wave 1.

Measurements: Relationships between Wave 1 cigarette smoking status (smoker, non-smokers) and Wave 2 drug use and disorder (abuse and/or dependence) were examined using logistic regression analyses. Analyses were adjusted for demographics; mood, anxiety, and substance use disorders and nicotine dependence.

Findings: Use of cigarettes at Wave 1 was associated with increased odds of drug use (OR= 1.44; 95% CI= 1.17-1.73) and drug use disorders (OR= 1.41 (1.23-1.62) at Wave 2 among those with remitted SUDs at Wave 1, after adjusting for demographics, psychiatric disorders, alcohol use disorders and nicotine dependence.

Conclusions: Among adults with remitted illicit drug use disorders, use of cigarettes appears to be associated with significantly increased likelihood of relapse to drug use and drug use disorder three years later. Concurrent treatment of cigarette smoking when treating drug use disorders may help improve long-term outcomes and reduce the negative consequences of both substances.

FUNDING: No funding

JUSTIFICATION: Our study provides evidence showing the important of concurrent smoking cessation-drug disorder treatment in improving outcomes and recovery efforts over the long term.

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POS3-61

DO PHYSICIANS DIFFERENTIATE BETWEEN DAILY AND NONDAILY SMOKERS WHEN COUNSELING FOR SMOKING CESSATION?

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Aims: To describe physicians' approach to counseling for smoking cessation in non-daily smokers.

Background: Nondaily smoking has increased in the US in the past decade. Nondaily smoking is often perceived to be less hazardous than daily smoking (DS) despite recent work showing that nondaily smokers (NDS) are exposed to significant levels of carcinogens. We sought to examine how physicians approach smoking cessation among NDS.

Methods: Participants were NDS (smoked < 24 days in the 30 days) and DS (smoked >25 days in the past month) recruited using a panel research company who completed an online survey. The online questionnaire queried their experiences with physicians’ approach to their tobacco use over the last 12 months.

Results: Participants included native NDS (no history of daily smoking > 6 months; n=297), converted NDS (previously smoked daily > 6 months; n=904), and heavy DS (smoked >10 cpd; n=578), and heavy DS (smoked >10 cpd; n=597). Heavy and light DS were more likely to be offered advice to stop smoking (OR=2.77 and 2.35, respectively, both p<0.001) than native NDS. Intention to quit in the next six months was a significant effect modifier (p=0.03) on the association between smoker type and the odds of being offered cessation assistance. Heavy and light DS intent on quitting in the next six months were more likely to be offered cessation assistance compared to native NDS [OR=3.62 (p<0.0001) and 2.55 (p=0.01)] respectively. Among those not intending to quit, heavy DS were slightly more likely to offer advice in quitting (OR=1.64, p=0.04) compared to native NDS. Lastly, converted NDS, light DS and heavy DS were all much more likely to have their health professional arrange follow-up with their office regarding cessation or refer them to a cessation program [OR=3.07 [p<0.0001], 2.53 (p=0.01), and 2.94 [p=0.001], respectively] than native NDS. Conclusions: Our data demonstrate that, compared to DS, native NDS are less likely to 1) be advised by their physician to quit smoking, 2) be offered assistance in smoking cessation or 3) be scheduled for follow-up regarding smoking cessation or referred to smoking cessation program. This may represent a reflection of common misperceptions that nondaily smoking does not incur risk.

FUNDING: This project is funded by Pfizer's Global Research Awards for Nicotine Dependence (Ahluwalia).

JUSTIFICATION: This research has the potential to influence physicians’ approach to smoking cessation counseling in nondaily smokers.
POS3-62
AN INTENSIVE BEHAVIORAL COUNSELING INTERVENTION TO SIMULTANEOUSLY PROMOTE PHYSICAL ACTIVITY AND SMOKING CESSION: A PROOF OF CONCEPT STUDY

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Tobacco use and lack of physical activity (PA) independently contribute to death/disease risk. Multiple health behavior change (MHBC) interventions targeting both at-risk behaviors simultaneously have large potential for public health impact. Smoking-PA intervention studies show promising results but have limited generalizability to underserved populations. This proof-of-concept study tested feasibility and potential efficacy of a novel MHBC intervention in promoting and sustaining PA and smoking abstinence among underserved sedentary smokers. All participants received 5 weeks of intensive individualized smoking cessation counseling (SSC). They were randomized to either SSC-only or SSC integrated with low-to-moderate-intensity PA (SCC+LMPA) which included (a) guiding participants with a tailored algorithm to reach and maintain ACSM-recommended 10,000 steps/day by Week 4 (quit day) and (b) promoting short bouts of PA as a primary smoking urge management strategy. Pedometers and International Physical Activity Questionnaire (IPAQ) were used to assess 7-day point prevalence PA at quit day, 1-week and 1-month follow-up. Smoking status was assessed using 7-day timeline follow-back. N=79 participants (78% of sample) completed the study. Sample characteristics include 51% female, 77% non-Hispanic, 59% < H.S. education, Mean age = 42.1 ± 10.9; FTND = 5.3 ± 1.3, BMI = 29.4 ± 7.4. SCC+LMPA mean quit day step count (M=7207.25, SD=4726.03) was greater than SCC-only (M=3947.03, SD=3655.27, t=3.36, p<.01) - group difference maintained at 1 month (t=2.27, p=.03). 38% of the sample were abstinent at 1-month (no group difference), and abstinent participants had higher steps/day (t=1.37, p=.17) and greater reported time and energy expended (METS) in moderate-intensity PA (t=2.16, p=.03). We will present multivariable models to further explain effects of PA on smoking cessation. Results suggest that SSC+LMPA participants are likely to achieve equivalent quit rates as intensive SSC-only while also increasing and maintaining PA. Thus, our model demonstrates feasibility and preliminary efficacy of an MHBC intervention in promoting healthful lifestyle behaviors in an underserved population.

FUNDING: Study funded by American Heart Association (13CRP14560028; Nair, PI)

JUSTIFICATION: This multiple health behavior change intervention integrates PA with evidence-based smoking cessation programming and demonstrates acceptability and feasibility of this model in a sample of sedentary underserved smokers, a population that bears disproportionately high rates of tobacco and sedentary behavior problems. This research would inform future studies for developing additional qualitative research with subpopulations as well as quantitative population-level measures of e-cigarette use by former smokers and dual users.

FUNDING: Center for Tobacco Products, Food and Drug Administration

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POS3-64
BELIEFS ABOUT E-CIGARETTES AMONG QUITLINE COUNSELORS

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E-cigarettes are increasingly popular, especially among smokers and recent quitters. Scientific evidence of e-cigarettes' usefulness and population impact will continue to emerge. Meanwhile quitlines report increasing e-cigarette use among callers and have little data on the efficacy and effectiveness of e-cigarettes to guide them. This study surveyed quitline counselors (U.S. and Canada) to assess their perceptions of e-cigarettes and responses to clients who ask about them. The survey was conducted in Feb 2014 in partnership with NAQC. 418 counselors completed the survey (estimated response=90% of the counselors at 18 participating quitline provider organizations). The survey assessed regulation, use as a quitting aid, safety, and clinical guidance given and organizational guidance received. Most counselors believed e-cigarettes should be regulated like traditional cigarettes regarding use by minors (93%), bans on use in certain areas (89%), advertisement (87%), and taxation (87%). One third believed they were effective quitting aids. Nearly 95% of counselors believed smokers who use e-cigarettes should use them only as a short term quitting aid. Counselors expressed concern about the addictive nature of e-cigarettes (87%) and the health risks associated with exposure to secondhand e-cigarette vapor (71%). Over 90% of counselors reported having received instruction from their employer about how to talk to clients about e-cigarettes; most commonly they were told to explain to clients that e-cigarettes are not FDA approved as a quitting aid (96.9%). Quitline counselors talk to many smokers and are in a position to influence smokers' use of e-cigarettes. They generally hold negative views of e-cigarettes and steer smokers away from their use. Short of completing the FDA approval process (requiring several years), it is not clear how (or whether) quitlines will integrate emerging data about the potential benefits and harms of e-cigarette use into clinical practice. Results from this survey provide a baseline understanding about how quitline counselors perceive e-cigarettes and talk with smokers who use them.

FUNDING: This study was supported by the NIH/NCI #128638.

JUSTIFICATION: These findings have direct application to clinical practice.

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POS3-63
ELECTRONIC CIGARETTE USE BEHAVIOR AND EXPERIENCE AMONG FORMER SMOKERS AND DUAL USERS: QUALITATIVE DATA THROUGH FOCUS GROUP APPROACH

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The main goal of this qualitative study is to gain a better understanding of e-cigarette use behavior and experience among adult e-cigarette users. To accomplish this we recruited adult e-cigarette users who were former cigarette smokers or are current users of both cigarettes and e-cigarettes. Between August and September 2014 six focus group discussions were conducted involving adult e-cigarette users in Seattle. Discussion topics included their daily use pattern of e-cigarettes; and the similarities/differences of user behaviors and experiences for both combustible and e-cigarettes. Flavors, nicotine levels, product characteristics, and various options of e-cigarettes, as well as health implications were discussed. We found the majority of participants to report nicotine craving relief when using e-cigarettes, and to describe e-cigarettes use as "satisfying" (versus "gratifying" for cigarette smoking). Younger participants (aged 18-34) are more likely to be attracted to the variety of flavors available for e-cigarettes, and to be more willing to explore various flavors and different product characteristic options available (e.g., variable power, nicotine levels). Older adults (aged 45-65) also like having flavors as options, but are less likely to explore flavor or product options. Flavors were reported to reduce bitterness of nicotine such that the taste of regular cigarettes or e-cigarettes having tobacco flavor seemed too strong. Some participants expressed the sentiment that they enjoyed the experience of “exhaling” and producing voluminous “clouds” of vapor. Notably, participants’ description of their daily use pattern varied to the degree that no common “unit” of a “session” could be easily summarized. Participants speculated that e-cigarettes would be a better health option compared to cigarettes. All of the information obtained from this study would inform future studies for developing additional qualitative research with subpopulations as well as quantitative population-level measures of e-cigarette use by former smokers and dual users.

FUNDING: This study was supported by a grant from the NIH/NCI #128638.

JUSTIFICATION: These findings have direct application to clinical practice.

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**פוס3-65**

**CALIFORNIA VERSUS NATIONAL SMOKING BEHAVIOR TRENDS BY MAJOR RACIAL/ETHNIC GROUPS, 1992-2010**

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California (CA) has the longest running comprehensive tobacco control program in the U.S. Studies have documented its success in reducing overall smoking rates, but suggest racial/ethnic disparities in its effects. CA progress relative to the US in this regard is unclear. This study examines trends in smoking behaviors among non-Hispanic white (NHW), non-Hispanic black (NHB), Hispanic/Latino (H/L), and Asian/Pacific Islander (API) groups in CA compared to the rest of the US. The Tobacco Use Supplement (TUS) to the Current Population Survey are national population-based surveys designed to monitor tobacco-related behaviors about every three years. We analyzed TUS data from 1992 to 2010. Ever smokers were categorized into heavy daily (20+ cigs/day), moderate daily (6-19 cigs/day), light and intermittent smokers (LITS; 0-5 cigs/day or non-daily smokers), and former smokers. The proportion of NHW heavy smokers in CA was 21.2% (+/1.6) in 1992 compared to 28.4% (+/-4.1) in the US. These proportions decreased to 8.3% (+/-1.2) and 18.1% (+/-4.4) in 2010, respectively. The proportion of NHB heavy smokers in CA was 16.6% (+/-4.6) in 1992 compared to 15.1% (+/-1.0) in the US and decreased to 3.2% (+/-2.8) and 11.3% (+/-1.0) in 2010, respectively. This represents an 81% magnitude decrease in heavy smoking among CA NHB compared to a 38% decrease for the rest of the US. The proportion of CA H/L heavy smokers was 8.0% (+/-2.0) in 1992 compared to 15.6% (+/-1.5) for US H/L heavy smokers. These proportions decreased to 2.7% (+/-1.3) and 8.3% (+/-1.2) in 2010, respectively. In 1992, the proportion of CA API heavy smokers was 17.6% (+/-5.1) compared to 16.4% (+/-2.8) for US API heavy smokers. In 2010, these proportions decreased to 5.4% (+/-2.6) and 8.7% (+/-1.7), respectively. LITS, Moderate, and Former smoker proportions increased for most groups across the 18-year time period. There was an overall shift toward lower consumption levels for all ethnic groups. Most striking were the overall consumption patterns illustrating CA impressive tobacco use reductions and continuing to perform better than the rest of the nation. Implications of these findings will be discussed.

FUNDING: Support was provided by the California Tobacco Related Diseases Research Program (21RT-0140; PI: Trinidad), the School of Community and Global Health at Claremont Graduate University, and the School for Social and Behavioral Sciences, College of Public Health and Human Sciences at the Oregon State University

JUSTIFICATION: Understanding racial/ethnic consumption trends and patterns across time and within differing tobacco control contexts will inform future tobacco control efforts to maximize effects across different groups.

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**פוס3-67**

**DAILY NICOTINE PATCH WEAR TIME IS ASSOCIATED WITH SMOKING CESSATION AMONG SOCIOECONOMICALLY DISADVANTAGED SMOKERS MAKING A QUIT ATTEMPT**

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Background: Daily use of the nicotine patch is associated with a greater likelihood of smoking cessation. The current study extends previous research by examining whether the number of hours that the 24 hour patch was worn each day during the first week of a cessation attempt was associated with smoking abstinence 4 and 12 weeks after a scheduled quit attempt.

Method: Ecological momentary assessment data were collected as part of a randomized clinical trial that evaluated the effectiveness of adjunctive financial incentives for smoking cessation at the Dallas County safety-net hospital. Participants were 75 adults who enrolled in the trial and who were prescribed the 24-hour nicotine patch. Adjusted logistic regression analyses were conducted to evaluate the association between average daily nicotine patch wear time and biochemically-verified 7-day point prevalence smoking abstinence at 4 and 12 weeks post-quit. The association between the number of days that the patch was worn for ≥16 hours and smoking abstinence was also examined. Adjusted models controlled for demographic characteristics, treatment group, and pre-quit cigarettes smoked per day.

Results: Participants were primarily non-White (78.7%), 70% had an annual household income < $20,000, and wore the patch for an average of 6.4 days for 13-15 hours per day. Adjusted logistic regression analyses indicated that greater average daily hours of patch wear during the first post-quit week was associated with a greater likelihood of achieving smoking abstinence at the 4 and 12 week post-quit follow-up visits (p-values <.05). In addition, having more days where the nicotine has to reduce his or her cigarette consumption. In this study we examine how cigarette use behaviors relate to self-reported financial strain among low income smokers.

FUNDING: National Cancer Institute, National Institutes of Health (R01 CA141527)

JUSTIFICATION: If smoking is indeed a barrier to housing, food, or healthcare, cessation outreach coupled with assistance programs could promote both smokefree lifestyles and financial stability.

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**פוס3-66**

**ASSOCIATIONS BETWEEN SMOKING BEHAVIORS AND FINANCIAL STRAIN AMONG LOW-INCOME SMOKERS**

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Objective: Many American households struggle to bring in sufficient income to meet basic needs related to nutrition, housing, and healthcare. Nicotine addiction and consequent expenditures on cigarettes may impose extra financial strain on low income households, given the lack of flexibility someone who is dependent on nicotine has to reduce his or her cigarette consumption. In this study we examine how cigarette use behaviors relate to self-reported financial strain among low income smokers.

Methods: We used data from OPT-IN, a randomized controlled trial of proactive tobacco cessation outreach. The study recruited adult smokers age 18-64 from the administrative databases of the state-subsidized Minnesota Health Care Programs (N=2406). Using OPT-IN’s baseline survey, conducted in 2011/12, we tested whether nicotine dependency, type of cigarettes used, and smoking intensity (cigarettes per day and number of smoking days out of the past 30 days) were associated with report of difficulty affording food, healthcare, housing, and living within one's income. All regression models were adjusted for race, education, income, age, and gender.

Results: Difficulty living on one's income (77.4%), paying for healthcare (33.6%), paying for housing (38.4%), and paying for food (40.8%) were common conditions in this population. Time to first cigarette and cigarettes smoked per day predicted financial strain related to affording food, housing, and living within one's income after adjusting for demographics (p<0.05). For instance, those whose time to first cigarette was greater than 60 minutes were about half as likely to report having difficulty paying for housing compared to those who had their first cigarette within five minutes of waking (adjusted odds ratio = 0.59 [95% CI: 0.41, 0.74]). No cigarette use behaviors were related to difficulty affording healthcare. Type of cigarette used did not predict financial strain of any type.

Conclusions: Smoking and specifically heavy smoking may contribute in an important way to the struggles that low income household with smokers face in paying for necessities.

FUNDING: National Cancer Institute, National Institutes of Health (R01 CA141527)

JUSTIFICATION: If smoking is indeed a barrier to housing, food, or healthcare, cessation outreach coupled with assistance programs could promote both smokefree lifestyles and financial stability.

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Conclusion: Greater daily patch wear time was associated with an increased likelihood of smoking cessation among socioeconomically disadvantaged smokers making a quit attempt. Findings suggest that strategies to increase daily patch wear time should be employed within smoking cessation interventions for disadvantaged populations.

JUSTIFICATION: The future intervention aimed at increasing daily nicotine patch wear time at first week post-quit may increase likelihood of smoking cessation within socioeconomically disadvantaged smokers.

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POS3-68 IMPACT OF CANADIAN TOBACCO PACKAGING ON QUITLINE REACH AND REACH EQUITY

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Background: Although smoking prevalence has declined in Canada, disparities in tobacco related health burden have remained. New warning labels with a quitline toll-free number were introduced in Canada in 2012. This paper examines the impact of these labels for seven Canadian provinces, focusing on the changes in the characteristics of quitline callers, treatment reach into three vulnerable groups in the population, and the impact on the reach equity for these groups.

Methods: This study is a quasi-experimental design where intake data were collected pre and post label policy from 7 provincial quitlines. The study focuses on incoming callers aged 18 and over from three vulnerable groups—young males (18-29), clients with low education (high school or less), and those residing in rural areas. Comparisons are made between the six months following the introduction of the labels and the same six months in the preceding year prior to the new labels on caller characteristics, treatment reach and reach equity for vulnerable groups.

Results: In the post-label period, 83% of incoming callers saw the labels. After the introduction of the labels caller characteristics changed. For the combined provinces, callers were younger, more likely to be male, had lower levels of education, were less likely to be white, and were more likely to be daily smokers. Overall quitline treatment reach increased from .04% to .11%. For young males, treatment reach increased from .02% to .09% and reach equity improved from a low of .37 to .86 (1.0 indicates equity). Treatment reach also improved for callers with high school or less (from .03% to .09%) and approached equity (from .77 to .99). Although reach improved slightly for rural residents (from .02% to .03%), there was little impact on reach equity (.64 and .69). There was some variation in the findings by province.

Conclusions: The introduction of the quitline toll-free number on tobacco warning labels in Canada changed the profile of incoming quitline callers and increased treatment reach for most provinces. There was improved treatment reach equity for young males and those with high school or less education, but not for rural residents.

FUNDING: Funded by a partnership of the CIHR Institute of Population and Public Health and the Public Health Agency of Canada, Chronic Diseases Intervention Division (grant # 112868), and the Canadian Cancer Society Research Initiative (grant #701019)

JUSTIFICATION: The translational applications of this study are important for both practice and public health policy as international jurisdictions consider implementation of tobacco packaging policies and population-based smoking cessation strategies.

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POS3-69 PATTERNS OF PREDICTORS OF CESSATION AMONG LATINO MALES AS THEIR PARTNERS TRANSITION FROM PREGNANCY TO POSTPARTUM

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Smoking among Latino males living in the U.S. is a relatively unaddressed public health problem. The Parejas study was a couples-based intervention designed to capitalize on potential natural increase in motivation to quit among a sample of Latino expectant fathers as they transition to postpartum. We compared two intervention arms: 1) written materials plus NRT (n=175) to 2) materials, NRT, and cessation counseling (n=173). We found high rates of cessation but no arm differences in 7-day point prevalence abstinence at the end of pregnancy and postpartum. The purpose of this secondary analysis is to examine changes in predictors of cessation over time and to explore arm differences to determine if the intervention had an effect on predictors of cessation, namely motivation, self-efficacy, partner support for quitting, worry, worry, self-image, and outcome expectations. We conducted repeated measures analysis using a generalized linear mixed model (GLMM) and linear mixed model for predictive support for quitting, while controlling for number of cigarettes smoked in the past 30 days and acculturation. Men in both arms had high motivation, high self-efficacy for quitting, and favorable outcome expectations for quitting at baseline; these levels remained high at the end of pregnancy and throughout postpartum. Worry about the effects of smoking on family was high at baseline and decreased over time in both arms (p<.0001). Men in the intervention arm were more likely than men in the control arm to report changing from seeing themselves as a smoker to seeing themselves as a non-smoker over time (p<.0001). Finally, men in the intervention arm were more likely than men in the control arm to perceive higher levels of positive support over time (p<.01). Most of the predictors of cessation were high or favorable at baseline and were not changed by the intervention or when men transitioned from the pregnancy to postpartum periods. These couples-based intervention was related to changes in smoking self-image and perceived support for quitting over time. Future interventions might consider a couple-based intervention to change these important predictors of cessation.

FUNDING: Funding for this research comes from a grant from NCI R01CA127307, Pollak, PI

JUSTIFICATION: Couples-based cessation interventions for Latinos may be effective for changing important predictors of cessation such as smoking self image and partner support for quitting.

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POS3-70 A QUALITATIVE INVESTIGATION OF LOW INCOME SMOKERS’ RESPONSES TO EXCISE TAX INCREASES

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Evidence that tobacco excise taxes are the most effective tool for reducing overall smoking prevalence is now well established. However, tax increases disproportionately affect lower income smokers (LIS), among whom smoking prevalence peaks while cessation success rates decline. Although higher taxes may stimulate quit attempts, they may also create unintended consequences, including displaced purchases, increased deprivation and reduced well-being.
New Zealand currently increases tobacco excise taxes by ten percent each year; within a month of the most recent increase, we conducted 27 in-depth interviews with LIS to explore how they manage tobacco's decreasing affordability.

Using a grounded thematic analysis approach, we identified four key themes: punishing the poor; self-regulation and displacement; tobacco as a precious commodity, and desperation. Nearly all participants wanted to quit smoking but they resented the burden increased excise tax creates, the judgment it represents about their lifestyle, and the choices it forces them to make. They responded to tax increases by trading down to cheaper brands and forms of tobacco, reducing consumption, and displacing other purchases. These sacrifices increased tobacco's value to them and stimulated behaviors to avoid waste, including minimizing butt length, recycling butts, reducing rolled stick size, and smoking half sticks. However, even these measures were often inadequate and many reported running out of tobacco and recycling their own butts or collecting discarded butts from gutters to re-use.

LIS experience extreme financial stress and cope using desperately frugal measures that induce high dissonance. All participants had reduced their consumption and sacrificed other purchases, and some had engaged in behaviors that reduced their self-esteem and others' perceptions of them. To reduce smoking among people with few resources, individual level interventions that humanize smokers, and make cessation support more widely available over longer periods and at reduced or no cost may be required. Failure to offer comprehensive support to complement tax increases could further alienate a marginalized group.

JUSTIFICATION: Excise taxes are widely used to stimulate smoking cessation but risk alienating disadvantaged smokers; consideration should be given to making fiscal policies more inclusive.

FUNDING: No Funding.

POS3-71
FACTORS ASSOCIATED WITH PRODUCT-USE PATTERN AMONG U.S. YOUTH TOBACCO USERS
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Background: Research documented factors associated with particular tobacco product use. Less is known about how these factors differ by product-use pattern among youth tobacco users.

Methods: A nationally representative sample of middle and high school tobacco users (N = 3969) was classified into five mutually exclusive categories: cigarette only, non-cigarette combustible products only (e.g., cigars), non-combustible products only (e.g., snuff), users of two-, and users of three-product categories. We examined associations between product-use categories and smoking-related beliefs, perceived risk, exposure to tobacco advertising, and quit attempts using weighted regression models.

Results: Among US youth tobacco users, 31.2% used two-product categories, 27.7% used non-cigarette combustible products only, 17.4% used three-product categories, 14.1% used cigarettes only, and 9.5% used non-combustible products only in the past 30 days. These patterns differed by age, gender, and race/ethnicity (ps < 0.05). Compared to cigarette only users, non-cigarette combustible and non-combustible only users were less likely to consider tobacco consumption socially beneficial. Non-cigarette combustible product only users were less likely to think about tobacco risks and attempt to quit in the past 12 months (ps < 0.05).

Similarities and differences existed between users of two- versus three-product categories. Compared to cigarette only users, both users of two- and three-product categories were more likely to receive coupons and promotions from tobacco companies, to be receptive to tobacco marketing, and less likely to perceive tobacco as dangerous (ps < 0.05). Only users of three-product categories were more likely to hold pro-tobacco smoking-related beliefs and to be exposed to tobacco advertisements (ps < 0.05).

Conclusion: Tobacco-use factors varied by product-use pattern. Differences existed between users of two versus three tobacco-product categories who were traditionally treated homogeneously as polytobacco users. Identifying salient beliefs among tobacco-product user subgroups can help us develop targeted cessation messages.

FUNDING: This research was supported by the Division of Intramural Research of the NIH, National Institute on Minority Health and Health Disparities.

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POS3-72
INTERVIEWS WITH SMOKERS ABOUT SMOKELESS TOBACCO PRODUCTS, RISK MESSAGES AND NEWS ARTICLES
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Background: Smokeless tobacco products (SLT) and their communication have been topics of discussion in harm reduction debates, but little is known about smokers’ perceptions of existing SLT risk messages. Our previous research has shown that new SLT products such as Camel and Marlboro snus have generated news coverage including various risk messages. This study aims to explore smokers’ perceptions of these products and news stories and their potential impact.

Methods: Thirty smokers were assigned to read one of three constructed news stories about snus and SLT. All articles began by describing the introduction of snus in the US and its traits, but differed in risk descriptions. The “favorable” version described SLT as a “safer” smoking alternative but presented no risks while the “cautious” version described risks and indicated SLT was not a safe alternative. The “mixed” version presented views from both story types. Participants were emailed a version to read and then immediately interviewed by phone.

Results: Most (23/30) had heard of snus before, believed it was intended to maintain cigarette company profits, and perceived snus to be more socially acceptable than traditional dip because it is pouch and spit-free (though some thought it was more harmful than dip). Across all conditions, participants expressed beliefs that SLT was as or more harmful than cigarettes because of its prolonged direct contact in the mouth, and graphic associations with oral effects including cancer. “Cautious” and “mixed” story participants also worried about the “unknown” effects of snus. However some “favorable” and “mixed” story participants indicated that they had changed their opinion (at least somewhat) after the article. Participants largely found quoted sources (e.g. researchers) to be credible and their conflicting viewpoints to be expected. The majority found the story to be interesting and informative and 11/30 said they would try snus in the future.

Conclusions: Exposure to news information about SLT products may shape product perceptions and interest. Future research should explore such media effects with larger sample sizes.

FUNDING: This work was funded by the National Cancer Institute and the Food & Drug Administration Center for Tobacco Products (R03CA175901).

JUSTIFICATION: This research has the potential to inform future policy decisions about how smokeless tobacco products are labeled, marketed and described by studying the effects and interpretations of existing messages that the public may already be encountering in the news.

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The use of electronic cigarettes (E-cigs) is becoming increasingly popular but their addictive potential is not fully characterized. The objective of this pilot study was to assess the clinical pharmacology of E-cigs, including assessment of pharmacokinetic factors that are associated with nicotine addiction, and retention of nicotine. To date, data from 3 subjects have been analyzed; additional subjects will be included in the final presentation.

Healthy, experienced adult E-cig users were enrolled in a 1-day inpatient hospital study. Subjects used their usual E-cig brand during two sessions: 1) standardized session, where they took one puff every 30 seconds for a total of 15 puffs, followed by a 4-h abstinence period. Exhaled nicotine after each puff was collected using 3 gas traps containing diluted acid solution connected in series to a pump. Blood samples were taken before and several times after the last puff; and 2) ad libitum session, subjects used the E-cig as they usually do. Blood samples were taken every 15 minutes. Plasma nicotine was analyzed by GC-MS and nicotine in e-liquids and gas traps was analyzed by LC-MS/MS.

One cartridge and 2 tank type E-cigs were used. The average maximum plasma nicotine concentration (Cmax) from the standardized sessions was 8.3 ng/mL (6.9 ng/mL at 2 min, and 9.1 and 8.9 ng/mL at 5 min, shown for subjects 1 through 3). The subjects took in an average of 1.83 mg of nicotine (0.95, 1.71, and 2.63 mg) and retained an average of 96% of the inhaled dose (100%, 99.9%, and 89%). During the ad libitum session, average plasma nicotine Cmax was 17.5 ng/mL (11.0 ng/mL at 75 min, and 12.5 and 29.0 ng/mL at 90 min).

It appears that E-cigs can be highly efficient as nicotine delivery devices, delivering levels of nicotine comparable to conventional cigarettes (~1-2 mg) with similar systemic retention (~80-90%). The nicotine Cmax after 15 puffs was lower than available data on smoking one cigarette (15-30 ng/mL), suggesting that not all nicotine inhaled and retained is being absorbed through the lungs. Based on pharmacokinetic considerations, E-cigs may have similar potential to produce nicotine addiction as conventional cigarettes.

FUNDING: Research reported in this abstract was supported by grant number 1PS50CA180890 from the National Cancer Institute and Tobacco Administration Center for Tobacco Products and P30 DA012393 from the National Institute on Drug Abuse. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH or the Food and Drug Administration.

JUSTIFICATION: This study highlights that E-cigarettes may produce nicotine addiction as conventional cigarettes based on pharmacokinetic considerations.

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Background And Aim: Information on changes over time in cigarette consumption among adult smokers is limited. The aim of this study is to identify recent cigarette consumption trajectories and associated factors among Ontario adult smokers.

Methods: Data were from the Ontario Tobacco Survey longitudinal study of adult smokers (18+). Baseline smokers were recruited between July 2005 and June 2008 and followed up as many as six times at 6-month intervals between January 2006 and June 2011. Growth mixture modeling was used to identify cigarette consumption trajectories. Factors associated with these trajectories were examined using survey multinomial logistic regression.

Results: Three trajectory patterns were identified from the entire cohort: increasing (8.5%), stable (79.9%) and decreasing consumption (13.6%). Compared to stable consumption smokers, increasing consumption smokers were more likely to have low education (adjusted odds ratio, AOR=2.16, p<0.001), to be never married (AOR=1.90, p<0.05), to use varenicline (AOR=2.61, p<0.01), and to receive advice from health professionals (AOR=2.88, p<0.001); they were less likely to smoke more cigarettes per day at baseline (AOR=0.83, p<0.01) and to have home smoking restrictions (AOR=0.57, p<0.05). Decreasing consumption smokers were more likely to be never married (AOR=2.47, p<0.01), to smoke more cigarettes per day at baseline (AOR=1.09, p<0.001), to have home smoking restrictions (AOR=2.18, p<0.001), and to make a quit attempt (AOR=2.05, p<0.001), compared to stable consumption smokers.

Conclusions: Three distinct cigarette consumption trajectories were identified among continuing adult smokers, with 8 of 10 smokers remaining stable in the number of cigarettes they smoked over a three-year period.

FUNDING: No funding.

JUSTIFICATION: In contrast to the common understanding (decreasing cigarette consumption), the majority of smokers had constant cigarette consumption over time in recent years.

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Background: Studies have shown that some smokers use e-cigarettes in addition to tobacco cigarettes. These smokers are commonly referred to as ‘dual users’. Since e-cigarette use among adolescents has been shown to be associated with cigarette smoking, there is a high risk that significant proportion of youth may actually be dual users. Very little is known about prevalence and risk factors of tobacco and e-cigarette dual use among youth.

Aims of the study: The aim of this study was to evaluate the prevalence and patterns of dual use among adolescents in Poland and to determine risk factors of dual usage.

Materials and Methods: An anonymous survey was administered to 1,785 students, aged 17±1.3 (mean±SD), 52% female, in 21 schools between
December 2013 and February 2014. Students were asked whether they had ever and in the past 30 days smoked tobacco cigarettes or puffed on e-cigarettes. We performed multivariate analysis controlled for age, sex, gender, place of living, family size, and a type of school. We also performed Chi-squared tests to determine differences in smoking patterns between dual users and the exclusive users of tobacco products.

Results: Smoking cigarettes was declared by 38% students and 30% reported puffing on e-cigarette in 30 days prior the survey was taken. Overall, 22% students were dual users of both electronic and tobacco cigarettes. Among those who smoked tobacco cigarettes, 63% also used e-cigarettes, and among those who used e-cigarettes, 74% also smoked cigarettes. Most dual users used products with high nicotine concentrations and fruit flavor. We also found that daily cigarette smoking rate was higher among dual users than among students who smoked just tobacco cigarette (69% vs. 32%, respectively; p<0.05). Students were less likely to be dual users if they were older (AOR= 0.71 (95%CI 0.55-0.92), or if they were male (AOR 0.74 (95%CI 0.59-0.91)).

Conclusions: Dual use of e-cigarettes and tobacco cigarettes is prevalent among Polish adolescents. Tobacco control programs should include new approaches to simultaneously prevent uptake of electronic and tobacco cigarettes by youth.

FUNDING: No funding.

JUSTIFICATION: This study suggested that tobacco control policy need to prevent uptake of electronic and tobacco cigarettes by youth.

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POS3-77
FACTORs CONTRIBUTING TO GEOGRAPHIC DISPARITIES IN UTILIZATION OF SMOKING CESSATION TREATMENT SERVICES IN TAIWAN

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Background: Few studies have ever conducted to examine the extent to which geographic disparities affect the use of smoking cessation treatment. Taiwan Cessation Treatment Services (TACTS) is a nationwide health program to cover counseling and part of pharmacotherapy for adult smokers attempting to quit. It is necessary to inspect, and overcome if any, factors leading to different utilization of TACTS between regions.

Purpose: This study aims to examine the factors contributing to regional disparities regarding the utilization of TACTS.

Materials and Methods: This is a population-based, longitudinal observation study recruiting a total of 434,325 subjects who participated the TACTS between July 2006 and December 2010 across 23 counties/cities in Taiwan. The primary outcome is the services utilization rate in a county/city. A multilevel analysis is conducted to determine the relationship between the TACTS utilization and smoker's region of residence with adjustment for probable confounding variables, including seasonality, smoking prevalence, county-level demographic and socioeconomic characteristics as well as health care resources.

Results: The observed utilization rates differed remarkably across 23 counties/cities in Taiwan, ranging from 2.73% to 8.17% in the first quarter of 2010. The utilization declined with a rate of 5.9% per quarter (RR=0.94, 95% CI: 0.92-0.96). Two county-level variables, the averaged Personal Disposable Income (PDI) and TACTS practicing physician-to-smoker ratio (PSR) significantly reduced the regional disparity of TACTS utilization. Given one additional physician providing service among 10,000 smokers in a county/city, the increment of utilization varied from a low of 9.0% in Kaoping region (RR=1.09, 95% CI 1.06-1.12) to a high 22.4% in the East region (RR=1.22, 95% CI 1.13-1.33). Averaged PDI inversely predicted the utilization of TACTS (X2=53.38, df=1, p<0.0001). The utilization rate significantly decreased 2.0%-5.2% for 10,000 TWD increase of averaged PDI.

Conclusion: Regional disparities of utilizing the TACTS was evident. The effect of PSR was able to minimize, rather than enlarge, the disparity between different regions. The PDI was a negative factor on using the TACTS.

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POS3-78
YOUTH MULTIPLE TOBACCO PRODUCT USE IN THE UNITED STATES: PREVALENCE AND RISK FACTORS

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Background: Noncigarette tobacco products are increasingly popular among youth, especially youth who also smoke cigarettes. Researchers need to understand multiple tobacco product use to assess the effects of non-cigarette tobacco products on population health.

Purpose: To report national youth estimates of current use patterns involving conventional cigarettes and other tobacco products and to examine risk factors for these patterns.

Method: Estimates of current use were calculated for conventional cigarettes, cigars, smokeless tobacco, hookah, e-cigarettes, pipes, bidets, kreteks, snus, and dissolvable tobacco using data from the 2012 National Youth Tobacco Survey (N=24,658), a nationally representative sample of U.S. middle and high school students. Associations between use patterns and demographic characteristics were examined using multinomial logistic regression.

Results: Among middle and high school students, 14.7% currently use one or more tobacco products. Of these, 2.8% use cigarettes exclusively, and 4% use one noncigarette product exclusively; 2.7% use cigarettes with another product (dual use); and 4.3% use three or more products (polytobacco use). Twice as many youth report current exclusive use of e-cigarettes alone than report dual use e-cigarettes and conventional cigarettes. Among current smokers, polytobacco use was significantly associated with male (aRRR=3.71), using flavored products (aRRR=6.09), nicotine dependence (aRRR=1.91), advertising receptivity (aRRR=2.52), and perceived prevalence categories (aRRR=3.61, 5.73).

Conclusions: About 8% of students in the United States use multiple tobacco products. Continued monitoring of tobacco use patterns is warranted, especially for e-cigarettes. Youth rates of multiple product use involving combustible products underscore needs for research assessing potential harms associated with these patterns.

FUNDING: This study was supported by RTI's evaluation of Florida Department of Health's Bureau of Tobacco Free Florida.

JUSTIFICATION: Regulatory agencies need to understand the effects new tobacco products have on use patterns to assess potential population harms or benefits, particularly among youth who are more vulnerable to the effects of nicotine than older individuals.

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POS3-79
SOCIO-DEMOGRAPHIC CHARACTERISTICS ASSOCIATED WITH SWITCHING TO SMOKELESS TOBACCO AS A CIGARETTE SMOKING CESSATION AID AMONG U.S. ADULTS, 2010-2011
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Introduction: Some studies suggest that cigarette smokers might switch to smokeless tobacco (SLT) for the purposes of smoking cessation. However, there is no conclusive evidence showing that switching to SLT promotes long-term smoking cessation. We examined socio-demographic characteristics of US adult cigarette smokers who had switched to SLT (chew tobacco, snuff/dip, and snus) as a smoking cessation aid during their past-year quit attempt.

Methods: Data came from the 2010-2011 Tobacco Use Supplement to the Current Population Survey. Current cigarette smokers were persons who had smoked ≥100 cigarettes in their lifetime and now smoked ‘every day’ or ‘some days’. Nicotine dependence was assessed with the Heaviness of Smoking Index (low, moderate, high), calculated from cigarettes smoked per day and the time to first cigarette after waking. Among those who made a past-year quit attempt (n=10,499), logistic regression was used to explore factors associated with switching to SLT as a cessation aid, adjusting for nicotine dependence, sex, age, US region, race/ethnicity, marital status, and education (p<0.05).

Results: About 3.5% of current cigarette smokers who made a past year quit attempt switched to SLT as a cessation aid. The odds of switching to SLT as a smoking cessation aid were higher among smokers with moderate rather than low dependence (AOR=1.46; 95%CI: 1.07-1.99), but were lower among females than males (AOR=0.23; 95%CI: 0.16-0.34), and among non-Hispanic blacks than non-Hispanic whites (AOR=0.42; 95%CI: 0.23-0.78). Persons aged 25-44; 45-64; and ≥65 had 0.58; 0.37; and 0.39 lower odds of switching to SLT as a cessation aid, respectively, compared to those aged ≤24 years (p<0.05). No differences were observed by other characteristics. About 26.3% of current SLT users also smoked cigarettes.

Conclusion: Among cigarettes smokers who made a past year quit attempt, males, younger adults, non-Hispanic whites and those with moderate nicotine dependence were more likely to switch to SLT as a cessation aid. A third of SLT users also used cigarettes. Enhanced efforts are warranted to educate smokers on the importance of using proven cessation methods.

FUNDING: There was no source of direct or indirect funding for the reported research

JUSTIFICATION: Knowledge of socio-demographic characteristics associated with switching to smokeless tobacco as a smoking cessation aid may help to identify which subgroups of smokers to target with educational programs about evidence-based smoking cessation aids for long term cessation.

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POS3-80
THE EFFECT OF MOBILE PHONE TEXT MESSAGES ON SHORT AND LONG TERM QUITTING IN MOTIVATED SMOKERS: A RANDOMISED CONTROLLED TRIAL
Stuart G. Ferguson, PhD*, Julia A.E. Walters, PhD, University of Tasmania

Behavioural support—often delivered via static self help booklets—has become a mainstay of comprehensive cessation interventions and has been found to consistently, if modestly, promote cessation. A number of recent studies have found that behavioural support delivered via text messages can significantly improve outcomes. However, exactly how such programs work—and hence how they can be improved—is currently unknown. A complication is that such programs have so far been evaluated in samples co-using pharmacotherapy, and/or in the absence of a control group using a non-text message based behavioural support program. We aimed to explore the effectiveness of a text message-based behavioural support program in the absence of pharmacotherapy. Methods: 284 interested quitters were randomised to either a text message group or a control condition.

The text group received tailored text messages 4-5 times a day (plus additional messages on request); participates in the control group received a quit booklet only. All participants monitored their smoking, affect and activities in real-time using hand-held smartphones during their quit attempt. Abstinence (verified by CO) was assessed at weekly study visits. Results: 7-day point-prevalence abstinence did not differ between the groups at either 28-day or 6mth follow-up (p>0.05). Discussion: The observed quit rates were on par with studies using brief advice in the absence of pharmacotherapy, but behavioural support offered by text messages in the absence of pharmacotherapy did not improve outcomes. Implications for future research will be discussed.

FUNDING: This study was support by a grant from the National Health & Medical Research Council awarded to the authors. Stuart Ferguson has consulted for GlaxoSmithKline Consumer Healthcare (GSKCH) on matters relating to smoking cessation and has received researcher-initiated project grant funding from Pfizer (through the GRAND initiative). Neither GSKCH nor Pfizer had any involvement in the current study.

JUSTIFICATION: The study has implications for the use of text messages to deliver behavioural support.

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POS3-82
SMOKING TOPOGRAPHY PREDICTS NICOTINE UPTAKE IN DAILY CIGARETTE SMOKERS
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Background: Cigarettes per day (CPD) is the conventional measure of nicotine exposure, but is a poor indicator of nicotine dose for heavy smokers. A number of studies have demonstrated a plateau effect in nicotine uptake among heavy smokers. Levels of cotinine increase linearly up to about 15-20 CPD and then level off with further increases in daily cigarette intake. We hypothesize that the intensity (e.g. puff volume) of smoking is reduced at higher levels of cigarette consumption.

Methods: Adult smokers (n=352) used the SODIM Smoking Puff Analyzer-Mobile (SPA-M) to collect smoking topography measurements at home ad libitum with all their cigarettes smoked in a three day period. Total puff volume per day was calculated as the sum of all puffs for all cigarettes smoked. All participants gave saliva samples for analysis of nicotine metabolites.

Findings: Regression models show a positive linear relationship between CPD and cotinine until a plateau at 16 CPD (p<0.001). Total puff volume was a significant predictor of CPD and rises linearly up to 11 CPD and then tapers off (p<0.001).

Conclusions: Total puff volume regulates nicotine uptake at different levels of daily smoke exposure.

FUNDING: National Institute of Drug Abuse (R01DA026815).

JUSTIFICATION: This study uses quantitative measures of smoking topography to explain the differences of nicotine exposure between light and heavy smokers.

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POS3-83
AFRICAN AMERICAN CIGARETTE SMOKING PATTERNS IN A U.S. NATIONAL SAMPLE
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Tobacco related health disparities among African Americans (AA) are a significant public health issue. AA cigarette smoking is generally characterized by 'lighter' smoking, high menthol preference, and higher dependence symptoms. In an effort to better understand heterogeneity in AA smoking, we used exploratory
Results: A total of 92 unique advertisements were identified for the time period examined and included only two brands: Black & Mild and Swisher Sweets. The 92 ads consisted of 53 direct mail and 39 e-mail advertisements. The objective of this study is to determine advertising expenditures and mail volume of the top 10 cigar brands in the US, and to assess their promotional content.

Methods: Mintel Comperemedia, a full-service advertising firm that provides coverage of direct mail and opt-in e-mail advertising, was used to acquire direct mail and e-mail advertising for the top ten cigar brands in the US, and to assess their promotional content.

Background: Cigar use has increased in the US in recent years, especially among youth, young adults, and women. Since cigar manufacturers are not required to report advertising expenditure data on cigars, little is known about how these products are marketed. However, direct mail marketing is a common tactic that companies use to promote cigarettes and smokeless tobacco and to distribute tobacco coupons to customers. In 2011, the tobacco industry spent $51.5 million on direct mail advertising of cigarettes and $7.5 million on direct mail advertising of smokeless tobacco, which constituted a significant portion of total advertising and promotional expenditures. The objective of this study is to determine advertising expenditures and mail volume of the top 10 cigar brands in the US, and to assess their promotional content.

Conclusions: The results of this study provide a detailed view of AA smoking and may help inform targeted culturally responsive intervention efforts, which may ultimately help reduce smoking and smoking related health disparities among African Americans.

FUNDING: This research was conducted at the University of Washington. It was supported by NIDA grant #R37DA018673 and a grant from American Legacy Foundation.

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Poster Session 3 • Friday, February 27, 2015 • 11:30 a.m.–1:00 p.m.

products regulation. Therefore, the FDA’s new authority has resulted in a large expansion of research activity across many disciplines to gain the information necessary to make regulatory decisions in the best interest of the public's health. We conducted bibliometric analyses of publication data in the domain of tobacco regulatory science (TRS). Publications were pulled from currently funded TRS investigators to examine author-topic modelling and co-authorship networks, as well as by keyword terms pulled from TRS priority areas identified by the FDA to look at how concepts are linked, temporal trends in TRS research, and to begin identifying the boundaries of TRS research. In order to assess the breadth and scope of TRS research funded by the FDA we also conducted content analysis of funded TRS grants and projects. We used automated, natural-language processing software and semantic network methods to extract data from grant descriptions and keywords. We will present information about shared or common research areas across grants and projects, identify unique contributions of certain grants, and detect content “holes” in the research based on previously identified research priority areas.

FUNDING: This research was funded through a small contract funded by NIH TRSP/FDA CTP.

JUSTIFICATION: This work provides a greater understanding of the research that forms the field of tobacco regulatory science in order inform future work in developing field.

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POS3-88
FROM MEDIA AGENDA TO POLICY AGENDA: A NARRATIVE REVIEW OF CONTENT ANALYSES OF TOBACCO-RELATED NEWSPAPER COVERAGE, 1989 TO 2014

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Background: The mass media play a significant role in the development of health policies. Given that tobacco control advocates can effectively partner with the media to shape a media agenda that is favorable for tobacco control and prevention, monitoring media content is an important step in the policy change process.

Purpose: This is the first study to synthesize 35 years of published analyses of tobacco-related newspaper content, and to examine the extent to which past content analyses examine content characteristics theorized to forward public health policy.

Methods: Content analyses were identified in PubMed and EBSCOHost databases. Included articles were structured content analyses that analyzed the volume and characteristics of tobacco-related newspaper content. For each article, we recorded the study location, timeframe, design, purpose, hypotheses, sampling frame, measured variables and statistical analyses.

Results: We identified 39 content analyses for inclusion. Primary study locations were the US (69%, n=27) and Australia (18%, n=7). Study designs varied: 8% were qualitative (n=3), 36% were descriptive (n=14), 41% were cross-sectional (n=16), and 15% were longitudinal (n=6). A priori hypotheses were uncommon, yet some studies tested for significant relationships between measured variables (e.g. article type and slant). Standard measured variables included article demographics, prominence, theme and slant. Many studies examined framing and sources, however measures were inconsistent. Despite their persuasive power towards policy development, the presence of narrative versus statistical evidence and the degree of localization were rarely studied.

Conclusions: Most content analyses were without a priori hypotheses or expected findings. No studies examined a theory-driven set of content characteristics influencing policy development. Future research should include comprehensive measures and test relationships between media content and policy progress.

FUNDING: No Funding.

JUSTIFICATION: Public health researchers and practitioners will understand the history of content analyses of tobacco newspaper coverage, and implications for future work relating the media agenda to the policy change process.

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POS3-89
MODERATION OF THE ASSOCIATION BETWEEN DEPRESSIVE SYMPTOMATOLOGY AND CIGARETTE SMOKING BY FRUIT AND VEGETABLE CONSUMPTION

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Introduction: Studies have consistently observed associations among depression, cigarette smoking, and fruit and vegetable consumption (FVC). This study evaluated FVC as a moderator of the association between depressive symptomatology (DS) and smoking.

Methods: We analyzed data from the National Longitudinal Survey of Youth 1979: Child and Young Adult. The study sample was from the Young Adult Survey portion, respondents aged 14-33 years at baseline in 2004 with 4-year follow-up. Moderation analyses were performed using the Johnson-Neyman technique to assess whether baseline FVC moderated DS-smoking associations cross-sectionally and longitudinally, among older adolescents at baseline (14-18 years) with transition into early adulthood, and among younger adults (19-33 years at baseline).

Results: Cross-sectionally, FVC moderated the DS-smoking association with a significant association among adolescents at FVC below 2.6 times/day (n = 534; p < .05), but not above this frequency. Among adults, the DS-smoking association was significant for those with FVC below 4.9 times/day (n = 2164; p < .05), but not above this frequency. Longitudinally among the baseline adolescent cohort, FVC moderated the association between baseline smoking frequency and follow-up DS. The smoking-DS association was only significant at FVC > 1.5 times/day and < 4.4 times/day (p < .05). Among adults, FVC moderated the inverse association between DS and quitting smoking (no longer significant at ≥ 1.2 times/day; p ≥ .05).

Conclusions: Moderation by FVC results paired with prior research suggests that higher FVC might prevent smoking progression, be protective against depressive effects of smoking, and serve as an adjunct to cessation. Further experimental research is warranted to test the efficacy of FVC for smoking prevention and cessation.

FUNDING: No Funding

JUSTIFICATION: This study found FVC to be a moderator of the association between depressive symptomatology and smoking among both adolescent and younger adult samples, suggesting that FVC might prevent smoking progression, be protective against depressive effects of smoking, and serve as an adjunct to cessation.

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POS3-90
SMOKERS' PERCEPTIONS OF THE HEALTH RISKS OF E-CIGARETTES AND OTHER TOBACCO PRODUCTS: IMPLICATIONS FOR TOBACCO CONTROL

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Introduction: Although traditional cigarettes are the most popular tobacco product among U.S. adults, rates of use of other nicotine and tobacco products are increasing. Beliefs that other nicotine and tobacco products are less harmful than cigarettes may be one driver of their increasing popularity. We sought to understand smokers' perceived likelihood of developing health problems from using cigarettes and four non-cigarette tobacco products (NCTPs: e-cigarettes, snus, dissolvable tobacco, and smokeless tobacco).

Methods: A U.S. national sample of 6,607 adult smokers completed an online survey in March 2013 assessing their beliefs about the likelihood that use of cigarettes and NCTPs would cause them to develop lung cancer, oral cancer, and heart disease.

Results: Smokers viewed e-cigarettes as less likely to cause lung cancer, oral cancer, and heart disease compared to regular cigarettes (all p<.001). Past use of e-cigarettes and intention to quit smoking were not related to beliefs about the riskiness of e-cigarettes. Participants viewed NCTPs other than e-cigarettes as more likely to cause oral cancer than cigarettes but less likely to cause lung cancer. In between-group comparisons, smokers rated e-cigarettes as less harmful than the other NCTPs for all three health conditions.

Conclusions: The consistent perception that e-cigarettes were less harmful than cigarettes could be one factor driving the dramatic increase in their use, which has not been matched by that of snus, dissolvable tobacco, or smokeless tobacco. Understanding smokers' beliefs about the health risks from different nicotine and tobacco products can inform policy (e.g., developing warning labels that clarify or correct inaccurate harm perceptions) and programs (e.g., designing smoking cessation interventions that build on existing beliefs about different health outcomes).

FUNDING: National Cancer Institute (Grant No. 1U01CA154254); UNC Lineberger Cancer Control Education Program (R25 CA57726)

JUSTIFICATION: Understanding smokers' beliefs about the health risks from different nicotine and tobacco products can inform policy (e.g., developing warning labels that clarify or correct inaccurate harm perceptions) and programs (e.g., designing smoking cessation interventions that build on existing beliefs about different health outcomes).

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POS3-91

SMOKERS' E-CIGARETTE INFORMATION SOURCES, RISK PERCEPTIONS, POLICY ATTITUDES AND USE INTENTIONS

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Background: Electronic cigarettes ("e-cigarettes") are innovations targeted at smokers as cigarette alternatives with the potential to impact public health if widely adopted. This study aims to describe smokers' e-cigarette risk perceptions, valued information sources, policy attitudes, context of first e-cigarette use and future use intentions.

Methods: Results are based on a 2014 e-cigarette focused survey of 500 current smokers recruited from GfK's Knowledge Networks nationally representative research panel.

Results: Smokers most frequently reported seeing e-cigarettes in stores (84%) or used by people around them (81%). Half of ever users first tried an e-cigarette from a known person while 43% initially purchased an e-cigarette. The majority (61%) believed e-cigarettes are less harmful than regular cigarettes, a belief largely attributed to intuition or “common sense” (82%) but also to news and advertisement sources. However, 33.1% rated e-cigarettes at 5 or above on a scale of perceived harmfulness (1=not at all, to 7=extremely harmful), and 80% agreed e-cigarette safety information was important to them. Approximately one-third said they would turn to a doctor first for information on e-cigarette safety, though an almost equal percent said they would turn to the Internet (25.5%) or product packaging first (24.2%). While most (62.5%) did not know that e-cigarettes are unregulated, 83-88% agreed that e-cigarettes should be regulated by the FDA for safety and quality, carry warning labels, and have the same legal age of sale as tobacco cigarettes. Over half (53.5%) of former e-cigarette users and 18.5% of never users indicated that they think they would smoke an e-cigarette in the next year, and 20% were more interested in using an e-cigarette made by a tobacco company.

Conclusions: Though most smokers believe e-cigarettes are less harmful than tobacco cigarettes, they do not necessarily believe that e-cigarettes are harmless, and think that safety/risk information about e-cigarettes is important and that e-cigarettes should be regulated. E-cigarette use will likely grow and product regulation is warranted.

FUNDING: This work was funded by the New Jersey Health Foundation and in part by the National Cancer Institute and the FDA Center for Tobacco Products (K01CA189301).

JUSTIFICATION: This presentation can inform policy, communication and educational activities related to electronic cigarettes.

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POS3-92

ATTITUDES TOWARD E-CIGARETTES AMONG SMOKERS WHO HAVE NEVER TRIED E-CIGARETTES

Yue-Lin Zhuang, PhD*, Shu-Hong Zhu, PhD, University of California, San Diego

Most e-cigarette users are smokers, and the majority of smokers have already experimented with e-cigarettes. A 2014 population survey showed that 53.7% of U.S. smokers have tried e-cigarettes. This study focused on the rest of the smokers: those who have never tried e-cigarettes. It examined their attitude toward e-cigarettes and their intention to use e-cigarettes in the future. The study is based on a national probability sample (N=1625) in the United States in 2014. The result shows that 58.0% of smokers who have never tried e-cigarettes would actually try e-cigarettes if offered one by a friend. The majority of these smokers, 86.2%, did not agree that e-cigarettes should be banned, and 69.8% of them believed e-cigarettes would be helpful for quitting smoking. In contrast to smokers who would not try e-cigarettes when offered one by a friend, these potential e-cigarette users held more positive attitudes toward e-cigarettes. In particular, they were less likely to agree that e-cigarettes should be taxed like regular cigarettes (36.9% vs. 62.5%), less likely to agree that e-cigarettes advertising should be banned as regular cigarettes advertising (40.6% vs. 60.9%), more likely to expect that e-cigarettes could help them quit smoking (69.8% vs. 49.2%), and more likely to believe that e-cigarettes are less harmful (49.8% vs. 35.4%). These results suggest that an even greater proportion of smokers than those who have already tried e-cigarettes (> 53.7%) will experiment with e-cigarette in the future, likely increasing the overall e-cigarette uptake rate in the next few years. Future longitudinal studies can also examine how well the attitude measures described here predict the experimentation and the regular use of e-cigarettes among adults.

FUNDING: This study was supported by the National Cancer Institute of the National Institutes of Health under the State and Community Tobacco Control Initiative, Award Number UC1CA154280. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

JUSTIFICATION: This study enhances the understanding of the epidemiology of e-cigarette use.

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POS3-93

EXAMINING SMOKING AND VAPING BEHAVIORS OF VAPOUR STORE CUSTOMERS

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The prevalence of e-cigarette (EC) stores has increased dramatically in recent years, as has the use of tank systems. The available literature explores online vapor forums to profile the EC community, yet there is little research investigating the vaping behaviors and preferences of EC store customers. The purpose of the present study is to begin to address this gap in the literature. A convenience sample of 100 vapor store customers (51% male; 76% White; Mage = 37.6, SD = 15.1) from four Midwestern, metropolitan vapor stores completed a short survey assessing their vaping/smoking history, current vaping/smoking behaviors, and vaping attitudes and preferences. All participants completed exhaled carbon monoxide testing to biochemically confirm self-reported smoking status (CO<11ppm). Participants had been vaping for a little over a year (Mmonths=14.6, SD=9.7), with 63.4% of EC users biochemically-verified smoking abstinent. The majority of customers (91%) reported enjoying vaping more than smoking, with 80% preferring non-tobacco EC flavors. However, 60% reported that they would still vape if the only flavor available was tobacco. On a scale from 1 (not important) to 10 (very important), participants reported that the most important EC features were "battery life" (M=8.3, SD=2.6), "tastes good" (M=8.4, SD=2.6), and "curbs cravings" (M=7.8, SD=3.3); the least important feature was "feels/ looks like traditional cigarette" (M=2.9, SD=3.2). A majority 'agreed' or 'strongly agreed' that they preferred to buy EC supplies at vapor stores because of "access to staff who can help troubleshoot EC problems" (85%), "enjoy the atmosphere" (74%), and "because the e-liquid is fresher" (86%). No significant differences were found between EC-only users and dual (EC & cigarette) users in terms of number of cigarettes smoked per day prior or nicotine dependence prior to initiation, length of EC use, and use of tobacco vs. non-tobacco EC flavors. Overall, vapor store customers demonstrated high rate of smoking abstinence and overwhelmingly preferred vaping to smoking; however, no differences were seen between EC-only users and dual users in terms of smoking history or vaping behaviors.

FUNDING: This research was funded by the Oklahoma Tobacco Research Center who is provided funding through the Oklahoma Tobacco Settlement Endowment Trust.

JUSTIFICATION: This study provides information that is useful in determining public policy regarding electronic cigarette use.

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POS3-94
THE NATURAL HISTORY OF E-CIGARETTE USE FOR SMOKING CESSATION AFTER HOSPITALIZATION

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Despite prohibition on marketing e-cigarettes for smoking cessation, they are often perceived as a quit aid, with smokers most often citing smoking cessation or reducing risk as the reason for use.67.8% of smokers have found they reduce cravings and assist with smoking reduction, suggesting help with smoking cessation; however, they have not been found superior to NRT.

This 6-month follow-up study examines the use and impact on quitting of e-cigarettes and recommended quit aids after a hospitalization, an event that often motivates a quit attempt.

740 hospitalized smokers were recruited and assigned to the control condition of a smoking cessation intervention. Participants were provided bedside smoking cessation advice. Patients were over age 18, smoked in the previous month, cognitively and physically able to participate, and had access to email and the internet, but were not required to want to quit smoking.

Demographics, smoking history, use of e-cigarettes, motivation to quit, and quit attempts in the previous year were assessed at baseline. Use of quit aids (varenicline, buproprion, or NRT), e-cigarettes and 30-day point prevalence smoking status were assessed at 6-months follow-up.

630 (85%) provided data at 6-months post-hospitalization. Most participants reported planning to stay quit (26%) or try to quit (57%) with the remaining unsure of plans (14%) or planning to not quit (3%). 42% of participants reported using quit aids and/or e-cigarettes after hospitalization with 83% of them having planned to stay quit or try to quit. Plans for quitting were predictive of 30-day point prevalence smoking abstinence at 6-months later (t=3.05, p<.001). The majority of patients chose “cold turkey” (57.8%) which had the highest quit rate (36%). More participants opted to use e-cigarettes (20%) than a quit aid (13.2%) or a combination of the two (8.6%) but had lower quit rates than either (20.6% vs. 31.3% and 25.9%, respectively).

These results suggest that electronic cigarettes, while more popular than quit aids in this sample, were not as effective for smoking cessation, and neither were as effective as “cold turkey,” the most common method for quitting.

FUNDING: NIDA-U01DA031515

JUSTIFICATION: This presentation has implications for understanding quitting methods and the effectiveness of e-cigarettes for quitting smoking among hospitalized smokers.

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POS3-95
E-CIGARETTE SUBSTITUTION FOR SMOKERS WITH SCHIZOPHRENIA OR BIPOLAR DISORDER WHO PREVIOUSLY FAILED TO QUIT

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Introduction: People with schizophrenia and bipolar disorders are more likely to smoke, less likely to quit, and suffer disparate morbidity and early tobacco-related mortality. Although many of these smokers want to quit, most are unable to do so for more than a few weeks, even with evidence-based cessation treatment combinations. We conducted a pilot study to assess the short-term effect of e-cigarette substitution on smoking among smokers with mental illness who had previously failed to quit with treatment.

Methods: We consented 22 daily smokers in outpatient treatment for mental illness (54.5% schizophrenia; 45.5% bipolar disorder) who were not currently trying to quit, and provided them with a supply of e-cigarettes (2nd generation NJOY) and instructions on use. We followed participants with four weekly assessments of breath CO, use of e-cigarettes, use of combustible tobacco, and satisfaction measures. Mean age was 43±14 years. Paired t-tests assessed changes in outcomes.

Results: Two participants completed a baseline evaluation only. Among the remaining 20, baseline mean weekly combustible tobacco use was 192±159 cigarettes. Use decreased to 67±76 cigarettes/week at study end (t=3.62, df=17, p=.005). Decrease in smoking was confirmed by a reduction in breath CO level from a baseline mean 27ppm to 15ppm at study end (t=3.25, df=18, p=.004). Two participants (10%) switched completely to e-cigarettes. Satisfaction with e-cigarettes was high (mean satisfaction and enjoyment ratings were 4.1 and 3.8 on a scale of 1-5). No serious adverse events were reported.

Conclusions: During one month of e-cigarette access, smokers with schizophrenia and bipolar disorder greatly reduced combustible tobacco use, coinciding with a 50% decrease in CO level. These pilot data suggest that a safety-tested e-cigarette product could reduce harm in these vulnerable smokers while they are unable to quit. Further research is needed to explore the safety, addiction liability and health impact of e-cigarette combination use and switching among people with severe mental illnesses and other vulnerable populations of smokers who are unable to quit.

FUNDING: No Funding.

JUSTIFICATION: Outcomes of this pilot study of switching from combustible tobacco to e-cigarettes in people with serious mental illness has potential public health implications for other vulnerable populations of smokers who struggle to quit.

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POS3-96
IS EXPOSURE TO E-CIGARETTE COMMUNICATIONS ASSOCIATED WITH PERCEIVED HARMs OF E-CIGARETTE VAPORS? RESULTS FROM A NATIONAL SURVEY OF U.S. ADULTS

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Background: Most U.S. adults have been exposed to information about e-cigarettes through another person, advertising, or news stories. Yet, the link between exposure to e-cigarette communications and public attitudes toward benefits and harms of e-cigarettes is not well understood. Prior content analyses reported that e-cigarette ads and media coverage frequently mention that e-cigarette vapor is harmless to people around users. This study tested the hypothesis that exposure to e-cigarette communications would be associated with lower perceived harms of secondhand vapor (SHV).

Methods: We analyzed survey data from 1449 U.S. adults who were members of KnowledgePanel, a nationally representative online research panel, from October-December 2013. Perceived harm outcomes were: (1) harmfulness of SHV to one’s health, (2) concern about health impact of breathing SHV, and (3) whether SHV was considered more/less harmful than secondhand smoke (SHS). Predictors were frequency of exposure in the past 30 days to: (1) advertising, (2) media (other than advertising), and (3) interpersonal discussion about e-cigarettes. Separately, we predicted perceived harm outcomes using exposure to these channels weighted by whether they were perceived to be mostly positive
or negative. Multiple regression analyses controlled for demographics, tobacco use, and e-cigarette use and were weighted to represent the general U.S. adult population.

Results: Exposure to advertising perceived as positive was associated with lower concerns about the health impact of breathing SHV (B=-0.051, 95% CI=-0.098,—0.005) and perceiving SHS as less harmful than SHS (B=-0.029, 95% CI=-0.050,—0.008). Exposure to interpersonal discussion perceived as positive was negatively associated with all three perceived harm outcomes. Non-advertising media exposure was not a significant predictor of any of the three outcomes.

Conclusions: Exposure to information about e-cigarettes perceived as positive through advertising and interpersonal discussion could have a role in shaping public perceptions of the harmfulness of SHV.

FUNDING: Data for this research was provided by the Annenberg National Health Communication Survey, supported by the Annenberg School at the University of Pennsylvania and the University of Southern California. Andy Tan conducted this work while a postdoctoral fellow at the Center of Excellence in Cancer Communication Research at the University of Pennsylvania (supported by NIH grant P20CA095866). Cabral Bigman conducted this work while an assistant professor at the University of Illinois at Urbana-Champaign. Susan Mello conducted this work while an assistant professor at Northeastern University. Ashley Sanders-Jackson conducted this work while a postdoctoral fellow at Stanford Prevention Research Center (supported by NIH grant T32 CA8481567). No financial disclosures were reported by the authors of this paper.

JUSTIFICATION: These findings may play a role in guiding public education efforts to increase public understanding of constituents in SHV and policies to restrict potentially misleading claims in marketing materials.

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POS3-98
EXPLORING TWITTER DATA FOR KEY CONVERSATIONS, TRENDS, AND PATTERNS RELATED TO E-CIGARETTES


Background: E-cigarette use has gained momentum in the United States. The use prevalence among youths is of particular concern. There are an increasing number of public dialogues about e-cigarettes, especially on social media—an outlet particularly popular among youth. It is important that we attempt to discern the core voices, message frames, and sentiment surrounding e-cigarettes. The objective of this analysis was to explore Twitter data during a critical time in the e-cigarette evolution by conducting a content analysis to identify key conversations, trends, and patterns.

Methods: 3.7 M tweets were supplied by the Twitter Firehose. They represented all public tweets sent between May 1, 2013 and May 1, 2014 that were matching strategic keywords. Metrics utilized for the purposes of this study were time, date, geolocation, user profile link, tweet content, and tweet link. Two-stage content analysis was performed: 1) randomly sampling tweets from the full dataset and classifying content for e-cigarette relevance until a manageable sample of at least 10,000 relevant tweets was achieved and 2) classifying content of each relevant tweet for sentiment. user description, genre, and theme. Bivariate associations and correlation analysis were performed as well.

Results: Findings show that 71% of the sample tweets were classified as positive sentiments, while negative and neutral tweets made 12% and 17% of the sample. Most tweets containing images (92%) were positive. The top two categories of users who tweeted about e-cigarettes were everyday people (65%) and E-cig community movement (16%). Personal opinion (28%) and marketing (21%) were the two largest genres of tweets, where advertising (26%) and policy/government (20%) were the two largest themes.

Conclusion: Analyzing social media trends is a meaningful way to inform public health practitioners of the current sentiments in regards to e-cigarettes, including who is engaged in the dialogue, what they are saying, and what they are doing. This study also provides a replicable methodology, as well as insights for how this method can be automated using computational methods such as supervised machine learning.

FUNDING: National Institutes of Health, National Cancer Institute

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POS3-99
EFFECT OF VAPING POWER ON AEROSOL SIZE DISTRIBUTION AND E-JUICE VAPORIZED IN A TYPICAL E-CIGARETTE

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E-cigarette technology has rapidly evolved toward higher powered devices that produce more concentrated aerosol and, presumably, a more satisfying vaping experience. This research characterizes the effect of vaping power on mass of e-juice vaporized as well as particle size and particle mass distributions.

Vaping aerosol was produced with a tank-style e-cigarette equipped with an adjustable voltage battery set to 3.3 and 11.2 Watts. Aerosol particle size distributions were measured simultaneously with a Scanning Mobility Particle Sizer (SMPS) and an Aerodynamic Particle Sizer (APS), providing a combined size measurement range of 16 nanometers (nm) to 19.8 micrometers (µm). This instrument ensemble was also used to characterize conventional cigarette smoke aerosol for direct comparison. Additionally e-juice vaporization mass was measured at 9 points between 3.0-11.9 watts.

Consistent with prior studies, vaping aerosol size distributions were bimodal in the ultrafine region; however, a previously unreported third mode was observed around 900 nm comprising approximately 95% of aerosol mass. Particle mass distribution shifted toward larger particle sizes at the higher vaping power, likely due to increased kinematic coagulation. Increasing power from 3.0 and 11.9 watts resulted in an 86-fold increase in e-fluid consumption.

Vaping device power has a dramatic effect on vaping aerosol concentration and mass distribution across particle sizes. Vaping aerosol mass spans a much wider particle size range than previously reported, although the major portion of the mass is still well within the respirable size range. Because e-cigarette technology continues to evolve toward high power/high output devices, these results demonstrate need for further research to inform the design and regulation of e-cigarette products.

FUNDING: This study was conducted at the University of Oklahoma, College of Public Health and was supported by Oklahoma Tobacco Research Center grant # C1081507.

JUSTIFICATION: Realizing that small differences in vaping power can result in large differences in e-juice vaporized as well as shifts in aerosol size distribution should inform public health and clinical research seeking to compare e-cigarettes with other nicotine delivery devices.

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POS3-100
NICOTINE RESIDUES IN HOUSES OF ELECTRONIC CIGARETTE USERS, TOBACCO SMOKERS AND NON-SMOKERS IN WESTERN NEW YORK, USA

Derek Bush, Maciej L. Goniewicz, PharmD, PhD*, Roswell Park Cancer Institute, Buffalo, USA

Purpose: Thirdhand smoke is the residue of tobacco toxica
tants that can persist on surfaces after smoking has ceased. The nicotine deposited on the surfaces can react with airborne chemicals to create carcinogens. While prior studies have shown that there is nicotine residue in tobacco smokers’ homes, none have examined the nicotine deposition on surfaces in electronic cigarette users’ homes.

Methods: We measured nicotine on surfaces in three groups of homes: 8 electronic cigarette users, 6 cigarette smokers, and 8 non-smokers. The wipe samples were taken from the homes of individuals residing in the Buffalo, NY area. The residents needed to have smoked or vaped in their home on a regular basis. Tobacco cigarettes had not been smoked in the homes of electronic cigarette users for over a year. Three surface wipe samples were taken in each room from the floor, wall and window. Nicotine was extracted from the wipes and analyzed using gas chromatography. A Kruskal-Wallis test was performed to determine statistical differences in the nicotine levels between the groups of homes.

Results: Half of the electronic cigarette users’ homes had detectable levels of nicotine on surfaces whereas nicotine was found in all of the tobacco cigarette smokers’ homes. Trace amounts of nicotine were also detected in half of the non-smokers homes. There was no significant difference in the levels of nicotine found upon the different surfaces in the homes (p > 0.05). Nicotine levels in electronic cigarette users homes was significantly lower than that found in cigarette smokers homes (average concentration 8.17 vs. 1.303-2.676 micrograms/m2; p<0.05). There was no significant difference in the amount of nicotine in electronic cigarette users’ and non-smokers’ homes (p>0.05).

Conclusions: Nicotine is a common contaminant found on indoor surfaces even in non-smokers homes. Using electronic cigarettes indoors significantly reduces thirdhand exposure to nicotine compared to smoking tobacco cigarettes.

FUNDING: This work was supported by Roswell Park Cancer Institute, National Cancer, Institute (NCI) (P30 CA016056), and National Cancer Institute CURE Supplement.
JUSTIFICATION: This is a preliminary study showing reduction in thirdhand exposure to nicotine in houses of electronic cigarette users compared to tobacco smoking.

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POS3-102
CORRELATES OF E-CIGARETTE USE AMONG NON-HISPANIC BLACK SMOKERS RESPONDING TO A PASSIVE ONLINE SCREENER IN WASHINGTON, D.C.


Introduction: The correlates of e-cigarette use among non-Hispanic Black smokers have not been closely examined. This study characterizes non-Hispanic Blacks who completed the parent study's online screener, explores the correlates of e-cigarette use in this sample, and demonstrates the feasibility of passive online recruitment in this population.

Methods: Data were collected passively via an online screener as part of the Moment Study (1R21DA036472-01), an ongoing mixed-methods ecological momentary assessment (EMA) study examining the environmental and psychological factors that influence e-cigarette initiation and cigarette displacement among adult smokers in the D.C. metro area. Potential participants responded to online and print advertisements and completed an online screener without contact with study personnel. Descriptive statistics and independent sample t-tests were used to characterize non-Hispanic Black e-cigarette users.

Results: Of the 186 individuals who completed the screener between May 28th and September 5th, 2014, 87 identified as non-Hispanic Black. Approximately half (53%) were male, with a median age of 35 years (interquartile range [IQR]=26-46) and a median 13 years (IQR=7-21) smoking. Nearly 60% were employed, 85% smoked menthol cigarettes, 40% were considering quitting in the next 6 months, and 28% had ever used e-cigarettes. Among the subsample of ever e-cigarette users (n=24), 67% were male, 67% were employed, 79% smoked menthol cigarettes, 29% were considering quitting in the next 6 months, and the median years smoking was 15 years. Non-Hispanic Black smokers who had ever used e-cigarettes were on average 6.5 years younger than never users (31 [IQR=26-40] vs. 37 [IQR=27-50]; p=0.04).

Conclusion: Within several months, passive online recruitment screened a large population of non-Hispanic Black smokers with a significant concentration of prior e-cigarette use. Younger age was significantly associated with e-cigarette ever use in this population, echoing trends seen at a population level among those who had ever used e-cigarettes. Findings will be updated with the most recent screener data in January 2015.

FUNDING: NIDA, Schroeder Institute

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POS3-103
USING ONLINE PROMOTIONS TO EXTEND REACH AND INCREASE ENGAGEMENT WITH THE TOBACCO FREE FLORIDA CAMPAIGN

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Background: Since 2008, the Florida Bureau of Tobacco Free Florida (BTFF) has been a powerful media campaign coupled with evidence-based tobacco cessation services to encourage Floridians to quit smoking and prevent initiation. State adult smoking rate is lower than the national average (17.7 percent FL vs. 19.6 percent US) and the smoking rate for high school students has decreased to a record low of 8.6 percent.

BTFF has been innovative in methods to increase reach, and engagement with social media. Among state Tobacco Control Programs (TCPs), BTFF was among the first to establish a TCP presence on Facebook, Twitter, and YouTube. TFF has the highest number of Twitter followers and promotes more content to their followers via Twitter posts (tweets) than other state TCP. Florida also has the highest number of video views of any state TCP.

Findings: This presentation will describe TFF activities, which have expanded the reach of its messages online, with the goal of disseminating innovative and promising promotion strategies. We will describe a brief, cost-effective promotion which increased followers to the TFF Facebook page in 2014 by 14.4 percent (to 248,338) and also increased post-level follower activity on the page. We will also describe TFF activities which results in a 135 percent increase in Twitter followers during 2014. We found that Twitter advertising was responsible for 96.3 percent of new followers and that mobile ad placements on Twitter increased follower reach (85.7 percent) and retweets (89.0 percent) more than ads aimed at desktop users. In addition, we found that promotion of the TFF YouTube channel generated 1,403,485 video views in 2014, of which 91.7 percent were Floridians. Federal agencies, other state TCPs, and other tobacco control media implementers will learn promising strategies to expand their follower base and increase interactions with tobacco-related messages on social media.

FUNDING: This study is funded by a contract from the Florida Department of Health, Bureau of Tobacco Free Florida.

JUSTIFICATION: Federal agencies, other state TCPs, and other tobacco control social media implementers will learn promising strategies to expand their follower base and increase interactions with tobacco-related messages on social media.

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POS3-104
EFFECTS OF ABSTINENCE AND VARENICLINE TREATMENT ON DEPRESSIVE SYMPTOMS IN ADULTS WITH SERIOUS MENTAL ILLNESS IN A 52-WEEK TRIAL

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Background: Depressive symptoms have been reported with tobacco abstinence and have been associated with lapse and relapse to smoking but the effects of tobacco abstinence and varenicline treatment on depressive symptoms in adults with serious mental illness (SMI) during early or sustained abstinence is largely unknown.

Methods: Adult smokers (n=201) entered a trial of maintenance varenicline treatment in smokers with SMI able to quit smoking during a 12-week open-label trial of varenicline and cognitive behavioral therapy (CBT). Eighty-seven participants attained 14-day point prevalence abstinence at week 12 and were randomly assigned to continue double-blind varenicline or identical placebo and CBT for 40 weeks. Depressive symptoms were assessed with the Calgary Depression Scale for Schizophrenia (CDSS), a validated clinician administered assessment, at every CBT visit from baseline to week 52.

FUNDING: This study is funded by a contract from the Florida Department of Health, Bureau of Tobacco Free Florida.

JUSTIFICATION: Federal agencies, other state TCPs, and other tobacco control social media implementers will learn promising strategies to expand their follower base and increase interactions with tobacco-related messages on social media.

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FUNDING: This study is funded by a contract from the Florida Department of Health, Bureau of Tobacco Free Florida.

JUSTIFICATION: Federal agencies, other state TCPs, and other tobacco control social media implementers will learn promising strategies to expand their follower base and increase interactions with tobacco-related messages on social media.

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FUNDING: This study is funded by a contract from the Florida Department of Health, Bureau of Tobacco Free Florida.

JUSTIFICATION: Federal agencies, other state TCPs, and other tobacco control social media implementers will learn promising strategies to expand their follower base and increase interactions with tobacco-related messages on social media.

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FUNDING: This study is funded by a contract from the Florida Department of Health, Bureau of Tobacco Free Florida.
Results: Among those who completed 9 or more weeks of open label varenicline (n=142, n=132 with Sz), CDSS scores decreased from a median of 3 (IQR:2-6) at baseline to 1 (IQR:0-4) at week 12 (p<0.001). There was no effect of abstinence on CDSS scores during the open phase, nor did the time-effect differ by abstinence status (14-day point prevalence abstinence at week 12). During the 40-week, maintenance phase (n=87, n=77 with Sz), CDSS scores did not differ between those who demonstrated 21-day-point-prevalence abstinence at week 52 vs. those who relapsed to smoking (p=0.94), did not change over time (p=0.10, week 12 Md=n1, IQR:0-5; week 52 Md=n2, IQR:0-6), and did not show an abstinence by time interaction (p=0.80). There was also no effect of varenicline treatment on depressive symptoms vs. placebo (p=0.37). This pattern of findings was replicated with depressive symptoms as assessed with the Brief Psychiatric Rating Scale depression-anxiety subscale and the Wisconsin smoking withdrawal scale sadness-depression score.

Conclusion: There was no observed effect of abstinence or varenicline treatment on depressive symptoms in stable outpatients with SMI. Reduction in depressive symptoms during open label treatment with varenicline was observed.

FUNDING: NIDA R01 DA021245: Smoking Cessation and Smoking Relapse Prevention in Patients with Schizophrenia; Investigator Initiated Grant Pfizer Inc.: Extended duration varenicline for prevention of relapse to smoking in patients with schizophrenia; NIDA K24 DA030443: Mentoring in Addiction Treatment Research

JUSTIFICATION: Prospective and controlled trials are improving our understanding of the effect of abstinence and of pharmacotherapeutic cessation aids such as varenicline on depressive symptoms in smokers with serious mental illness and should affect policies restricting smoking cessation treatment in this population.

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POS3-106 TIME TRENDS FOR TOBACCO CONTENT IN U.S. AND NATIONALLY PRODUCED FILMS POPULAR IN MEXICO AND ARGENTINA, FROM 2004-2012

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Background: Studies in 13 different countries have shown that exposure to tobacco in movies is associated with initiation of youth smoking. Public health advocacy appears to have lowered tobacco content in US-produced films over the past decade. Monitoring of tobacco content in other developed film industries, as in Argentina and Mexico, are necessary in order to determine the need for policy development in those countries.

Method: The sample was drawn from the top 100 grossing movies in Mexico and Argentina for each year from 2004-2009. The sample included 82 Argentine produced, 92 Mexican produced, and 559 US-produced films that were popular in both countries. A reliable methodology for content coding tobacco appearances was used that involved timing onscreen duration of tobacco use and recording appearances of tobacco brands. The prevalence of films that portrayed any tobacco use and any tobacco brands, and mean seconds of use for films containing tobacco were calculated and compared within each rating category by year and country of production.

Results: Overall 80% of Mexican produced and 86% of Argentine produced movies contained tobacco. The percentage of US-produced movies popular in Mexico and Argentina that contained tobacco was lower than nationally produced films at 47%. For US films the percentage of movies with tobacco decreased from 2004 to 2010, yet this percentage began to increase again from 2011 to 2012. Percentage of films with tobacco decreased over time in Mexican produced films, while for Argentine produced films there was no change. In terms of mean seconds of tobacco use in films containing tobacco, there has been an increase in seconds in the most recent years for movies produced in all three countries. Both Mexican and Argentine films had higher percentages of tobacco brand appearances (24% in Mexico, 14 % in Argentina) compared to the 5% of US films popular in Mexico and Argentina.

Conclusion: Films produced in Mexico and Argentina were more likely to contain tobacco compared to US-produced films, which suggests these countries need more public health advocacy efforts to address tobacco in films.

FUNDING: Funded by grant R01 TW009274-01, Fogarty Institute, NIH

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POS3-105 SMOKELESS TOBACCO BRAND PERCEPTIONS AMONG CURRENT MOIST SNUFF AND SNUS USERS

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Background: The tobacco industry aggressively markets smokeless tobacco products, a strategy that likely contributed to the rise in moist snuff consumption over the past decade. An understanding of consumer perceptions of brand characteristics may highlight factors associated with brand success and product use.

Methods: Current moist snuff and/or snus users from a nationally-representative web survey (n=411) indicated how well various descriptors characterize the leading smokeless tobacco brands. After seeing images of each product, they rated the extent to which the word or phrase describes the brand, using a scale from “not well at all” to “extremely well.”

Results: Copenhagen and Grizzly ranked highest as being masculine brands, with 42.6% and 34.0% of smokeless tobacco users reporting that this term describes the brands either very or extremely well. The brands diverged, however, on measures of quality, such that Copenhagen was often perceived as a quality brand and Grizzly ranked lowest in the category. Skoal and Camel Snus were commonly regarded as being youthful brands, but they differed in terms of risk perception. Camel Snus was infrequently considered a risky product, whereas 40.2% of respondents felt that risky adequately described Skoal. Despite being perceived as a lower risk product, Camel Snus was rated poorly in satisfaction. Only 28.3% of smokeless tobacco users felt that satisfying characterized the brand very or extremely well.

Conclusions: Users’ perceptions of brand characteristics align with the brands’ respective marketing strategies and product offerings. The perceived masculinity of Copenhagen and Grizzly, for example, is evident in their advertisements, which commonly feature outdoor activities like hunting and fishing. Skoal has the highest market share of fruit flavored products among the leading brands, perhaps contributing to its youthful image. The influence of industry marketing and brand imagery, especially on current smokeless tobacco users, shapes perceptions about the quality and attributes of the products themselves.

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ASSOCIATION BETWEEN E-CIGARETTE USE, ADVERTISING EXPOSURE AND PERCEPTIONS OF E-CIGARETTES IN ADOLESCENTS AND YOUNG ADULTS

Deepa R. Camenga, MD*, Grace Kong, PhD, Dana Cavallo, PhD, Meghan E. Morean, PhD, Suchitra Krishnan-Sarin, PhD

Introduction: E-cigarette use among adolescents and young adults is increasing. We describe adolescents and young adults’ perceptions of e-cigarettes in relation to health, smoking cessation, and in comparison to traditional cigarettes.

Methods: We assessed e-cigarette perceptions among middle school (n=1137), high school (n=3452), and college students (n=545) in CT using cross-sectional surveys in fall 2013. We conducted multivariable logistic regression analyses to assess associations between perceptions of e-cigarettes and cigarette/e-cigarette use status and exposure to e-cigarette advertising.

Results: The sample was 53% female, 74.8% Caucasian, 5.9% lifetime e-cigarette users, 5.4% current e-cigarette-only users, 2.5% current cigarette-only users, and 5.4% dual e-cigarette and cigarette users. Overall, 58.8% of the sample reported that they strongly agreed/agreed that “e-cigarettes are harmful to your health”, 56.2% that “e-cigarettes are safer than cigarettes”, 36.4% that “e-cigarettes help people quit smoking”; and 56.2% that “e-cigarettes are safer than quitting smoking medications.” Multivariate logistic regression analyses showed that lifetime e-cigarette users, current e-cigarette-only users and dual users, but not cigarette-only users, were more likely than never-smokers to believe that e-cigarettes were less harmful than cigarettes and were safer than existing smoking cessation medications. Recent exposure to e-cigarette advertisements on TV/radio was associated with increased likelihood of believing that e-cigarettes were safer than cigarettes (OR 1.34; 95% CI 1.17-1.52) and existing smoking cessation medications (OR 1.34; 95% CI 1.19-1.51) and decreased likelihood of believing they were harmful to health (OR 0.86; 95% CI 0.75-0.99).

Discussion: More than half of youth perceive that e-cigarettes are safer than cigarettes, and e-cigarette use is associated with having positive perceptions of the product. Future research is needed to determine how advertising effects youth e-cigarette perceptions and use patterns.

FUNDING: This work was supported by the National Institute on Drug Abuse grants P50DA009241 and 1K12DA030312-01A1

JUSTIFICATION: The findings of this study of adolescents and young adult’s perceptions of e-cigarettes may inform e-cigarette prevention efforts and advertising regulation efforts.

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EFECT OF MENTHOL CIGARETTE CONTENT ON MAINSTREAM SMOKE VOC EMISSIONS AND UPTAKE

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Although the gas phase accounts for about 95% by weight of cigarette mainstream smoke (MSS), the cancer potency factors of the smoke-related volatile organic compounds (VOCs) are generally much lower than those of the emitted semi-volatile based carcinogens. However, because of the much higher concentrations of the VOCs in MSS, several are associated with the highest calculated cancer risks of conventional cigarettes, making this probably the most hazardous fraction in MSS. To study the effects of cigarette mentholation on VOCs in cigarette smoke, we are conducting a study using the nonmenthol/menthol pair of two types of cigarettes: a commercial nonmenthol brand that we custom-mentholated; and Camel Crush (CCR), a commercial cigarette with a capsule in the filter that releases menthol solution if crushed. Within each cigarette pair, the only differences between the cigarettes are their menthol content. Exhaled breath from a subset of the sample population, was monitored for each cigarette pair for select VOCs (acetaldehyde, acetoinitrile, acrylonitrile, benzene, 1,3-butadiene, 2,5-dimethylfuran, ethylbenzene, isoprene) using a sophisticated real-time method while their individual puff topographies were recorded. The puff profiles then were used to drive a smoking machine and the yields of the same target VOCs were determined. Average yields (in micrograms/cigarette) were evaluated to compare relative toxicities and smoker uptake of each compound. Yields ranged from ~6 μg/cig for acrylonitrile to ~3,000 μg/cig for acetaldehyde, but ranged from ~50 to 14 times less, respectively, in exhaled breath. Ratios of yields from nonmenthol/menthol versions of each pair were calculated to determine the effect of menthol on VOC exposures. Ratios for the CCR cigarette pairs for all VOCs across all African Americans were less than those for Caucasians and for both races in the custom-mentholated cigarettes. Across all subsets of the data, menthol has the strongest impact on 1,3-butadiene, with indications that it has the lowest average ratios, with individual subject ratios as low as 0.3 in exhaled breath and 0.5 in MSS. Broader implications of these results will be discussed.

FUNDING: Funding for this project was from NIH-National Cancer Institute (R01 CA162085, Buehler) to Battelle Memorial Institute.

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POS3-110

A QUALITATIVE STUDY OF COLLEGE-AGE SMOKERS’ PERCEPTIONS OF EFFECTIVE CAMPUS-BASED SMOKING CESSATION PROGRAMS

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Background: Smoking cessation rates in college smokers are low and few seek formal treatment to support their quit efforts. We explored how campus-based smoking cessation programs could be designed to maximize appeal.

Methods: Three focus groups were conducted with a sample of 18-25 year old (n=18) cigarette smokers in one public college in Connecticut in 2012. A standard focus group guide was used to ask participants about their perceptions of smoking cessation programs, and barriers and facilitators to participating in smoking cessation treatment. Group discussions were recorded, transcribed, and examined using thematic analysis.

Results: Participants wanted smoking cessation programs to be tailored and personalized, and did not believe any one type of treatment could be beneficial to all college smokers. They were wary of joining smoking cessation programs, as many of them did not want to be formally labeled as a smoker trying to quit. Therefore, some participants preferred self-guided treatment components that maintained privacy, such as texting and computer programs. Participants believed that the engagement of social supports (friends/family) was critical to achieving success, and some therefore suggested that group smoking cessation competitions would be appealing. Successful programs also needed to focus on how to manage the necessary social realignment (i.e. need to engage with non-smoking peers) to achieve cessation. Although most participants were not interested in smoking cessation medications, they felt more apt to try free medications, with nicotine replacement therapy described as the most appealing medication.

Conclusions: College smokers may prefer personalized, campus-based smoking cessation programs that maintain privacy by utilizing self-guided treatment components such as texting/computer programs and offer free medications. Understanding the factors that promote college smokers’ participation in smoking cessation treatment is critical when designing effective interventions.

FUNDING: This work was supported by the National Institute on Drug Abuse grants P50DA009241 and 1K12DA033012-01A1.

JUSTIFICATION: The findings of this study can help inform the development of grants P50DA009241 and 1K12DA033012-01A1.

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POS3-111

TEXT MESSAGING TO IMPROVE ADHERENCE TO WEB-BASED CESSATION TREATMENT

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Introduction: Adherence to Internet cessation programs is consistently low; most users visit 1-2 times and do not use program elements that can promote abstinence. Text messaging may be an effective tool to increase Internet adherence: it is accessible and easy to use and can proactively prompt ongoing site use. This study explored the impact of a combined text/web program on website adherence.

Method: Participants were current smokers that registered on BecomeAnEX.org (EX), an interactive cessation website with a large community. Text message signup occurred during EX registration. Daily messages were sent for up to 10 weeks; more frequent messages were delivered around a user’s quit date. Keywords (e.g., ‘MOOD’) generated on-demand support and information.

Messages frequently encouraged use of EX. Website and text message use were logged in a relational database; analyses focus on 3-month metrics. Descriptive analyses examined baseline differences by text enrollment status. Logistic regression models examined text enrollment as a predictor of website utilization, controlling for baseline covariates.

Results: From Aug 2013-May 2014, N=22,648 participants registered on EX: 9.6% (N=2,168) fully enrolled in text messaging. Text users were more likely to be female (77.1% vs 67.7%, p<.000), non-Hispanic (95.1% vs. 93.9%, p<.03), and slightly younger (43.6±12.8 vs 44.6±14.0, p=.001) than non-users. Controlling for baseline covariates, text users were more likely than non-users to return to EX (OR=1.25, 95% CI 1.14-1.38), to set a quit date on EX (OR=1.34, 95% CI 1.21-1.47), and to use core elements of the site including the cigarette tracker (OR=1.35, 95% CI 1.23-1.48), addiction videos (OR=1.28, 95% CI 1.16-1.41), and the community (OR=1.22, 95% CI 1.11-1.34). Text users received an average of 108 messages (SD=62) from the system; a small proportion used CRAVE (20%), MOOD (13.9%) and SLIP (15.7%) keywords.

Conclusions: Improving adherence to web-based cessation programs is critical to maximize their impact. A companion text messaging program can increase use of an Internet cessation program. Optimizing and further integrating these programs may enhance their impact.

FUNDING: This project was supported by internal support from the American Legacy Foundation.

JUSTIFICATION: A companion text messaging program may enhance the impact of web-based cessation programs by increasing use and adherence.

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POS3-112

AWARENESS AND USE OF SOUTH ASIAN TOBACCO PRODUCTS AMONG SOUTH ASIANS IN NEW JERSEY

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South Asians are the third largest Asian group in the US and among the fastest growing racial groups in New Jersey (NJ). Tobacco consumption among South Asians is characterized by several smoked and smokeless tobacco products indigenous to the Indian subcontinent. However, there is a paucity of research on tobacco use behaviors among South Asians in the US. We conducted focus groups to examine the awareness and use of South Asian tobacco products such as bidis, gutka, paan, paan masala, and zarda, their context of use, and their cultural significance among South Asians living in the US. Eight focus groups were conducted with South Asian adults living in Central NJ. Participants were recruited through university postings or community contacts in South Asian enclaves. Inclusion criteria included ethnic identification as South Asian, being over age 18, and English language proficiency. Focus groups were organized by age group, gender, and birthplace. Participants included 78 adults of South Asian descent from 18 to 67 years old. Roughly 60% of respondents were male, 83% identified as Indian, and 37% were born in the U.S. About 30% reported now using hookah while current use of other products was relatively low. Overall, participants were aware of a wide variety of foreign and American tobacco products with older South Asians identifying a greater variety of indigenous products compared to younger South Asians. Hookah was consistently recognized as popular among the younger generation while products such as paan or paan masala were more commonly identified with elders. Hookah was discussed as being associated with the college or young adult culture and not South Asians in particular. Use of tobacco-related products such as hookah, paan, and supari were described as common at social gatherings or after meals. Relaxation was perceived as a benefit of tobacco use. Health risks were seen as a negative effect of use, but there was no consistent understanding of the degree of risk among products. Better understanding of these products among South Asians will help in designing public health interventions in these communities.

FUNDING: This work was supported by the National Cancer Institute and FDA Center for Tobacco Products (R21CA164913).
POS3-113 E-CIGARETTE FEATURES PREFERRED BY ADOLESCENT USERS

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E-cigarette use is increasing among youth, with rates more than doubling over the past few years. However, little is known about the e-cigarette features that are preferred by adolescent users. More information about these features may inform tobacco regulation. In the spring of 2014, we surveyed five high schools and two middle schools in CT (N = 5152) about perceptions and use rates of e-cigarettes. Analyses for this study were restricted to past-30 day e-cigarette users (10.3%; HS=490, MS=43). Participants were 45% female, 15.9 years old (SD=1.4), used e-cigarettes 9.7 (SD= 10.6) in the past 30 days and all had smoked a traditional cigarette in the past 30 days. Nicotine content, concentration, tank size, duration of tank use, as well as information on used and preferred brands of e-cigarettes, and terms used to communicate about this product with peers, were assessed. Chi-square tests determined differences between daily and non-daily cigarette smokers. In the past 30 days, 47.5% of adolescents used e-cigarettes with nicotine, 29.6% without nicotine, 7.9% with both, and 8.6% did not know if their e-cigarette contained nicotine. Nicotine concentrations typically used varied: 27.8% used 0 mg, 8.8% used 6 mg, 11.6% used 12 mg, 7.5% used 18 mg, 6.2% used 24 mg, 3% used other, and 31.5% reported that they did not know. Tank size varied with 15.3% never using a tank, 22.3% using tanks <10 mL, 15.3% using tanks >10 mL, 2.5% using other, and 44.6% reporting they did not know. Duration of time to use one tank varied, with 3.4% stating < 1 day, 7.9% 1-2 days, 9% 3-7 days, 6.6% > 7 days, and 11.8% reporting weekly differences. Among cigarette smokers, daily smokers (67.7%) were more likely to use e-cigarettes with higher nicotine content than non-daily smokers (32.3%) (p=0.021). Blu, Encore, and Logic were the most used e-cigarette brands, with Encore and Blu rated as favorites. Finally, despite the notion that adolescents refer to this product using various names, “e-cigs” was identified as the most commonly used term. These results suggest that adolescents use e-cigarettes with variable nicotine content, concentrations, and tank size and there is uncertainty about specific features.

FUNDING: National Institute on Drug Abuse grant 500DA009241.

POS3-115 WHICH COLLEGE STUDENTS ARE LIKELIER TO BE SUSCEPTIBLE TO USING E-CIGARETTES?

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Background: Since 2007, electronic cigarettes (e-cigarettes) have gained popularity in the U.S. We examined factors that could lead young adults to try e-cigarettes. In a sub-group of never e-cigarette users, we assessed correlates of “susceptibility” to future e-cigarette use.

Methods: Data were collected using a web-based survey from a convenience sample of 1,437 students attending four colleges/universities in Upstate New York. Results were summarized using descriptive statistics and a logistic regression model examined susceptibility to e-cigarette use among never e-cigarette users (n=935) based on an adaptation of Pierce’s susceptibility to cigarette smoking measure.

Results: Among those who never tried e-cigarettes, older students (aged 20-23 years) had lower odds of susceptibility to trying e-cigarettes compared with younger students (AOR=0.61). Ever cigarette smokers (AOR=9.41) and those who had experimented with cigarette smoking (AOR=4.30), those who used any tobacco products besides cigarettes in the past 30-days (AOR=1.83), those who drank any alcohol in the past 30-days, and those who did not disagree that e-cigarettes are less harmful than tobacco cigarettes (AOR=2.85) demonstrated greater odds of susceptibility to e-cigarette use in the future. The strongest predictor of e-cigarette susceptibility was cigarette smoking, with over 9 times greater odds of susceptibility to e-cigarette use. It should be noted that we have a very biased sample of cigarette smokers, in that, the large majority of ever smokers (79.1%) had already tried e-cigarettes, and therefore were not part of this analysis.

Conclusions: Among college students, we found that a handful of risky behaviors, including cigarette smoking, other tobacco use, and alcohol use was associated with susceptibility to future use of e-cigarettes, among those who have never tried e-cigarettes. Although most ever smokers have tried e-cigarettes, those who have not, are highly likely to try them in the future.
Introduction: Electronic cigarette (e-cigarette) use is growing. Little is known about the use of e-cigarettes among adult smokers who are trying to quit, especially in a vulnerable population.

Methods: Adult Appalachian current smokers were enrolled in a randomized cessation trial that included counseling and free nicotine replacement therapy (NRT) over 10 weeks. Beginning in April 2012, baseline and follow-up information was obtained about the use of e-cigarettes (n=348). Socio-demographic and tobacco-related characteristics of participants and reasons for use were assessed. This abstract describes the baseline analyses.

Results: At baseline, 18.4% reported using e-cigarettes every day or some days. Most e-cigarette users were 25-54 years old (53.1%), female (75.0%), white (92.2%), had more than a HS degree or GED (56.3%), and lived above the 100% poverty level (71.0%). There were no significant differences between e-cigarette users and non-users in socio-demographic characteristics. E-cigarette users were more likely to be surrounded by non-smokers (p<0.001), have more restrictive outdoor smoking policies at work (p<0.03), used more resources in the past for quitting (p=0.004), and were more tempted to smoke in negative affect situations (p=0.006) than non-users. Using more resources and negative affect situations were associated with higher odds of e-cigarette use in a multiple logistic regression (p<0.03). Most e-cigarette users believed them to be less harmful than cigarettes (71.4%). Primary reasons for e-cigarette use included: “help you quit” (53.7%) and “make it easier to cut down” (53.1%).

Conclusion: E-cigarettes are used as a resource to help in quitting and reducing cigarette consumption. Limitations of this study include a small sample size and a homogenous study population (i.e. trying to quit and Appalachian). As a next step, follow-up data will be analyzed to determine the association between e-cigarette use and 3, 6, and 12 month abstinence from cigarettes. This study emphasizes the importance of continued research into the use of e-cigarettes as a smoking cessation aid, especially among those serious about quitting and in vulnerable populations.

FUNDING: This study was supported by NIH grants R01 CA129771; UL1TR000090; and P50 CA180908.

JUSTIFICATION: Although there is insufficient data on long-term abstinence, some consumers report that they are using electronic cigarettes to help them quit smoking.
adjusted for educational attainment, income, having children living at home, marital status, partner's smoking status, and smoking behaviors including quit intentions and attempts and heaviness of smoking.

Results: In Mexico and Australia, where graphic HWL imagery was used (i.e., premature infant, dead fetus), women aged 40 and under reported stronger believability, worry, and quit motivation than all other groups. In Canada, where HWL imagery features a pregnant woman’s belly, ratings were unassociated with gender/age groups. Across countries, having children at home was associated with stronger believability, worry, and quit motivation in response to HWLs. Stronger effects among women of reproductive age were limited to pregnancy HWLs in each country.

Conclusions: HWLs that depict graphic effects (dead fetus, premature infant) to illustrate smoking-related pregnancy risks appear to be particularly effective among women of reproductive age.

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POS3-119
METHOD DEVELOPMENT AND ANALYSIS OF PYRAZINES IN HOOKAH TOBACCO AND HOOKAH TOBACCO SMOKE USING HS-SPME
Vishal Mehta*, Cindy DeForest Hauser

Pyrazines are heterocyclic flavoring compounds which have been identified in cigarette tobacco and cigarette tobacco smoke. Pyrazine content in tobacco is of specific significance because pyrazine precursors in tobacco are associated with higher levels of the phosphate ion, which in turn increases delivery of nicotine to tobacco smoke. This suggests that pyrazines in tobacco play a role in increasing the addictiveness of nicotine. In this study we develop an optimal protocol to collect and identify pyrazines in hookah tobacco using headspace solid-phase microextraction (HS-SPME). Tobacco samples were exposed to temperatures of 30°C, 50°C, 70°C and 90°C and SPME fibers Carboxen/polydimethylsiloxane (Carboxen/PDMS), polydimethylsiloxane/divinylbenzene (PDMS/DVB), and polydimethylsiloxane (PDMS), and polyacrylate were tested for optimal recovery. Other variables included the effect of fiber exposure time, the use of a saturated sodium chloride solution, and stirring during extraction. Compounds adsorbed to the fiber were analyzed using GC-MS. Optimal extraction conditions found were the use of a Carboxen/PDMS fiber with an adsorption time of 20 minutes and an extraction temperature of 50°C in the presence of NaCl without stirring. Using this protocol, 2-methylpyrazine, 2,6-dimethylpyrazine, 2-ethylpyrazine, 2,3-dimethylpyrazine, 2,3,5-trimethylpyrazine, 2,3-diethylpyrazine, and 2,3,5,6-tetramethylpyrazine were identified. The LOD and LOQ of the method are in the ranges of 0.07-0.13 and 0.33-0.67 ng/g tobacco, respectively. Pyrazine was the only tested pyrazine that was not found in the tobacco. Preliminary results from hookah smoke analysis will also be presented.

FUNDING: No Funding

JUSTIFICATION: Pyrazine precursors in tobacco are associated with higher levels of the phosphate ion, which in turn increases delivery of nicotine to tobacco smoke, suggesting that pyrazines in tobacco play a role in increasing the addictiveness of nicotine.

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POS3-120
ANALYSIS OF METALS IN HOOKAH TOBACCO AND SMOKE USING ATOMIC ABSORPTION SPECTROSCOPY
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Hookah smoking is spreading as a trend in the United States and across the world, while many risks associated with this method of tobacco use are still uncharacterized. In this study we present the results of the analysis of hookah tobacco and smoke for Chromium, Copper, Manganese, Magnesium and Nickel. An electronic smoking machine generated smoke particulate that was collected on glass fiber filters. Tobacco and particulate filters were digested using concentrated nitric acid. The resulting solutions were analyzed for metal concentration using a flame atomic absorption spectrometer. Traces of each metal were found and quantified. Preliminary results investigating the contribution of charcoal and the role of the filtration media will also be presented.

FUNDING: No Funding

JUSTIFICATION: Understanding the chemical composition of hookah smoke has important implications in policy around public health issues associated with exposure to hookah smoke.

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POS3-121
PRELIMINARY DATA ON THE IMPACT OF ACADEMIC DETAILING ON THE FAX REFERRAL PROGRAM
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Background: The Systems Training and Outreach Program (STOP) is an academic detailing program developed by the Arkansas Department of Health (ADH), in partnership with Alere Wellbeing, Inc. STOP provides consultation and training to health care providers and organizations on resources such as the Arkansas Tobacco Quitline (ATQ), Brief Tobacco Intervention and other tobacco cessation resources.

Methods: This face-to-face outreach program utilized two primary components- 1) engagement of providers to build capacity; and 2) analysis and re-design of office systems to systematically identify tobacco users, advise them to quit and refer those ready to quit to the appropriate treatment resources. Alere Wellbeing reported data to the ADH, and the University of Arkansas at Little Rock- Institute of Government provided the evaluation of the STOP program. STOP facilities were defined as facilities that had one or more visit by a STOP outreach specialist. Outreach was provided by 4-5 full time academic detailers.

Results: During fiscal year (FY) 2014, 6051 fax referrals were generated by STOP clinics and STOP reached 3,116 providers and 1,212 organizations. The range of visits per facility/provider was 1-39 and the median number of visits was 2. In FY 13, 25% of ATQ program registrants entered the program by fax referral compared to 28% that entered the program using the same method in FY 14. Among clinics that had the most contact with an outreach specialist, preliminary analysis suggests the quit rates among STOP clinics were no lower than quit rates at non-STOP clinics. Program costs were $694,000 during FY 14.

Conclusions: The efforts of STOP may be a factor for the increase in fax referrals to the ATQ. More research is needed to determine the effectiveness of STOP training on quit rates and use of other resources.

FUNDING: The Systems Training and Outreach Program receives funding from the CDC and the Master Settlement Agreement.
JUSTIFICATION: The research may inform other public health interventions that seek to use academic detailing to affect behavior change.

CORRESPONDING AUTHOR: Jennifer Montgomery, MPH, Cessation Health
seek to use academic detailing to affect behavior change.

JUSTIFICATION: The research may inform other public health interventions that

BACKGROUND: Tobacco use is inversely correlated with socioeconomic status. In Maine, residents with MaineCare (Medicaid) smoke at a rate of 42.4% while only 17.5% of non-MaineCare residents smoke. To increase quit rates, the Maine Tobacco Helpline (MTHL) provides free telephonic counseling and additionally provides nicotine replacement therapies (NRT) for adults who are ready to quit, who have no medical contraindications and no health insurance coverage for NRT. Prior to September 2012, MaineCare beneficiaries did not qualify for MTHL NRT because it was covered by their pharmacy benefits. Between September 2012 and December 2013, MaineCare stopped covering all tobacco treatment medications, making MaineCare recipients eligible for NRT through MTHL. This study examines the effect of the NRT policy change on registrations, the demographic and tobacco use profiles of registrants, and program utilization.

METHODS: This retrospective observational study consists of Maine tobacco users who registered with the MTHL between October 1, 2011 and August 31, 2012 (xNRT year) or October 1, 2012 and August 31, 2013 (NRT year). The first registration for each individual during each time period was included in analyses and individuals who registered during both time periods were excluded. We ran frequency analyses and chi-squared tests to compare registrant profiles during the two study periods.

RESULTS: The number of registrations increased between the two time periods, from 5461 to 7165. Individuals with MaineCare accounted for 17.7% of registrants in xNRT year and 48.6% of registrants in NRT year (p<0.05). Registrants in NRT year were less educated, more likely to have multiple chronic conditions and more addicted to nicotine than registrants in the xNRT year (p<0.05). MaineCare recipients were more likely to enroll in the multiple call program and complete more counseling calls in the NRT year than the xNRT year.

CONCLUSIONS: These preliminary findings suggest that access to NRT through the MTHL effectively motivated MaineCare recipients to use MTHL's counseling services. We plan to evaluate quit outcomes among MaineCare recipients with and without quitline provided NRT.

FUNDING: This evaluation was conducted while the first author was a research intern at MaineHealth-Center for Tobacco Independence. Support was provided by Maine Medical Center Research Institute and Maine Center for Disease Control-Partnership for a Tobacco-Free Maine.

JUSTIFICATION: This study suggests that providing NRT access through the quitline motivates use of counseling services.

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POS3-123
CHEMICAL CONSTITUENTS AND HEALTH RISK ASSESSMENT OF SMOKELESS TOBACCO PRODUCTS

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OBJECTIVE: Use of smokeless tobacco (ST) products is associated with adverse health risks. Data is limited, however, regarding the chemical makeup of conventional and novel (e.g., Snus) ST products.

METHODS: 12 conventional and 7 snus ST products purchased between the years 2007 and 2009 were analyzed for chemical constituents. Nineteen chemicals along with pH, nicotine, and free nicotine were characterized and their levels compared. Principal components analysis (PCA) was used to determine the variance among the ST products. Lifetime cancer risk estimates using the EPA Carcinogenic Potency Database were determined for 8 chemical constituents. Kruskal-Wallis one-way analysis of variance was used and any p-value lower than 0.05 resulted in a statistical significance.

RESULTS: PCA showed that two principal components explained 70% of variance in the data (PC1, 56.3%; PC2, 14.2%). Significantly higher nicotine levels were found in conventional ST compared to snus (p=0.012). Benzo[alpha]pyrene was about 30 times higher in the conventional ST. Arsenic and formaldehyde were not detected in conventional ST, but detected in snus. Other chemicals including cadmium, nickel, nitrate, and tobacco-specific nitrosamines were present at relatively high concentrations in conventional compared to snus ST products (p<0.05), while selenium were significantly high in snus ST products (p<0.05). Lifetime cancer risk estimates above the acceptable target USEPA level were observed for 5 carcinogens (cadmium, N-nitrosodimethylamine , N-Nitrosoanabasine, N-Nitrosornicotine, and 4-(methyl)nitrosamines)-1(3-pyridyl)-1-butanone) in all or some ST products. The total lifetime cancer risks from carcinogens were exceeded USEPA's acceptable cancer risk level by about 19 times.

Conclusions: The comprehensive chemical characterization of both conventional and snus ST products from this study may be helpful in better understanding the health risks associated with the use of ST products. The high levels and cancer risk estimates for certain chemical constituents of ST products will further inform regulatory decision makers and aid them in their efforts to reduce carcinogen exposure in ST products.

FUNDING: Transdisciplinary Tobacco Use Research Center grants P50 84718 from the National Cancer Institute and the National Institute on Drug Abuse, 1R01 CA114377-01A2, and NCI N01-PC-64402 - Laboratory Assessment of Tobacco Use Behavior and Exposure to Toxins.

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POS3-124
EFFECTS ON THE DELIVERIES OF SMOKE CONSTITUENTS FROM THE REUSE OF “RECYCLED” ROLL-YOUR-OWN TOBACCO

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Roll-your-own (RYO) tobacco use has increased in popularity as a result of differences in taxation and increased prices of factory-manufactured (FM) cigarettes from regulation. A common misconception among RYO users has been that RYO cigarettes are safer than FM cigarettes. While published data on RYO cigarette products and their use is limited, it is believed that RYO users are more prone to relighting and reusing the unburned portions of their cigarettes—potentially altering the smoke characteristics and constituent deliveries of this “recycled” tobacco. The present research aimed at testing the hypothesis that RYO cigarette smokers who reuse/recycle unburned tobacco from incompletely-smoked cigarettes are potentially exposed to higher levels of harmful smoke constituents due to the unburned tobacco acting as a trap and accumulating these constituents. To test this hypothesis, RYO cigarette smoke from fresh and recycled tobacco-collected using the Canadian Intense smoking regime (60 mL
Poster Session 3 • Friday, February 27, 2015 • 11:30 a.m.–1:00 p.m.

POS3-125
TESTING A TOBACCO INTERVENTION IN A PRIVATE CLINIC IN THAILAND

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Background: Currently, very few private clinics in Thailand screen their patients with the intent to provide any tobacco cessation counseling. Our aim was to pilot test a procedure for routinely delivering tobacco-related counseling in private clinics and to assess client acceptance and response to a brief educational session asking clients to take personal action against tobacco use.

Methods: We trained and provided printed material to all clinic staff to provide a brief (5 minute) educational session to both smokers and nonsmokers who visited the clinic. We tracked staff performance giving smokers brief advice, printed quitting information and referral to Thailand's national quit line, and giving nonsmokers printed information on avoiding exposure to secondhand smoke, especially in the home and workplaces. We did a 6 month follow-up of both smokers and nonsmokers by phone to ask whether they recalled the intervention and what action, if any, they had taken.

Results: Staff performed counseling for only 2 months, giving counseling to 65 smokers and over 400 nonsmokers. The clients of the clinic were older than the general population and more male for smokers (75%) and female (70%) for nonsmokers. Total follow-up at 6 months was 89% for smokers and 75% for nonsmokers. Of the smokers, 52% remembered the intervention (n=30), 34% tried to quit with 40% of those who tried to quit successful. Disappointingly, only 10% of those who tried to quit used the quit line. Surprisingly, 82% of nonsmokers remembered the intervention, and of those reached by phone, 66% (n=199) said they had taken some action to make their homes smoke-free. In addition, 44% said they had asked a smoker to try to quit or smoke away from children in the family.

Conclusion: Our small pilot study provides evidence that small clinic interventions in older working class populations can have an impact that promotes smoking cessation and protection from exposure to secondhand smoke. It shows that private clinic staff in neighborhood clinics can effectively counsel clients on tobacco harms to increase smoker and nonsmoker awareness and actions against tobacco use.

FUNDING: No Funding

POS3-126
CUMULATIVE GENDER-BASED VIOLENCE EXPOSURE SCORE (GBV SCORE) AND ITS ASSOCIATION WITH CURRENT SMOKING

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Background: Prevalence of smoking among Ohio Appalachian women is 8 percentage points higher than in other regions of Ohio. Women in Ohio Appalachia are also exposed to various forms of sexual and intimate partner violence at elevated rates, with 57% reporting gender-based violence exposure in their lifetime. Although sexual and intimate partner violence exposure is associated with current smoking in the region (OR: 3.0, p<.001), it is unknown if exposure to multiple forms of gender-based violence cumulatively influence association with current smoking behavior. The purpose of this study is to determine if a cumulative gender-based violence exposure score (GBV Score), representing eight unique forms of sexual and/or intimate partner violence exposure, is associated with current smoking.

Methods: Women in 3 Ohio Appalachian counties were randomly selected to complete an interview administered cross-sectional survey utilizing a postal household sampling frame. Smoking status (current vs. former or never) was obtained. A GBV Score comprised the sum of exposure to eight forms of intimate partner and/or sexual gender-based violence: demeaning emotional abuse, fear, coercive coercion, coerced sexual abuse and forced sexual abuse (range: 0-8). Logistic regression analysis was conducted in SAS.

Results: A total of 408 women completed the survey (mean age=51; 89% insured; 20.1% current smokers). The analytic sample contained 398 participants who provided complete gender-based violence exposure histories. There is a significant association between GBV Score and current smoking status (p <.0001). For each one unit increase in the GBV score (representing an exposure to a different form of intimate partner and/or sexual violence) the odds of current smoking is expected to increase by 29.9% (OR=1.299, 95% CI: 1.174, 1.437).

Discussion: Cumulative exposure to various forms of gender-based sexual and intimate partner violence is significantly positively associated with current smoking behavior and should be considered in any interventions aimed to decrease tobacco use among this vulnerable population.

FUNDING: No Funding

POS3-127
TOBACCO CONTENT IN NATIONALLY PRODUCED FILMS FROM EUROPE AND LATIN AMERICA COMPARED TO U.S. PRODUCED FILMS, FROM 2004-2009

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Background: Studies in multiple countries have found a relationship between exposure to onscreen movie smoking and adolescent smoking. Many of these studies have focused only on tobacco content in U.S. produced films, neglecting nationally produced films. Our aim is describe tobacco portrayals in nationally
produced films from six European countries (Germany, Iceland, Italy, Netherlands, Poland, UK) and two Latin American countries (Mexico and Argentina) and compare them to US-produced films.

Methods: The sample included 337 national films (220 European & 117 Latin American) that were among the top grossing films in each country from 2004 to 2009. The comparison sample of US films included 548 films that were popular in at least one of the 8 countries over the same time period. A reliable methodology for coding tobacco appearances was used. The prevalence of tobacco was calculated and compared for all films and by movies rated for youth in their respective countries (ages 0-14), with chi-square to assess difference across countries.

Results: There were significant differences between countries in the prevalence of movies containing tobacco (p < .001 for youth-rated and all films). Despite these differences more than half of nationally produced films contained tobacco regardless of country or being rated for youth. Three of the European countries (Germany, Iceland, and Italy) only had films that were rated for youth, but the majority of these films depicted tobacco (71%, 94%, and 85%, respectively). The lowest prevalence of tobacco was in The Netherlands for youth-rated (53%) and for all films (58%), which was even lower than the US at 54% for youth-rated films and 63% for all films. However, the US still had a lower prevalence of films with tobacco than all other countries.

Conclusions: Nationally produced movies depict characters that may embody shared cultural values and therefore have a larger impact on youth than Hollywood films. In addition more of these nationally produced films contain tobacco than US produced films. Because of this, research is needed to assess youth exposure to tobacco content in nationally produced films and determine their impact relative to Hollywood.

FUNDING: Funded by grant R01 TW009274-01, Fogarty Institute, NIH to Hollywood.

FUNDING: Funded by grant R01 TW009274-01, Fogarty Institute, NIH to Hollywood.

Poster Session 3 • Friday, February 27, 2015 • 11:30 a.m.–1:00 p.m.

POS3-128
MAINE’S EXPERIENCE WITH HEALTH CARE PROVIDERS AND QUITLINE PROMOTION

Alessandra Kazura, MD*, Jessie E. Saul, PhD, Tim Cowan, MS, Lori Travis, MS

Background: Maine’s tobacco control program intensified promotion of quitline referrals from health care providers between 2007 and 2012. Also, in 2009, a tobacco tax increase occurred, and in 2012, the quitline became the only source of tobacco treatment medication for those with Medicaid. This study examines quitline use and characteristics of users pre- and post-program change.

Methods: Samples consisted of adult tobacco users registering for services January, 2007 through December, 2008 (24 months) and September, 2012 through August, 2013 (12 months). Method of entry included provider referrals (PR), callers who heard about the program from a health care provider (HCP), and all other self-callers (SC). We analyzed caller demographics, tobacco use characteristics, chronic disease status, and interventions received by registrants. Chi-square tests compared selected characteristics by method of entry.

Results: Total registration volume increased from an average of 393 registrants per month in 2007-8 to 689 per month in 2012-13. Provider referred registrants comprised the largest change, from 29 (7%) to 96 (17%) per month, but as in 2007-8 were less likely to receive an intervention in 2012-13 than HCP and SC (PR 69%, HCP 92%, SC 91%, P<.0001). Across all three entry methods, larger percentages of callers in 2012-13 reported Medicaid insurance than in 2007-8. Similarly larger percentages of callers in 2012-13 were older (55+) across entry methods. The following patterns were similar in 2012-13 and 2007-8: PR and HCP were more likely to have a chronic disease than SC, and more likely to have smoked 20 years or more. Greater proportions of the PR groups were light smokers (1-9 cigs per day). Time to first cigarette was similar across all methods of entry.

Conclusions: Referral volume nearly doubled after promotion intensified. Policy changes likely contributed to this, especially for those with Medicaid, but the study design does not allow confirmation of this. Health care providers may be assisting reach with older, lower income, and lighter smokers. Future steps could test strategies to improve engagement of those who are referred.

FUNDING: This evaluation was conducted while the first author was at MaineHealth-Center for Tobacco Independence. Supported by Maine Center for Disease Control, Partnership for a Tobacco-Free Maine.

POS3-129
E-CIGARETTE FLAVOR PREFERENCES AMONG ADOLESCENT LIFETIME E-CIGARETTE USERS, CURRENT E-CIGARETTE USERS, AND DUAL USERS

Kevin M. Gutierrez, PhD*, Grace Kong, PhD, Meghan E. Morean, PhD, Dana Cavullo, PhD, Deepa Camenga, MD, Patricia Simon, PhD, Christian Connell, PhD, Suchitra Krishnan-Sarin, PhD, Yale University, School of Medicine

The use of e-cigarettes has increased in recent years. Notably, unlike that of cigarettes, the marketing of flavors other than menthol are not restricted with respect to e-cigarettes. This may, in turn, increase the attractiveness of e-cigarettes for adolescents and lead to an increase in addiction potential. However, little is known regarding flavor preferences and their relation to patterns of use among adolescent e-cigarette users. The present study examines the flavor preferences among adolescents who were lifetime e-cigarette users, past 30-day e-cigarette users, and past 30-day users of both e-cigarettes and traditional cigarettes (dual users).

This study was part of a large school survey (n = 5,152) conducted in June 2014 among high school and middle school students in CT examining perceptions, attitudes, and use rates of tobacco products. Twenty-three percent of the sample reported lifetime use of e-cigarettes, 10% of the sample reported past 30-day use of e-cigarettes, and 4% of the sample reported dual use of e-cigarettes and traditional cigarettes in the past month.

Among lifetime e-cigarette users, fruit, candy, and vanilla flavors were the most preferred (38%, 12%, and 9%, respectively). Similarly, among past 30-day e-cigarette users, fruit, candy, and vanilla flavors were also the most preferred (49%, 15%, and 10%, respectively). Among dual users, fruit, candy, and menthol flavors were the most preferred (49%, 18%, and 14%, respectively). Additionally, 95% of the entire sample reported that they would “definitely not” or “probably not” try an e-cigarette if it only came in tobacco flavor, suggesting that the plethora of e-cigarette flavors available may be particularly attractive for adolescents.

These findings suggest that regulation of e-cigarette flavors may be an effective prevention strategy as it may reduce the attractiveness of using e-cigarettes among youth.

FUNDING: P50DA009241; P50DA036151; PHS GRANT NUMBER 5 T32 DA 19426-10

JUSTIFICATION: Results of the present study suggest that regulation of e-cigarette flavors may be an effective prevention strategy as it may reduce the attractiveness of using e-cigarettes among youth.

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POS3-130
POPULATION HEALTH IMPACT MODEL TO ESTIMATE THE EFFECT OF INTRODUCING MODIFIED RISK TOBACCO PRODUCTS ON MORTALITY
Z. Sponsioiello-Wang\textsuperscript{1,2}, P.N. Lee\textsuperscript{3}, G. Baker\textsuperscript{1}, A. Gonzalez Zuloeta\textsuperscript{1}, F. Lüdicke\textsuperscript{1}, R. Welkunut\textsuperscript{1}, \textsuperscript{1}Philip Morris Products S.A. Neuchâtel, Switzerland, \textsuperscript{2}P. N. Lee Statistics and Computing Ltd., Sutton, United Kingdom

According to the 2012 Food and Drug Administration (FDA)'s Modified Risk Tobacco Products (MRTP) framework, there is an inherent difficulty in making premarket assessments of the effect of introducing an MRTP on the population as a whole. FDA therefore encourages the development and application of innovative analytical methods to make preliminary estimates of the potential effects including modeling. Philip Morris International is developing a Population Health Impact Model to assess the effect that the introduction of a MRTP would have on the population.

The modeling approach uses available smoking prevalence and disease-specific mortality data as well as relative risk (RR) estimates for the most common smoking related diseases from epidemiological studies. Calculations rely on generally acknowledged methods and it is a goal to reduce the number of necessary assumptions to a minimum. The model will consist of two major components, the Prevalence (P) and Epidemiological (E) Risk Component. The P-Component uses a state-transition Monte Carlo microsimulation model to estimate changes in the distribution of smoking habits (combustible cigarette (CC) and/or MRTP) occurring in a hypothetical population of a given size over a defined period, separately for a scenario where the MRTP is introduced and a scenario where it is not. The E-Component uses estimates of the RRs of smoking-related diseases for current smokers compared to never smokers and for former smokers by time quit to estimate the number of smoking-attributable deaths. The MRTP-related risk reduction quantification will be based on a comprehensive risk assessment integrating evidence on non-clinical and clinical research. Using an estimate of the exposure from the MRTP relative to CCs and smoking cessation, the model compares smoking-attributable deaths under each scenario to derive the estimated reduction in smoking-attributable mortality associated with the introduction of a MRTP.

FUNDING: Philip Morris Products S.A., Neuchâtel, Switzerland

JUSTIFICATION: Population Health Impact Model is developed to assess the effect that the introduction of a Modified Risk Tobacco Product (MRTP) would have on the population

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POS3-131
A PILOT STUDY OF TOBACCO SALES AND ADVERTISING AT THE POINT-OF-SALE AROUND SCHOOLS IN CHANGSHA, CHINA
Ling Wang, MPH, Bo Lu, PhD, Mary Ellen Wewers, PhD, Randi E. Foraker, PhD, Amy K. Ferketch, PhD, The Ohio State University

Background: Tobacco sales are prohibited around schools in many large cities in China. However, Chinese youth still have easy access to tobacco products and high awareness of tobacco advertising at the point-of-sale.

Objective: To examine the density and the characteristics of tobacco retail outlets around schools in China, and the corresponding advertisements and warning messages at the point-of-sale.

Methods: A pilot study was conducted in May 2014 in Changsha, China. Ten schools were selected in the city. Tobacco retail outlets within a 300-meter radius of two selected schools were audited. The number of tobacco retail outlets within a 300-meter radius of the other eight schools was counted without auditing. The major items on the audit form included: 1) store demographics; 2) exterior and interior tobacco advertising practices; 3) availability and characteristics of tobacco products; 4) display of the tobacco products; and, 5) no sales to minors' warning messages.

Results: In total, 36 stores were audited and 98 stores were counted without audit. The preliminary results showed that there were, on average, nearly 3 tobacco retail outlets located within a 100-meter radius of each school and about 14 retail outlets within 100 to 300 meters of each school. The tobacco retail outlets were small markets/supermarkets (40%), convenience stores (20%), and tobacco and alcohol shops (7%). The majority of the outlets (58%) displayed cigarettes visibly in the primary checkout counter. Among the audited stores, over 90% displayed cigarettes within 3 feet of the floor and within 12 inches of candy and gum displays. About 17% of the outlets had a sign warning ‘no sales to minors’ and the percentage of outlets that had the sign decreased as the distance from the school increased. Tobacco advertising at the point-of-sale was relatively less prevalent in stores that are not designated tobacco shops. All tobacco shops have some form of tobacco advertising both inside and outside of the store.

Conclusions: Tobacco retail outlets are under-regulated in China. To protect youth, it is crucial to better regulate the location of tobacco retail outlets, tobacco product displays and tobacco advertising at the point-of-sale.

FUNDING: No Funding

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POS3-132
SMOKING INITIATION AMONG U.S. COLLEGE STUDENTS: A TIME-TO-EVENT ANALYSIS
C. Amanda Schweizer, MS\textsuperscript{1}, Neal Doran, PhD\textsuperscript{2}, Tamara Wall, PhD\textsuperscript{2}, Mark G. Myers, PhD\textsuperscript{1}, 1San Diego State University/University of California, San Diego Joint Doctoral Program in Clinical Psychology, 2V.A. San Diego Healthcare System and University of California, San Diego

Young adult never smokers may be vulnerable to smoking initiation, progression to regular smoking and development of a tobacco use disorder. Epidemiologic studies have demonstrated a substantial portion of current smokers, estimated to be between 11-20%, first smoked a cigarette during college or young adulthood. Previous studies have implicated alcohol use, other substance use, gender, and ethnicity in young adult smoking initiation. In particular, Asian-American adult smokers retrospectively report initiating smoking later than White/Caucasian adult smokers. Previous findings suggest initiation is occurring throughout college but may be more prevalent earlier in the college career, however this has not been empirically tested, to our knowledge. The current study builds upon research on smoking initiation during college among young adults of Korean or Chinese descent (Myers et al., 2009). Participants (N=267) were never smokers aged 18-24 years and currently enrolled at a four-year university who were interviewed in person annually over four years. All participants were first-year college students at the time of the first interview. Cox regression and Kaplan-Meier analysis were used to identify factors associated with smoking initiation. During the study period, 25% of baseline never smokers tried their first cigarette. Kaplan-Meier survival curves significantly differed between males and females (Log Rank χ2 (1) = 9.34, p = .002). For males, but not females, smoking initiation was mostly likely to occur between the first and second interviews. Cox regression models revealed baseline recent heavy drinking episodes (4 < drinks for females, 5 < drinks for males), other tobacco use, other drug use, and greater behavioral undercontrol were associated with earlier initiation of smoking for both males and females. Greater self-reported exposure to smoking and past-year alcohol use problems were associated with earlier initiation for males but not females. These findings highlight the risk for smoking initiation throughout college among Asian American young adults and suggest a need for targeted smoking prevention efforts in this population.

FUNDING: This study was funded by grants from the California Tobacco-Related Disease Research Program (TRDRP 10RT-1042 and 12RT-0004) and the National Institute on Drug Abuse (F31 DA 30032)

JUSTIFICATION: These findings highlight the risk for smoking initiation throughout college among Asian American young adults and suggest a need for targeted smoking prevention efforts in this population.

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EXAMINING HOOKAH USE AMONG TEXAS COLLEGE STUDENTS

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Hookah use among college students has been increasing in recent years. Yet, few studies examine the risk factors associated with current hookah use. This study examined two risk factors, harm perceptions and beliefs about government evaluation of hookah, associated with current use of hookah among 18-24 year old college students, and explored differences between current hookah users and non-users on cigarette smoking status, demographic characteristics, and the two risk factors. Participants were 5,028 18-24 year old (Mean age=20.5, SD=1.71; 59.6% female) students from seven public universities in Texas. Students completed an online survey in spring 2012, assessing their hookah knowledge, beliefs, and use behaviors. Items were drawn from the Texas YTS and the Beliefs About Alternative Nicotine Delivery Devices Survey. In this sample, 10.8% of participants reported current hookah use. Results from chi square analyses and t-test indicated that cigarette smokers (chi square(1)=67.37, p<.001), males (chi square(1)=20.42, p<.001), students reporting lower harm perceptions regarding hookah use (t(4258)=13.75, p<.001), and those who believed the government evaluates hookah for safety (chi square(1)=7.64, p<.01) were significantly more likely than their peers to be current hookah users. Additionally, non-Hispanic White students were more likely than Hispanic students, but not African American or students reporting Other race/ethnicity, to be current hookah users (chi square(1)=10.38, p<.001). Results from a logistic regression analysis indicated that after controlling for cigarette smoking status (OR=7.08, CI=5.65-8.86), gender (OR=1.27, CI=1.01-1.59), and race/ethnicity (OR=1.48, CI=1.02-2.14), harm perceptions of hookah use (OR=0.59, CI=0.52-0.66) but not beliefs about government safety evaluation of hookah, were associated with an increased likelihood of current hookah use. Findings point to the importance of educating college students, particularly cigarette smokers, about the dangers of hookah use. Moreover, tobacco prevention and cessation programs should be implemented to reduce initiation and continued hookah use and dual use of this product with cigarettes.

FUNDING: No funding.

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PERCEIVED PARTNER RESPONSIVENESS PREDICTS SMOKING CESSION OUTCOMES AMONG SELF-QUITTERS

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Greater relationship quality predicts better smoking cessation rates, but it is not clear how relationship quality operates to improve smoking cessation. Most studies examine support for quitting in particular, and not more general partner support or relationship quality. However, support for quitting has only
inconsistently been related to smoking outcomes. The current research examines
the association between several measures of relationship functioning and smoking
outcomes in a sample of self-quitters. Married and cohabiting couples in which one
partner was a current smoker participated in a 21-day (three-week) experience
sampling study of self-quitting. Both partners completed baseline measures of
positive and negative support for quitting, more general support provision,
perceived partner responsiveness, trust, and relationship satisfaction. During the
experience sampling phase of the study, the self-quitter completed a lapse report
each time he/she smoked. This report included a question regarding the number
of cigarettes smoked. Additionally, both partners completed one morning report,
one evening report, and up to three random reports daily. At follow-up, self-quitters
reported whether they had relapsed. Reports were biochemically verified using
expired breath carbon monoxide analysis. Predictors of smoking outcomes were
examined using a series of negative binomial and logistic regression analyses.
When all baseline relationship functioning measures were entered simultaneuously
as predictors, greater perceived partner responsiveness predicted fewer total
days smoking, fewer total cigarettes, a lower likelihood of relapsing, and a lower
carbon monoxide reading. No other relationship functioning variables emerged as
consistent predictors of smoking outcomes. In the current study, perceived partner
responsiveness operated over and above the effects of smoking-specific support
and relationship satisfaction to predict smoking outcomes. Perceived partner
responsiveness may be a particularly potent predictor of quitting success.

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number R21DA04068. The content is solely the responsibility of the authors and
does not necessarily represent the official views of the National Institutes of Health.

JUSTIFICATION: Understanding how partners influence smoking cessation may
allow for the development of successful interventions that involve the partner in
the quit attempt.

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POS3-137
UNDERSTANDING CESSION AMONG SMOKERS WITH
DEPRESSION: LINKING POPULATION TO CLINICAL PRACTICE

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Background: Public health efforts to understand the disproportionate tobacco
related disease burden among smokers with depression may be enhanced by
linking population-level surveillance to clinical practice. With 70% of all smokers
visiting a primary physician each year, universal monitoring of smoking status
and depression in primary care settings can be used to better characterize how
changes in depressive symptoms, co-occurring chronic physical conditions and
their treatments impact smoking cessation.

Method: The current study used methods based in item response theory to
link Patient Health Questionnaire (PHQ-2, PHQ-9) depression screening tools
across a diverse group of Hispanic (n=1,671), African American (n=899), Asian
(n=2,679), and White (n=10,263) patients screened in 2011-2012 for tobacco use
and depression in UCSD Family Medicine primary care clinics.

Results: Linear mixed-effects models with adjustment for age, gender, and
racial/ethnicity suggested that both current smoking (b=0.23, p<0.01) and
tobacco-related diseases including diabetes, obesity, asthma, arthritis, and
gastroesophageal (GERD) reflux (p’s<0.01) were related independently to higher
depressive symptoms. Use of antidepressants (b=-0.03, p<0.05) and behavioral
health service (b=-0.08, p<0.01) from collaborative care (CC) were related to
greater decreases in depression over time. Among current smokers, physical
illnesses including hypertension (OR=1.5, p<0.01), arthritis (OR=1.9, p<0.01)
and GERD (OR=1.5, p<0.01) but not level of depression (OR=1.1, p<0.6) were
independently predictive of quit attempts during the year. Level of depression
(OR=0.69, p<0.01) and hypertension (OR=0.75, p<0.01) were associated with
lower quitting success.

Conclusions: Smokers presentation with tobacco-related physical illness
may facilitate physician-assisted attempts to quit. Primary care treatments are
effective in reducing depressive symptoms. Efforts to promote more effective
cessation attempts among smokers with elevated depressive symptoms may
involve engaging behavioral health staff to promote combined behavioral and
pharmacologic treatments for this vulnerable population.

FUNDING: California Tobacco Related Disease Research Program (21XT-0076)

JUSTIFICATION: Given evidence for continued efforts to quit and poor cessation
outcomes, smokers with depression in primary care may benefit from physician-
assisted treatments that engage behavioral health providers.

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POS3-138
POSITIVE HEALTH BEHAVIORS PREDICT GREATER SUCCESS AT
RESISTING SMOKING TEMPTATIONS

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Research suggests that positive health behaviors may improve smoking
cessation outcomes. These benefits may accrue because positive health behaviors
decrease smoking urges or because they increase the ability to resist smoking
temptions. Although some work has shown that smoking urge is decreased
during and immediately following exercise, the longer-term effect of exercise and
other health behaviors on smoking temptations is relatively unknown. The current
research examines the association between the frequency of positive health
behavior use (e.g., exercise, vegetable consumption) and total smoking days,
total number of cigarettes smoked, and total number of smoking temptations over
two weeks in a sample of self-quitters. Married and cohabiting couples in which
one partner was a current smoker participated in a 21-day experience sampling
study of self-quitting. After each smoking lapse, the self-quitter completed a
lapse report that included a question regarding the number of cigarettes smoked.
Additionally, both partners completed one morning report, one evening report,
and up to three random reports daily. In each report, self-quitters reported the
number of temptations they had experienced since their last report. Both partners
completed questions about other health behaviors (e.g., exercise, vegetable and
fruit consumption, etc.) during the evening report. The frequency with which both
the self-quitter and the partner engaged in positive health behaviors was used to
predict the total number of smoking days, the total number of cigarettes smoked,
and the total number of temptations experienced in a series of Poisson regression
analyses. Results indicated that more frequent use of a given health behavior
(e.g., exercise) was associated with fewer total smoking days and fewer cigarettes
smoked, but with a greater number of temptations. In the current study, more
frequent use of positive health behaviors appears to assist with smoking cessation
through greater ability to resist temptation, and not through a decrease in smoking
urge.

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Institute on Drug Abuse (NIDA) of the National Institutes of Health under award
number R21DA04068. The content is solely the responsibility of the authors and
does not necessarily represent the official views of the National Institutes of Health.

JUSTIFICATION: Pairing positive health behaviors with an intervention to
decrease smoking temptation might be particularly effective in assisting smoking
cessation rates.

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POS3-139
VULNERABILITY TO SMOKELESS TOBACCO AMONG THOSE WITH LOWER SOCIOECONOMIC STATUS

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Introduction: Individuals with lower socioeconomic status (SES) are especially vulnerable to cigarette use. Less research has been conducted examining whether this same vulnerability extends to other types of tobacco use; this has important implications for tobacco regulatory science. This study used data from the National Survey on Drug Use and Health (NSDUH) to investigate associations between SES and smokeless tobacco (ST) use.

Methods: Odds were generated for current cigarette smoking and ST use (i.e., past 30 days) among adults (≥18) based on SES variables (annual income, educational attainment, industry employed in), after adjusting for potentially confounding influences of other demographics and substance abuse and dependence. Vulnerability to cigarette smoking was assessed to confirm that SES was associated with increased smoking in this data set (i.e., positive control).

Results: Odds of current cigarette smoking increased as a graded inverse function of income and educational attainment, and were increased among those working in blue-collar compared to white-collar industries. Being unemployed, unmarried, younger, male, non-Hispanic Caucasian, meeting alcohol, marijuana, cocaine, or heroin dependence criteria, and meeting criteria for MDD all increased the odds of being a current cigarette smoker in the final adjusted model. ST use was also increased among those working in blue-collar industries and was lower among college graduates, but did not differ between those with some college and < high school education. Alcohol dependence, current cigarette use, being younger, male, and non-Hispanic Caucasian were all associated with increased ST use in the final adjusted model.

Conclusions: SES predicts vulnerability to cigarette smoking and ST use, although the shape of the function relating educational attainment and use varies across these two types of tobacco use. Alcohol and other drug dependence predict increased vulnerability to cigarette smoking; only alcohol dependence predicts ST use. Being younger, male, and non-Hispanic Caucasian are predictive of both kinds of tobacco use. These results suggest overlapping but not isomorphic vulnerabilities to tobacco products.

FUNDING: This research was supported by National Institute on Drug Abuse (NIDA) Institutional Training Award T32DA07242, NIDA and Food and Drug Administration (FDA) Tobacco Centers of Regulatory Science Award P50DA036114, National Institute of General Medical Sciences (NIGMS) Centers of Biomedical Research Excellence (COBRE) Center Award P20GM103644. The authors are solely responsible for its content; this does not necessarily represent the official views of the funding agencies and institutes.

JUSTIFICATION: This study has important implications for tobacco regulatory science in that it shows overlapping, but not isomorphic, patterns of vulnerability across tobacco products.

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POS3-140
NICOTINE DEPENDENCE INDICATORS AMONG PREGNANT SMokers: PREDICTORS OF TIME-TO-FIRST-CIGARETTE AND Cigarettes PER DAY

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Tobacco regulatory science involves conducting research to inform policies to protect the public health. To assess tobacco-related addiction potential, effective measures of dependence are critical. Nicotine dependence (ND) is an established predictor of difficulty abstaining from smoking, and two common indicators of ND are time to first cigarette (TTFC) and cigarettes per day (CPD). Although TTFC is a more robust predictor of quit success in the general population, Kurti et al. (submitted to SRNT, 2015) showed that TTFC and CPD independently predict quit success among pregnant smokers, with CPD being the more robust predictor. That both TTFC and CPD independently predict quitting among pregnant smokers raises questions about what is unique about these two correlated measures.

The purpose of the current study was to identify unique predictors of TTFC and CPD in 349 pregnant smokers who participated in trials examining the efficacy of financial incentives for smoking cessation. Participants were randomized to an intervention condition in which they earned vouchers exchangeable for retail items contingent on smoking abstinence or a control condition in which they received vouchers independent of smoking status. Backward elimination regression modeling was used to identify common and unique predictors of TTFC and CPD (analyses conducted separately). Both TTFC and CPD were strong predictors of one another (TTFC predicting CPD: chi square (X2(1)) = 43.9, p < .01; CPD predicting TTFC: t(1) = 16.5, p < .01), and both were predicted by attempting to quit prior to pregnancy (TTFC: X2(1) = 9.8, p > .01; CPD: t(1) = 2.7, p > .01). TTFC was uniquely predicted by rules against smoking in the home (X2(1) = 6.1, p > .01) and beliefs that smoking would harm the baby (X2(1) = 4.8, p = .02). CPD was uniquely predicted by whether the mother had previously attempted to quit during this pregnancy (t(1) = −2.9, p > .01). These findings provide insights into why both measures may be useful in pregnant smokers, with TTFC being uniquely associated with current external and psychological constraints on smoking and CPD with a woman’s history of trying to quit in the current pregnancy.

FUNDING: This research was supported by National Institute of Health (NIH) Tobacco Centers of Regulatory Science Award P50DA036114, Research Awards R01DA014028 and R01HD075669, Institutional Training Grant T32DA07242, and Centers of Biomedical Research Excellence Center Award P20GM103644.

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POS3-141
THE ASSOCIATION BETWEEN IMPULSIVITY AND WILLINGNESS TO SMOKE IS MEDITATED BY CURRENT BEHAVIORAL ADDICTIONS IN NEVER SMOKING ADOLESCENTS

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Background: Previous literature indicates that impulsivity increases risk of smoking and engagement in non-drug addictive behaviors in adolescents. Here we further investigated the potential relationship between impulsivity, engagement in behavioral addictions (e.g., problem gambling, online and offline gaming, exercise), and willingness to smoke in adolescent non-smokers.

Method: In this cross-sectional study, high school students in the Los Angeles area (N=2144; 56% Female; Mean age=14.1) who reported no prior history of smoking experimentation completed self-report surveys measuring impulsivity, willingness to try cigarettes given the opportunity, and a range of non-substance behavioral addictions. We conducted mediation analyses to test the hypothesis that adolescents with greater self-reported impulsivity would report greater willingness to smoke, and that this relationship would be mediated by the number of non-substance behavioral addictions.

Results: As predicted, there was a significant total effect association from impulsivity scores to willingness to smoke (b=0.054, p<0.001, CI[0.039, 0.068]), indicating that more impulsive adolescents reported greater willingness to smoke cigarettes if given the opportunity. Additionally, this association was mediated by the number of self-reported behavioral addictions (significant indirect effect: b=0.005, p<0.05, CI[0.003, 0.009]). DISCUSSION: Non-smoking adolescents with higher levels of impulsivity reported greater willingness to smoke and this was mediated by non-substance related behavioral addictions. These findings suggest that non-substance related behavioral addictions may account the risk of tobacco use initiation in the future carried by impulsivity, perhaps because behavioral addictions may be a marker of general addiction propensity that is yet to extend to substances of abuse until after early adolescence. Given that behavioral addictions...
POS3-142
THE BENZALDEHYDE CONCENTRATION IS SEVERAL TIMES HIGHER IN AEROSOL GENERATED FROM CHERRY FLAVORED LIQUIDS COMPARED TO THE AEROSOL FROM LIQUIDS WITH DIFFERENT FLAVORS

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Most of e-cigarettes users choose flavored products. An addition of aroma substances may potentially encourage non-smokers, mainly young people, to start to use e-cigarettes, and thus to become nicotine addicted. However, aroma substances used are allowed in the food products, but they long-term inhalation effect on users health has not been recognized. One of flavors components may be benzaldehyde, which is used as preservation and aroma agent in food-perfume industry. In a form of vapors, it may cause lacrimation and eye pain, conjunctiva redness, feeling of burning in nose and throat, cough, difficulties in breathing. Animal studies demonstrated that chronic exposure to that compound may be a reason of central nervous system disorders.

Threat related to aroma compounds addition to liquids is not only connected to the possibility of non-smokers encouraging, especially young people, to e-cigarettes use, but also to introduction of harmful compounds to an organism. The producers should withdraw cherry flavored liquids from their production.

Biomarker analysis demonstrates a high degree of non-compliance with smoking VLNCs, indicating that smokers supplement them with conventional cigarettes. This approach allows for assessment of non-compliance that extends beyond limited self-report, and should be considered as a tool for researchers to use in assessing responses when switching from conventional cigarettes to VLNCs.

A clinical trial of gradual nicotine reduction was conducted. Data from 53 participants were analyzed. Using plasma cotinine concentrations measured at baseline and while smoking VLNCs, we compared within-subject ratios of plasma cotinine comparing usual brand to VLNC in relation to nicotine content of these cigarettes. In another approach we used nicotine pharmacokinetic data to estimate absolute plasma cotinine/cigarettes per day threshold values for compliance based on the nicotine content of VLNC.

The two approaches showed concordance indicating at least 60% non-compliance with smoking VLNCs. In a sensitivity analysis assuming extreme compensation and extreme values for nicotine metabolic parameters, non-compliance was still at least 40%. Both estimates were much higher than the self-reported non-compliance of 21%, even though subjects were encouraged to report non-compliance without penalty.

POS3-144
DUAL TOBACCO USE AMONG HIGH SCHOOL STUDENTS IN NORTH CAROLINA

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Although high school (HS) students are more likely to use cigarettes than other tobacco products, emerging tobacco products are becoming increasingly popular and students may use more than one tobacco product at a time. The purpose of this study was to assess patterns and trends of dual tobacco use among HS students in North Carolina (NC). Data from the NC Youth Tobacco Survey (NCYTS) from 2011 and 2013 were used to assess patterns and trends of dual tobacco use among NC HS students. The NCYTS is a public and charter school-based survey of students in grades 6-12. In 2011, 4,791 HS students responded (overall response rate 78.2%). In 2013, 4,092 HS students responded (overall response rate of 67.8%). Dual users were classified as using more than one tobacco product, including: cigarettes; chewing tobacco; cigars, cigarillos, or little cigars; tobacco in a pipe; bidis; clove cigarettes; and emerging products, such as hookah, e-cigarettes. SAS survey procedures were used to account for the complex survey design and sampling weights. From 2011 to 2013, the prevalence of dual use among...
HS students remained high, 17.3% in 2011 (95% CI: 15.2%-19.3%) vs. 19.1% in 2013 (95% CI: 17.3%-20.8%). Among HS students in 2013, prevalence of dual use was highest among White students (22.4%, 95% CI: 20.0%-24.8%), those in 12th grade (27.0%, 95% CI: 23.2%-30.8%), and among males (24.5%, 95% CI: 21.6%-27.4%). In 2011, 83.5% of current smokers (95% CI: 80.5%-86.5%) were dual users compared to 86.7% of current smokers in 2013 (95% CI: 82.8%-90.7%). In 2011, 90.1% of current e-cigarette users (95% CI: 87.1%-93.1%) were dual users compared to 79.6% in 2013 (95% CI: 74.5%-84.8%). A high percentage of high school students in NC, particularly those using cigarettes and e-cigarettes, report using more than one tobacco product. Given these rates, increased surveillance is needed to monitor uptake of dual tobacco use rather than monitoring use of each product in isolation.

FUNDING: The North Carolina Youth Tobacco Survey was administered with support from the Centers for Disease Control and Prevention Grant or Cooperative Agreement Number, DP 14-1415.

JUSTIFICATION: This research provides data on trends in dual tobacco product use among students in North Carolina, which can be used to help inform future interventions and surveillance efforts.

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POS3-145
ASSOCIATION OF SMOKING STATUS WITH INHIBITORY CONTROL ON TWO MEASURES OF STOP-SIGNAL TASK PERFORMANCE

Jim Lumsden*, Angela Attwood, Marcus Munafò

There is a growing body of evidence suggesting that addictive behaviours are associated with heightened impulsivity. However, research on the relationship between smoking status and measures of inhibitory control, which is suggested to index impulsivity, is mixed. We compared 53 smokers and 51 non-smokers on two variants of the stop signal task, which is designed to measure inhibitory control. We used two versions of the stop signal task, one a standard computer-based measure, and one a newly designed ‘game-like’ measure. Gamified versions of standard computerised tasks might be more engaging than standard versions, and thereby provide more valid data. We found evidence suggesting that both tests were equivalent for the purpose of evaluating response inhibition, and that subjects found the game-like test more enjoyable and less boring to complete. However, we found no clear evidence that smoking status was associated with inhibitory control, with smokers and non-smokers having similar stop-signal reaction times (F [1,102] = 0.085, p = 0.771) and commission error rates (F [1,102] = 3.00, p = 0.086). Our findings suggest that smokers and non-smokers do not differ strongly on measures of inhibitory control, which stands in contrast to many previous studies of impulsivity and addictive behaviours. One possible reason for this discrepancy may be that high impulsivity is not a general feature of all addictive behaviours, but instead may only be specific to some.

FUNDING: Funding was provided by Cambridge Cognition (http://www.cambridgecognition.com/) & the South West Doctoral Training Centre (SWDTC) ESRC Studentship Award.

JUSTIFICATION: Understanding whether smokers have increased disinhibition may allow us to understand how addictive behaviours develop; and therefore allow the design of more effective interventions.

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POS3-146
E-CIGARETTE USE AMONG HIGH SCHOOL STUDENTS IN NORTH CAROLINA: AN EMERGING TOBACCO PRODUCT OF INTEREST

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Emerging tobacco products, especially e-cigarettes, have received increased national attention, but little research has been conducted on changing patterns in their use over time. The purpose of this study was to assess patterns and trends of e-cigarette use among high school (HS) students in North Carolina (NC). Data from the NC Youth Tobacco Survey (NCYTS) from 2011 and 2013 were used to assess patterns and trends of e-cigarette use among NC HS students. The NCYTS is a public and charter school-based survey of students in grades 6 - 12. In 2011, a total of 4,791 HS students responded (overall response rate of 78.2%). In 2013, a total of 4,092 HS students responded to the survey (overall response rate of 67.8%). Ever, current, and considering e-cigarette users were defined respectively as students who had ever tried an e-cigarette, students who used an e-cigarette in the last 30 days, and students who were considering using e-cigarettes in the next year. To account for the complex survey design and sampling weights, data were analyzed by using SAS survey procedures. Prevalence of current e-cigarette use among HS students increased from 1.7% (95% CI: 1.2%-2.2%) in 2011 to 7.7% (95% CI: 5.7%-9.7%) in 2013. Among current e-cigarette users in 2013, prevalence was highest among males (10.9%, 95% CI: 7.3%-14.5%), those in 12th grade (10.8%), and White students (11.2%, 95% CI: 7.7%-14.6%). Among all HS students in 2013, 20.1% (95% CI: 15.9%-24.3%) reported that they had ever tried e-cigarettes, were currently using e-cigarettes, or were considering e-cigarettes. Among those considering using e-cigarettes in 2013 (prevalence: 10.0%, 95% CI: 7.9%-12.1%), 34.3% were current smokers (95% CI: 27.0%-41.5%). There was a marked increase in the prevalence of current e-cigarette use among NC HS students from 2011-2013, likely attributable to multiple factors. Given this trend and the high number of students who have ever tried, currently use, or are considering using e-cigarettes, increased monitoring of e-cigarette uptake and impact of use on experimentation or cessation are needed.

FUNDING: The North Carolina Youth Tobacco Survey was administered with support from the Centers for Disease Control and Prevention Grant or Cooperative Agreement Number, DP 14-1415.

JUSTIFICATION: This research provides data on e-cigarette use among adolescents in North Carolina, including most recent prevalence and change in prevalence over time, which can be used to inform policy makers and practitioners understanding of e-cigarettes’ reach and use.

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POS3-147
PSYCHOSOCIAL FACTORS CORRELATED WITH SOCIOECONOMIC STATUS IN SMOKERS ENROLLED IN A TOBACCO DEPENDENCE TREATMENT STUDY IN HARLEM

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Tobacco use is a leading cause of socioeconomic health disparities. Lower socioeconomic status (SES) groups smoke at higher prevalence rates and are significantly less likely than higher SES groups to respond to a variety of tobacco control and tobacco dependence treatment efforts. Identifying psychosocial factors associated with SES is important to understanding and ultimately addressing these disparities. This exploratory study examined correlations between SES and baseline psychosocial factors among a diverse group of smokers enrolled in a tobacco dependence treatment study. Factors included multiple measures of socioeconomic and perceived social status, tobacco use, dependence, the perceived consequences of smoking, withdrawal, motivation, self-efficacy, stress, positive and negative affect, depression, anxiety, coping, general impulsiveness, self-control, delay discounting, perceived discrimination, and trauma experiences.
POS3-148
TOBACCO USE AND DEPRESSION: USING THE 2011-2012 NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (NHANES) TO INVESTIGATE FACTORS AND BARRIERS ASSOCIATED WITH SMOKING CESSATION AMONG U.S. ADULTS

Thalia P. Farieutta, MS*, Julie K. Bower, PhD, MPH, Amy K. Ferkelitch, PhD, The Ohio State University College of Public Health

Introduction: Depressed adult smokers report higher smoking rates and heightened difficulties in cessation compared to non-depressed smokers. The purpose of this study was to describe factors associated with smoking cessation barriers and to evaluate the independent effect of depressive symptoms.

Methods: Using the Center for Disease Control and Prevention’s National Health and Nutrition Examination Survey 2011-2012 survey, we investigated smoking and smoking cessation behaviors among adults aged 20-79. We used linear and logistic regression models to evaluate the association of depressive symptoms, determined by Patient Health Questionnaire 9 scores (PHQ-9), with age at smoking initiation and heaviness of smoking, as well as quit length among former smokers.

Results: Regression analyses highlighted factors associated with cessation barriers. Age of initiation was related to depression; on average, individuals with depressive symptoms began smoking cigarettes 1.5 years earlier than those without depressive symptoms (95% CI: -2.4, -0.6).

Aspects of smoking intensity were also found to be associated with depression. The odds of being a medium/heavy smoker were 3.4 times as high in depressed adults versus those without depressive symptoms (95% CI: 1.8-6.5). The odds of waiting less than an hour after waking to smoke a cigarette were 3.1 times as high in adults with depressive symptoms (95% CI: 1.5-6.5). Depression status was not related to number of cigarettes smoked. Among those meeting depression criteria, the odds of smoking at least 11 cigarettes per day were 1.3 times as high compared to those without depressive symptoms (95% CI: 0.8-2.2).

Finally, adults meeting depression criteria had 0.38 times the odds (95% CI: 0.2-0.9) of having a quit length of one year or greater compared to adults not meeting criteria.

Discussion: Adults with depressive symptoms may possess several qualities that make cessation difficult. Combined with high tobacco use among this population, these findings help to identify factors associated with difficulties in smoking cessation among those with depression. Further research should focus on examining uses of cessation therapy among these individuals.

FUNDING: No funding.

JUSTIFICATION: This study highlights the disproportionate appearance of smoking cessation barriers among individuals with depression; these barriers make individuals with depression especially important to address in cessation therapy.

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POS3-149
FACTORS THAT INFLUENCE HOOKAH USE IN COLLEGE STUDENTS IN THE UNITED STATES: A SYSTEMATIC REVIEW

Andrea M. Stroup, MPH*

Background/Context: Approximately one in five college students in the United States used a hookah in the year previous to being asked and about 48% of all students have ever used a hookah in their lifetime. The increasing trend of hookah use has become the second most popular form of tobacco consumption in U.S. college students. This paper summarizes literature on the current evidence of factors that influence hookah use in college students in the United States.

Study Question: What are the factors that influence hookah use in college students in the United States?

Evidence Acquisition: A systematic review of the literature was conducted in order to answer the study questions. After completing a comprehensive review of the peer-reviewed literature, 27 items were found to be relevant to this review.

Evidence Synthesis: It was found that there were many factors that influence hookah use in U.S. college students. The two most commonly reported factors associated with hookah use were low perceived susceptibility to negative health outcomes of hookah use and concurrent use of cigarettes. In addition, U.S. college students held more positive attitudes and normative beliefs than negative attitudes and normative beliefs about hookah use.

Conclusions: There has been limited research published on factors that influence hookah use in college students in the United States. However, there is opportunity for future studies to increase the quality and quantity of evidence that could be used to develop and improve interventions and prevention programs to curb hookah use.

Key Words: hookah, initiation, college, shisha, waterpipe, hubble bubble, nargile, argileh

FUNDING: No Funding

JUSTIFICATION: This review provides the latest information published on factors influencing hookah use in U.S. college students which could be used to develop interventions, prevention programs, health education materials, and regulations related to hookah use.

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POS3-150
A COMPARISON OF CHARACTERISTICS OF TIME AND ADVICE EGOCENTRIC NETWORKS AMONG OHIO APPALACHIAN WOMEN

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Introduction: Social networks play a role in smoking, yet this may differ by network type. Close knit and central networks have been found to be resistant to change but may function differently than networks used for medical advice. The goal of this study was to characterize the time and advice egocentric social networks of women in Ohio Appalachia according to smoking status.

Methods: A cross-sectional survey design was used. Women, 18 years of age, were recruited from three Ohio Appalachian counties using an address-based sampling approach. Sociodemographic and smoking-related information was collected during a face-to-face interview with the woman (i.e. ego): A description of her time and advice social network ties (e.g. alters) was also obtained. An egocentric social network analysis was completed, according to ego smoking status.

Results: A total of 408 women (i.e. egos) were enrolled. Time networks were larger and more dense than advice networks (p < 0.001) with alters on average younger and less educated than egos compared to advice network alters (p < 0.001). Never and former smoking egos had more homophilous networks than egos who currently smoked.

Conclusions: Differences were found in characteristics of time versus advice networks showing that not all social networks operate in the same way. Advice networks may be more beneficial to smoking cessation. This study should assist with further development of cessation interventions that involve members of the smoker's social network.

FUNDING: This work was supported by the National Institutes of Health P50 Grant #SP3CA105632-06. This work was also supported by the National Center for Advancing Translational Sciences NIH Grant #UL1TR000090.

JUSTIFICATION: This work has potential application for developing smoking cessation programs using social networks.

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POS3-151
TELEPHONE BASED VERSUS FACE TO FACE ASSIST LINKED BRIEF INTERVENTION ON TOBACCO ABSTINENCE IN A NIGERIAN CLINICAL SETTING

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Introduction: Tobacco use and related health problems still constitute serious public health concern in Nigeria. The objective of this study was to determine the effectiveness of telephone based compared with strictly face to face intervention in increasing abstinence from tobacco use.

Methods: Participants (687), 14 years and above were consecutively randomized into either a telephone based (TB) or face to face (FTF) ASSIST LINKED Brief Intervention. Intervention was a 12-week program and consisted of a weekly telephone-based monitoring (TFM) aimed at ensuring treatment adherence and strict face to face ASSIST LINKED Brief Intervention. Main outcome measure was percentage abstinence at 3 and at 6 months after intervention and positive urine screen for nicotine. Within group analysis was carried out using Wilcoxon Signed Rank Test and intergroup analysis was by Chi2 statistic. SPSS 17.0 was used for all analyses.

Results: At 3 and at 6 months, significantly fewer participants in the FTF group reported abstinence, p = 0.02. p = 0.01 respectively but reported more positive urine screen, p = 0.001, p = 0.002 respectively compared with the TB group. Percentage abstinence rate significantly increased in the TB group at 3 months compared to at baseline, p = 0.01 and at 6 months compared to at 3 months, p = 0.001. In the FTF group, there was also a significant change in percentage rate of abstinence at 3 months, p = 0.04, and at 6 months p = 0.03 respectively.

Conclusion: A telephone based program offers superiority than a strict face to face tobacco intervention program because it enhances treatment adherence.

FUNDING: No Funding

JUSTIFICATION: human contacts reduces chances of successful substance use Intervention because many subtenancy users do not feel inclined to discuss this area because of its sensitive nature.

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POS3-152
DETERMINATION OF HYDROGEN CYANIDE CONTENT IN MAINSTREAM CIGARETTE SMOKE VIA HEADSPACE GC/MS

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Mainstream cigarette smoke is a complex aerosol of more than 4000 chemicals, many of which are toxic. Understanding the levels of these toxic chemicals in mainstream cigarette smoke is important for assessing risk in tobacco use. Hydrogen cyanide (HCN) is a toxic chemical which prevents the tissues from utilizing oxygen. Cigarettes were smoked on a linear smoking machine under two smoking regimens: ISO (35 mL puff volume; 60 s interval) and Intense (55 mL puff volume; 3 s interval; 100% ventilation blocking). Cyanide was collected on a NaOH treated Cambridge filter pad. After smoking, internal standard was added and cyanide was extracted in water. Cyanide was quantitatively analyzed using a GC-MSD. Samples were introduced as a heated headspace injection and cryo-focused on-column prior to separation and detection in SIM mode. Method validation was performed including examining standard reference cigarettes in order to optimize various method parameters. In order to see how tobacco blend variations can affect HCN delivery, mainstream smoke HCN from various single blended research cigarettes were measured and compared. A comparison of commercially available cigarettes was done in which HCN content was studied relative to their physical properties (filter type, ventilation and tobacco weight). We selected several charcoal-filter cigarettes as well as regular cellulose acetate filter counterparts for comparison. Charcoal filtered cigarettes can reduce volatile compounds including HCN. Mainstream HCN deliveries from these cigarettes were analyzed and compared between the different filter type cigarettes. For the charcoal filtered cigarettes, HCN deliveries observed were between 3.45 ug/cig and 211 ug/cig under ISO smoking conditions, and 181 ug/cig and 524 ug/cig under intense smoking conditions. A broad survey of the HCN content in popular commercially available cigarettes sold in the United States was done. Samples were studied under both the ISO and Intense smoking regimens. Under the ISO smoking condition, reported HCN deliveries ranged from 3.74 ug/cig to 201.1 ug/cig. Under the Intense condition, the deliveries ranged from 267.6 ug/cig to 467.0 ug/cig.

FUNDING: FDA CTP

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POS3-153

THE INFLUENCE OF GRAPHIC WARNING LABELS ON LOW-INCOME SMOKERS’ EFFICACY BELIEFS AND RISK PERCEPTIONS: A QUALITATIVE STUDY

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Graphic warning labels may help address U.S. smoking disparities by socioeconomic status (SES), but work is needed to develop more effective labels. Health communication theories indicate that messages depicting threat (severity of and susceptibility to health effects) and efficacy (confidence to perform a behavior to reduce the threat) may promote behavior change, but this has received little attention in label research. To inform the development of labels to promote cessation, this qualitative study explored perceptions of 12 graphic warning labels with self-efficacy messages paired with messages portraying high, low, or no threat from smoking among low SES smokers. We conducted in-depth interviews with 25 low-income adult smokers in Baltimore, MD. Participants discussed the labels’ role in their efficacy beliefs and risk perceptions. Data were analyzed through framework analysis. Many participants reported that several efficacy messages were credible and helpful for quitting. Efficacy messages in which participants vicariously experienced the characters’ quit successes were reported as most influential to self-efficacy beliefs. Labels portraying a high threat were reported as most influential to their perceived severity of and susceptibility to smoking risks because of the vivid picture, negative emotional reactions (such as fear), clarity of information, and personal experiences with the health effects. Efficacy messages paired with no threat, followed by high threat, were seen as most influential on efficacy beliefs because the efficacy labels with no threat showed role models for quitting and the benefits of quitting, whereas efficacy labels with high threat made them confident to quit to avoid negative health effects. Role model-based efficacy messages with testimonial narratives from former smokers may enhance the effectiveness of labels by making smokers’ self-efficacy beliefs about quitting most salient. Labels that portray a range of threat levels may increase the risk perceptions of smokers at different stages of readiness to quit. The findings may aid in the development of labels to address smoking disparities among low SES populations in the U.S.

FUNDING: This study was supported by the National Institute On Drug Abuse and the Food and Drug Administration Center for Tobacco Products (grant numbers R01DA032217-04 and R01DA032217-04S), as well as by the National Institute Of Allergy And Infectious Diseases, The Johns Hopkins Center for AIDS Research (grant number 1P30 AI094189).

JUSTIFICATION: The findings of this study can be used to inform graphic warning label development, research, and policy.

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POS3-154

PERCEPTIONS OF SIMILARITY TO THE CHARACTERS ON GRAPHIC WARNING LABELS AMONG LOW-INCOME, URBAN SMOKERS IN THE UNITED STATES

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Consistent findings in the health communication literature suggest that individuals’ perceived similarity to a character increases the message’s persuasiveness and influence on attitudes and behaviors. However, this theoretical construct has not been adequately explored in graphic warning label research. To inform the development of graphic warning labels that promote smoking cessation, this qualitative study explored low-income, urban U.S. smokers’ perceptions of characters who portrayed the negative effects of smoking (negative characters) and benefits of quitting (positive characters) on graphic warning labels. In-depth interviews were conducted with 25 adult men (n=12) and women (n=13) smokers in Baltimore, Maryland. Participants were asked about their perceived similarity and dissimilarity to characters on eight labels. Data were coded using an inductive and deductive approach and analyzed using the framework method, a type of thematic analysis. Participants reported feeling similar to positive characters more often than negative characters. The factors that seemed to have the most influence on perceived similarity were aspiration to be like the characters, feeling similar emotions (such as happy or upset), and experiencing similar health conditions or treatments (such as difficulty breathing or hospitalization), attitudes (such as having a positive outlook), and life experiences. Age and gender concordance between the character and participant appeared to play a small role; participants reported that racial concordance played no role. The findings suggest new approaches for the design of persuasive labels and quit campaigns, such as characters as role models for cessation and characters progressing from minor to serious illnesses to enhance risk perceptions. This study illustrated the need to measure perceived similarity to characters when evaluating the effectiveness of graphic warning labels.

FUNDING: This study was supported by the National Institute On Drug Abuse and the Food and Drug Administration Center for Tobacco Products (grant numbers R01DA032217-04 and R01DA032217-04S), as well as by the National Institute Of Allergy And Infectious Diseases, The Johns Hopkins Center for AIDS Research (grant number 1P30 AI094189).

JUSTIFICATION: The findings of this study can be used to inform graphic warning label development, research, and policy.

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POS4-1
SOCIAL NETWORKING HABITS OF ELECTRONIC CIGARETTE E-FORUM USERS
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Electronic cigarettes (e-cigarettes) are gaining in popularity at a time when the understanding of the health hazards is not established. It’s important for professionals to better understand how and what information is being disseminated in order to correct non-evidence-based and potentially misleading information. This study was designed to provide a better understanding of the social networking habits of e-cigarette users who visit online e-cigarette forums.

E-cigarette users were recruited from the ‘e-cigarette forum’ website and completed an online survey inquiring about their use of Facebook, Twitter, YouTube and other social networking websites. The survey inquired about participants’ e-cigarette postings to each site and whether their posts portrayed an e-cigarette as positive, neutral, or negative.

A total of 154 surveys were completed. Approximately 89% of respondents had created Facebook accounts and 86% of those who posted something to the site posted positively regarding e-cigarettes. Possession of a Twitter account was reported by 55% of respondents and 87% of those who posted indicated their posts were positive. The YouTube website was visited by 93% of respondents and 94% of those who posted reported the posts as being positive. Possession of an account on another social networking website was reported by 19% of respondents and 100% of those who posted to the site reported positive postings.

Social media is popular among e-cigarette users who visit online e-cigarette forums. Many users tend to post positive information regarding their e-cigarette use. Better understanding this behavior allows professionals to prepare themselves for correcting potentially misleading information presented, as well as providing an opportunity for harnessing the power of social media in that effort.

FUNDING: No Funding.

JUSTIFICATION: The study provides public health professionals with a better understanding of the social networking habits of e-cigarette users who visit online e-cigarette forums; this allows professionals to prepare for correcting potentially misleading information, as well as providing an opportunity for harnessing the power of social media in that effort.

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POS4-2
SMOKING PREVALENCE IS HIGHER AND SHOWS LESS REDUCTION OVER TIME IN THOSE WITH POOR MENTAL HEALTH
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Introduction: While smoking prevalence has been dropping for smokers without mental illness, it has been fairly static for those with mental illness.

Methods: We obtained data from the Behavioral Risk Factor Surveillance System from 2001 - 2010 to examine the relationship between poor mental health and current, daily, and intermittent tobacco use in New Jersey.

Results: During 2001 through 2010, current, daily, and intermittent smoking prevalence was higher in those with poor mental health as compared to those with better mental health. As compared to the year 2001, current smoking prevalence was significantly lower between 2003 and 2010 for those reporting better mental health, but was only lower in 2008 and 2010 for those reporting poor mental health.

Conclusions: This study is important because in addition to being the first to examine daily and intermittent smokers with and without poor mental health, these data suggest several policy implications. Current tobacco control strategies may be less effective for individuals with poor mental health, and new approaches may be warranted. While smokers with behavioral health comorbidity should be designated as a tobacco use disparity group and receive priority funding, this is still not the case.

FUNDING: This work was supported by NIDA 1R34DA030652 and New Jersey Department of Health, Division of Family Health Services D6SF514CCTC007, awarded to the first author (MLS).

JUSTIFICATION: If smoking prevalence is not decreasing among smokers with mental health problems despite making a similar number of quit attempts, smokers with mental health problems may require better treatments, more efficacious strategies for getting them into treatment, or both.

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POS4-3
SOURCES OF ELECTRONIC NICOTINE DELIVERY SYSTEMS AWARENESS: RELATIONSHIPS WITH PERCEIVED SAFETY AND USE
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Introduction: Electronic Nicotine Delivery Systems (ENDS) awareness and use has more than doubled over the past two years, which may be related to increased media-based and interpersonal communications. This study examined associations between sources of ENDS awareness, safety perceptions, and ENDS use.

Methods: Ethically diverse current/former smokers were recruited via the community and internet from June-August 2014. A telephone survey (N=246) assessed media-based (e.g., TV/radio, magazines, internet, billboards) and interpersonal (e.g., friends, significant other, health care provider) sources of ENDS awareness, safety perceptions, and lifetime use.

Results: Awareness of ENDS was high (99%). Participants learned of ENDS through multiple sources (M=5.2, SD=1.7, Range: 1-9), including 3.4 (SD=1.2; Range: 0-5) media-based sources and 1.8 (SD=1.0, Range: 0-2) interpersonal sources. TV or radio ads were associated with lower perceived ENDS safety (p<.01), as were internet sources (p=.046). Lifetime ENDS use was associated with internet sources (74%), signs at stores or gas stations (69%), or learning of them from interpersonal sources (p=.01). Smoking status was also related to sources of ENDS awareness; current smokers were more likely to recall ENDS ads at stores or gas stations (p=.01) and reported a greater likelihood of lifetime use compared to former smokers (p=.02).

Discussion: The current sample reported high ENDS awareness and multiple exposures to related messages. Perceptions of ENDS safety were lower among participants who recalled TV, radio, and internet sources of awareness. The internet, store or gas station advertisements, and personal sources of communication were positively associated with lifetime ENDS use. These data suggest that channels of ENDS awareness are related to risk perceptions and use. Because ENDS-related messages are becoming more widespread, this study has implications for future marketing restrictions as well as health education campaigns designed from both harm reduction and anti-ENDS perspectives.

FUNDING: University of Miami

JUSTIFICATION: This study could help inform marketing practices and possibly restrictions of electronic nicotine delivery systems to improve tobacco control efforts.

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POS4-4
DEMOGRAPHIC, PSYCHOSOCIAL, AND GENETIC RISK ASSOCIATED WITH SMOKELESS TOBACCO USE AMONG MEXICAN HERITAGE YOUTH

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The negative health consequences of smokeless tobacco (ST) use are well documented. In Texas, while the prevalence of ST use among non-Hispanic youth has declined over the last ten years (as in the US overall), it has remained constant among Hispanic youth. Given that Hispanics represent the majority of the Texas population under the age of 18 years, this trend suggests that a better understanding of the risk factors associated with ST use among young Hispanics is timely and warranted. The purpose of this study was to examine demographic, psychosocial, and genetic risk factors associated with ST use.

Participants (n=1,328) were recruited in 2005-06 to a Hispanic youth cohort, followed up in 2008-09 (n=1,154) and again in 2010-11 (n=1,000). Survey data were collected via interviews in the family home, after which height and weight measurements were taken. Participants provided a saliva sample, which was genotyped for single nucleotide polymorphisms identified from the literature as associated with sensation seeking behaviors in the dopamine, opioid, and serotonin pathways. “Never users” reported never having tried ST on all three surveys; “ever users” reported ST use at least once. Established demographic and psychosocial risk factors associated with youth cigarette smoking were examined as potential covariates.

We used Bayesian False Discovery Probability tests to evaluate the chance of false-positive associations for the variants studied. Principal component analysis was used to control for underlying population stratification. Three cross-sectional multivariable logistic models were computed, one for each wave of data. Results were consistent across models. Gene variants on SERGEF, TPH1, TRDHE, ALDH2, and SLC6A4 significantly increased risk of ever using ST. Male sex (OR=2.2; 95% CI: 1.2-4.0), higher SES (OR=1.6; 95% CI: 1.1-2.2), elevated BMI and current cigarette use (p<0.01 for both), higher levels of anxiety and social disinheritment, and lower social status (p<0.05 for all) were associated with ever use of ST. Our data show gene polymorphisms, in addition to demographic and psychosocial factors, are associated with ST experimentation in Hispanic youth.

FUNDING: This research was supported by grants from the National Cancer Institute CA105203 to MRS and K07 CA126988 to AVW and the Intramural Research Program of the National Human Genome Research Institute Z01HG200335 to LMK.

JUSTIFICATION: Our results show that genetic factors may help identifying youth at high risk for ST experimentation, which together with behavioral and psychosocial factors, may help develop individualized intervention strategies.

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POS4-5
PREGNETS: A SMOKING CESSATION INTERVENTION FOR PREGNANT AND POSTPARTUM WOMEN

Nadia Minian, Jessica Penner, Rosa Dragonetti, Peter Selby, CAMH

Background: In Ontario, more than one in ten pregnant women smoke. The use of tobacco during pregnancy carries many health risks, including several types of cancer, to both the fetus and mother.

Motivation for innovation: During pregnancy, women are highly motivated to stop smoking and look for support throughout the quitting process. If women are able to quit smoking, they reduce many health risks for them and the fetus. Despite their efforts to quit smoking, many pregnant smokers do not access public health resources for assistance because of a lack of knowledge of supports available and due to the stigma, shame and guilt associated with smoking.

To support the quitting process, Center for Addiction and Mental Health re-launched its Prevention of Gestational and Neonatal Exposure to Tobacco Smoke (Pregnets) website.

Process of developing, implementing and evaluating the innovation: Pregnets hosts information on smoking cessation practices for pregnant and postpartum women, a toolkit for health care providers, an online, moderated forum through which women can access information and discuss their smoking experiences anonymously with other women, and a personalized plan for quitting or reducing smoking. The Pregnets team conducted an environmental scan, a literature review and interviews and focus groups with women across Ontario to inform the development of a revitalized website, which was launched in 2012. A formative and outcome evaluation was conducted using a realist and participatory approach. Based on the recommendations from the evaluation, a blog has recently launched in order to help with dissemination.

Implications for practice: By encouraging women and healthcare providers to adopt best practices for smoking cessation and creating more opportunities for peer support, Pregnets has the potential to reduce the prevalence of smoking among pregnant women and thus promote health and reduce healthcare costs across Ontario.

FUNDING: Echo: Improving Women’s Health in Ontario (Website); CIHR (blog); Shoppers Drugmart (blog)

JUSTIFICATION: By encouraging women and healthcare providers to adopt best practices for smoking cessation and creating more opportunities for peer support, Pregnets has the potential to reduce the prevalence of smoking among pregnant women and thus promote health and reduce healthcare costs across Ontario.

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POS4-6
VALIDATION OF THE INTERNALIZED SMOKE STIGMA INVENTORY

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The denormalization of smoking as a public health strategy may have unintended consequences of creating shame and isolation in vulnerable groups unable to quit. We aimed to validate the Internalized Stigma of Smoking Inventory (ISSI), a brief measure of smoking stigma. In a sample of 956 smokers with mental health diagnoses (48% nonHispanic Caucasian, 49% female), we examined the internal factor structure, reliability, and construct validity of the ISSI. Exploratory and confirmatory factor analyses in two random subsamples reduced the ISSI from 13 to 8 items (Cronbach α=.83) with three identified subscales: a) smoking self-stigma related to shame (α=.80), b) perceptions of felt smoking stigma related to social isolation (α=.81), and c) smoking-related discrimination experiences (α=.70) (RMSEA=0.09, Bentler CFI=0.943, SRMR=.04). Within individuals, discrimination was the most commonly endorsed of the three scales. A multivariate generalized linear model examined construct validity for the three subscales, and included demographic, health, and tobacco-related variables as well as alternative forms of stigma (mental illness- and ethnicity-based). The model predicted 21-30% of subscale variances. Greater smoking self-stigma was most closely related to increased readiness to quit smoking (etab2 =.11); greater smoking felt stigma was predicted by greater stigma in other domains (etab2=.17); and smoking-related discrimination was associated with demographics (etab2=.06). Namely, women, nonHispanic Caucasians, and those with higher education reported greater smoking-related discrimination. The ISSI appears to tap three unique though complementary forms of smoking stigma (i.e., self-, felt, and discrimination) related
to greater readiness to quit and additional forms (or stacked) stigmas. Notably, smoking-related discrimination appeared more saliently experienced by those groups for whom tobacco is least accepted (females, more educated).

FUNDING: This work was supported by the National Institute of Mental Health grant number R01 MH083884, National Cancer Institute grants number CA-113710 and CA-57472, National Institute on Drug Abuse grants number R32 DA018991 and #P50 DA09253, NHLBI grant #5T32HL007034-39, and the State of California Tobacco-Related Disease Research Program grant number #21BT-0018.

JUSTIFICATION: A validated smoking stigma scale (the Internalized Stigma of Smoking Inventory) will allow researchers to further explore facilitators and barriers to smoking cessation related to the shame, isolation and discrimination experienced as a smoker.

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POS4-7
JUDGING THE TOBACCO RETAILER BY ITS COVER

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Background: Despite restrictive regulation of tobacco marketing in mass media, the tobacco epidemic is sustained in part by strong marketing at the point of sale. There is substantial evidence that these marketing efforts impact youth smoking initiation, progression from experimentation to regular use, and relapse. There is evidence that tobacco industry marketing practices target disadvantaged racial and economic groups acting to reinforce health and economic disparities. Of additional concern are the promotion and sale of smokeless products, e-cigarettes, and flavored products that appeal to youth.

Methods: The present study examines the tobacco marketing features of 182 randomly selected tobacco retail stores in urban and rural parts of Ohio. The study 1) uses a clustering technique to group stores based on similarity of their salient external marketing features (their “cover”); 2) provides a quantitative and visual demographic description of store clusters including distributions of store type (e.g., grocery, gas), the racial and household income characteristics of the surrounding geographic areas, and whether the area is considered rural; and 3) describes cluster-wise internal marketing features with a focus on flavored products, electronic cigarettes, price, and price promotions.

Results: Stores fall into two clusters—those with moderate levels of external tobacco marketing features (sparse), and those with high levels (dense). The dense cluster is comprised of convenience stores. The dense cluster is also comprised of stores in census tracts with lower median incomes and higher proportions of people identifying as African American or Hispanic. The relative density of external marketing features also positively correlates with the density of internal marketing features of the stores.

Conclusions: This study suggests a clear focus on convenience stores as an interaction point between tobacco industry and the consumer. The strength of marketing efforts seems to be higher in poorer and less White geographic areas. The strength of interaction point between tobacco industry and the consumer. The strength of internal marketing features of the stores.

FUNDING: This study was supported by NIH grant P50 CA180908.

JUSTIFICATION: This research informs the foci of regulatory intervention that is aimed to improve public health by protecting underprivileged populations and malleable youth.

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POS4-8
THIRDHAND SMOKE (THS) CONTAMINATION IN HOMES: THE INFLUENCE OF INDOOR BANS AND NUMBER OF CIGARETTES

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Thirdhand smoke (THS) residue forms from secondhand smoke (SHS) and is linked to health consequences (e.g., DNA damage) in animal and in-vitro studies. Even in homes that ban indoor smoking, carcinogenic THS enters on the breath, clothes, hair, and skin of those in contact with tobacco smoke and transfers by desorbing (e.g., from skin) and adhering to surfaces in the home. THS, which reemits indoors for months, may be most dangerous for premature infants discharged to smoking households who are exposed via ingestion (e.g., child pica behavior), dermal transfer, and inhalation. Homes with indoor smoking have THS levels 7 times greater than homes with smokers that ban indoor smoking. Protective benefits of indoor smoking bans have not been explored at different household smoking levels, and reexamination of THS after establishing an indoor ban has not been studied. Families with an infant in the neonatal ICU were recruited as part of a larger SHS trial (N = 119). Using a standardized protocol, participants’ homes were sampled prior to and at 6 months post-discharge (N = 22) with cotton wipes moistened with a 1% solution of ascorbic acid to measure nicotine (a THS marker). Background nicotine levels in the cotton, solvent, or air were subtracted from all samples. Tobit regression resulted in a main effect of ban status and total number of household cigarettes (<10/day vs. ≥11/day) on nicotine concentration (p<0.05). Homes with a smoking ban and low household smoking had the lowest nicotine (geometric mean [GM]=1039 ng/m2) and homes that permitted indoor smoking with higher smoking levels had the greatest nicotine (GM=14,923 ng/m2). Homes with a smoking ban whose occupants smoked at higher levels, however, had comparable surface nicotine (GM=9057 ng/m2) to homes with no smoking ban and lower smoking (GM=7061 ng/m2; p=0.94). Follow-up data suggested that starting an indoor smoking ban led to significant reductions in surface nicotine (range: 2401-22,774 ng/m2). This is the first report of significantly lowered THS levels following indoor ban implementation. Indoor bans are less protective, however, in homes in which families smoke more heavily.

FUNDING: This study was supported by grant R01 HL107404 through the U.S. National Institute of Health, National Heart, Lung, and Blood Institute.

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POSTER SESSION 4 • FRIDAY, FEBRUARY 27, 2015 • 5:15 P.M.–6:45 P.M.

POS4-9
THE USE OF FOREVER FREE EXTENDED SELF HELP BOOKLETS FOR SMOKING RELAPSE PREVENTION - A QUALITATIVE PROCESS EVALUATION REPORTING ON THE UK EXPERIENCE

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Aims: To understand the unique and complex patient perspectives of how self help booklets for the prevention of smoking relapse are used in the UK population.

Design: An embedded qualitative study utilising a grounded theory approach to data collection and analysis.

Setting: A randomised controlled trial of self-help materials (a British version of the Forever Free extended self-help booklets for smoking relapse-prevention) (SHARPISH - ISRCTN 36988856), was a UK HTA funded RCT recruiting over 1400 patients from the UK specialist stop smoking service.

Participants: All participants contributed free text questionnaire responses. A sub-sample of participants were then purposefully sampled, consisting of 44 participants across both the trial groups.

Analysis: Thematic content analysis of free text questionnaire responses and Grounded Theory (GT) analysis of interview data. GT analysis involved in-depth inductive coding until theoretical saturation was reached. 3 researchers independently coded transcripts to verify and develop the coding scheme.
Findings and Conclusions: The qualitative analysis found important variation, as some individuals liked and engaged with the self help booklets, whilst others reported not reading and not referring back to the booklets. This suggests that careful targeting of self help booklets towards those motivated to engage with self help may be beneficial. Participants reported that the relapse prevention content of the booklets, whilst appropriate, often did not enhance the detailed advice that they had already received via specialist UK stop smoking services.

FUNDING: The SHARPISH trial was funded by the UK NIHR Health Technology Assessment funding stream. Dr Caitlin Notley is in receipt of a Research Fellowship from the UK Society for the Study of Addiction.

JUSTIFICATION: In the UK context of advanced specialist stop smoking services, extended self help support booklets did not appear to offer additional educational input above and beyond the tailored face to face advice received by patients during smoking cessation appointments.

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**POS4-11**

**EXAMINING USE OF FULL FLAVOR CIGARETTES AMONG DISADVANTAGED SMOKERS**

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Rationale: Socioeconomic status (SES) is inversely associated with risk of smoking and adverse health outcomes. Among smokers, SES is also highly associated with use of full-flavor cigarettes. We examined whether use of full-flavor cigarettes among disadvantaged smokers is associated with adverse outcomes.

Method: The primary data source was the 2012 National Survey on Drug Use and Health (NSDUH). In the first step of the analysis, adverse outcomes associated with SES were identified, including a wide range of health outcomes and nicotine dependence. Next, multiple logistic regression was used to examine whether outcomes associated with SES were also associated with cigarette type in adults and adolescents. Finally, significant relations were tested for reliability using the 2011 NSDUH.

Results: Nicotine dependence, but not other adverse outcomes, was associated with cigarette type. After controlling for the potential confounding effects of SES and other sociodemographic characteristics, those who smoked ultra-light, light, and medium cigarettes were 57%, 52%, and 30% less likely to be nicotine dependent compared to those smoking full-flavor cigarettes (p < .0005). This relationship between nicotine dependence and use of full-flavor cigarettes was evident in adults and adolescents and reliable when analyses were repeated using the 2011 NSDUH.

Conclusions: Smoking full-flavor cigarettes is associated with greater odds of nicotine dependence and may contribute to the higher levels of nicotine dependence and associated difficulties quitting seen in economically disadvantaged smokers. One potential mechanism is that the lower effort required to obtain nicotine from full-flavor cigarettes may endow them with greater relative reinforcing effects. The present results are correlational and cannot support causal inferences, but should subsequent research demonstrate that full-flavor cigarettes have greater dependence potential, it could have important implications for tobacco regulatory policy. Socioeconomically disadvantaged populations differentially smoke full-flavor cigarettes and may be experiencing greater harm in the form of nicotine dependence from doing so.

FUNDING: This research was supported by National Institute on Drug Abuse (NIDA) Institutional Training Award T32DA07242, NIDA and Food and Drug Administration (FDA) Tobacco Centers of Regulatory Science Award P50DA036114, National Institute of General Medical Sciences (NIGMS), and Centers of Biomedical Research Excellence Center Award P20GM103644.

JUSTIFICATION: This study helps to identify health disparities (such as increased nicotine dependence) on a population level to inform tobacco regulatory science.

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POS4-12
GENOTYPE X ENVIRONMENT INTERACTION IN HUMAN SMOKING BEHAVIORS: CURRENT RESEARCH FINDINGS AND AN ASSESSMENT OF VALIDITY

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Twin and molecular genetic studies suggest that the importance of genetic influences on the risk of smoking behaviors may vary under different environmental circumstances. Yet, a lack of consistent replications across studies makes it difficult to deduce the true effects of gene by environment interactions (GxE). As a means to better understand how genetic factors combine with environmental influences in the etiology of smoking behavior, this critical review sought to evaluate twin and molecular studies investigating smoking-related GxE according to three criteria: biological plausibility or evidence of association, tests for artificial interaction, and reporting and interpretation of interactions. Thirteen studies of smoking-related GxE were identified by searching for the following terms: “smoking”, “smoking behavior”, “smoking cessation”, “genetic factors”, “environmental factors”, “twin”, “gene by environment”, “gene-environment”, “interaction”, and “moderation” in electronic databases (i.e. Google Scholar, PubMed, ScienceDirect, and Elsevier). These studies identify a number of environmental moderators of genetic risk for smoking behavior. However, since only three of the identified studies met full criteria, definitive conclusions regarding the validity of these GxE findings could not be made. Many studies tried to limit false-positive results by testing biologically plausible hypotheses or attempting to replicate findings from previous studies, but only half tested for artifactual interactions by accounting for gene-environment correlations. Added to this, the methods of measurement and analyses were not always explicitly reported or consistent, making it difficult to make comparisons across studies. Continued study is needed to refine our understanding of how genes and the environment combine to influence the development of smoking behavior, as well as to develop new methodologies to overcome power-related issues in GxE research.

FUNDING: This study was conducted while the corresponding author was at Virginia Commonwealth University and supported by the National Institutes of Health's National Center for Advancing Translational Science (award number UL1TR000058) and the National Institutes of Health's National Institute on Drug Abuse (project number 1R01DA025109-01A2: Developmental Genetic Epidemiology of Smoking).

JUSTIFICATION: Findings from studies of smoking-related GxE will be used to characterize the effects of genes on various biological pathways involved with smoking initiation, progression, addiction, and cessation, and determine the clinical relevance of GxE interactions in patients and public health domains.

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POS4-13
TIME TO FIRST CIGARETTE PREDICTS EXPIGNED CARBON MONOXIDE IN ADOLESCENT SMOKERS

Steven Branstetter*, Russell Nye, Andrea Stroup, Tiffany Grey, Malia Ali Mohammed Moazam Ali, Kimberly Horn

Adolescent smoking patterns are substantially different from adults, and these irregular patterns make assessing dependence and health risk difficult. Among adolescents the number of cigarettes per day (CPD) may not be an ideal measure of exposure given the variability of smoking and questionable validity of self-reported number of daily cigarettes. For example, adolescents tend to smoke significantly more on weekends than on week days and there is a discrepancy between self-reported cigarette use and expected cotinine values among teen users. The time to the first cigarette of the day (TTFC) has emerged as a leading measure of nicotine dependence and risk exposure because it is related to nicotine dependence, cessation, tolerance, relapse, and carcino-gen exposure —regardless of the number of CPD. The present study sought to determine the relation between TTFC and a non-invasive reliable biomarker of smoking behavior (CO) among a sample of adolescent smokers beginning a cessation program. Moreover, the present study compared the relative effectiveness of other individual nicotine dependence items versus TTFC in predicting CO. An empirical relation between CO and TTFC, independent of self-reported cigarettes per day, may be useful in assessing risk of cessation failure, addiction levels and risk exposure.

Self-reported smoking behaviors were collected at baseline prior to entering the Not-On-Tobacco cessation program. Assessments included TTFC, the Modified Fagerstrom Test for Nicotine Dependence (mFTQ), and CPD. Participants recorded time of last cigarette and provided a sample of expired carbon monoxide (CO). The sample was 2057 (56% female) teens (M=16.2; SD=1.23) who smoked an average of 15.1 (SD=9.6) CPD. Regression analyses controlling for age, gender, age of first cigarette, time since last cigarette, and CPD found that TTFC (β=-.06, SE=.37, p < .001) was a significant predictor of CO, even controlling for CPD. Additionally, TTFC was the only item from the mFTQ to predict CO. Results reflect an important relation between TTFC and CO, regardless of the number of CPD. These two measures may be indicators of cessation failure, addiction, risk exposure and progress during and after intervention.

FUNDING: No Funding

JUSTIFICATION: An empirical relation between CO and TTFC, independent of self-reported cigarettes per day, may be useful in assessing risk of cessation failure, addiction levels and risk exposure.

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POS4-14
PATTERNS OF CIGAR AND CIGARETTE USE AMONG YOUTH IN THE UNITED STATES

Youn O. Lee, PhD*, Christine J. Hebert, BA, Michelle Barnes, MPH, James M. Nonnemaker, PhD

In 2012, cigars (cigars, cigarillos, and little cigars) were the second most used tobacco product after cigarettes among youth in the United States. Little is known about multiple product use patterns, such as concurrent use of cigars and cigarettes. We examine the demographic characteristics, smoking characteristics, and risk factors associated with concurrent use of cigars and cigarettes among youth using data from the 2012 National Youth Tobacco Survey, N=28,673. Weighted estimates of the prevalence of cigar use only, concurrent cigar and cigarette use, and cigarette use only were calculated. Predictors of cigar only use, concurrent cigar and cigarette use, and cigarette only use were measured using multivariable logistic regression. In the U.S., 3.5% of youth smoke cigars but not cigarettes, 4.7% currently smoke cigarettes but not cigars, and 4.6% of youth currently use cigars and cigarettes concurrently. Controlling for other factors, youth living with a cigar user (RRR=2.05 P<.05), who use flavored tobacco products (RRR=1.98 P<.05), identifying as non-Hispanic black versus non-Hispanic white (RRR=5.81 P<.01), and identifying as Hispanic versus non-Hispanic white (RRR=3.31, P<.01) were significantly more likely to be cigar only users than cigarette only users. Our findings show that youth who use cigarettes are more likely to use them concurrently with cigarettes than use them alone. These results suggest that black and Hispanic youth are at increased risk for cigar use; with Hispanic youth at particular risk for concurrent use of both cigars and cigarettes. The association between using flavored tobacco products and cigarette use warrants further study to examine how flavorings may affect cigar use patterns.

FUNDING: This study was supported by RTI's evaluation of Florida Department of Health's Bureau of Tobacco Free Florida.

JUSTIFICATION: Results can be used to identify risk factors for concurrent use of cigarettes and cigars, monitor prevalence of youth multiple product use, and identify vulnerable populations potentially in need of interventions for cigar use.

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POS4-15
COMPLIANCE WITH RUSSIA’S TOBACCO ADVERTISING AND PRODUCT DISPLAY BAN
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Introduction: Point-of-sale (POS) advertising and product display are strategies used by the tobacco industry to promote their products. This study measured compliance with Russia’s tobacco control law that banned all advertising at POS environments on November 15, 2013, and all product displays on June 1, 2014.

Methods: Observations were conducted in the Russian cities of St. Petersburg and Kazan, after the advertising ban took effect (April-May 2014, Wave 1), and 2-3 months after the display ban took effect (Aug-Sep 2014, Wave 2).

Data collectors followed a protocol to conduct observations in retail environments including: supermarkets, convenience stores, and kiosks. Observations were conducted in low, medium and high SES neighborhoods.

Results: Observations were conducted in 289 retail environments in Wave 1. In Wave 2, 18 retailers had closed, 43 retailers no longer sold tobacco, and 1 venue converted from a convenience store to a non-retail business (Wave 2, n=227). In Wave 1, 28% (n=75) of venues used light boxes to advertise tobacco products, and 7% (n=21) used enlarged packs. In Wave 2, a single venue still used a light box while no venue had enlarged packs on display. In Wave 1, signage that used brand colors (or other identifiers but no written text) was observed in approximately half of venues (49%, n=142); this was reduced to approximately one-third of venues in Wave 2 (36%, n=80). Venues were observed for any product display including tobacco products visible from the street, the cashier area, or on a powerwall. In Wave 1 almost all venues (95%) displayed products; in Wave 2, 14% of venues had a product display.

Conclusions: Following the implementation of a comprehensive tobacco advertising and product display ban, there was a reduction in the number of retail environments selling tobacco. Very few examples of POS advertisements were observed with the near elimination of light boxes and enlarged packs—loopholes the industry exploited prior to this display ban. Following the June 1st implementation of the law, there was a dramatic reduction in the proportion of venues displaying products, however 14% of venues were not compliant with the display ban.

FUNDING: This work was supported by The Bloomberg Initiative to Reduce Tobacco Use.

JUSTIFICATION: This work may support other jurisdictions working on similar policy development, implementation, and evaluation of comprehensive tobacco advertising and promotion laws.

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POS4-16
A “RAPID-RESPONSE” SURVEILLANCE SYSTEM TO MONITOR YOUTH TOBACCO USE AND TOBACCO MARKETING: INTRODUCING THE TEXAS ADOLESCENT TOBACCO AND MARKETING STUDY (TATAMS)
Melissa Stigler, PhD; *, Joanne Delk, MS,1, Cristine Delnevo, PhD, Olivia Wackowski, PhD, Jane Lewis, PhD, Keryn Pasch, Ph.D; Alex Loukas, Ph.D; Cheryl Perry, Ph.D; UT Health, School of Public Health, Rutgers School of Public Health, UT Austin, Department of Kinesiology and Health Education,

TATAMS is a three-year, longitudinal cohort study of more than 5,000 youth (12-17 years old) living in the four largest cities of Texas (Houston, Dallas-Ft. Worth, San Antonio, Austin). Developed as a multi-component, “rapid-response” surveillance system, TATAMS is designed to further FDA’s understanding about the diversity of tobacco products used by youth and the impact of tobacco marketing practices on youth tobacco use. Data will be collected every 6 months and include (a) repeated web-based surveys; (b) objective audits of tobacco marketing at point-of-sale and in media; and (c) tobacco sales data using Nielsen’s Convenience Track System. This presentation will provide an overview of these quantitative and qualitative data sources, how they will be linked in the surveillance system, and how they will be analyzed. Special attention will be given to the development of the web-based survey, which recently underwent field testing to refine the data collection methods and measures to be used. Three rounds of cognitive interviews were conducted with 24 participants in Austin, Texas. Of these, 63% (n=15) were male, 58% (n=14) were non-White, and 71% (n=17) were Hispanic; the average age of respondents was 14 years. Measures were adapted from existing youth tobacco surveys (e.g., PATH, NYS) and refined based on extensive feedback gathered in the cognitive interviews. Few students were familiar with the term “little filtered cigars” and some were unfamiliar with the term “e-cigarette.” “Clippers” and “vape pens,” respectively, were identifiers youth used much more often. A variety of photographs were tested to help students correctly identify these tobacco products and others, like hookah and snus. Questions about the use of cigars and e-cigarettes needed to be more explicit, to separate out the use of these products for tobacco, rather than marijuana. When asked to report their exposure to tobacco advertising, youth often mistakenly reported exposure to counter-marketing campaigns, instead. Findings from TATAMS will inform future FDA communication campaigns and FDA rules about the manufacture, sales, and marketing of tobacco products.

FUNDING: Tobacco Regulatory Science Program, NIH/FDA

JUSTIFICATION: Findings from TATAMS will inform future FDA communication campaigns and FDA rules about the manufacture, sales, and marketing of tobacco products.

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POS4-17
CONSUMER PERCEPTIONS OF E-CIGARETTES: A COMPARISON OF SMOokers AND NON-SMOKERS IN A MECHANICAL TURK SAMPLE
Sebastian Bauhoff, PhD, Adrian Montero, MBA, Deborah Scharf, PhD, RAND Corporation, USC

Given plans to extend its regulatory authority to e-cigarettes, the Food and Drug Administration (FDA) Center for Tobacco Products (CTP) has immediate need for information about how e-cigarettes are perceived by the public. To contribute to this knowledge base, we used Mechanical Turk (MTurk), a “crowdsourcing” labor market platform, to rapidly survey a large (n=800), nationally representative sample of ever (44%) and never smokers (56%), with (28%) and without e-cigarette experience (67%). Data showed that smokers and non-smokers learned about e-cigarettes primarily through the internet and from conversations with acquaintances. Although smokers were more likely than non-smokers to believe that e-cigarettes help smokers quit (p<0.01), both held similar perceptions that e-cigarettes are less harmful than cigarettes despite being as addictive as traditional cigarettes. Smokers, however, were more likely to believe that e-cigarettes are less expensive than traditional cigarettes (p<0.01). Smokers and non-smokers also expressed different preferences for regulating e-cigarettes, with non-smokers preferring more restrictions on e-cigarette use indoors (p<0.001). Finally, among never-users of e-cigarettes, current smokers were more likely than non-smokers and former smokers to report that they would try e-cigarettes in the future (p<0.001). Coding of open-field responses showed that smokers’ top reason for wanting to try e-cigarettes was to quit or reduce smoking (56%) while non-smokers would try e-cigarettes because of curiosity (57%). In contrast, smokers’ top reason for not trying e-cigarettes in the future was health and safety concerns while non-smokers’ top reason was self-image (i.e., identifying as a non-smoker). Findings suggest that there are well-defined channels through which individuals learn about e-cigarettes and that many perceptions and beliefs about e-cigarettes are widespread. However, smokers and non-smokers have different reasons for wanting to try or avoid e-cigarettes. Public health messages designed to impact future e-cigarette use may need to be tailored separately to smokers and non-smokers.

FUNDING: No funding
Poster Session 4 • Friday, February 27, 2015 • 5:15 p.m.–6:45 p.m.

POS4-18
ADJUSTED ODDS OF CARDIOVASCULAR AND PULMONARY DISEASE AMONG MENTHOL VERSUS NON-MENTHOL CIGARETTE SMOKERS IN THE UNITED STATES: ANALYSIS OF NHANES, 1999-2012

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Available data from the National Health and Nutrition Examination Survey (NHANES, 1999-2012) were used to examine self-reported (i.e., “has a doctor or other health professional ever told you that you had...”) hypertension, myocardial infarction, congestive heart failure, stroke, and chronic obstructive pulmonary disease (i.e., emphysema, chronic bronchitis) among menthol compared to non-menthol cigarette smokers. NHANES provides data from a nationally representative sample of the non-institutionalized, civilian population in the United States. Individual data were available and analyzed for approximately 6,000-7,000 smokers (depending on the outcome), 20 years of age and older. Multiple logistic regression was used to assess the odds of the specified disease outcome among menthol compared to non-menthol smokers, controlling for relevant covariates, including age, gender, race/ethnicity, education level, body mass index, average number of cigarettes smoked per day, number of days smoked in the past 30 days, age of starting to smoke regularly, whether any other tobacco products were used in the past five days, and the poverty income ratio. Models were built using purposeful selection of covariates, and differed depending on the disease outcome. Analyses were performed overall and stratified by gender, age (i.e., 20 to 70 years, and >70 years), and race/ethnicity (i.e., non-Hispanic White, non-Hispanic Black, and Mexican American). Overall results indicate no statistically significant differences in any disease outcome in comparisons of menthol versus non-menthol smokers. Stratified analyses generally indicate no statistically significant differences, except for statistically decreased odds of myocardial infarction and congestive heart failure among non-Hispanic Black menthol compared to non-menthol smokers. These findings clarify inconsistencies in the literature with regard to the potential for menthol versus non-menthol cigarette use to differentially affect stroke incidence.

FUNDING: RAI Services Company

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POS4-19

Stephan Risi, MA*, Stanford University

Amid discussions about the benefits and dangers of electronic cigarettes, the one thing that both proponents and opponents of these devices agree on is their radical novelty. This paper challenges this sense of novelty by showing that very similar aerosol smoking devices have a history reaching back not ten or twenty years, but all the way to the 1960s. Specifically, it follows the history of ‘Ariel’, a secret project by British American Tobacco (BAT) to develop the first functional precursor of today’s e-cigarettes between 1962 and 1967.

Realizing that nicotine is addictive but also a potentially helpful tranquilizer, BAT sought to develop a healthier “cigarette” that could ensure the company a future, should cigarettes become regulated. By heating instead of burning tobacco, the scientists working on Ariel managed to produce an aerosol device that, by aerosol delivery, delivered nicotine without any tar or carbon monoxide while retaining the look and feel of a cigarette. After three years of development, BAT had succeeded in producing a number of prototypes and received two patents on aerosol smoking devices, but ultimately decided to abandon the project to avoid endangering its main product, cigarettes.

Despite this eventual failure, revisiting Ariel today affords us insights into past understandings of the relationship between smoking, nicotine, and addiction as the device invited some of the earliest reflection about questions like: ‘Can harm and addiction be separated?’. Furthermore, the hundreds of internal reports and memos about the development highlight how challenging it is conceive of a device to administer nicotine both a poison and an irritant to the lungs, belying the notion that e-cigarettes are ‘simple’ tools that just administer nicotine. But most importantly, revisiting Project Ariel counters the notion that electronic cigarettes are something radically new and rather highlights the fact that similar devices have a history reaching back more than half a century.

FUNDING: No Funding.

JUSTIFICATION: By highlighting the long history of devices similar to electronic cigarettes, this paper can encourage policy makers to not be overwhelmed by a sense of novelty and urgency, and to look for long-term solutions instead of short-term fixes for e-cigarettes.

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POS4-20
YOUTHS’ SHARING OF INFORMATION ABOUT TOBACCO AND E-CIGARETTES ON ONLINE AND OFFLINE PLATFORMS

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Background: The literature shows that conversations are an important platform for disseminating information that may result in both positive and negative smoking-related outcomes. Thus it is important to examine the way people diffuse information in the context of new media platforms and new products such as e-cigarettes. This study examines sharing patterns among youth, comparing information-sharing of tobacco and e-cigarettes on online and offline platforms.

We also examined whether sharing patterns differed among current tobacco and e-cigarette users, and whether sharers were likely to diffuse pro-smoking information.

Methods: In an online survey of 814 13-25 year old smokers and nonsmokers, we measured sharing behaviors with regard to 1) tobacco products (including cigarettes) and 2) e-cigarettes, as well as belief items which were combined to create a pro-smoking and pro-vaping scale. Cross-tabulations were used to examine sharing behavior among tobacco and e-cigarette users, and whether sharers of tobacco or e-cigarette information had higher pro-smoking/vaping beliefs.

Results: 30% of youth shared smoking/vaping-related information in general; of smokers/e-cigarette users, about 60% shared information. Youth are about 3-5 times as likely to share via interpersonal conversations rather than online platforms, depending on their smoking status. Roughly similar proportions of smokers and e-cigarette users shared information about tobacco (42% and 45% respectively), but twice as many e-cigarette users (51%) shared information about e-cigarettes than did cigarette smokers (23%). Overall, sharers were more likely to hold pro-smoking beliefs. E-cigarette sharers had higher pro-smoking and pro-vaping beliefs than tobacco sharers.

Conclusions: Product users share more than non-users, and have more positive views; we speculate then that the conversations in circulation are more pro than anti-smoking. These findings have implications for future anti-smoking/anti-vaping efforts.

FUNDING: Supported by TCORS grant # P50CA179546.

JUSTIFICATION: The findings of this study may affect future anti-smoking and anti-vaping efforts; not only should public health researchers and campaign developers continue to consider conversations as an important platform for information diffusion, but they should also be wary of the direction in which information-sharing could have effects.
POS4-22 UNDERSTANDING THE E-CIGARETTE LANDSCAPE: AN ENVIRONMENTAL SCAN OF POINT OF SALES AND WEBSITE FORUMS

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The introduction of electronic nicotine delivery systems (ENDS) into the United States has drastically changed the landscape of tobacco prevention and control. Using the Host, Agent, Vector, Environment (HAVE) model, we conducted a three-phase pilot study to assess environment (point of sales) and agent (ENDS) characteristics: 1) content analysis of web forum blogs to assess where ENDS are purchased; 2) environmental scans at brick and mortar POS to increase knowledge about ENDS product configurations; 3) development of novel survey measures about product awareness and use based on the environmental scans at POS. The objective of the present study is to present findings from phases 1 and 2. In May-June 2014, we identified POS where ENDS users purchased their devices. Content analysis of two separate online web was conducted. The following POS were identified places for purchasing ENDS (in order of frequency cited): Specialty Stores (vape, tobacco, smoke shops), Internet, Walmart, Gas Stations, Walgreens, Shopping Malls, convenience stores, grocery stores, Rite Aid. Using this list, a density map of POS within a 1-, 2- and 3-mile radius around 3 college campuses in Georgia were identified; 4 POS within 1-mile radius and 2 POS each within a 2- and 3-mile radius were selected to conduct the environmental scans. In June-August 2014, two graduate research assistants collected data from the selected POS through mobile pictures; data were entered into Excel spreadsheets. Analysis of the data indicated that during June-August 2014, five main configurations of ENDS products were being sold: 1) manufactured/ packaged products; 2) customizable ENDS (parts that can be assembled); 3) Do It Yourself (DIY); 4) zero nicotine electronic delivery systems (ZNEDS); 5) e-liquid vials. Findings indicate a diverse range of ENDS products are infiltrating the market at a rapid pace, requiring regulations on the sales and marketing of the products. In addition, the diversity of ENDS device warrants further research on awareness, use, and safety of the products, as well as, surveillance on the sales and marketing of ENDS.

FUNDING: This pilot study was funded under GSU’s Tobacco Center of Regulatory Science (FDA TCORS) R01 research project “Conducting Consumer Behavior, Risk Perception and Media Research on Novel Tobacco Products” and was supported under GSU’s Tobacco Center of Regulatory Science (FDA TCORS) RO1 research project “Conducting Consumer Behavior, Risk Perception and Media Research on Novel Tobacco Products” and was supported by Grant Number: 1P50DA036128-01.

JUSTIFICATION: The environmental scan of electronic nicotine delivery systems (ENDS) at point of sales will provide an assessment of the various products sold and the development of detailed survey measures, which may have potential translational applications for both policy and public health.

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POS4-23 HEALTH CARE PROVIDER’S ADVICE TO QUIT—DOES IT WORK FOR ADOLESCENT SMOKERS? A PROPENSITY SCORE MATCHING APPROACH

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Research on the influence of health care provider advice on quit attempts among smoking adolescents has shown mixed results. These results may be due to selection bias—adolescent smokers who get advice may be different from those who do not on a range of confounding factors including age of initiation, attitudes toward smoking, smoking intensity, exposure to other anti-tobacco messages, and number of smoking friends. Additionally, the effects of advice on quit attempts may be different between age categories. The present study used propensity scores to match participants to reduce selection bias and, in effect, determine a robust measurement of the association between health care provider advice and past-year quit attempts among early, mid, and late adolescent smokers. This study used self-reported data from the 2011 National Youth Tobacco Survey, a nationally representative cross-sectional survey of U.S. middle and high school students (adolescents). For each adolescent age category, multivariate logistic regression models were used to examine associations between health care provider advice and quit-attempts, while controlling for confounders in the full (pre-match) sample and a smaller (post-match) sample created by propensity score matching. There was a significant association between receiving advice from a health care provider and past-year quit attempts among mid adolescents in both the pre-match (OR=1.40) and post-match (OR=1.50) samples. The odds ratio increase after matching suggests that the pre-match sample estimate underestimated the relationship between provider advice and past-year quit attempts, due to sample selection bias. Relationships between health care provider advice and quit attempts were not significant in either the pre or post-match samples for early or late adolescents. Propensity score matching reduced the bias in the post-match sample and provided a more robust estimate of the influence of provider advice on past-year quit attempts among mid adolescents, compared to the pre-match estimates. Results suggest that counseling from health care providers is an important intervention to promote quitting-behavior, especially among mid adolescents.

FUNDING: No Funding

JUSTIFICATION: This study adds to the justification for health care provider screening and smoking-related advice among adolescents; a low-cost intervention that could greatly impact smoking rates among adolescents.

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POS4-24 CIGARETTE SMOKING AND RISK OF ALCOHOL USE RELAPSE AMONG ADULTS IN RECOVERY FROM ALCOHOL USE DISORDERS

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Background: Individuals in recovery from alcohol use disorders (AUDs) frequently continue to smoke cigarettes. The purpose of this study was to examine the relationship between cigarette smoking status and risk of AUD relapse in adults with remitted AUDs among adults in the United States.

Methods: Data were drawn from Wave 1 (2001-2002) and Wave 2 (2004-2005) of the National Epidemiologic Survey on Alcohol and Related Conditions. Analyses included the subsample of respondents who completed both waves of data collection reported a history of alcohol abuse and/or dependence prior to Wave 1 (N=9134). Relationships between Wave 1 cigarette smoking status (smoker, non-smokers) and Wave 2 alcohol use, abuse, and dependence were examined using logistic regression analyses. Analyses were adjusted for demographics; mood, anxiety, and substance use disorders; nicotine dependence; and AUD severity.

Results: Use of cigarettes at Wave 1 was associated with alcohol use, abuse, and dependence at Wave 2 among those with remitted AUDs at Wave 1, and these relationships remained significant in most cases after adjusting for demographics, psychiatric disorders, substance use disorders, and AUD severity. Meeting criteria for nicotine dependence was not significant covariate in the relationship of smoking and Wave 2 AUDs.

Conclusions: Among adults with remitted AUDs, use of cigarettes was associated with significantly increased likelihood of alcohol abuse and dependence three years later. Concurrent treatment of cigarette smoking when treating alcohol use disorders may help improve long-term alcohol outcomes and reduce the negative consequences of both substances.

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Conclusions: Among adults with remitted AUDs, use of cigarettes was associated with significantly increased likelihood of alcohol abuse and dependence three years later. Concurrent treatment of cigarette smoking when treating alcohol use disorders may help improve long-term alcohol outcomes and reduce the negative consequences of both substances.
POS4-25
NUMBER OF CIGARETTE SMOKED AND NICOTINE ADDICTION LEVELS NOT ASSOCIATED WITH DAILY VAPING AMONG KOREAN AMERICAN YOUNG ADULT DUAL USERS

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Background: E-cigarette (EC) use among combustible cigarette (CC) smokers (i.e., dual use) has been implicated as one method of decreasing CC use, as EC may ‘substitute’ for CC via pharmacological/sensoromotor satiation needed by dependent smokers. Korean American (KA) young adults are at high risk for dual use in particular, given their more prevalent CC use relative to other ethnic minorities. However, the research examining dual use has shown inconsistent results and most available studies have involved between-subject designs. To address whether EC use facilitates reductions CC among dual users, studies using within-subject designs are needed. In the current daily diary study, we examine whether EC use is associated with number of CC use during that day. Based on substitution hypothesis, we anticipated a negative relationship between EC use and daily number of CC smoked, and explored whether this relation was moderated by nicotine dependence level.

Methods: Seventy eight KA young adults participate in a 7-day ecological momentary assessment study. As part of the study protocol, participants also completed daily survey at the end of the day, at which point participants were asked whether they had used any alternative tobacco product, including EC. Generalized linear mixed model was used to examine whether within-participant variation number of CC smoked, between-subject variance in dependence, and their interaction were associated with EC use the same day.

Results: Controlling for covariates, level of nicotine dependence was not associated with the likelihood of daily EC use across the seven days (est=-.81, p=.23). Variation in number of CC smoked within-participants was not associated with EC use on that day (est=.15, p=.88). The interaction between dependence score and within-person number of CC was not significant (est=.02, p=.86).

Discussion: Using a within-subject study, the hypothesized negative association between EC and CC use was not observed. Given that these findings may be unique to KA young adult population who, in comparison to some other populations, may be less dependent on nicotine and have cultural contexts likely condone smoking.

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JUSTIFICATION: E-cigarette use may not facilitate reductions in combustible cigarette use among dual users.

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POS4-26
PREFERRED FLAVORS AND REASONS FOR USE AND DISCONTINUED USE OF TOBACCO PRODUCTS AMONG USERS, FORMER USERS, AND NONUSERS

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Objectives: To examine preferred flavors and reasons for use and discontinued use of alternative tobacco products among users, former users, and nonusers.

Design/Methods: We recruited 1567 participants aged 18-34 years through Facebook ads targeting tobacco users and nonusers in August 2014 to complete an online survey assessing sociodemographics, tobacco use, preferred flavors, and reasons for use and discontinued use of tobacco products.

Results: Our sample was an average of 25.17 (SD=5.09) years old, 49.6% male, 87.0% White, 13.1% Hispanic, and 53.2% never married. Current use rates were as follows: 56.3% cigarettes, 53.1% e-cigarettes, 16.5% hookah, 20.5% small cigars, and 5.9% smokeless tobacco. Across all products, nonusers of each product reported being most likely to try the product in fruit flavors (e-cigarettes 38.8%, hookah 66.9%, small cigars 30.3%, smokeless tobacco 21.7%). Similarly, users of each product reported using fruit flavored tobacco/nicotine product (e-cigarettes 66.9%, hookah 88.8%, small cigars 21.7%), with the exception of smokeless tobacco users, who most commonly used menthol or mint flavored (67.4%). However, 29.3% of e-cigarette nonusers, 37.6% of hookah nonusers, 46.1% of small cigar nonusers, and 62.1% of smokeless tobacco nonusers reported not being interested in using them. A dominant theme regarding reasons for use across tobacco products was flavor. 60.2% of e-cigarette users, 65.9% of hookah users, 45.2% of small cigar users, and 28.3% of smokeless tobacco users reported that “because they come in appealing flavors” was a reason for use; 53.2% of e-cigarette users, 51.2% of hookah users, 29.3% of small cigar users, and 15.2% of smokeless tobacco users said that they “like experimenting with various flavors.” Interestingly, 20.3% of former e-cigarette users, 33.4% of small cigar users, and 32.1% of smokeless tobacco users said that they did not use them recently because they “don’t like the flavor.”

Conclusions: Flavors play an important role in reasons for use, and sweet flavors, particularly fruit flavors, are highly preferred. Regulating flavors may impact uptake by young adults.

FUNDING: This research was supported by the National Cancer Institute (1K07CA139114-01A1; PI: Berg) and the Georgia Cancer Coalition (PI: Berg).

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POS4-27
READINESS AND CAPACITY OF U.S. LUNG CANCER SCREENING SITES TO DELIVER TOBACCO USE TREATMENT (TUT)

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Lung cancer screening using low dose helical computed tomography (LDCT) is now widely recommended for adults 55-80 who are current or former heavy smokers. In addition to early detection, annual lung cancer screening provides an unprecedented opportunity to reach smokers and deliver evidence-based smoking cessation interventions. However, little is known about the current status of tobacco use treatment (TUT) delivery in lung cancer screening programs.

We constructed survey items based on current tobacco treatment guidelines and existing surveys measuring readiness and capacity of health care settings to deliver evidence-based tobacco use treatment. We administered the online survey to a purposive national sample of site coordinators from 152 lung cancer screening sites to determine the capacity and readiness to deliver evidence-based tobacco use treatment.
facilities within the United States that have pledged adherence to best practices for delivery of high quality lung cancer screening. Response rate (61%) was very good (n=93 respondents).

Most respondents reported that, at the initial screening visit, a majority of their patients are asked about their current smoking status (96.8%) and current smokers are advised to quit (81.7%). However, tobacco treatment assistance appears suboptimal with fewer (57%) respondents reporting that a majority of their patients received cessation counseling or were referred to the Quitline (60.2%) and even fewer (36.6%) reporting that cessation medications were recommended to a majority of their patients. Respondents reported offering significantly less TUT during follow-up screening visits. Barriers to TUT delivery include lack of sufficient knowledge of the PHS guidelines, lack of time, lack of reimbursement for services, and lack of institutional support. However, despite these apparent gaps in TUT delivery, respondents indicated strong endorsement for integrating best practices for smoking cessation into lung cancer screening programs.

Our findings underscore the importance of addressing barriers to TUT delivery in lung cancer screening sites. This study provides a quality of care benchmark for subsequent dissemination and implementation efforts to integrate tobacco cessation treatment into routine lung cancer screening.

FUNDING: MSK Society Funds

JUSTIFICATION: Despite current gaps in tobacco treatment delivery, lung cancer screening sites represent promising venues for promoting smoking cessation among screening enrollees.

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**POS4-28**

IMPLEMENTING 'STOP SMOKING IN ITS TRACKS': A CESSATION PROGRAM FOR PREGNANT ABORIGINAL WOMEN

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Background: Smoking during pregnancy among Australian Aboriginal women remains three times the rate among non-Indigenous women. There have been no published trials of interventions successfully supporting pregnant Aboriginal women to quit. ‘Stop Smoking in Its Tracks’ is a comprehensive cessation program designed with and for pregnant Aboriginal women, with both motivational support and strategic support (advise on strategies to assist quitting) components. The feasibility and acceptability was assessed in a small pilot study. This paper presents data on implementation of the program and tests whether implementation rates relate to quitting behavior.

Design: The program was implemented by antenatal services caring for pregnant Aboriginal women in two sites. Data was collected by providers on specially designed forms. Implementation scores were calculated for motivational support and strategic support provided. Self-reported quitting was validated by expired CO. Associations between quitting behaviors and implementation scores were tested using chi-square tests.

Results: 22 of 38 eligible women enrolled in the program with 19 completing the program. Among women completing the program, implementation rates were: 17 (89%) received | 4 of 5 motivational components; and 10 (56%) received | 4 of 5 strategic components. Receipt of | 4 motivational components was significantly associated with number of quit attempts and successful quitting for | 24 hours (CO confirmed). Receipt of | 4 strategic components was associated with quit attempts, successful quitting for | 24 hours and prolonged quitting at 36 weeks gestation (CO confirmed).

Conclusions: Quitting behavior was related to degree of program implementation, with both motivational and strategic components important in this small pilot study. Larger trials are warranted with efforts to increase implementation of strategic elements of the program and further assessment of the role of different elements in successful quitting.

FUNDING: Supported by a grant from the Australian Commonwealth Department of Health and Ageing. Dr Passey receives salary support from the NHMRC, the Cancer Institute of NSW and the Sydney Medical School Foundation.

**POS4-29**

CONCURRENT MARIJUANA AND TOBACCO USE: MODES OF USE AND PERCEPTIONS OF THE EFFECTS OF CONCURRENT USE

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In light of changing marijuana policies and high rates of concurrent use with other substances, we examined concurrent use of marijuana, tobacco, and alcohol; modes of use; and perceptions of marijuana's effect on the effects of alcohol and tobacco. We recruited 1567 participants aged 18-34 years via Facebook ads targeting tobacco and marijuana users and nonusers in August 2014 to complete an online survey assessing these factors. We computed frequencies and means and used chi-square tests and ANOVAs to compare findings across groups. The sample was an average of 25.2 (SD=5.1) years old, 49.6% male, and 87.0% White. Current use rates were: 41.4% marijuana, 81.7% any tobacco (56.3% cigarettes, 53.1% e-cigarettes, 16.5% hookah, 20.5% small cigars, 5.9% smokeless tobacco), and 69.7% alcohol. Average days of marijuana use in the past month among users was 17.9 (SD=11.3) Tobacco and alcohol use rates were higher among marijuana users vs. nonusers (69.5% cigarettes, 31.4% small cigars, 27.4% hookah, 7.7% smokeless tobacco, 77.3% alcohol; p<.01), with the exception of e-cigarettes (52.4%). While 32.2% reported smoking marijuana in a water pipe with tobacco, 12.3% vaporizing marijuana with tobacco, and 72.4% rolling marijuana in cigar papers with tobacco in their lifetime, few marijuana users reported commonly using tobacco and marijuana these ways (2.5%, 0.6%, and 3.7% respectively). Most smoked marijuana in a bowl, as a joint, or in a waterpipe without tobacco (77.0%, 47.6%, and 44.5%, respectively). While only 12.5% and 31.1% of marijuana users reported always or sometimes using marijuana when drinking alcohol, respectively, 32.5% and 27.0% of marijuana users reported always or sometimes using marijuana while using tobacco, respectively. However, 58.4% indicated that marijuana enhances alcohol's effects, whereas 36.0% reported that marijuana enhances nicotine's effects. The patterns and modes of use of tobacco, marijuana, and alcohol in the young adult population are unclear. Despite reports of commonly using marijuana when using tobacco, only one-third agreed that marijuana enhances the effects of nicotine.

FUNDING: This research was supported by the National Cancer Institute (1K07CA139114-01A1; PI: Berg) and the Georgia Cancer Coalition (PI: Berg).

JUSTIFICATION: The patterns and modes of use of tobacco and marijuana in the young adult population are unclear. Despite reports of commonly using marijuana when using tobacco, only one-third agreed that marijuana enhances the effects of nicotine.

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**POS4-30**

USING A MODIFIED REASONED ACTION APPROACH MODEL TO ASSESS INTENTION TO QUIT TOBACCO

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Media communication campaigns are one of the primary means used to prevent the initiation and encourage the cessation of tobacco use. Behavior change theories are a useful tool to design and evaluate such campaigns. One common behavior change theory used to design and evaluate tobacco cessation campaigns is the Reasoned Action Approach (RAA). The theory posits that decreases in tobacco
use are expected to result from changes in intention to quit tobacco, which in turn is a product of perceived norms, attitudes, perceived behavioral control, and beliefs regarding smoking. Although the theory is used frequently by tobacco campaign evaluators, at least three notable problems exist with the Reasoned Action Approach as it relates to tobacco cessation media campaigns. One, it underestimates the impact of social norms on intention to quit tobacco. Two, it does not include a measure of campaign awareness. Three, there is a lack of understanding among health campaign planners on how to best utilize the theory in campaign design and evaluation. The present research uses a modified version of the RAA to assess key determinants of intention to quit tobacco among a statewide, representative sample of tobacco users. Using structural equation modeling, results suggest that injunctive social norms (β=0.42) most strongly informed tobacco users’ intention to quit tobacco, and that the inclusion of campaign awareness and a measure of social norms allows for additional explained variance. Results are discussed in terms of their implications for both scholars and health campaign professionals.

The study suggests theoretical modifications to the RAA that contributes to existing behavior change research on tobacco cessation media campaigns. It also clearly demonstrates how health campaign professionals can effectively implement the model into a professionally run campaign. In sum, the modified model employed in the study offers evaluators a more complete understanding of how to assess a tobacco cessation media campaign's impact on intention to quit tobacco while simultaneously adding to a growing body of academic literature aimed at advancing existing behavior change theories.

FUNDING: No funding.

JUSTIFICATION: This study directly demonstrates how tobacco media campaign practitioners can implement behavior change theory to design and evaluate tobacco cessation campaigns.

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PO4-31
QUIT4BABY: RESULTS FROM A PILOT TEST OF A MOBILE SMOKING CESSATION PROGRAM FOR PREGNANT WOMEN

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Background: Text messaging programs on mobile phones have shown some promise in helping adult smokers quit smoking. This study describes the results of a pilot test of Quit4Baby, a text messaging program for pregnant smokers enrolled in text4baby.

Methods: Pregnant women enrolled in text4baby and who were current smokers or had quit within the last 4 weeks (N=20) were enrolled in the Quit4Baby pilot. Participants were surveyed at baseline and at 2 and 4 weeks post-enrollment.

Results: The majority of participants responded to the program favorably; highly rated aspects included the content of the program, skills taught within the program, and encouragement and social support provided by the program. On average, users made 5.4 responses to the texts throughout the program and no participants unenrolled. Participants agreed and completely agreed that the program was helpful in quitting (M=4.5; SD=0.60), that the program gave good ideas on quitting (M=4.4; SD=0.90), and that they would recommend the program to a friend (M=4.7; SD=0.70). Participants rated programmatic messages and the following message categories were deemed most helpful: messages that promoted behavioral substitutions (e.g. core messages aimed at providing alternative healthy behaviors to replace smoking, or responses to participant-input TIP keyword) (M=4.3; SD=1.20). Participants reported smoking an average of 7.6 cigarettes per day at baseline, which decreased to 4.7 cigarettes at 2-week follow up, and 2.4 cigarettes at 4-week follow up. Self-reported seven-day abstinence also increased from 5% at baseline, to 25% at 2-week follow up, and 35% at 4-week follow up.

Conclusions: The pilot test provides support for the feasibility of Quit4Baby, a text-based service to help pregnant smokers quit. Suggestions for improvement included increasing the message dose and making the program “quitpal” more interactive. Future studies are needed to assess whether Quit4Baby is effective for pregnancy smoking cessation.

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JUSTIFICATION: This study has the potential to (1) build a new bridge between established programs in text messaging for smoking cessation, pregnancy smoking cessation, and educational text messaging to pregnant women; (2) increase the reach of smoking cessation programs that are specifically targeted to pregnant smokers by making use of the subscriber base of one of the largest public health text messaging programs, namely text4baby; and (3) provide a new approach in the design and delivery of pregnancy smoking cessation programs.

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PO4-32
ACADEMIC MEDICAL CENTER EMPLOYEES’ VIEWS OF TOBACCO USE AND POLICY CORRELATE WITH TOBACCO INDUSTRY TIES

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Tobacco use is the leading cause of preventable mortality in the US, yet 18% of Americans as well as 16% of healthcare employees still smoke. We hypothesized that healthcare workers in the home town (Winston-Salem, NC) of RJ Reynolds Tobacco Company (RJR) who smoked or had personal or professional ties to the company would view the company more positively and smoking more leniently, affirming the corporate influence of RJR on the culture of tobacco at an academic medical center. Methods: The study was carried out at Wake Forest Baptist Medical Center (WFBMC) and also by review of relevant artifacts and web-sites. Focus groups of employee smokers and non-smokers informed an 11-item questionnaire that was distributed to 30 smokers and 30 former and non-smokers. Results: WFBMC has a history of past support by RJR with past donations of land, buildings and construction capital. Artifacts at WFBMC revealed RJR support and positive comments about RJR. Current smokers, as well employees with RJR ties, strongly agreed/agreed that WFBMC “owes its success to RJ Reynolds” and that “it was wrong for WFBMC to implement its [census-wide] smoke-free policy after having accepted significant monetary support from RJ Reynolds.” Current smokers also strongly agreed/agreed that smokers’ “needs and opinions...should have [been] considered before [WFBMC] implement[ed] its smoke-free policy.” Current smokers as well employees with RJR family ties strongly agreed/agreed that patients and visitors “should be provided with an easily accessible place to smoke.” Logistic regression revealed that agreement with these statements and lower educational levels predicted current smoking. Conclusion: The tobacco industry in general enhances public goodwill through “corporate social responsibility,” e.g., sponsoring events or supporting respected public causes or organizations. Our work shows that even an academic medical center’s workforce (both smokers and nonsmokers) can be influenced by tobacco industry community and medical center support.

FUNDING: Intramural Medical Student Research Program, Wake Forest School of Medicine

JUSTIFICATION: Tobacco control experts should be aware that the tobacco industry’s support of respected public causes and organizations successfully burnishes its image, even among health care workers at an academic medical center.

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POS4-34
CANADIAN OPTOMETRY STUDENTS REPORTED ENGAGEMENT WITH TOBACCO USE PREVENTION AND CESSATION

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Introduction: Smoking contributes to a range of eye diseases including age-related macular degeneration (AMD) and cataract. The current study surveyed senior optometry students in Canada to understand their attitudes and current practices addressing tobacco use with their patients.

Methods: Optometry students, who provide patient care, from both of Canada’s Doctor of Optometry programs (Université de Montréal and University of Waterloo) were emailed an invitation with a link to a web-based survey. No incentives were provided.

Results: The survey was completed by 61 respondents (response rate of 23%). Smoking was believed to be associated with AMD and cataract by 100% and 54% of respondents, respectively. Most respondents (82%) reported they regularly or always advise patients to quit using tobacco. The most commonly reported support provided for patients who smoke was the recommendation that they talk to their family physician about quitting (34%). Few respondents (28%) reported that they were familiar with cessation services that were available in the community. Almost all respondents (98%) reported that they were interested in learning more about how to help patients quit smoking, and most (95%) reported they were interested in a continuing education program after graduation that focused on providing specific smoking prevention and cessation advice to their patients.

Conclusions: Canadian optometry students are aware of some of the impacts of smoking on ocular health; however, most respondents do not know how to connect their patients with cessation resources in their community or engage in specific cessation education. There is a deep interest among optometry students to learn more about how to address tobacco use with their patients.

FUNDING: Funding for the survey was provided by Health Canada’s Federal Tobacco Control Strategy. The Propel Centre for Population Health Impact is supported by a major program grant from the Canadian Cancer Society Research Initiative (CCSR grant #701019).

JUSTIFICATION: Health care practitioners can play an important role in addressing tobacco use—encouraging and supporting cessation as well as playing a role in prevention. Optometrists and other eye health specialists are well positioned to address tobacco use; however, little is known about their current behaviours or what some barriers might be to engaging with patients on the subject of tobacco.

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POS4-35
SOCIAL/ENVIRONMENTAL FACTORS ARE ASSOCIATED WITH SMOKING CESSATION IN A DIVERSE SAMPLE OF MOTHERS IN CALIFORNIA

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Background: Extant research has not examined how race/ethnicity impacts quitting among women, and limited research has examined which factors are associated with quitting beyond the peripartum period. The current study examined the influence of race/ethnicity and social/environmental factors on quit rates among a population-based sample of mothers aged 20-57 in California.

Methods: We used cross-sectional data from a follow-up survey designed to examine disparities in cancer risk behaviors. Data from 542 women who reported smoking at least 100 cigarettes in their life were used. Variables examined included neighborhood poverty, current income, change in income, smoking in the home, friends who smoke, discrimination, emotional support, practical support, financial support, food insecurity, neighborhood safety, and perceived stress.

Results: Quit ratios were high, from a low of 40.5% for black women to a high of 82% among foreign-born Latinas (total sample=72.5%). Black women were significantly less likely to quit compared to white women (odds ratio [OR]=0.22, 95% confidence interval [CI]=0.12-0.43). This disparity remained after accounting for education, age and partner status (OR=0.47, 95% CI=0.23-0.98). Controlling for race/ethnicity, education, age and partner status, social/environmental variables were tested in separate logistic regressions. Allowing persons to smoke in the home, having a majority of friends who smoke, perceptions of one’s neighborhood as somewhat or very unsafe, and food insecurity were each associated with decreased odds of quitting. These variables were entered into a single model with covariates to examine their unique association with quit status. Only having a majority of friends who smoke remained significant (OR=0.22, 95% CI=0.11-0.41).

Conclusions: Black women and unpartnered women experience a notable disparity in quitting not fully accounted for by demographic variables previously shown to be important to cessation. Whether quitting influenced a change in social networks or vice versa cannot be determined here, but results demonstrate that social networks may be very important to the process of smoking cessation among women.

FUNDING: This work was supported by a grant from the American Cancer Society (RSGT-11-010-01-CPPB) to C. Cubbin and a grant from the National Cancer Institute (K01 CA157689) to Y. Castro.

JUSTIFICATION: the current study can inform targets of treatment among female smokers and thus has implications for treatment development.

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POS4-36
USE AND EXPERIENCES OF E-CIGARETTES IN A DARK MARKET

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New Zealand does not allow the sale or advertising of nicotine-delivering e-cigarettes (ECs), though individuals may import ECs for personal use. Although smokers report strong interest in ECs and regulators face pressure to liberalize current policy, debate continues over whether doing so would accelerate or impede progress towards NZ’s goal of becoming smokefree by 2025. Few NZ studies have explored EC trial, continued use, or motivations for and determinants of these behaviors; nor have regulatory options been explored with smokers and non-smokers. To examine these questions, we conducted an on-line survey (N=833) of smokers (daily n=335; intermittent n=73) and non-smokers (former n=160; never n=265).

Among smokers, 65% (±4.6%) had heard of, and 31% (±4.5%) had used, ECs (cf. 37% and 34% who had used nicotine patches and gum, respectively). Curiosity was the main motivation for trial (61% ±6.6%), but a third of ever EC users cited a desire to reduce use of smoked tobacco or to quit. The most common reasons for
POS4-37
INFORMING MEDIA STRATEGIES TO INCREASE QUITLINE UTILIZATION

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Media campaigns are an effective strategy for promoting calls to state Quitlines. Recent research suggests that ads eliciting strong emotions and using graphic imagery may be especially effective in driving calls to state Quitlines, as illustrated by the CDC's federal Tips From Former Smokers campaign. In Connecticut, calls to the Quitline increased dramatically during the first year of the Tips campaign.

In 2012 the Connecticut (CT) Tobacco Use Prevention and Control Program was allocated $2 million for a tobacco counter-marketing campaign using Tips ads. The CT Tobacco Program contracted with a private media vendor to design and execute a culturally competent, integrated statewide tobacco use cessation-focused media campaign intended to drive calls to the Quitline, targeting adults from groups that experience disparities in tobacco use and tobacco-related disease. The campaign launched in November, 2013 and included a mix of English and Spanish language Tips ads, tagged with CT Quitline information on TV, radio, print magazines, online, and in venues such as bus shelters and movie theaters.

As part of a comprehensive evaluation of the overall tobacco control program in Connecticut, we conducted a series of focus groups with smokers. The focus groups were designed to inform strategic campaign modifications during its second year that would expand campaign reach and support strong Quitline call volume. We report findings on:
1. The impact of Quitline knowledge and perceptions on motivation to use the service;
2. Awareness and perceptions of existing tobacco cessation media campaigns;
3. Reactions to novel ads from other state campaigns (available through the CDC Media Campaign Resource Center);
4. And, the extent to which selected media messages elicit and strengthen motivation to make a quit attempt and/or utilize the Quitline.

Findings may be useful to other states working to augment federal media campaign efforts and effectively use state-based campaigns to increase Quitline utilization.

FUNDING: Connecticut Department of Public Health
POS4-40
DIFFERENCES IN TOBACCO PRODUCT USE AMONG PAST MONTH ADULT MARIJUANA USERS AND NON-USERS: FINDINGS FROM THE 2005-2012 NATIONAL SURVEY ON DRUG USE AND HEALTH

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Individuals who use marijuana (MJ) are more likely than those who do not to use tobacco. As a primarily smoked substance, it is unknown how policies making MJ use legal may further impact tobacco use, or use of specific tobacco products. The purpose of this study was to assess differences in combusted vs. non-combusted and individual tobacco product use between past month MJ users and non-users. Trends in overall tobacco use and use of specific tobacco products among MJ users are also explored.

Data were obtained from 449,668 adults participating in the 2005-2012 National Survey on Drug Use and Health, a cross-sectional, household interview survey conducted annually. Data from the three most recent survey years (2010-2012) were used to assess differences in the prevalence of various tobacco products, by past month MJ status. Data from all years were used to assess trends in overall tobacco use, combusted tobacco use, and use of cigarettes, cigars, and blunts among MJ users; linearity and trend significance were assessed using orthogonal polynomial regression models.

From 2010-2012, the prevalence of any past month tobacco use among past month MJ users was 79.0% (vs. 25.6% for non users, p<.0001); 77.8% of past month MJ users reported past month combusted tobacco use (vs. 23.7% of non-MJ users, p<.0001). By product, 61.0% of past month MJ users reported past month cigarette use, 41.6% reported past month blunt use, and 20.5% reported past month cigar use. Trends in past month combusted tobacco use and combusted tobacco use by MJ users decreased significantly between 2005 and 2012 (p<.05 and p<.0001, respectively). Trends in past month cigarette use and cigar use also decreased, while trends in past month blunt use remained stable.

While past month tobacco use declined among past month MJ users from 2005 to 2012, levels of overall and combusted tobacco use remain significantly higher than those of non-MJ users. Interventions to support MJ users in quitting tobacco are needed.

FUNDING: No Funding

JUSTIFICATION: The prevalence of tobacco use, overall, and by product, remains significantly higher among marijuana users vs. non-users; as legalization policies increase the acceptability of marijuana use, interventions to support marijuana users in quitting tobacco are needed.

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POS4-41
THE EX SMOKERS HALL OF FAME INITIATIVE: THE PHILADELPHIA EXPERIENCE

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In the past 4 years, smoking has declined by 15% among adults in Philadelphia. Most ex-smokers have never been publicly acknowledged for their accomplishment, nor have their successes been highlighted to inspire current smokers in their quit attempts.

In 2013, the Philadelphia Department of Public Health developed the “Ex-Smokers Hall of Fame” (ESHOF), highlighting the stories of municipal employees who quit smoking. Participants were recruited via email, and 18 of about 50 submissions were chosen to highlight compelling quit-stories and reflect diversity in race, gender, and occupation. Videos were recorded to capture 4 components of their smoking histories: 1) initiation, 2) smoking patterns, 3) cessation attempts, and 4) post-cessation well-being.

These stories were then disseminated through a website, social media, a Mayoral press conference, and a traveling photo exhibit-reaching 1.6 million people. At least 3 other large local employers are planning their own ESHOF campaigns as a result of this effort.

Key themes emerged from a content analysis of the 18 participants’ stories. Most began smoking in their teens due to peer influences. The average number of years of smoking was 27. Ex-smokers reported between 1 and “hundreds” of unsuccessful prior quit attempts. The motivations for quitting were to avoid worsening of one’s own health, to protect children’s health, and/or as a result of experiencing the smoking-related death of a family member. While quit methods varied, only a few reported use of an FDA-approved smoking cessation medication. The majority quit “cold turkey” and utilized a wide range of strategies, including tapering, formal or informal cessation counseling, and prayer. Many highlighted their improved overall health since quitting, including exercising and making dietary changes.

The ESHOF captured and highlighted the diverse nature of smokers’ life-courses, particularly the importance of health events in motivating quit attempts and the frequency and diversity of unaided quitting. These findings have implications for tobacco control programming and have already been incorporated into broader social marketing campaigns locally.

FUNDING: Funding for this project was made possible by funding from the PA Department of Health

JUSTIFICATION: The Ex Smokers Hall of Fame Initiative is adaptable in a number of public health settings and provides an excellent opportunity to highlight and promote tobacco policy and control efforts.

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POS4-42
NATIONAL TRENDS IN NONDAILY SMOKING PATTERNS AND RELATION TO QUIT ATTEMPTS: THE NATIONAL HEALTH INTERVIEW SURVEY, 2000-2012

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Introduction: Nondaily smokers comprise those with varying smoking patterns, including almost daily smokers and very infrequent smokers. These patterns may be differentially associated with quit attempts and quitting. This study assessed how nondaily smoking frequency (number of days/month) and amount (cigarettes per day [cpd]) have changed over time. The relationship between each nondaily smoking frequency-amount group and past year quit attempts was also explored.

Methods: Data were obtained from 15,252 adult nondaily smokers participating in the 2000-2012 National Health Interview Survey, a cross-sectional, household interview survey conducted annually. A nondaily smoking frequency-amount variable was created by combining the frequency of days smoked in the past 30 (1-7, 8-14, and 15-29 days) with cpd on smoking days (1-2, 3-5, and 6+ cpd). Weighted Least Squares regression was used to estimate trends over time, by frequency-amount group, and sex. We used logistic regression of pooled data to assess the relationship between each group and making a past year quit attempt.

Results: Among both male and female nondaily smokers, the proportion of frequent-light smokers (15-29 days, 1-2 cpd) increased significantly over time while the proportion of frequent-heavy smokers (15-29 days, 6+ cpd) decreased. Trends for other nondaily frequencies were not significant. In pooled analyses, frequency-amount group was significantly associated with making a past year quit attempt, with the adjusted odds of trying to quit generally increasing as frequency and amount of smoking increased. Compared to frequent-heavy smokers,
frequent-light smokers had 30% lower odds of making a past year quit attempt (p<.0001). Individuals in the frequent-light smoking group tended to be younger, with a higher percentage of black or Hispanic individuals than most of the other frequency-among-groups.

Discussion: At a population level, frequent-light nondaily smoking appears to be growing while frequent-heavy nondaily smoking is declining. Enhanced public health and clinical interventions are needed to address the lower quit attempt rate among frequent-light smokers.

FUNDING: There are no funding sources to declare for this work. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

JUSTIFICATION: Enhanced clinical and public health interventions are needed to address differential quit attempt rates among nondaily smokers based on the frequency and amount of nondaily smoking.

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Poster Session 4 • Friday, February 27, 2015 • 5:15 p.m.–6:45 p.m.

POS4-43
CHALLENGES OF ASSESSING ENDS USE AMONG COLLEGE STUDENTS: RESULTS FROM COGNITIVE INTERVIEWS

Sherman Chow, MPH, MA**, Josephine T. Hinds, BS1, Alexandra Loukas, PhD2, Kerin E. Pasch, PhD, MPH2, Cheryl Perry, PhD2, Cristina Delineo, PhD, MPH2, Olivia Wackowski, PhD, MPH3, University of Texas, Kinesiology and Health Education, 2109 San Jacinto D3700, on the challenges and importance of accurately measuring ENDS use. The findings from this study could inform and guide researchers to more accurately measure ENDS use, and help prevent the growing trend of customizable e-liquid. Valid and reliable measures of ENDS use are needed, especially in light of the changing landscape of these products. The growing trend of customizable e-liquid adds yet another level of complexity to this issue highlighting the need for additional research.

RESULTS: Each round. Of the 18 students, 11 were past 30-day users, eight used ENDS at some point, of which 14 items assessed quantity and frequency of ENDS use. Cognitive interviews were conducted in three rounds, and the survey was revised after each round. Of the 18 students, 11 were past 30-day users, eight used ENDS that required e-liquid, two used disposable e-cigarettes, and 1 used both types. Results:

Results indicated that users could readily report ever use and past 30-day use (i.e., frequency or number of days used) of ENDS, and brand of disposable ENDS products. However, quantifying average daily use of e-liquid was difficult because of inconsistent reporting across respondents. Items which were most problematic included those focused on quantity consumed, in terms of concentration and amount of e-liquid (e.g., average ml daily), as well as bottle and tank size, and number of tank refills.

Conclusion: Existing measures of ENDS use did not appropriately capture quantity of the product used, specifically for ENDS devices requiring the addition of e-liquid. Valid and reliable measures of ENDS use are needed, especially in light of the changing landscape of these products. The growing trend of customizable ENDS devices that can more precisely control combustion and intake of nicotine e-liquid adds yet another level of complexity to this issue highlighting the need for additional research.

FUNDING: National Institutes of Health

JUSTIFICATION: The findings from this study could inform and guide researchers on the challenges and importance of accurately measuring ENDS use.

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POS4-44
CREATING SMOKE FREE HOMES IN HEALTH DISPARITY COMMUNITIES: A COMMUNITY-BASED PARTICIPATORY RESEARCH EVALUATION OF A MOTIVATIONAL INTERVIEWS INTERVENTION

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Background: Little research has been conducted to examine the feasibility of delivering interventions to reduce home SHS using community health workers (CHWs). This study evaluated a home-based motivational intervention (MI) in three Massachusetts health disparity communities, using a community-based participatory research framework.

Methods: A two-arm, randomized controlled design in which a positive control (usual best practices: UBP) was compared with a single MI session delivered by CHWs, to primary caregivers of children under age six. Main outcome measures were: cigarettes smoked in the home (past week), air nicotine levels, child’s salivary cotinine and adoption of a household smoke-free policy.

Results: N=138 families enrolled and 122 (88%) completed a 6-month follow-up interview. Participants were 91% female, 32% Hispanic and 43% non-Hispanic/ non-White. 36% were unemployed, and 57% had a high school education or less. No significant differences were observed between MI and UBP on the main outcomes. A greater proportion of participants reported positive changes in smoking behavior (from inside to outside or non-smoking) than no change or negative changes (no smoking to outside or inside; p = 0.04). Change in household nicotine level was predicted by season (summer follow-up was associated with greater SHS reduction; p<.01) and nicotine level and child cotinine predicted by parent smoking (p’s < .01), after controlling for community and demographic variables.

Conclusions: Factors such as limited CHW training and support, and low intervention dose may have impacted MI effectiveness. Home-based CHW-delivered SHS interventions are a viable strategy for families in health disparity communities, but optimal outcomes may depend on parental non-smoking status. Further research should address whether smoke free home interventions should be delivered in tandem with smoking cessation.

FUNDING: Supported by grant 5R24-MD-002772, from the National Institute on Minority Health and Health Disparities

JUSTIFICATION: Translation of these findings will support the development and implementation of more effective smoke-free home policies among underserved communities

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POS4-45
NICOTINE AND TOXICANT EXPOSURE AMONG U.S. SMOKELESS TOBACCO USERS, 1999-2012

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Introduction: We estimated levels of nicotine and toxicant exposure among US smokeless tobacco users as compared with other tobacco use based on data from the National Health and Nutrition Examination Survey (NHANES) between 1999 and 2012.

Methods: Tobacco use status and biomarker concentrations were assessed in adults ages 20 years and older who completed NHANES Tobacco Use Questionnaire and provided biospecimens as part of the Mobile Exam Center
POSS-46  RACIAL DIFFERENCES IN SMOKING BEHAVIORS AMONG PARTICIPANTS IN THE ACRIN NATIONAL LUNG SCREENING TRIAL (NLST)

Giselle K. Perez, PhD*,1 Pallavi Kumar, MD,1 Kelly Hyland, BA1, Elyse R. Park, PhD, MPH1, Ilana F. Gareen, PhD2, JoRean D. Sicks, MS3, Christopher Lathan, MD3, Massachusetts General Hospital, Brown University, Dana-Farber Cancer Institute

Cigarette smoking is an important modifiable risk factor for lung cancer and a leading cause of cancer death. Blacks have proportionally higher lung cancer mortality rates and poorer smoking cessation outcomes compared to whites. Lung cancer screening with low-dose computed tomography (LDCT) may help promote early detection of lung cancer and smoking cessation efforts amongst high risk populations; however, little is known about the impact of screening on smoking behaviors. In this sub-study of the NLST, we examined smoking behaviors among 1623 white (mean age 60.9 years) and 248 black (mean age 59.6 years) smokers at 4 ACRIN sites. Racial differences in smoking behavior (24-hour, 7-day quit attempts, and 6-month abstinence) were compared at 12 months post-screening. At baseline, white smokers had a higher intensity of tobacco use (56.8 vs. 48.6 mean pack-years, p<0.001), longer duration of smoking (43.0 vs. 41.9 years, p=0.04), and higher daily cigarette consumption (26.5 vs. 23.3 p<0.001) compared to black smokers. At 12 months post-screening, black smokers were more likely to report more 24-hour quit attempts (50.4% vs. 41.8%, p=0.03); however, there were no significant differences in rates of 6-month continuous abstinence (p=0.83). Less than 2% of both white and black smokers were referred to cessation programs, only 5-6% participated in such programs, and less than 1% reported use of NRT. Black race was associated with a higher likelihood of a 24-hour (OR 1.5, 95% CI 1.1, 2.0) and 7-day quit attempt (OR 1.5, 95% CI 1.05, 2.03); however, only CT screening was associated with 6-month continuous abstinence (OR 1.8, 95% CI 1.1, 2.2). In conclusion, black smokers reported a greater number of quit attempts compared to white smokers; however, black smokers did not have higher rates of sustained smoking cessation. This may be partially due to low rates of cessation support. Lung cancer screening offers an important opportunity to counsel smokers and convert quit attempts to sustained smoking cessation, particularly for black smokers.

FUNDING: American Cancer Society's Mentored Research Scholar Award (MRSG-005-05-CPPB), the ACRIN/NLST Trial (U01CA79778 S2)

JUSTIFICATION: These findings highlight the importance of introducing targeted interventions at the time of lung cancer screening to promote abstinence among current smokers, particularly black smokers who are at highest risk for poorer health outcomes.

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POS-47  THE ENDS GAME: FACTORS AFFECTING E-CIGARETTE USE IN OKLAHOMA

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The use of electronic nicotine delivery systems (ENDS) is increasing but estimates of prevalence in Oklahoma are lacking, and factors associated with ENDS use are underexplored. We analyzed population-based, cross-sectional data from a statewide evaluation of a health campaign. Telephone surveys were conducted in 2014 with a sample of adults living in households with children. Respondents (n=1030) were asked if they had ever tried ENDS, which included any form of electronic cigarette, tank system, vapor device or other similar device. Current ENDS use was defined as some day or everyday use in the last 30 days. Data were weighted to represent the state’s adult population, and multivariable logistic regression was used to explore the relationship between cigarette smoking status and socio-demographic variables with current ENDS use. About 22% (n=274) of respondents had ever tried ENDS and 10% (n=112) were current users. Seventy-six percent (n=129) of everyday smokers, 57% (n=40) of someday smokers and 32% (n=76) of former smokers had tried one. Less than 5% of never smokers had ever tried ENDS. Thirty-one percent (n=53) of everyday smokers, 28% (n=19) of someday smokers and 14% of former smokers (n=35) were current ENDS users. Only 5 never smokers (1%) reported current use. After controlling for covariates, current smokers were about 8 times more likely to be current ENDS users than non-smokers (former and never smokers combined) (OR=8.3, 95% CI 5.1-13.4). Younger age (<35 years) was associated with a 6-fold increase in the odds of current ENDS use, independent of smoking status and other covariates (OR=6.3, 95% CI 1.3-30.9). The most common reason given for using ENDS was to quit smoking cigarettes (52%) and another 12% reported using to reduce the number of cigarettes smoked. Dual use of ENDS and combustible cigarettes was high. For respondents with cross-sectional data it is unclear the extent to which dual use represents a transitory stage toward quitting cigarette smoking, or a pattern of sustained nicotine addiction which might undermine cessation attempts.

FUNDING: Study funded by the Oklahoma Tobacco Settlement Endowment Trust

JUSTIFICATION: This study adds to the body of research around e-cigarette use and has the potential to inform public health and policy decisions involving their use.

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POS-48  TOBACCO SMOKE INCURSIONS IN MULTI-UNIT HOUSING AMONG SPANISH AND ENGLISH SPEAKING HISPANICS

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Many Hispanics live in multi-unit housing (MUH) without smoking restrictions. Tobacco smoke diffuses between units, potentially affecting non-smoking residents. Hispanics for whom English is not their primary language may be particularly vulnerable due to language barriers and immigration concerns. The objective of
this study is to describe tobacco smoke incursions in MUH for Spanish and English speaking Hispanics. We recruited U.S. resident 18+ years living in MUH from a nationally representative online panel. Analyses are limited to Hispanic residents. Variables included demographics, tobacco use, building policies, and frequency of smoking in their unit. Chi-square and logistic regression models were done on data weighted to adjust for design effects. Completion rate was 60%, resulting in 3,696 U.S. adults, 607 of whom self-reported being Hispanic (53% were male and 43% were administered the survey in Spanish). Compared to English speakers, more Spanish speakers reported smoke free policies for units (57% vs. 41%, p<.01), believed that smoking should not be allowed in units (87% vs. 61%, p<.01), had a child living in the home (67% vs. 37%, p<.01), and did not have a smoker living in the home (84% vs. 69%, p<.01). There were no differences in household rules against smoking inside the home (70% vs. 63%). Among smoke free households, reported unit incursions were significantly higher for Spanish speakers (37% vs. 25%, p<.01). Of those with incursions, Spanish speakers were more likely than English speakers to report daily or weekly incursions (73% vs. 53%, p<.01). Despite reporting more incursions, Spanish speakers were much less likely to complain to their landlord about these incursions (13% vs. 44%, p<.01). These differences persisted in multivariate models adjusting for age, sex, and child in the home. Many Hispanic residents of MUH experience tobacco smoke incursions into their private homes. Although Hispanics who primarily speak Spanish are more likely to live in buildings in which smoking is not allowed in units, they are more likely to report tobacco smoke incursions into their units. Access to smoke-free housing should be a right for all.

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POS4-49
A PROFILE OF HOSPITALIZED SMOKERS AND THE CARE THEY RECEIVE

Background: Identification and treatment of patients who smoke is a priority for hospitals. Patients with mental illness tend to smoke at higher rates than those without, but there is a paucity of evidence about the state of treatment offered to these patients.

Methods: As part of a randomized controlled trial of post-discharge smoking cessation interventions, we assessed care for smokers at two large hospitals in New York City. Adult patients were eligible for study inclusion if they: smoked at least one puff of a cigarette in the past 30 days; spoke English, Spanish, or Mandarin; were not incarcerated or in police custody; were not pregnant or breastfeeding, and had a U.S. phone number. Study staff reviewed participants' electronic medical records (EMR) for information about type of inpatient unit, history of medical or psychiatric illnesses, and tobacco treatment received.

Results: From July 2011 to April 2014, we enrolled 1619 study participants. 632 (39%) were on psychiatric inpatient units. Mean age was 48 years, 79% were male. Smoking status was assessed at admission in 1582 (98%) and bedside counseling was provided in 1411 (88%). Of those that received counseling, the EMR indicated that 1122 received it from nurses and 153 received it from physicians. For 707 patients (44%), physicians ordered smoking cessation pharmacotherapy during hospitalization. On discharge, 295 patients (19%) were prescribed cessation medication. Patients on psychiatric units were more likely to be counseled by their physician regarding smoking cessation (odds ratio [OR] 1.56, 95% CI 1.02-2.45) and were more likely to be prescribed cessation medication in hospital (OR 3.06, 95% CI 2.46-3.86) than were patients on non-psychiatric units. There was no association between type of inpatient service (psychiatric vs. non-psychiatric) and likelihood of prescription of smoking cessation medication at discharge.

Conclusions: At urban safety-net hospitals, patients who smoke have high rates of mental illness and substance use disorders. Although assessment and counseling are provided at relatively high rates, there is much room for improvement in use of smoking cessation pharmacotherapy.

FUNDING: Supported by NHLBI#R01-HL105229.

JUSTIFICATION: This study demonstrates significant gaps in care for hospitalized smokers; health systems need to implement more effective systems to ensure that all patients receive optimal care, especially for high-risk populations.

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POS4-50
TOBACCO CONTROL THROUGH CORPORATE SOCIAL RESPONSIBILITY
Vijay Bhasker Yetapu*, VChangeU

Research shows that when employers implement a Tobacco free policy, tobacco users are more likely to quit. Looking after the wellbeing of the employees is an essential and indispensable part of any organization.

As Corporate Social Responsibility (CSR) has become mandatory in India, we have conducted "Healthy and Happy Living" workshops under CSR activity for several public and private sector companies in 2 states and 12 districts of India.

The objective was to encourage employees and their family members to focus on key health behaviours such as increasing physical activity, improving eating habits, reducing stress, and ceasing tobacco and alcohol use among addicts.

Conducted workshops under CSR activity for Gujarat State Electricity Corporation Ltd, covering seven power plants located in 8 districts, delivered 72 Sessions for the employees, family members, students and villagers.

Conducted similar workshops for Exel Rubber Ltd in Andhra Pradesh covering 4 districts, delivered 20 Sessions on Tobacco and Alcohol Awareness for the employees of five manufacturing units.

We have spread the awareness about harms of Smoking, Chewing Tobacco on health and environment.

Awareness through creative videos and innovative posters along with effective presentation in regional language has helped in achieving a better outcome.

Out of 16852 members who attended the sessions, we could see instant response from 963 members who have quit their addictions on the same day and many other decided to give away their addictions at the earliest.

Over 90% of the members could completely quit and less than 10% couldn't stay quit.

In house medical staff has supported the addicts in quitting process.

Family members who attended the workshop have decided to keep their homes Tobacco Free for protecting the other family members from SHS.

The Heads of the plant have released notices to all employees and the shop owners on prohibition of smoking in public places and to ban the sale of tobacco in their plants.

The success of these workshops attributed to conduct similar workshops in other companies.

FUNDING: No Funding.

JUSTIFICATION: This approach will be a breakthrough in protecting public health by raising awareness in every section of the society.

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POS4-52
A PROFILE OF “FULL-TIME” ADOLESCENT SMOKERS
Sabastian Tapia*, Courtney Manion, Sarah Ghattas, Amanda LaCue, Melissa Mercincavage, Steven Branstetter, Kimberly Horn

Adolescent smoking is defined, in part, by irregular smoking behaviors: teens tend to smoke fewer cigarettes per day than adults, tend to smoke more on weekends than on weekdays, and they have high rates of intermittent or non-daily smoking. However, for a small population of teen smokers, cigarette use is not only regular, it has become a “full time” job. Specifically, in a sample of over 8,000 adolescent smokers seeking to quit nearly 3% smoked over 2 packs of cigarettes per day. That totals, on average, a cigarette every 30 waking minutes. This small sub-population of smokers may be at significant risk for a range of negative consequences related to such heavy smoking behaviors, including social, occupational and health outcomes. Understanding this subpopulation may help identify those smokers most likely to be at high risk and well as help guide interventions and target specific behaviors and beliefs associated with high risk smoking.

Participants were 8,855 adolescent (M=15.9 years; SD=1.26) smokers (56% female) measured prior to participation in the American Lung Association’s Not-On-Tobacco program. Overall, the sample smoked 15 cigarettes per day on average (SD=9.9). Among this population, a total of 3.4% (N=302) reported smoking 2 packs of cigarettes a day or more (>40 cigarettes per day). Significantly more of the heavy smokers were male (4.4%) as compared to females (2.7%), X2 (2, N=8834) = 20.01, p = < .01. Heavy smokers started smoking younger than lighter smokers, t(6999) = 8.87, p< .001, and were significantly less confident in their ability to quit, t(8704) = 2.80, p < .01. The heavy smokers were more likely to believe that smoking is an effective tool for weight loss t(1469) = 3.50, p < .001 and stress management t(1669) = 2.21, p< .05 compared to lighter smokers. Finally, heavy smokers were less likely than lighter smokers to enjoy school t(1200) = 2.50, p < .01 and less likely to rate school attendance and grades as important t(1999) = 2.51, p < .01.

FUNDING: No funding.

JUSTIFICATION: Understanding this subpopulation may help identify those smokers most likely to be at high risk and well as help guide interventions and target specific behaviors and beliefs associated with high risk smoking.

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POS4-54
EVALUATION OF A SMOKING CESSATION TEXT MESSAGE PROGRAM FOR PREGNANT WOMEN AND NEW MOTHERS
Sondra Dietz, MA, MPH*, Bethany Tennant, PhDD, Brian Keefe, MAa, Mary Schwanze, Carol Freeman, Erik Augustson, PhD, MPHb, Heather Patrick, PhDc, ICF international, dThe National Cancer Institute

The negative health effects of smoking both during pregnancy and early post-partum, on mother and child, are well established. Despite this, some women continue to smoke during pregnancy or re-initiate smoking after delivery. Increasing the number of pregnant women who abstain from cigarette smoking and reducing smoking relapse among postpartum women who quit during pregnancy is therefore a key public health goal. One way to effectively increase attempted and sustained quit attempts among these women may be through emerging mHealth technologies, such as text message intervention programs. The goal of this in-depth interview pilot study was to explore knowledge, attitudes, and behaviors related to smoking cessation and pregnancy and feelings toward the National Cancer Institute’s SmokefreeTXT smoking cessation text message intervention among nine current or former smokers who were pregnant or gave birth in the past year. Findings from the interviews revealed that the main reasons pregnant women and new mothers smoked was to deal with stress and boredom, yet all of the women wanted to quit smoking because they believed it would be healthier for them, their unborn baby, and their existing children. The interviews also showed that all of the women liked the consistency of the SmokefreeTXT program messages and support, and the ability to reach out when having a craving. In order to most effectively address the needs of pregnant and early postpartum smokers and those who recently quit, text message programs should be customizable and interactive. The data gathered from these interviews are being used to inform the development of new text message libraries and materials geared to help pregnant women and mothers take steps toward leading a healthier, smoke-free lifestyle.

FUNDING: The National Cancer Institute

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POS4-55
ELECTRONIC-CIGARETTE MODEL PREFERENCES: A U.S. POPULATION STUDY
Caroline Chen, PhD*, Shu-Hong Zhu, PhD, Lu Yin, MS, Yue-Lin Zhuang, PhD, University of California, San Diego

As electronic cigarette design continues to evolve, devices may generally be grouped into two models: “cigalikes” and “tank” systems. “Cigalikes” come in disposable and refillable types and mimic the appearance of traditional cigarettes. “Tanks” feature a prominent refillable chamber which users can fill with nicotine-containing e-liquid in a wide range of flavors and nicotine concentrations. Tanks are generally capable of delivering more nicotine than cigalikes. This study examined the preference of these two models in a probability sample of adult current and former smokers representative of the population of the United States.

Participants were 233 (54% female) adolescent smokers between 14 and 19 years (M=16.53; SD = 1.33). Participants completed a series of self-report questionnaires, including smoking history and average minutes per day of PA, which was divided into high activity (>31 minutes) and low activity (<30 minutes). All questionnaire were administered prior to entering the Quit n’ Fit program, and adaptation of the Not-On-Tobacco intervention. Participants smoked, on average 12.3 cigarettes per day (CPD) (SD = 9.5) and started smoking at an average age of 11.5 years (SD=2.7). Independent samples t-test reflect that there was no difference between high activity and low activity groups on the number CPD, t(221) = 1.6 or .

p = .10. However, there was a significant difference in the confidence in the ability to quit, with those in the high activity group being significantly more confident than those in the low PA group, t(221) = 2.2, p = .03. Cessation success rates and the mediating effect of confidence will also be presented (analyses pending). Results suggest that greater PA is associated with increased quit confidence, even though there is no difference in smoking intensity (CPD). Physical activity may play an important role in cessation success by increasing confidence levels.

FUNDING: No funding.

JUSTIFICATION: Gaining a greater understanding as to what role physical activity can play in confidence to quit may inform cessation programs for adolescents.

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A total of 3,708 current smokers and 2,852 former smokers participated. The primary outcome was success of e-cigarette model: cigalikes or tank systems and e-cigarette use is defined as "currently using" when respondents answered the question, "do you currently use e-cigarettes every day, some days, or not at all." The findings show that former smokers were significantly more likely to use tanks than current smokers (58.0% vs. 45.6%), while current smokers were significantly more likely to use cigalikes than former smokers (61.2% vs. 45.7%). Smokers who have made at least one quit attempt in the last 12 months were more likely to use tanks than smokers who have not made a quit attempt (54.9% vs. 33.4%). Furthermore, among those who made a quit attempt, the rate of using tanks was higher for those who succeeded than for those who failed (60.8% vs. 52.9%). In summary, the preference for tanks is positively correlated with smokers' intention to quit smoking and their success in quitting. Findings suggest that tank models' ability to deliver high levels of nicotine and adaptability may be important considerations for the design of e-cigarettes as possible cessation aids. Future longitudinal studies should examine whether dual users switch from cigalikes to tanks as they become motivated to quit smoking.

FUNDING: This study was supported by the National Cancer Institute of the National Institutes of Health under the State and Community Tobacco Control Initiative, Award Number U01CA154260. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

JUSTIFICATION: Paper informs policy on whether electronic-cigarettes have a potential role to play in population smoking cessation.

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POS4-57
FREE AND EASY: REMOVING BARRIERS INCREASES YOUNG ADULTS' INTEREST IN NICOTINE PATCHES AND GUM
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Background: Young adult smokers who want to quit may not use nicotine replacement therapy because the cost is prohibitive. To eliminate this barrier, Leave The Pack Behind (an Ontario government-funded, age-tailored tobacco control program) established an online ordering platform offering free, 8-week treatment courses of nicotine patches or gum to young adults (18-29 years) who meet health eligibility criteria and agree to complete 3 research surveys. We examined the demographic and tobacco use characteristics of young adults who accessed nicotine replacement products through the online platform.

Methods: The ordering system was consistently promoted through social and traditional media on all post-secondary campuses and extensively in communities across Ontario.

Results: Between September 30, 2013 and August 31, 2014, 11,709 individuals (3% of all young adult smokers in Ontario) visited the ordering site. Of these, 7,781 completed the screening; and 4,896 (63%) were eligible to receive patch/gum and completed the baseline survey. The average age of participants was 24.5 years (SD = 3.4) and 47% were male. A majority (87%) of orders were placed by young adults not enrolled in a college or university with 49% reporting their highest level of education to be high school or less. Most smokers (81%) reported smoking >10 cigarettes per day and a high level of nicotine dependence was observed with 79% having their first cigarette within 30 minutes of waking. A higher proportion of smokers ordered patch (64%) than gum (36%). On a 5-point Likert scale, smokers reported strong intentions to use the nicotine replacement products every day as recommended (M = 4.6, SD = 0.9).

Discussion: Today's young adults are accustomed to the ease and immediacy of online transactions. In just under a year, the online platform resulted in 4,896 young adult smokers receiving nicotine replacement products. This online platform meets a need that has not been filled before. It appears to be an appealing and tailored service for young adults that increases young adults' access to evidence-based interventions.

FUNDING: This study was funded by the Government of Ontario.

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POS4-56
ASSESSING ELIGIBILITY FOR A PILOT STUDY TO PROVIDE A TEXT-BASED SMOKING CESSATION INTERVENTION TO SMOKERS DISCHARGED FROM THE HOSPITAL
Erin Hammett, BS*, Susan Veldheer, M.S, RD, Jessica Yingst, MS, Shari Hrabovsky, MSN, Jonathan Foulds, PhD

Background: Joint Commission Tobacco Use Measures require providing treatment to and following up with smokers who have been discharged from the hospital. These standards are currently optional, but could become mandatory. This analysis assessed whether hospitalized smokers met inclusion criteria to participate in a pilot study that uses text messages to provide smoking cessation information and follow-up after discharge.

Methods: Participants self-identified as tobacco users at the time of admission and were offered smoking cessation counseling by licensed health professionals. Those who accepted counseling were further screened for inclusion in the study. Main factors affecting inclusion were tobacco and/or technology related. Tobacco inclusion criteria included smoking 20 cigarettes in the 30 days prior to admission and being willing to give up all forms of tobacco. Technology inclusion criteria included being capable of receiving text messages and being willing to send and receive text messages. Participants with incomplete screening data were not included in the analysis.

Results: 303 tobacco users accepted inpatient counseling and were screened for the study, of which 27% (n=83) were eligible, consented, and enrolled. Among those who were not eligible, 36% (n=77) were excluded for tobacco inclusion criteria, 33% (n=73) for technology inclusion criteria. Among those who were not eligible, 36% (n=77) were excluded for tobacco inclusion criteria, 33% (n=73) for technology inclusion criteria. 10% (n=22) were not eligible for other reasons.

Conclusion: In this small pilot study, the majority of exclusions were related to screening criteria created prior to implementation. It should be noted that only a small number of exclusions (n=13)- were due to the participant being uninterested in sending and receiving text messages. Should this type of intervention be considered in the future to meet Joint Commission Tobacco Use Measures, careful consideration should be given to inclusion criteria to allow for broader participation.

FUNDING: This study was funded through the Penn State Center for Integrated Healthcare Delivery Systems, a unit of the Clinical and Translational Sciences Institute.

JUSTIFICATION: A text message system may be considered as a way to meet the Joint Commission Core Measurement of assessing tobacco use status after discharge.

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POS4-58  
YOUNG ADULT LIGHT SMOKERS INTEREST IN USING NICOTINE PATCHES AND GUM TO QUIT SMOKING

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Background: Most nicotine replacement giveaway programs do not offer products to smokers who smoke fewer than 10 cigarettes per day. Leave The Pack Behind (an Ontario government-funded, age-tailored tobacco control program) recently established an online ordering platform offering free, 8-week treatment courses of nicotine patches or gum to young adults (18-29 years) who meet health eligibility criteria, smoke at least 1 cigarette per day, and agree to complete 3 surveys. We examined the demographic and tobacco use characteristics of light (<10 cigarettes per day) versus heavy (≥10 cigarettes per day) smokers who accessed nicotine replacement products through the online platform.

Methods: The ordering system was consistently promoted through social and traditional media on all post-secondary schools and extensively in communities across Ontario.

Results: Between September 30, 2013 and August 31, 2014 11,709 individuals (3% of all young adult smokers in Ontario) visited the ordering site. Of these, 7,781 completed the screening; and 4,896 (63%) were eligible to receive patch/gum and completed the baseline survey. About 1/5 of the smokers who accessed products smoked < 10 cigarettes per day. Light smokers smoked an average of 5.8 (SD = 2.0) cigarettes per day compared to 19.1 (SD = 8.1) for heavy smokers (t = -92.1, p < .001). Forty-four percent of light smokers smoked within 30 minutes of waking versus 87% for heavy smokers (chi square = 822.6, p < .001). Equal proportions of heavy smokers ordered gum and patch whereas a higher proportion of heavy smokers ordered patch (67%) compared to gum (33%) (chi square = 94.1, p < .001).

Discussion: Young adult light smokers are interested in nicotine replacement therapies and are willing to seek treatment. Heavier smoking and stronger addiction cannot be seen as necessary indications for nicotine replacement products. Follow-up will demonstrate the effectiveness of offering this service to heavy and light smokers. Usage patterns and cessation outcomes are under investigation.

FUNDING: This study was funded by the Government of Ontario.

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POS4-60  
WILL COMMUNITY COLLEGE STUDENTS ENGAGE IN USING A WEB ASSISTED TOBACCO INTERVENTION? PRELIMINARY FINDINGS FROM THE WATI STUDY

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Community college (CC) students represent a growing and underserved priority population for cessation intervention. About one third have used tobacco in the past month, and their smoking prevalence (about 28%) is consistently higher than the national adult prevalence (18.9%). Interventions for college smokers are limited, despite that fact that college smoking is increasing, and very little is known about interventions with CC students. Web Assisted Tobacco Interventions (WATIs) have been shown to be effective in other populations, but only when there is high utilization. Interactivity, content and features need to be studied for associations with higher utilization.

In this comparative effectiveness trial, we aimed to explore whether CC students would successfully quit when provided with WATIs. Participants were randomized to either a WATI with articles and manual progress tracking tools or a WATI with highly interactive content and tools. This paper aims to answer the question: “Will CC students use a Web Assisted Tobacco Intervention to quit smoking?”

Between September 2012 and July 2014, 798 students were enrolled in the study. Data demonstrate that CC students will use a WATI: logins averaged 2.6 times. Students took advantage of the types of content and features available through the program to which they were assigned. That is, those assigned to a WATI with static content and manual progress trackers demonstrated use of these resources (use rates range from 2-68%). Conversely, those assigned to a WATI with more interactive features used the interactive tools such as an online quit plan tool (81%) and online interactive trackers (10%-77%), with relatively lower use of static articles and other content compared to students in WATI (3-12% use vs 12-37% use). Patterns of utilization will be described in detail.

Overall, the data indicate that CC smokers will use a WATI for smoking cessation, and use patterns vary based on available levels of resource interactivity. Though the effectiveness of these programs on smoking abstinence remains to be determined, current results indicate the viability of this modality for reaching this underserved and under-researched population.

FUNDING: This work was supported by National Cancer Institute Grant R01CA152093-01 (McIntosh, PI).

JUSTIFICATION: Identification of web-based features, content, and interactivity elements that increase utilization and/or efficacy in tobacco cessation with this under-researched priority population will inform interventionists and researchers.

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POS4-59  
BEHAVIORAL ECONOMIC SUBSTITUTABILITY OF E-CIGARETTES AND TOBACCO CIGARETTES

Patrick S. Johnson*, Olga Rass, Lauren R. Pacek, Matthew W. Johnson

Electronic cigarettes (e-cigarettes) are at the center of considerable public health controversy. While e-cigarettes may cause unknown harms, they might also decrease public health harms by serving as substitutes that reduce or replace the use of tobacco cigarettes, which are associated with overwhelming mortality. The public health impact of e-cigarettes may therefore depend on their substitutability for tobacco cigarettes. This study administered behavioral economic hypothetical purchasing tasks assessing the reinforcer interactions among e-cigarettes and tobacco cigarettes among individuals who use both products. Results showed that when either tobacco cigarettes or e-cigarettes were exclusively available, participants consumed a greater number of e-cigarette puffs than tobacco cigarette puffs at the lowest monetary unit price (demand intensity), and that increases in unit price caused less dramatic decreases in e-cigarette consumption than tobacco cigarette consumption (elasticity). When available concurrently, the unit price of tobacco cigarette puffs increased, consumption of tobacco cigarette puffs decreased, and the consumption of e-cigarette puffs increased, meaning that e-cigarettes met one definition of behavioral economic substitution. In those who had used nicotine gum, there was a trend for e-cigarettes to show greater substitutability than nicotine gum. Moreover, the concurrent availability of e-cigarette puffs decreased consumption of tobacco cigarette puffs across all unit prices of combustible cigarette puffs, showing e-cigarettes to satisfy another definition of behavioral economic substitutability. E-cigarette puff availability decreased tobacco cigarette puff consumption significantly more so than did the availability of nicotine gum. These data suggest that e-cigarettes may serve as a behavioral economic substitute that decreases consumption of tobacco cigarettes. Although important questions remain, such as whether e-cigarettes cause harm themselves, or whether they may prevent or delay nicotine cessation among smokers, these data indicate that e-cigarettes may potentially serve a powerful role as smoking cessation or reduction aids.

FUNDING: This work was supported by NIDA grants T32 DA07209 and R01 DA032363.

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POS4-61
INCIDENCE, MORTALITY AND SURVIVAL TRENDS OF SMOKING-RELATED CANCERS IN WOMEN IN SETIF, ALGERIA, 1990-2009

Zoubida Zaidi, PhD*, Mokhtar Hamdicherif, PhD, Cancer Registry of Setif, University Hospital of Setif, Algeria

Introduction: Tobacco use is the leading preventable cause of disease and premature death, in Algeria and in the world. Our main objective is to estimate the impact of the tobacco on the women’s cancerous mortality and the morbidity in the Wilaya of Setif.

Methods: Incidence datas, were obtained from the population-based cancer registry of Setif, the cancer survival informations were obtained by the mortality datas, this file was coupled with the active follow-up of the vital status of the wilaya.

These cancer sites included in the monograph 100E of the international agency for research on cancer on 2012. The colorectal, the ovary, the breast cancers and the myelogenous leukemia, by adding them to the list of the smoking-related cancers with the significantly relationship between tobacco use and the following cancers included in the 2004 monograph : oral cavity and pharyngeal, esophageal, stomach, liver, pancreatic, laryngeal, lung and bronchial, cervical cancers and kidney, urinary bladder cancers.


Results: From 1990 to 1996, we registered an age-adjusted incidence standardized rates (ASR) of the total cancers by 71.3 with an ASR of 34, 5 of the SRC per 100,000 women/year.

From 2005 to 2009, the ASR is 120, 3 of the total cancers with an ASR of 82, 1 of the SRC per 100,000 women/year.

A significantly increase incidence rates of the SRC for the both sexes, the annual percentage change was (+7, 2%) in women. The mortality of the SRC represents 47, 3% of the global mortality in women. On 2001-2005, cancer survival of the SRC is uniformly low.

Conclusions: The change over time in the smoking related cancers incidence of females in Algeria can be explained fairly well by the increase in cumulative cigarette consumption at the national level. Prevention and tobacco control efforts are still needed to further reduce the burden of this disease.

FUNDING: No funding.

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POS4-62
THE RELATIONSHIP OF HOUSEHOLD SMOKING ENVIRONMENTS AND CESSATION HISTORY, PLANS, AND SELF-EFFICACY AMONG LOW-INCOME SMOKERS

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Objective: Low-income smokers face numerous barriers to quitting smoking that include hurdles at the individual level (e.g. lack of knowledge about evidence-based tobacco treatment) and environmental factors (e.g. broader community norms, social circle factors that may subtly discourage quitting). Despite these barriers, low-income smokers’ household environments could facilitate quitting by making it seem possible, desirable, and thus something to strive for. We sought to examine how home smoking rules and other household members’ smoking behaviors related to low-income smokers’ past quit attempts, readiness to quit, and self-efficacy to quit.

Methods: OPT-IN was a randomized controlled trial of proactive tobacco cessation outreach. The study recruited adult smokers age 18-64 from the administrative databases of the state-subsidized Minnesota Health Care Programs. The present analysis used data from OPT-IN’s baseline survey, which was completed by 2,406 participants and conducted in 2011/12. We tested household environmental factors’ associations with past-year quit attempts, readiness to quit, and quitting self-efficacy in regression models adjusted for race, education, income, age, gender.

Results: Smokers who lived in homes with more restrictive household smoking policies were more likely to report having made a quit attempt in the past year, had greater readiness to quit, and greater self-efficacy related to quitting (all p<0.05). Having more friends and family who smoke was associated with lower readiness to quit (p<0.05) but was not related to past-year quit attempts or quitting self-efficacy. Having one or more household members who smoke was not related to any of the outcomes examined.

Conclusions: This study was cross-sectional and thus it is unknown if household policies preceded individuals’ quit attempts, quit readiness, or self-efficacy. However, the relationship between household smoking policies and the cessation-oriented outcomes suggests that pro-quitting adjustments to household environment might possibly be accomplished though household policy change, even in the presence of other household members who are smokers.

FUNDING: National Cancer Institute, National Institutes of Health (R01 CA141527)

JUSTIFICATION: If smokefree household policy does help facilitate cessation attempts in low-income populations, this could be a useful intervention strategy.

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POS4-63
E-CIGARETTE USE AMONG PREGNANT AND POSTPARTUM WOMEN: PREVALENCE AND BELIEFS

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The popularity of e-cigarette use is growing, particularly among women. E-cigarette companies are actively propagating the idea that e-cigarettes are safer than cigarettes and an effective quit aid. Studies in several areas call into question the safety of these products in pregnancy. The goal of this pilot project was to use a brief survey to define the prevalence of e-cigarette use among pregnant and postpartum women in New Haven, CT. We also assessed beliefs about harm to the fetus/neonate rather than harm to the user.

86 pregnant and postpartum women completed a one-time survey on electronic cigarettes either in clinic or over the phone. Respondents were asked about ever-use of e-cigarettes, use since becoming pregnant, history of smoking and perceptions of harm to the fetus/neonate as compared to cigarettes. Analysis was done using Fisher’s exact test.

8.1% (n=7) of participants had not heard of e-cigarettes and did not complete the remainder of the questionnaire. 79 responses were evaluated. 22% (n=18) of those who completed the questionnaire endorsed ever-use of e-cigarettes. 5.1% (n=4) endorsed use since becoming pregnant. 3.8% (n=3) had been screened for e-cigarette use by a medical provider. 22.8% (n=18) believed that e-cigarette use during pregnancy is less harmful to the fetus than cigarette use. 22.8% (n=18) believed that e-cigarette use while breastfeeding is less harmful to the neonate than cigarette use. History of smoking was associated with ever-use of e-cigarettes (p<0.05) in this population but not the belief that e-cigarettes are less harmful to the fetus than cigarettes. However, ever-use of e-cigarettes was associated with this belief (p<0.05).
The preliminary data indicate that, while e-cigarette use during pregnancy and postpartum is not common, it is present and that a large minority of this population believes that e-cigarette use in pregnancy and while breastfeeding is less harmful to the fetus/neonate than cigarette use. Associations between beliefs and behavior around e-cigarettes should be explored further in order to identify at-risk mothers.

**FUNDING:** This research is supported by NIDA grant K12 DA 000167-21 (PI Potenza)

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**POS4-65**

**ASSESSMENT OF TOBACCO DEPENDENCE SCREENER AMONG SMOKELESS TOBACCO USERS**

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Variants of the FTQ and FTND are widely used to study dependence among ST users. However there is a need for a dependence measure which is based on the clinical definition of dependence and is easy to administer. Tobacco Dependence Screener (TDS), a self-administered 10-item scale, is based on the DSM-IV and ICD-10 definitions of dependence. It is commonly used as a tobacco dependence screening tool in cigarette smoking studies but it has not been evaluated for dependence in ST users. The purpose of this study is to evaluate the TDS as a measure of tobacco dependence among ST users.

Data collected from a community based sample of exclusive ST users living in Oklahoma (n=95) was used for this study. TDS was adapted to be used for ST dependence as the references for smoking were changed to smokeless tobacco use. Concurrent validity and reliability of TDS were evaluated. Salivary cotinine concentration was used as a criterion variable. Overall accuracy of the TDS was assessed by ROC curve and optimal cutoff scores for dependence diagnosis were evaluated.

There was no floor or ceiling effect in TDS score (mean = 5.42, sd = 2.61). Concurrent validity of TDS as evaluated by comparing it with FTND-ST was affirmative. Study findings showed significant association between TDS and salivary cotinine concentration. The internal consistency assessed by cronbach’s alpha indicated that TDS had acceptable reliability (alpha = 0.765). TDS was negatively correlated with time to first chew/dip and positively correlated with years of ST use. Results of logistic regression analysis showed that at an optimal cutoff score of TDS 5+, ST users classified as dependent had significantly higher cotinine concentration and FTND-ST scores.

TDS demonstrated acceptable reliability and concurrent validity among ST users. These findings are consistent with the results of previous cigarette smoking studies evaluating TDS. A self-administered tobacco dependence measure based on a clinical definition of dependence is an effective tool in research setting.

**FUNDING:** Oklahoma Tobacco Research Center

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**POS4-66**

**TOBACCO AND NICOTINE CONTAINING PRODUCTS USE PATTERNS AMONG COLLEGE STUDENTS IN USA**

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Background: The use of Tobacco and Nicotine Containing Products (TNCPs) has been increasing among college students, creating dual use and multi-use of tobacco products. There is little research which examines patterns of multiple-TNCP’s use. This study explores these patterns among college age students.

Methods: We conducted a cross sectional study using a random sample of college students. An online self-administered survey version of the self-report National College Health Assessment determined their use of cigarettes, hookah, cigars, and smokeless tobacco in February 2014. Additional questions assessed current use and intention to use e-cigarettes.

Results: 1012 students completed the survey. The mean age was 23.13 years (SD=5.45); 62% were females, 64% were white, 13.7% Black, 15.9% Asian and 6.4% from other ethnicities. Most were undergraduate students (76%), 23% were graduate students, and 1% were in other categories. Among current TNCP users (n=313), 18% were cigarette users, 11% were waterpipe users, 8.3% were e-cigarette users, 5.9% were cigar, little cigar and clove cigarette users, and 5.2% were smokeless tobacco product users. Concerning multiple use of TNCPs over the past 30 days, 59% used a single product, 26.5% used two products, 9.3% used three products, 4.1% used four products and 1.2% used all 5 TNCPs surveyed. Nevertheless, ever use of TNCP was 55.2% (n=610). Concerning ever use of multiple products, 29.8% ever used a single product, 18.9% ever used two products, 19.0% ever used three products, 17.8% ever used four products, and 14.4% ever used all 5 TNCP categories surveyed.

Conclusions: Ever use of TNCPs is high among college students and current use of multiple TNCPs is relatively high as well. Students experiment with multiple TNCPs and many of them remain current users, which could cause increased morbidity and mortality. There is a need to understand the behavioral characteristics which contribute to experimentation and subsequent use of multiple TNCPs.

**FUNDING:** No Funding

**JUSTIFICATION:** There is a need to understand the behavioral characteristics which contribute to experimentation and subsequent use of multiple tobacco and nicotine containing products.

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**POS4-67**

**THE ASSOCIATION BETWEEN E-CIGARETTE INFORMATION SCANNING AND COGNITIONS AMONG YOUTH AND YOUNG ADULTS: DOES CURRENT CIGARETTE SMOKING STATUS MATTER?**

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Introduction: E-cigarettes are affordable and easily accessible, are highly promoted and advertised, and can be used in public places. Routine exposure to e-cigarette information in the media or through conversations (“scanning”) may shape cognitions about e-cigarettes. We wondered whether scanning might relate to cognitions differently for smokers and non-smokers. For example, smokers might intend to use e-cigarettes in the hope of quitting, to the extent that they are promoted as cessation tools. Alternatively, non-smokers might be attracted to using e-cigarettes, to the extent that they are perceived as normative and harmless. The aim of the current study was (1) to examine the association between e-cigarette information scanning and related cognitions, and (2) to explore whether current cigarette smoking status moderates this relationship.
Methods: We collected a nationally representative telephone sample of 13 - 25 year olds from June - September 2014 (N = 814). The main outcome measures were e-cigarettes related cognitions (beliefs about positive and negative consequences, perceived norms, self-efficacy, and intentions to use e-cigarettes). All estimates adjust for multiple possible confounders.

Results: On average the 13 - 25 year olds reported low current use of (14.1%) and intentions to use (15.0%) e-cigarettes. Only the 17.3% who are smokers showed a significant association of e-cigarette information scanning with positive perceptions of and intentions to use cigarettes. Scanning was universally associated with normative beliefs, but not with self-efficacy or beliefs about negative consequences of e-cigarette use.

Conclusions: Smoking and non-smoking youth and young adults differ in the relationship of scanning e-cigarette information and the related cognitions about e-cigarettes. Particularly smokers seem to be susceptible to routine exposure to e-cigarette information; we speculate that they hope e-cigarettes will help them quit. With regard to public health campaigns, changing norms and beliefs about the positive consequences of using e-cigarettes may constitute mechanisms of action, which need to be investigated in longitudinal research.

FUNDING: Research reported here was supported by NCI and FDA Center for Tobacco Products (CTP) under grant # P50CA179546. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH or the Food and Drug Administration.

JUSTIFICATION: The results of the current study offer important insights into how routine exposure to e-cigarette information affects e-cigarette-related cognitions in smokers and non-smokers in order to develop effective public health campaigns targeting these subgroups.

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POS4-68
IDENTIFYING THE CAUSAL MECHANISMS UNDERPINNING E-CIGARETTE “POPULATION EFFECTS”

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The emergence of alternative nicotine products, particularly electronic cigarettes (e-cigarettes), presents a number of vexing questions for health policymakers. After the uncertainties surrounding the direct harm of e-cigarettes, the most important remaining questions focus on whether the use of e-cigarettes, or the marketing that is associated with them, will have a causal effect on tobacco cigarette smoking. These questions are both highly relevant to policymakers and an important component of the criteria necessary for “reduced harm” or “reduced-exposure” designation under the 2009 Family Smoking Prevention and Tobacco Control Act. However, shedding light on the true population effects—causal mechanisms by which use or marketing of electronic cigarettes affect subsequent tobacco smoking behavior—is not as simple as it may sound. This paper has four sections. The introduction elaborates on the policy context for the issue of e-cigarette population effects. The next section on mechanisms catalogs the main causal pathways that might mediate these population effects, taking gateway and cessation effects separately. The third section will discuss inferential obstacles that make it difficult to discern whether these theoretical mechanisms obtain in the real world, along with some research design strategies that can help address these difficulties. The conclusion will address what is known and uncertain about the presence and magnitude of the causal mechanisms introduced in section 2, and will suggest what ought to be done right now, with the knowledge that we already have, to facilitate the mechanisms that might lead to positive outcomes and block the mechanisms that might lead to negative ones.

FUNDING: No Funding

JUSTIFICATION: This paper aims to assist e-cigarette policymakers by providing a framework for understanding e-cigarette population effects.

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POS4-69
LIKING E-CIGARETTES: BRAND BEHAVIOR AND FAN ENGAGEMENT OF E-CIGARETTE FACEBOOK PAGES

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Introduction: With e-cigarette sales projected to top $2.5B in 2014, research on their marketing and promotion is crucial. The FDA intends to regulate e-cigarette marketing in traditional media, but social media will remain largely unmonitored. Facebook has huge potential for reach and for the cultivation of brand ambassadors.

Methods: Using a Facebook analytics tool, we identified 44 e-cigarette brand Facebook Pages and selected the 10 most liked Pages for analysis. Our dataset consisted of all Page activities (Page and fan posts, fan likes, comments and shares) over time. Fan engagement was calculated as the total likes, shares and comments (LSC) for each post. We analyzed 5-10 posts with the highest engagement per Page.

Results: All Pages were created between 2010 and 2012. Engagement across brands peaked in 2012, averaging 300 LSC per post per month and 200,000 total LSC on the 10 pages. Despite having comparable Page posts and an increasing fan base, total LSC fell to 134,000 in 2013, and is on track this year for 78,000. A fan engagement score was calculated by dividing total 2014 LSC by total Page likes. Scores ranged from 0.5 to 0.02. Photos were the most popular type of post. The most used appeals were giveaways requiring fans to like, share, or comment to receive free products (58%), with an average engagement of 362 LSC per post. Asking users to comment on questions such as what flavors they like were used in 14% and averaged 112 LSC. The most engaging posts were unrelated to the product such as brain teasers and funny images, which averaged 2,724 and 1,914 LSC per post, respectively. Nearly 20% of the posts were anti-smoking.

Implications: E-cigarette activities reflect an understanding of the medium of Facebook and fan preferences for Facebook content. Most posts (73%) were designed to generate traffic, increase reach and maintain visibility in fans’ newsfeeds, and just 14% used direct product advertising appeals. This analysis represents a first step toward understanding effective e-cigarette social media marketing strategies and how brands are working to remain relevant in a competitive media environment.

FUNDING: NCI/FDA P50-CA-179546 (Tobacco Product Marketing in a Complex Communication Environment)

JUSTIFICATION: This analysis represents a first step toward understanding effective e-cigarette social media marketing strategies and how brands are working to remain relevant in a competitive media environment.

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POS4-70
NORMS OF HISPANIC RESIDENTS OF MULTIUNIT HOUSING ON SECONDHAND AND THIRDHAND SMOKE

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Exposure to tobacco smoke has been shown to exacerbate allergies, asthma, diabetes, heart disease, and high blood pressure. Hispanic populations are particularly vulnerable to the harmful effects of SHS and THS; there are more Hispanics living in multiunit housing than Whites. The purpose of this study was to understand Latinos’ knowledge, attitudes, and behaviors about second hand (SHS) and thirdhand smoking (THS); and to develop and test a low-fidelity focus group guide aimed at empowering residents of multiunit housing to protect themselves from SHS and THS. A focus group guide was developed that included questions categorized in 12 areas to obtain information about adult Hispanics’ knowledge and misconceptions about SHS and THS, their exposure, social norms, and preferred methods for addressing the issue. Three focus groups were conducted in English and Spanish with a total of 24 participants. The information was coded
and analyzed in a thematic format guided by grounded theory. The behavior targets for this analysis are those that encourage collaboration of Hispanic tenants to pass anti-smoking rules. Findings from qualitative analyses showed that smoking bans inside the Hispanic homes were universal. However, smoking still drifted in from the outside via several modes that were outside of their control. This study confirmed previous knowledge about Hispanics' attitudes towards SHS as smoking related norms either followed or did not follow the universal Latino cultural values of respeto, simpatía, collectivism, and familismo. An interesting finding was that participants were concerned about marijuana secondhand smoke. They pointed to a need of including this substance in tobacco education materials, as tobacco was often used in combination with marijuana. The discussions generated new ideas for addressing the leap between knowledge and action that is needed to protect multiunit housing residents from SHS and THS. Non-smokers preferred to designate smoking areas. Findings from this study warrant a more targeted intervention that engages community participants in the development and addresses cultural values in order to address the burden SHS imposes on Hispanic families.

FUNDING: Tobacco Related Disease Research Program grant #21RT-0119

JUSTIFICATION: This study has translational applications for health practitioners and public health and policy makers as it reveals gaps in health education and policies that can be addressed to lessen the burden of SHS and THS in a vulnerable population.

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POS4-72

USING SOCIAL MEDIA TO EXAME CAMPAIGN REACH

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Social media has fundamentally changed the way that we receive, create, share and process information. In August 2014, Legacy premiered a new truth campaign called Finish It, aiming to empower youth to be the generation that ends smoking. In addition to television advertisements, the campaign strongly integrated social media as a tool for youth empowerment. This study presents an analysis of the social conversation surrounding the FinishIt campaign on the microblogging network of Twitter. Data were obtained from a vendor, GNIP, licensed to provide access to the entire corpus of Twitter data, using a data streaming process referred to as the "Firehose," as well as via Simply Measured, a social media analytics provider. For this analysis, data collection was in August 2014. The amount of conversation is determined through an analysis of unique users reached, number of tweets and mentions, and keywords and hashtags. In the first month of the campaign, there were 3,332 tweets with the #FinishIt hashtag from 2,597 unique Twitter accounts. Most of the tweets indicate organic use of the hashtags such as viewers tweeting about TV ads during a television show, demonstrating dual screen use behavior. During the first month of the campaign, 5,514 unique individuals engaged with the @truthorange account, with an average of 2.7 engagements (organic mentions, @replies, retweets, and favorites) per person, for a total of 14,650 engagements. Account followers increased by 18.9% (10,633 new followers) in the first month of the campaign. Preliminary results suggest social media can be a powerful tool to amplify the messages individuals receive from television advertising and other sources, as well as an important channel for conversation and interpersonal communication around key campaign messages. The next phase of this study will involve analyzing themes of conversation through content categorization and topic modeling, Understanding how social media can further reach and engagement of public health messages provides a unique opportunity to optimize interventions targeted at youth and young adults.

FUNDING: Funded by Legacy

JUSTIFICATION: Understanding how social media can further reach and engagement of public health messages provides a unique opportunity to optimize interventions targeted at youth and young adults.

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POS4-71

TOBACCO USE BY SEXUAL IDENTITY AMONG YOUNG ADULTS IN THE U.S.: THEN AND NOW

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National surveillance data are limited for the lesbian, gay and bisexual (LGB) population, a group that has been historically targeted by the tobacco industry. This study used data at baseline (Wave 1) and 2.5 years (Wave 5) from the Legacy Young Adults Cohort to examine cross-sectional patterns of tobacco use (cigarettes and other tobacco products) among an LGB young adult population. At baseline, 6.5% of the wave 1 sample (n=251) self-identified as LGB. At Wave 5, 6.9% self-identified as LGB (n=247). Bivariate weighted analyses generated prevalence estimates for ever and past 30-day use of tobacco products. At Wave 1, 60% of heterosexual participants had ever used a tobacco product compared to 80% of gay participants (p=0.003) and 75% of bisexuals (p=0.02). At Wave 5, 55% of heterosexual participants had ever used a tobacco product compared to 74% of gay participants (p=0.004) and 66% of bisexuals (p=0.07). At both waves, gay and bisexual participants were more likely to self-identify as smokers compared to heterosexuals. Gay and bisexual Wave 1 respondents reported significantly higher ever use of cigarettes and hookah compared to heterosexuals. Bisexual respondents also reported significantly higher ever use of little cigars/cigarillos and e-cigarettes at baseline. The only product with differential past 30-day use at Wave 1 was cigarettes, with higher use reported by gays compared to heterosexuals (34.8% vs. 18.4%, p=0.005). At Wave 5, gay and bisexual participants reported significantly higher ever use of e-cigarettes and nicotine replacement products compared to heterosexuals; gay participants also reported higher ever and past 30-day use of hookah. A significantly higher proportion of the homosexual (but not bisexual) group reported past 30-day cigarette, hookah, and snus use at Wave 5 relative to the heterosexual group (p values all <.05). In Waves 1 and 5, tobacco use was higher among sexual minorities, but it is not consistent within the homosexual and bisexual groups. Efforts should be made not only in surveillance but in capturing these differences between homosexuals and bisexuals which allow for more tailored prevention and cessation efforts.

FUNDING: Funded by Legacy.

JUSTIFICATION: Efforts should be made not only in surveillance but in capturing these differences between homosexuals and bisexuals which allow for more tailored prevention and cessation efforts.

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POS4-73
PREVALENCE OF VIOLENCE AGAINST WOMEN IN FEMALE SMOKERS ATTENDED AT ONE SMOKING CESSION UNIT IN BUENOS AIRES CITY: A CROSS SECTIONAL STUDY

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Female smoking has been associated with several psychosocial determinants including single motherhood, anxiety, depression and Violence Against Women (VAW) among others. VAW is considered a critical source of stress. Several studies have shown that women smokers are twice more likely to report VAW than non-smokers. There is no data to support this association in Argentina, where VAW prevalence at primary care level is about in 44%.

Objective: To assess the prevalence of VAW in female smokers who receive smoking cessation treatment and compare the prevalence of non-psychotic mental disorders and self-perception of health status between female smokers with and without report of violence.

Method: Data were obtained from 409 women systematically chosen during 2011 to 2014 in the Smoking Cessation Unit (Hospital de Clínicas, University of Buenos Aires). The instrument was developed by the International Planning Parenthood Federation and discriminates among emotional, physical and sexual abuse. To assess non-psychotic mental disorders and depression we applied the Self-Reporting Questionnaire-20, (SRQ-20, developed by the WHO) and the Beck's Test. All instruments were locally validated. We collected demographic data, perception of health status and tobacco related information.

Results: All women agreed to participate. Their mean age was 51.73 years (SD+/-12.11), mean years of education were 13.24 (SD+/- 3.96), 51.59% did not have a partner and 69.93% had children. The mean for the Fagerström score was 4.78 (SD+/- 2.38). Lifetime prevalence of VAW was 66.9% and 13.20% reported some kind of current violence. Emotional and physical violence were the most frequent: 58.56% and 31.30%. The prevalence of non-psychotic mental disorders and depression were 42.05% and 49.14%, respectively.

Women were more likely to report VAW if they were living with a partner (OR=4.04, CI 95% 1.68-9.72), had an unstable employment situation (OR=2.49, CI 95% 1.24-5.01), a Beck score > 20 (OR=3.37 CI 95% 2.06-5.49) and had worst perception of their health status (OR=3.25 CI 95% 1.22-8.68).

VAW prevalence in our smoking cessation unit is 1.52 times than the prevalence at primary level.

FUNDING: This study was conducted while the first author was at the University of Buenos Aires. Supported by the 2010 “Carrillo-Oñativia” grant, National Health Ministry, Argentina.

JUSTIFICATION: If this data can be generalized it is necessary to include this screening in smoking cessation units systematically considering that they are both major causes of death and disability.

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POS4-74
INVESTIGATING TOBACCO USE IN TOP HOLLYWOOD MOVIES, 2008-2011

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Background: The Surgeon General concluded that there is a causal relationship between depictions of smoking in the movies and smoking initiation among young people. In view of that, to assess progress toward the Healthy People 2020 objective, the Office on Smoking and Health at the Centers for Disease Control and Prevention (CDC) has been tracking and reporting annually on tobacco use imagery in youth-oriented movies as a core surveillance indicator. Considering the importance of this topic, the present study explored the prevalence and correlates of tobacco use in scenes from movies nominated for the Academy awards (Oscar) from 2008 to 2011.

Methods: The inclusion criteria applied were: films which had been nominated in one or more of the following categories: best film, best actor and best actress from 2008 to 2011 with scenes showing drug consumption and/or effect of substance use in a scene lasting more than 10 seconds. We used survey settings to control for over- or under-estimation of the prevalence of a variable in given year or movie. Comparisons were performed between tobacco use scenes and other drugs use scenes. Firstly, we carried out univariate logistic regression models for each of the 36 variables. Then we selected variables for a multivariate model.

Results: In this sample of 515 scenes, tobacco use was associated with: scenes from historical movies, only one person using, elderly not using, and using in nature, on the street or at work; when compared with other drugs use. Moreover, the use of tobacco has not been associated with: scenes from movies with high opening gross, men using, and a central role in the scene; when compared with other drugs use.

Conclusion: Nowadays, the use of tobacco in scenes from Hollywood movies have different characteristics compared to the use of other drugs. Tobacco has been presented as a drug of lonely use, in outside home environment, disassociated with elderly. From our findings, smoking has performed far from the male ideal, and the central role within the movie scene, features that were most associated with cigarette use in films erstwhile.

FUNDING: No Funding

JUSTIFICATION: Considering there is a causal relationship between depictions of smoking in the movies and smoking initiation among young people, it is a Public Health issue to explored the prevalence and correlates of tobacco use in movie scenes.

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POS4-75
PREDICTORS OF PREGNANT QUITTERS’ INTENTION TO RETURN TO SMOKING POSTPARTUM
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Objective: Although many pregnant women quit smoking, most return to smoking postpartum. Returning to smoking is strongly related to women’s stated intention about smoking during pregnancy. We examined factors related to women’s intention to return to smoking to improve intervention trials.

Method: We report baseline data from a randomized controlled trial to prevent postpartum return to smoking. Women (n=382) were English-speaking women who smoked at least 100 cigarettes in their lifetimes and at least 5 cigarettes a day prior to becoming pregnant. We fit logistic regression models to test whether women’s intention to return to smoking was associated with demographic and smoking factors such as race, parity, and smoker self-identity.

Results: 43% of women had a strong intention of returning to smoking. Factors independently associated with intending to return to smoking were: African American race (OR=1.7, CI=1.0-3.0), lower education (OR=1.7, CI=1.0-2.7), stating they did not want to be currently pregnant (OR=2.1, CI=1.1-4.0), being not as concerned about the harmful effects of smoking to themselves (OR=1.6, CI=0.9-2.8), viewing quit as temporary (OR=2.3, CI=1.4-3.9), and self-identifying as smokers (OR=8.7, CI=4.9-15.3).

Conclusion: Although some factors related to intention to return to smoking were unchangeable, it might be possible to attempt to change women’s attribution of why they quit to be more permanent and to have them change their self-identity to be a "non-smoker" from a "smoker who is not currently smoking." Helping women have stronger intentions to stay quit can promote less return to smoking postpartum.

FUNDING: This work was supported by R01NR009429

JUSTIFICATION: Helping women adjust their concerns about harms of smoking for themselves, their attributions for their cessation, and their smoker identity could change their intention to return to smoking postpartum.

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POS4-76
PERCEPTIONS OF ELECTRONIC CIGARETTE E-FORUM USERS: A CROSS-SECTIONAL STUDY
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Electronic cigarettes (e-cigarettes) are gaining in popularity at a time when a definitive understanding of the health hazards is lacking. It’s important for professionals to better understand the perceptions of e-cigarette users to understand their reasons for use and the factors which are influencing those perceptions. This study was designed to provide a better understanding of the perceptions of e-cigarette users who visit online e-cigarette forums regarding their views of e-cigarettes in comparison to traditional cigarettes.

E-cigarette users were recruited via the ‘e-cigarette forum’ website and completed an online survey inquiring about their perceptions of e-cigarettes. Participants were asked to indicate whether they strongly agree, agree, don’t know, disagree, or strongly disagree to nine statements regarding e-cigarette use compared to traditional cigarettes.

A total of 154 surveys were completed. Approximately 96% of respondents felt that e-cigarettes had fewer negative health effects than traditional cigarettes and were effective at helping people quit smoking. Compared to conventional cigarettes, 92.9% of respondents agreed that long-term use of e-cigarettes was less expensive, and 77% indicated that e-cigarettes were less addictive. When asked if more people will use e-cigarettes than traditional cigarettes in the future, 88.5% of respondents agreed. Compared to using traditional cigarettes, 28.3% of respondents felt that e-cigarette users appear more attractive, while 18.6% of respondents indicated that using e-cigarettes was ‘cooler.’ Merely 3.2% of respondents felt that e-cigarettes were more attractive to people under the age of 19 than traditional cigarettes. Approximately 85% of respondents indicated that the immediate benefits of using e-cigarettes outweigh any potential long-term harm from using them. E-cigarettes are perceived more favorably than traditional cigarettes in a variety of ways among e-cigarette users who visit online e-cigarette forums. Understanding these views allows professionals to better understand the reasons behind their use of e-cigarettes and which factors of e-cigarette use should be further researched or addressed.

FUNDING: No Funding.

JUSTIFICATION: This study provides information regarding the perceptions of electronic cigarette e-forum users; understanding these perceptions allows public health professionals to better understand the reasons behind their use of e-cigarettes and which factors of e-cigarette use should be further researched and addressed.

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POS4-77
STRAIGHT-TO-WORK YOUNG ADULTS WHO VAPE AND SMOKE
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Non-college educated, or straight-to-work (STW) young adults have a higher rate of smoking than college-educated young adults, but little is known about their use of e-cigarettes or how vaping changes smoking behaviors and beliefs. Thirty interviews were conducted with STW young adults ages 19-29 years old. They were asked about smoking/vaping behaviors, their identity as a smoker once they began vaping, influences on decisions to smoke and vape, how people viewed them differently as a vapor, beliefs about safety and health impacts of vaping, and how they got information about vaping. Results from interviews showed most STW young adults started vaping to quit smoking. Most vapers still smoked sometimes, but no longer identified themselves as smokers. They felt that others had a more positive image of them as vapers. STW young adults reported a cycle of smoking and vaping. Some who had transitioned to vaping went back to smoking when their e-cigarette broke, or smoked whenever they ran out of e-liquid to hold them over until they could get back to the store. When asked what they would do with a group a people who smoked, vapers said they would smoke a cigarette rather than vape. Many STW young adults who both vaped and smoked daily had little idea of how much nicotine they were consuming each day. Some young adults enjoyed vaping in designated no smoking locations in defiance of rules, but most said that they did not vape inside public buildings or in restaurants out of respect for others. They discussed vaping around children and whether vaping promoted smoking. STW young adults said when they wanted information on vaping they would rely on vapor store staff or trust Google to give them accurate information. Regardless of the source, vaping information on the Internet was considered accurate if something was said in two or more places. STW young adults who vape and smoke are vulnerable to consuming large amounts of nicotine through concurrent use, and changing beliefs about their smoking identities while they vape may make them more likely to continue smoking. They are also more vulnerable to misinformation about vaping, and its potential health impacts.

FUNDING: This project was funded by the Oklahoma Tobacco Research Center

JUSTIFICATION: The results from this study of an understudied group of young adults who have integrated vaping into their smoking behaviors has important implications for prevention and cessation interventions and increases our understanding of how vaping influences young adult beliefs about smoking.

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**POS4-78**

THE ASSOCIATION BETWEEN SCHOOL SMOKING POLICIES AND SOCIOECONOMIC INEQUALITIES IN SMOKING AMONG 14 TO 17 YEAR OLD ADOLESCENTS

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Background: Previous studies suggest that strong school smoking policies may decrease smoking rates among students. However, the evidence is inconsistent and it is unknown if these effects vary between socioeconomic groups. This study aimed to examine the association between school smoking policies and socioeconomic inequalities in smoking among 14 to 17 year old adolescents.

Methods: Data of 11,015 adolescents of 50 schools in six European cities were obtained from the 2013 SILNE survey. Two smoking outcomes were used: daily smoking and, among daily smokers, smoking on school premises. The school smoking policy was measured using five variables, total policy perceived by students, and total policy reported by staff with three subscales: regulations (smoking bans), information on policies and sanctions. Multilevel logistic regression analyses controlled for 8 socioeconomic indicators and the smoking environment. Interaction was tested between school smoking policies and academic achievement of the student.

Results: Total policy as perceived by students as well as staff showed no association with daily smoking and a non-significant negative association with smoking on school premises (OR total policy students:0.89, 95%CI:0.78-1.03, OR total policy staff:0.87, 95%CI:0.81-1.24). Stronger regulation of smoking was associated with lower odds of daily smoking (OR:0.81, 95%CI:0.69-0.96) though not as clearly with smoking on school premises (OR:0.91, 95%CI:0.73-1.12). Unexpectedly, stronger policies regarding information and sanctions were associated with higher odds daily smoking. Interactions between policy and academic achievement were not significant, suggesting a similar impact in high and low socioeconomic groups.

Conclusions: Our findings suggest that the preventive effects of school smoking bans, as suggested in some previous studies, also apply to different parts of Europe. The strength of regulations, rather than sanctioning and providing information, seem to affect adolescent smoking in both lower and higher socioeconomic groups.

FUNDING: European Union's Seventh Framework Programme for Research and Technological Development (FP7) SILNE Grant no. 278273-2

**POS4-80**

FACTORS ASSOCIATED WITH OUTCOMES OF QUIT ATTEMPTS AMONG SMOKERS IN AN INDUSTRIAL WORKPLACE IN SOUTH AFRICA

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Background: The interactions of smoking regulations with the physical labour demands of the industrial workplace may result in outcomes of quit-attempts different from that in the general population. In this study, we investigated quit-attempts outcomes and factors associated with successful quit-attempts among ever-smokers in a multi-national steel manufacturing company in South Africa.

Methods: In a cross sectional study, we used a structured questionnaire to obtain information on demography, smoking patterns, motivations and treatments used during quit-attempts from 230 consecutively sampled ever-smokers. Analysis included use of chi-square test, t-test, analysis of variance and logistic regression. Main outcome measures included: the outcomes of quit-attempts (successful or not) and the factors that predicted successful outcome.

Results: Participants’ mean age was 37 years and they smoked an average of 19.8 cigarettes per day. Most participants were white (71.3%), men (82.2%), had grade 12 or more education (81.3%), married (70.9%), employed (65.2%) and field-based / manual labourers (73.9%). All participants had made a quit-attempt but only 52 (22.6%) were successful (abstinent for 6 months or more). Successful participants were significantly more likely to be: older (43.5 Vs 35.8 years; p=0.000), married (0.007), permanently employed (p=0.02), had grade 12 education or more (p=0.01), smoke their first cigarette of the day after 30 minutes of being awake and made a quit-attempt for reasons other than concerns for family and friends (p=0.001). On logistic regression, receipt of support from family/friends (OR=8.8; p=0.004), the use of varenicline (OR=4.0; p=0.0008) or nicotine replacement therapy (OR=0.099; p=0.007) predicted successful outcome.

Conclusion: Notwithstanding the manual-labor intensive environment, the vast majority of smokers in this industrial workplace attempted to quit, with success rate similar to that in the general population. Even in this setting, supportive social networks and the use of cessation medications during quit-attempts remain crucial for success.

FUNDING: No funding

**POS4-81**

THE IMPACT OF SMOKING REDUCTION ON MENTAL HEALTH: COMPARISON OF TRADITIONAL AND CAUSAL METHODS

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Background: Smoking reduction (SR) is offered as a route to quit or as a harm reduction approach for smokers who may not be ready to stop smoking immediately or who cannot stop. There are some physical health benefits of SR, however there is limited evidence about the impact of smoking reduction on mental health. One possibility is that by reducing cigarette consumption the smoker will experience longer periods of, and more intense psychological withdrawal symptoms in-turn worsening their mental health.

Aim: The aim of this study was to assess the association between smoking reduction and change in mental health using traditional and causal approaches.

Method: Data were from five trials of NRT for smoking reduction and analyses compared the difference in mental health (SF-36) at 18 week follow-up with adjustment for baseline values, between bio-validated reducers (n=177) and continuing smokers (n=509). Estimates derived from regression modelling,
Results: Adjusted and unadjusted estimates were similar, and there was no association between reduction and change in mental health between groups. The adjusted difference from regression modelling alone was, 0.01 (95% Confidence interval (CI) I: -2.42 to 2.44); from PSM was, 0.85 (-2.2 to 3.9); and from IV approach was, -1.04 (-3.14 to 1.05).

Conclusions: Comparison of estimates derived from three different statistical approaches reduced the possibility unknown confounding and reverse causation. All three methods indicated that there was no association between smoking reduction and change in mental health. We conclude smoking reduction is likely a safe pathway to cessation for stressed smokers and smokers with mental health disturbances.

FUNDING: This study was funded by a National Coordinating Centre for Research Capacity Development scholarship

JUSTIFICATION: We conclude smoking reduction is likely a safe pathway to quit.

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POS4-82
ELECTRONIC NICOTINE DELIVERY SYSTEMS AND SECONDHAND SMOKE: ARE ENDS A THREAT TO SMOKING BANS?
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Introduction: Electronic Nicotine Delivery Systems (ENDS) have been marketed as a safer alternative to traditional cigarettes (TCs). However, initial evidence suggests that ENDS could pose a secondhand vaping risk. Few organizations have implemented smoke-free restrictions including ENDS, and little data is available regarding views on ENDS smoking bans. This study compared current and former cigarette smokers on (a) perceptions of secondhand exposure and (b) bans for ENDS and TCs.

Methods: Adult current and former smokers (N=182) completed a telephone survey in English; 45% Black, 31% White, 21% Hispanic. Participants were recruited via flyers at local businesses, community partners, and internet-based advertisements in South Florida (June-August 2014).

Results: Nearly all participants (99%) were aware of ENDS. Views on secondhand exposure and bans for ENDS versus TCs differed. Overall, 77% (91% former smokers; 73% current smokers, p<0.02) viewed secondhand smoke from TCs as very bad for health, compared to 13% for ENDS. Most participants endorsed complete TC smoking bans at their homes (81% former smokers; 55% current smokers, p<0.01), whereas 29% fully banned ENDS at home. The same pattern was observed for smoking TCs and ENDS at homes in general. Most participants supported complete workplace TC smoking bans (82%). Views on ENDS workplace bans were more varied; 35% supported full bans, 42% supported partial bans, and 23% supported no restrictions on ENDS at workplaces. Although not statistically significant, more former smokers supported full ENDS workplace bans than current smokers (47% vs. 30%). Among employed participants (n=78), 79% worked in TC-free settings, compared to 33% in settings with ENDS-specific bans. Forty-three percent reported no ENDS policy at work, and 19% were unaware of the policy (24%).

Discussion: Early evidence suggests possible health risks from secondhand vaping, yet neither current or former smokers viewed ENDS as a significant health threat and were relatively less supportive of ENDS bans. Although more research is needed on consequences of secondhand ENDS exposure, these findings have implications for public health policies.

FUNDING: University of Miami

POS4-83
THE ASSOCIATION OF SMOKELESS TOBACCO USE AND PARTICIPATION IN ORGANIZED SPORT - FINDINGS FROM THE YOUTH SMOKING SURVEY 2010 (CANADA)
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Introduction: Smokeless tobacco (SLT) describes a class of non-combustible products including chewing tobacco and snuff. In recent years SLT use among youth, while remaining low prevalence, has increased in Canada. SLT has historically been associated with certain sports, most notably baseball. There is evidence that some youth believe SLT can enhance athletic performance. The following study examines the association of SLT use among Canadian youth who participate in organized sports teams.

Methods: This study uses data from the 2010 cycle of the Youth Smoking Survey (YSS), a nationally representative sample of Canadian students in high school (grades 9 through 12, n=31,396). Reported proportions and modeling use weighted data.

Results: Approximately half of the male respondents (48.5%) and more than a third of female respondents (37.5%) reported they participate in intramural or team sports.

In 2010, 9.3% of male high school students reported ever use of SLT, and 3.9% reported current use, compared to 2.2% and 0.9% for high school aged female respondents.

Male students who participate in sports teams were more likely to have tried (OR 1.8; 95% CI 1.4-2.3) or to be current SLT users (OR 2.7; 95% CI 1.9-4.0) compared to male students who do not participate in sports. In comparison, female students who participate in sports teams were less likely to have tried (OR 0.9; 95% CI 0.5-1.5) or to currently use SLT (OR 0.3; 95% CI 0.2-0.7) compared to female students who do not participate in sport.

Conclusions/Discussion: Males who participate in organized sports (intramural and team sports) are more likely to use SLT. Females who participate in organized sports are less likely to use SLT. It is unclear if male youth believe SLT will enhance performance but this warrants further study. These results suggest that prevention efforts may benefit from targeting organized teams through education interventions and/or tobacco-free sport policies.

FUNDING: The Propel Centre for Population Health Impact is supported from a major program grant from the Canadian Cancer Society Research Initiative (CCSRI grant #701019). The Youth Smoking Survey is a product of the pan-Canadian capacity building project funded through a contribution agreement between Health Canada and the Propel Centre for Population Health Impact. The YSS consortium includes Canadian researchers from all provinces and provided training opportunities for university students at all levels. The views expressed herein do not necessarily represent the views of Health Canada.

JUSTIFICATION: Prevention efforts may benefit from targeting organized teams to address perceptions/beliefs that smokeless tobacco products can improve performance; evidence may also support tobacco-free sport policies.

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POS4-84
PSYCHOGRAPHIC CHARACTERISTICS AND HEALTH BEHAVIORS IN YOUNG ADULTS
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Few studies using psychographic segmentation have been conducted; no studies within predominantly Hispanic samples have been published. The aims of this study were to identify psychographic (e.g., lifestyle characteristics) clusters and their relation to tobacco and alcohol use within a primarily Hispanic young adult sample on the U.S./México border.

Participants (N =755; 72.5% female; ages 18-25, Mage=20.7 [2.16]; 87% Hispanic) completed an online survey including: sociodemographics, an intentions to smoke scale, tobacco use/history, the Smoking Stage of Change Scale, the Daily Drinking Questionnaire/binge drinking, a social activities scale, a stressors/worries scale, a psychographic survey, a music preference question, the Brief Sensation Seeking Scale, and the Mini-International Personality Item Pool. A two step cluster analysis identified two groups ([AIC=8690.6]; ratio among distance measures=1.71). A MANCOVA (Wilks' λ=.91, F [17, 636]=3.86, p < .001) and chi square analyses assessed group differences. 'Popular Extroverts' (49.3%) reported: a higher risk for ever trying tobacco (χ² [1]=10.61, p =.001); using alcohol (past month [F(1, 652)=9.69, p=.002); and ever (χ² [1]=8.23, p < .01)/past month (χ² [1]=12.80, p < .001) binge drinking). 'Popular/Conventional' also reported higher: extroversion F(1, 652)=40.03, p < .001, sensation seeking F(1, 652)=20.38, p < .001, and stress scores F(1, 652)=7.56, p < .1. 'Mainstream/Conventional' (50.7%) reported: a higher percentage of individuals having smoked at least one day in the past month (χ² [1]=3.85, p<.05) and greater intentions to smoke (all ps < .02).

Given their endorsement of being 'popular' and greater ever use of tobacco, 'Popular Extroverts' may benefit from prevention messaging that includes promoting peer support and intensity oriented activities (e.g., hiking). Messaging for 'Mainstream/Conventional' may promote cessation through traditional modalities and tobacco free activities (e.g., walking in park). Future directions include testing (e.g., focus groups) specific messaging for these groups which may be used as part of mass media interventions to reduce young adult tobacco use prevalence.

FUNDING: This project was funded by A Smoke Free Paso del Norte Grant No. 226-8113-63A.

JUSTIFICATION: Findings from this study suggest targets for mass media messaging regarding tobacco use within predominantly Hispanic young adults.

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POS4-88
HOOKAH USE AMONG HIGH SCHOOL STUDENTS IN NORTH CAROLINA: ALTERNATIVE TOBACCO PRODUCT USE ON THE RISE AMONG YOUTH
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Objective: Although youth cigarette use is declining in the United States, adolescents are increasingly turning to alternative tobacco products, such as hookahs. This study aims to assess trends and correlates of hookah use among high school (HS) students in North Carolina.

Methods: Data were analyzed from the NC Youth Tobacco Survey (NCYTS) in 2011 and 2013, where 4,791 HS students in 2011 and 4,092 HS students in 2013 completed the survey (overall response rate: 78.2% and 67.8%). The NCYTS uses a 2-stage cluster design to produce representative data for grades 6-12 in NC public and charter schools. Hookah current use was defined as use on at least one day in the last 30 days, and ever use was defined as ever trying, even just one time in the past. Bivariate and multivariate logistic regression were conducted to examine the correlates of hookah current and ever use. To account for the complex survey design and sampling weights, data were analyzed by using STATA svyset procedures.

Results: Prevalence of current hookah use among HS students significantly increased from 3.6% (95% CI:2.8%-4.5%) in 2011 to 6.1% (95% CI:4.9%-7.5%) in 2013. 12.6% of HS students in 2013 reported that they had ever tried or were currently using hookahs, which is higher than 2011 data (9.8%). Among current and ever users in 2013, prevalence was highest among males, those in 12th grade, White students, those reporting weekly disposable income of more than $50, those currently smoking cigarettes , and those with at least one closest friend smoking cigarettes. White and Hispanic students were at higher odds for currently or ever
using hookah (White: AOR=1.38, p<.05; Hispanic: AOR=1.54, p<.05) compared to Black students. Having more than $10 to spend each week also increased odds for hookah use (311-50/week: AOR=1.51, p<.01; >$50/week: AOR=1.96, p<.001).

Conclusion: The significant rise of current hookah use among NC HS students is quite concerning. The higher use among youth with higher disposable income and dual use of hookahs and cigarettes need to be understood and acted upon in public health campaigns. Understanding of social normalization and perceived health risks of hookah use among youth is warranted for future prevention efforts.

FUNDING: The North Carolina Youth Tobacco Survey was administered with support from the Centers for Disease Control and Prevention Grant or Cooperative Agreement Number, DP 14-1415.

JUSTIFICATION: This research provides data on hookah use among high school students in North Carolina, including trends and correlates of hookah current and ever use, which can be used to inform policy makers and practitioners for understanding of hookah use and putting prevention efforts.

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POS4-90
STRESS AS A SUSTAINING FACTOR FOR TOBACCO USE AMONG THE LESBIAN, GAY, BISEXUAL AND TRANSGENDER COMMUNITY IN NEW YORK CITY: RESULTS FROM A QUALITATIVE ANALYSIS

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Background: Little is known on the rates of alternative tobacco product, electronic cigarette, and polotobacco usage among lesbian, gay, bisexual, transgender (LGBT) persons. Within New York City (NYC) the smoking prevalence for homosexuals is 31.5%, which is double that of heterosexuals. Several theories have emerged as explanations for the high smoking prevalence, including a history of targeted advertisement by tobacco companies, accepted social normative behaviors of bar patronage for socialization and friends and family who use tobacco.

Methods: Qualitative data from eight leaders at various LGBT community organizations located in NYC were collected during key informant interviews. Data were analyzed for common themes using a grounded theory design. Key themes were phrases that appeared at least twice in a single interview or across two different interviews. Excerpts are unique quotes spoken by the participants that discuss the key theme(s) and serve as the unit of measure in this analysis.

Results: A total of 18 key themes and 110 unique excerpts were identified. The top three key themes were: current smoking patterns (32.72%, N=36), stress (25.45%, N=28) and reasons for smoking (20.91%, N=23). For current smoking patterns, the top three subthemes were smoking as a gateway for other destructive behaviors, smoking as a coping mechanism and youth. For stress, the three most occurring subthemes in this category were persecution, culture differences and stigma. Additionally, stress was also a common co-occurring code among current smoking patterns and reasons for smoking.

Conclusion: Racism, immigration, persecution, socialization, fear of deportation and blending into one's community are some of the stressors that people describe as reasons for their continued tobacco use. To investigate the association between tobacco use and stress the results from this analysis informed the creation of a web-based anonymous survey to query tobacco use and stress among the LGBT community in NYC. As laws become more protective of immigrant and LGBT rights more research is needed to investigate the impact of these laws on stress and tobacco use.

FUNDING: no funding

JUSTIFICATION: Stress and methods to cope with stressors must be addressed before making a quit attempt among LGBT smokers to ensure a successful cessation attempt.

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POS4-91

NAATPN IDENTIFIES SIGNIFICANT OUTCOMES OF TOBACCO CONTROL EFFORTS IMPACTING THE AFRICAN AMERICAN COMMUNITY

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Great racial disparities exist in smoking and related health outcomes in the United States. African American (AA) smokers start smoking later and smoke less than white smokers but are less likely to quit, thus making them more likely to be long-term smokers. In addition, the tobacco industry has a long history of targeting African Americans with menthol cigarettes, which have been shown to be more addictive than non-mentholated cigarettes. In 2008, CDC’s Office on Smoking and Health funded the National African American Tobacco Prevention Network (NAATPN) to focus tobacco control leadership, expertise and promotion in the AA community. In 2012, NAATPN sought to determine significant outcomes of tobacco control efforts impacting Black and AA communities. To achieve this goal, a qualitative document search and series of interviews, modeled after the Delphi Technique, were conducted. Researchers and consultants reviewed the resulting qualitative documents and interview responses. The 13 identified outcomes were categorized into five broad classifications: 1) Menthol: Emergence of menthol as a focus for advocacy, policy and research; 2) Policy and Legal: Public policy and legal action aimed at reducing tobacco usage and consumption; 3) Advocacy: Focusing on tobacco control networking aimed at bringing together local groups under one umbrella and facilitating growth of local, organic, and grassroots capacity in AA communities; 4) Diversity: Ethnic diversification of the tobacco control movement [post 1995]; Emergence of diversity and inclusivity as values and principles used in shaping/driving policy, advocacy, and outreach; and 5) Cessation: Creation of a cessation guide for the AA community. In addition to these major outcomes, opportunities for action were identified, including the need to increase scholarly, peer reviewed research on smoking in minority populations and to encourage AA leadership organizations and media to implement anti-smoking campaigns. These data allow for identification of opportunities for action in AA tobacco control and prevention.

FUNDING: Funding for this project was provided by the National African American Tobacco Prevention Network.

JUSTIFICATION: Despite great strides in reducing smoking at the national level, racial disparities persist. By identifying promising work that has been done to address tobacco use among African Americans, we can then pinpoint best practices and identify gaps that could help us to address these significant racial disparities.

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POS4-92

NETWORK ANALYSIS OF THE TEAM NAVAJO COALITION FOR A SMOKEFREE NAVAJO NATION

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Background: The purpose of the Networks among Tribal Organizations for Clean Air Policies project is to map the network of organizations and individuals on Navajo Nation working for smokefree workplaces and public places. The primary group that the NATO CAP project is studying is the Team Navajo health coalition (TN), a Navajo-led community coalition dedicated to increasing community involvement in tobacco control issues.

Methods: A survey was conducted with TN members in Fall/Winter 2013. Network information was collected by asking TN members to report their relationships with other members. The survey also asked about opinions/beliefs about smokefree policies on Navajo Nation.

Results: All four TN networks—strategic planning, information sharing, education, and service delivery—were highly centralized around a few individuals. The average number of ties for coalition members for each network were relatively high, with the highest average for the information sharing network (mean ± SD = 23.66 ± 17.41). Relationships among members also seemed to be somewhat organized around geographic location. The education and information sharing networks had the highest density (0.21 for both), and the service delivery network had the lowest density (0.15). Reciprocity was highest for the information sharing and strategic planning networks (0.11 for both).

Discussion: The highly centralized network indicates that the group, right now, relies heavily on a small number of people to connect the rest of the group. This can make knowing who to go to for information easier, but this type of network structure also tends to be more vulnerable to becoming fragmented if a central person were to leave the network. Low reciprocity for the networks could indicate an uneven flow of communication across members, with a small core of members who actively communicate with each other and many members on the periphery who only receive communications. This was supported by the large number of people who reported they were either not an active member of the coalition or were unsure whether they were an active member.

FUNDING: National Cancer Institute, NIH

JUSTIFICATION: This research can inform the processes of fostering collaboration for achieving policy change.

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POS4-93

‘TALKING ABOUT THE SMOKES’: ADAPTING THE INTERNATIONAL TOBACCO CONTROL (ITC) POLICY EVALUATION PROJECT FOR ABORIGINAL AND TORRES STRAIT ISLANDER AUSTRALIANS

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This paper will describe how we used and adapted the methods of the International Tobacco Control (ITC) Policy Evaluation Project to understand what is assisting Aboriginal and Torres Strait Islander smokers to quit. The ITC Project is accepted as the most rigorous method of evaluating national tobacco control policies. Australia is a world leader in tobacco control, and been involved in the ITC Project since it was established in 2002. However, 41% of Aboriginal and Torres Strait Islander Australians aged 15 and over were daily smokers in 2012, 2.6 times the age-standardised prevalence of other Australians. There is limited evidence from this setting to guide the increased attention and funding to Aboriginal and Torres Strait Islander tobacco control. Our project is the first ITC project that has just sampled a high smoking prevalence sub-population within a country. Crucial to the success of the project has been the involvement of Aboriginal Community Controlled Health Services (ACCHSs) and their state and national representative bodies in all aspects of the research. This has been crucial in overcoming considerable distrust of research. We used a non-probabilistic quota sampling design, based on meaningful clusters: the communities served by ACCHSs. Community surveys were conducted face-to-face rather than by phone, and we also surveyed ACCHSs staff in each wave. In the baseline survey we interviewed 2522 Aboriginal and Torres Strait Islander people in 35 locations. The sample closely matched the distribution of the Aboriginal and Torres Strait Islander population in a random national household survey by age, gender, jurisdiction and remoteness. There were inconsistent differences in some socio-economic factors, but in both surveys, similar percentages of smokers reported having quit in the last year, and daily smokers reported similar numbers of cigarettes smoked per day. The project provides a detailed and nationally-representative description of Aboriginal and Torres Strait Islander smoking behaviours, attitudes, knowledge and exposure to tobacco control activities and policies, and their association with quitting.

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scholarship and a Sidney Myer Health Scholarship, and Matthew Stevens by an NHMRC fellowship.

JUSTIFICATION: This paper has implications for future tobacco control policy research among other Indigenous populations in USA, Canada and New Zealand, and among other high smoking prevalence sub-populations.

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**POS4-95**
PREDICTORS OF WANTING TO QUIT IN A NATIONAL SAMPLE OF AUSTRALIAN ABORIGINAL AND TORRES STRAIT ISLANDER SMOKERS

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The prevalence of daily smoking among Aboriginal and Torres Strait Islander peoples is three times more than double that of non-Indigenous Australians. There has been little research on differences in motivation to quit. This paper explores wanting to quit using baseline data from Talking about the Smokes, an ITC Project with Aboriginal and Torres Strait Islander people in Australia. We used a stratified cluster design to survey a national sample of 1,643 Aboriginal and Torres Strait Islander smokers in 2012/13. Multivariable logistic regression modelling was used to compare smokers who wanted to quit with those who did not. Similar to the Australian population, 70% of Aboriginal and Torres Strait Islander smokers wanted to quit. There was no clear social gradient in wanting to quit. Interest in quitting was positively associated with social normative and environmental factors: agreeing that non-smoking sets a good example to children (OR: 2.34, 95% CI 1.35-4.05), holding the perception that community leaders disapprove of smoking (OR 1.58, 95% CI 1.15-2.18), reporting support to quit from family and friends (OR 1.49, 95% CI 1.08-2.06) and having a smoke-free home (OR 1.32, 95% CI 1.01-1.72). Smokers exposed to targeted advertising were also more likely to want to quit (OR 1.49, 95% CI 1.10-2.01), but no other intervention was significant. Similar to other populations, past quit attempts (median=3) were strongly predictive of wanting to quit, with ORs of: 3.76 (95% CI: 2.61-5.40) for those who had quit 1-3 times, to 9.29 (95% CI: 5.71-15.12) for those who had quit over 3 times previously, compared with never. Also similar to other populations, wanting to quit was negatively associated with smoking more cigarettes per day and saying you enjoy smoking, and positively associated with worry about future health consequences and believing quitting to be beneficial. In conclusion, though interest in quitting and factors that predict wanting to quit are similar in Aboriginal and Torres Strait Islander Australians and the Australian population, targeted and other campaigns that address social norms and other environmental factors may boost motivation to quit.

FUNDING: The project was funded by the Australian Department of Health. Anna Nicholson was supported by an National Health and Medical Research (NHMRC) post-graduate scholarship and a Sidney Myer Health Scholarship. David Thomas by a National Heart Foundation fellowship and Matthew Stevens by an NHMRC fellowship.

JUSTIFICATION: Funding targeted and other campaigns that address social norms and other environmental factors may boost motivation to quit. Though interest in quitting and factors that predict wanting to quit are similar in Aboriginal and Torres Strait Islander Australians and the Australian population, targeted and other campaigns that address social norms and other environmental factors may boost motivation to quit and keep quitting on the agenda for Aboriginal and Torres Strait Islander smokers.

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**POS4-96**
SEXUAL AND GENDER MINORITY COMMUNITY-BASED TOBACCO CESSATION PROGRAM: TAILORED RECRUITMENT AND EVIDENCE-BASED INTERVENTION

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Background: A higher prevalence of smoking in sexual and gender minority (SGM; lesbian, gay, bisexual, transgender, queer and other non-heterosexual sexual orientations and non-traditional gender identities) populations has been well-established. This national trend is true in Missouri, where a smoking rate of 36% in the SGM population is greater than the general population rate of 24%.
Fewer SGM individuals utilize primary care services and therefore may not receive the same physician-based recommendations to quit smoking as their non-SGM counterparts.

Methods: An evidence-based brief intervention (the “5-As” framework) and motivational interviewing were used for those seeking cessation services at three SGM community organizations in the St. Louis area. Coaching and a 2-week supply of nicotine replacement therapy were offered to the smokers with follow-up sessions available. Additionally, semi-structured telephone interviews were conducted with counselors from the three smoking cessation programs to obtain their feedback on various issues pertaining to implementation.

Results: Over a 14 month period, 195 smokers (56% SGM) utilized the cessation service. Of those participants who were contacted in a follow-up survey (n=33), 27.3% reported quitting. Fidelity to the program components of: discussing quit plans, setting quit dates, and providing NRT varied considerably by organization.

Conclusion: Using community organizations is an effective method to recruit smokers and expand opportunities for cessation programs beyond quitline services and in clinical settings. This program was moderately successful in the self-reported quit rates and provided an evidence-based cessation strategy for smokers to quit.

FUNDING: Missouri Foundation for Health
JUSTIFICATION: This case study demonstrates the feasibility and effectiveness of incorporating tobacco cessation into community organization that serve disparate populations such as LGBT centers.

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POS4-98
DEVELOPMENT OF EVIDENCE-BASED RECOMMENDATIONS AND A QUIT PLAN TEMPLATE FOR ADOLESCENT TOBACCO CESSATION

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Background: The CDC estimates that 14% of high school and 3.5% of middle school students smoke cigarettes. Research finds that adolescent smoking cessation programs, compared with control conditions, increase the probability of quitting by 46%. While many local and national tobacco prevention campaigns targeting adolescents are in place, few evidence-based, age-appropriate resources exist to help them quit.

Methods: A systematic review of adolescent tobacco cessation was conducted. Search criteria included articles published from 1994-present, full text available online, and availability in English. Search terms included: youth, teen, adolescent, or child AND smoking, tobacco, cigarette, or nicotine AND cessation, quit, quiting, nicotine replacement therapy, intervention, Wellbutrin, bupropion, Chantix, or varenicline. Databases searched included Ovid Medline, Cinahl, PsychINFO, and Scopus, with 332 articles identified. Of those, 130 were found to meet the inclusion criteria (addressed ages 13-17, focused on cessation rather than prevention, took place in the U.S./a developed country, and was a peer-reviewed original research or review article).

Results: These articles were developed into a systematic review that includes evidence-based recommendations and a quit plan template for adolescent tobacco cessation. The quit plan covers reasons for quitting, triggers, coping strategies, support, and the rewards of quitting.

Conclusions: To improve quit rates, these evidence-based recommendation should be utilized when implementing cessation services for adolescents. Cessation interventions should include a behavioral component, such as the completion of the evidence-based quit plan template, to achieve optimal success.

FUNDING: Missouri Department of Health and Senior Services
JUSTIFICATION: The evidence-based recommendation and quit plan template resulting from this study can be used by organizations and healthcare providers who work in adolescent cessation. The Missouri Department of Health and Senior Services will be distributing the final versions of these products statewide.

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POS4-97
PERFORMANCE AND CONSTRUCT VALIDITY OF THE CIGARETTE DEPENDENCE SCALE (CDS-12) FOR SMOKING AND OF AN ADAPTATION TO SMOKELESS TOBACCO USE (STDS-12) IN SWEDISH POPULATION SAMPLES

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Introduction: The 12-item Cigarette Dependence Scale (CDS-12) has been previously used to study tobacco dependence in non-clinical populations. However, it has not yet been tested in large samples of low-intensity smokers or to assess dependence on smokeless tobacco.

Methods: We investigated performance and construct validity of the CDS-12 and of its adaptation to smokeless tobacco (STDS-12) in two Swedish population samples. One sample consisted of young adults (1,246 ever daily smokers and 1,086 ever daily snus users). The second sample included 1,229 current smokers and of its adaptation to smokeless tobacco (STDS-12) in two Swedish population samples. One sample consisted of young adults (1,246 ever daily smokers and 1,086 ever daily snus users). The second sample included 1,229 current smokers and 855 users of snus between 16-84 years. Scores' distribution, internal consistency, construct validity, and associations with other indicators of tobacco dependence were analyzed.

Results: Both scales performed well and had acceptable internal consistency (Cronbach alpha 0.88-0.93 for CDS-12 and 0.87-0.93 for STDS-12). For both scales, factor analyses suggested a one-factor model. CDS-12 score and proportions classified as dependent were significantly higher among daily smokers compared to non-daily smokers, positively correlated with number of cigarettes with 0.82 (95% CI 0.70 to 0.95) increase in the score for each additional cigarette per day, negatively correlated with quit attempts as well as their duration. The same pattern was seen for STDS-12, apart from correlation with quit attempts. In both samples, scores for STDS-12 among snus users were consistently higher than scores for CDS-12 among smokers.

Conclusions: The 12-item Cigarette Dependence Scale (CDS-12) and its adaptation to smokeless tobacco appear to perform well in population-based studies including young and low-intensity tobacco users.

FUNDING: This work was supported by Swedish Research Council for Working Life and Social Research (FAS), (grant 2008-0876 to M.R.G.); by internal funding of the Karolinska Institutet; and by the Swedish Ministry of Health and Social Affairs.

JUSTIFICATION: This work can contribute to the study of occurrence and determinants of dependence in general populations.
CHARACTERIZING USE PATTERNS AND PERCEPTIONS OF RELATIVE HARM IN DUAL USERS OF ELECTRONIC AND TOBACCO CIGARETTES

Olga Rass*, Lauren R. Pacey, Patrick S. Johnson, Matthew W. Johnson

Use of electronic cigarettes (e-cigarettes) is increasingly prevalent among current smokers of traditional tobacco cigarettes, yet little is known about the dual use of these products. An online survey assessed user demographic characteristics, product use patterns, and perceptions about relative benefits and harms of e-cigarettes and tobacco cigarettes in dual users (n=350) registered on the crowdsourcing website, Amazon Mechanical Turk (MTurk). Compared to tobacco cigarettes, e-cigarettes were used less often and were associated with lower nicotine dependence. Primary motives for e-cigarette use were harm reduction and cessation of tobacco cigarette smoking. E-cigarettes use was more convenient than tobacco cigarettes, with greater use likelihood in settings with tobacco cigarette smoking restrictions or when others’ health would be adversely affected by tobacco cigarette smoke. Conversely, participants reported using tobacco cigarettes more often than e-cigarettes in hedonic situations (after eating, drinking coffee or alcohol, or having sex), outdoors, or when stressed. Participants were twice as likely to report wanting to quit tobacco cigarettes compared to e-cigarettes in the next year and intended to quit tobacco cigarettes sooner than e-cigarettes. Tobacco cigarettes were perceived as more harmful and addictive than e-cigarettes, but also more enjoyable than e-cigarettes. Additional research is needed to assess single product users (i.e., individuals using only e-cigarettes) and users with extended histories of e-cigarette use in order to provide recommendations for regulatory decisions.

FUNDING: This work was supported by NIDA grants T32 DA07209 and R01 DA032363.

JUSTIFICATION: Current tobacco cigarette smokers who also use e-cigarettes (‘dual users’) are key to resolving both negative and positive public health claims regarding e-cigarettes in the controversy surrounding their use.

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POINT-OF-SALE MARKETING FOR A VARIETY OF TOBACCO PRODUCTS IN URBAN AND RURAL OHIO


A considerable amount of research has examined the retail environment for cigarettes and smokeless tobacco, identifying how point-of-sale exposures are closely related to smoking-related disparities across communities. However, very little work has conducted surveillance for alternative tobacco products, such as cigars, e-cigarettes, and e-cigarettes. Therefore, the purpose of the present study was to examine the point-of-sale marketing of various tobacco products and determine whether this marketing was associated with demographic characteristics (population density, poverty, race/ethnicity) in the state of Ohio.

During the summer of 2014, fieldworkers collected comprehensive tobacco marketing data from 201 stores in Ohio (101 in Appalachia, 100 in Columbus). Stores were randomly selected and stratified geographically throughout each county. The store audits included external features (e.g., outside advertisements for particular products) and internal features (e.g., what products were being sold, sales/promotions). The address of each store was also geocoded to a 2010 census tract, providing us with information about the community in which the store was located.

Consistent with previous point-of-sale research, regression analyses indicated that there were more exterior ads for menthol cigarettes in urban Columbus than rural Appalachia. Novel findings were that when counting the variety of product types advertised outside, a greater number were advertised in Columbus than Appalachia. In particular, external advertising for e-cigarettes was more prevalent in Columbus. External advertisements for cigars were also more likely in high-poverty communities. The sale of flavored e-cigarettes was much more likely in Columbus than Appalachia.

Overall, our results indicate that compared to rural Appalachia (where cigarette smoking is already extremely prevalent) urban Columbus is experiencing greater point-of-sale marketing for alternative tobacco products. Across these two areas, poverty-based differences were also detected. Findings have implications for a new means of perpetuating tobacco-related health disparities.

FUNDING: NCI: P50 CA 180908

JUSTIFICATION: These findings present some of the first information about marketing of alternative tobacco products (e.g., e-cigarettes) and could inform future policy.

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MENTHOL SMOKING DIFFERENTIALLY PREDICTS SMOKING INTENSITY AND DESIRE TO CHANGE AMONG BLACK AND WHITE SMOKERS

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Menthol smokers consume fewer cigarettes than non-menthol smokers but demonstrate the same health-related consequences and are less successful at quitting. Race has also been linked to smoking intensity, menthol use, and health consequences of smoking in that Black smokers have been shown to prefer menthol cigarettes and consume fewer cigarettes than non-Black smokers, but have higher tobacco-related morbidity and mortality. Few studies have examined the links among menthol use, smoking intensity, and desire to quit smoking taking into account the effects of race. This study examined whether race moderated the relationship between menthol use and smoking intensity and whether smoking intensity differentially predicted desire to quit smoking (in the next 6-months) across White and Black menthol and non-menthol smokers. Participants were 323 Black and White adult menthol and non-menthol smokers in Washington, D.C. who completed the screening for an observational study about smokers who drink regularly. Information was collected on demographics, menthol preference, smoking intensity (operationalized as high intensity [3 10 cigarettes per day] or low [< 10 cigarettes per day]), and desire to quit smoking in the next 8-months ("definitely likely" to "not at all"). Higher scores indicating lower desire to quit). Overall, menthol cigarettes were used by 73% of the sample, specifically 92% of Black and 30% of White participants. Logistic regression analyses showed a significant race by menthol interaction predicting smoking intensity, such that among Black smokers, menthol use was associated with lower smoking intensity, whereas among White smokers, there was no significant association between menthol use and smoking intensity. There was also a significant smoking intensity by race by menthol interaction predicting desire to quit in the next 6-months, such that while menthol low intensity smokers had the highest desire to quit smoking, and black non-menthol high intensity smokers had the lowest desire to quit smoking. Findings support the role of smoking intensity in understanding the complex relationship between race, menthol, and smoking and health outcomes.

FUNDING: R03CA175870-01A1

JUSTIFICATION: Findings could inform clinical research as to the specific biological and psychosocial mechanisms to examine that underlie the links among menthol, smoking intensity, and desire to quit differentially across Black and White smokers.

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POS4-102
NON-CIGARETTE TOBACCO PRODUCT USE AMONG METROPOLITAN AND NON-METROPOLITAN FLORIDA ADOLESCENTS

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Introduction: Studies have documented higher prevalence of smoking among non-metropolitan than metropolitan youth. However, few studies, if any, have examined the disparities in other tobacco product use among non-metropolitan youth. This represents a significant knowledge gap particularly given the rise in the prevalence of cigar and electronic cigarette use among youth.

Methods: We examined whether the prevalence of use of various non-cigarette tobacco products differ among metro and non-metro Florida middle and high school students (aged <18 years) using the 2012 Florida Youth Tobacco Survey (unweighted n=69189). Participants were classified into living in a metro or a non-metro county according to the Rural Urban Continuum Code. Ever and past 30 day use of various non-cigarette tobacco products were assessed. We compare the prevalence of each non-cigarette tobacco product use by metro status adjusted for age, gender, and race/ethnicity, and accounted for multi-stage sampling approach through weighted regression models.

Results: The prevalence of ever using the following non-cigarette tobacco products was higher among non-metro than metro Florida youth (p<0.05): chewing tobacco (16% vs. 7%), cigars/cigarillos/little cigars (21% vs. 16%), bidis/kreteks/pipe (6% vs. 4%), electronic cigarettes (8% vs. 6%), and cigars with marijuana (20% vs. 18%). Non-metro Florida youth were less likely than metro youth to have ever used hookah (7% vs. 10%, p<0.05). In terms of past 30 day use, non-metro Florida youth were more likely than metro youth to use the following products: chewing tobacco (8% vs. 3%), cigars/cigarillos/little cigars (10% vs. 7%), bidis/kreteks/pipe (3% vs. 2%), electronic cigarettes (4% vs. 2%), and cigars with marijuana (10% vs. 9%).

Conclusions: Florida youth living in the non-metropolitan counties are more likely than Florida youth living in the metropolitan counties to experiment with and currently use most of the non-cigarette tobacco products. Future research need to explore whether these disparities exist in other parts of the US, and to focus on strategies to reduce tobacco use disparities among non-metropolitan youth.

FUNDING: Dr. Choi’s effort on the abstract is funded by the Division of Intramural Research, National Institute on Minority Health and Health Disparities, National Institutes of Health. Dr. Bernat’s effort is supported with a grant from the National Cancer Institute (R03 CA168411; D. Bernat, Principal Investigator).

JUSTIFICATION: The findings from this study inform further public health research to understand the use of non-cigarette tobacco products in non-metropolitan adolescents and the development of prevention and cessation interventions that will meet their needs to reduce tobacco use disparities.

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POS4-103
IF YOU BUILD IT, WILL THEY COME? INITIAL IMPACT OF EXPANDING QUITPLAN® SERVICES

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A key strategy to reducing tobacco use is increasing the reach of population-based cessation services. In March 2014, ClearWay Minnesota launched a new suite of QUITPLAN Services - a set of Individual Services to choose from (two-week NRT starter kit, email program, text messaging, and printed quit guide), and the Helpline (phone counseling plus NRT, integrated email, integrated text messaging, and materials). Tobacco users can enroll in any of the services either online or by phone. A new media campaign, “No Judgments—Just Help” was launched to promote these services. The first four months of data were examined to understand service volumes, service selection, and enrollee characteristics and compared to 2013 data where appropriate.

More people enrolled in QUITPLAN Services in four months than in all of 2013 (6,395 vs. 5,922). Average daily inbound calls increased by 34%, average daily web visits increased by 42%, and average daily enrollments increased by 226% in March-June 2014 compared to calendar year 2013. After the new services were launched, average weekly tobacco users served increased from 100.3 to 399.3 (t=7.84, df = 19.399, p < 0.001). 69% enrolled online and 31% by phone.

The following differences (p < 0.05) were found among all enrollees in March-June 2014 compared to calendar year 2013: more men (43.5% vs. 37.4%); more whites (88.1% vs. 85.5%); fewer Hispanics (1.6% vs. 3.3%) and more reporting using non-cigarette tobacco products only (4.4% vs. 2.6%).

There were differences (p < 0.05) between those enrolling in Individual Services and in the Helpline. Those enrolling in Individual Services were younger (average age 42 vs. 47); white (89% vs. 83%); less likely to be ready to quit in next 30 days (8% vs. 2%); and more likely to use non-cigarette tobacco products (12% vs. 6%) compared to Helpline enrollees.

Significant service changes and a new media campaign have had promising early impacts on reach and enrollments in QUITPLAN Services. More tobacco users are engaging with services and we are reaching different groups. Future research will assess satisfaction and quit outcomes to ascertain whether these changes are impacting quitting behavior.

FUNDING: ClearWay Minnesota

JUSTIFICATION: Re-engineering population-based cessation services to provide an array of options, and promoting the array of options, has the potential to increase both the reach of population-based cessation services and increase quit attempts.

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POS4-104
COMPARING MANITOBA YOUTH WHO USE ALTERNATIVE TOBACCO PRODUCTS AND CIGARETTES WITH THOSE WHO ARE TOBACCO-FREE: A SECONDARY ANALYSIS OF A POPULATION-BASED SURVEY

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Background: Marketing of alternative tobacco products target and are appealing to youth. While our understanding of youth who use cigarettes is well informed, the same cannot be said for youth who use alternative tobacco products.

Methods: A secondary analysis of a population-based data set investigated current use of chew tobacco, cigarillos, and cigarettes among youth in Manitoba; grades 7 to 12. The data were obtained from the 2012/13 Youth Health Survey, which is a school-based provincial initiative. Associations between the youth using any of these products and their self-reported involvement in sport, school and community involvement, part-time work, volunteerism, mental-wellness and alcohol/drug use were examined; and comparisons were explored with responses from tobacco-free youth.

Results: Rates of chew and cigarillo use were lower than cigarettes for all grades. Rates of use for any of the tobacco products increased with age and approximately 80% of youth using tobacco products were in grades 10-12. Gender difference for chew and cigarillo users was distinct; consistently of the youth using chew and cigarillos, there were more males across all grades. Compared to tobacco-free youth, users were less involved in their community and school, and more likely to have paid part-time work than to volunteer. Reporting of poorer mental health
was higher among tobacco product users, and these youth also reported higher incidence of bullying, and substance use. Physical activity was highest among chew tobacco users, which are also the youth most likely to be involved with a coach.

Conclusion: We have entered an era where cigarettes are no longer the only tobacco product youth encounter. Opportunities for anti-tobacco messaging are expanding and creativity is needed in order to target all subsets of youth population to support the youth of today remaining tobacco free.

FUNDING: No external funding supported this work, which was completed as a summer student experience.

JUSTIFICATION: Increased awareness of trend differences in who uses various forms of tobacco products is becoming necessary to inform youth prevention programs and policies.

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POS4-105

REAL-TIME CHARACTERIZATION OF THE PARTICLE SIZE DISTRIBUTION OF ELECTRONIC CIGARETTE MAINSTREAM AEROSOL

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The electronic cigarette (e-cig) employs heating-cooling principles to generate aerosol from a supersaturated vapor mixture of organic compounds (nicotine, glycerol, propylene glycol, and flavorants). Particle size is critically important to determining which region of the human respiratory system will be most affected by aerosol inhalation. E-liquids contain highly volatile compounds that result in quick particles evaporation, and therefore e-cig aerosol is best characterized using real-time techniques and quick sample delivery with low sample dilution.

We used a differential mobility spectrometer in tandem with a smoke cycle simulator to provide fast aerosol delivery and analysis with minimum dilution (1/25). This approach allows real time high resolution (38-45 size classes) measurements of a wide range of particle sizes (5 - 2,500 nm) and concentrations (9 orders of magnitude). Two types of e-cigs (V2 and Blu) with fixed power and non-refillable e-liquid cartridges were used and the following flavors and nicotine strengths were tested: V2 - Green Tea, Mint, Peppermint, Red, Sahara, and 0, 0.6, 1.2, 2.4% nicotine; Blu - Cherry Crush, Classic, Tobacco, Java Jolt, Magnificent Menthol, Peach Schnapps, Pina Colada, Vivid Vanilla, and 0, low, medium, high nicotine.

Crush and Hypermint flavors, and 0, 0.6, 1.2, 2.4% nicotine; Blu - Cherry Crush, Classic, Tobacco, Java Jolt, Magnificent Menthol, Peach Schnapps, Pina Colada, Vivid Vanilla, and 0, low, medium, high nicotine.

Treatment Specialist (TTS) trained in motivational interviewing delivered education period designed to reduce the number of cigarettes smoked. A certified Tobacco

POS4-106

USING THE ELECTRONIC CIGARETTE FOR IMMEDIATE SMOKING REDUCTION IN PATIENTS AT RISK FOR CERVICAL DYSPLASIA AND ASSOCIATED DIAGNOSES

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Immediate smoking cessation is critical in women diagnosed with cervical dysplasia, a condition that is exacerbated by smoking. Recent studies have reported some success with smoking reduction and cessation for people using electronic nicotine delivery systems (ENDS), even when the individuals originally had no desire to stop smoking. In this pilot study 31 women with cervical dysplasia and associated diagnoses sampled NRT (nicotine gum or lozenge) and ENDS (Blu e-cigarette) and chose the method they preferred to try for a 6 week intervention period designed to reduce the number of cigarettes smoked. A certified Tobacco Treatment Specialist (TTS) trained in motivational interviewing delivered education about the risks of smoking and behavior change strategies, and trained women in the intervention method of their choice. The primary outcome measure was reduction in the average number of cigarettes smoked per day at the 12-week follow-up visit. Twenty-eight women chose the ENDS product, thus comprise the study population for this analysis. Although 2 women were lost to follow-up, they were included in the analysis, and no change in cigarette smoking from baseline was assumed. At the 12-week follow-up, eight of 28 (28.6%) women were abstinent from cigarette smoking for at least 7 days, with 5 continuing to use the electronic cigarette. An additional 4 had reduced daily cigarette consumption by 75% or more (cumulative 12/28 or 42.9%), and another 7 had reduced by 50 percent or more (cumulative 19/28 or 67.9%). At the 12 week follow-up 21 women (75%) continued to use the electronic cigarette and 12 (42.9%) were dual users.

This pilot study adds to the growing body of literature that suggests that the use of electronic cigarettes may reduce cigarette consumption and may assist individuals in smoking cessation.

FUNDING: No funding.

JUSTIFICATION: This pilot study adds evidence that electronic cigarettes may reduce cigarette consumption and may assist individuals in smoking cessation.

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POS4-107
ELECTRONIC NICOTINE DELIVERY SYSTEMS AND RACE/ETHNICITY

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Introduction: Racial/ethnic minorities have long been targets for cigarette use. Electronic nicotine delivery systems (ENDS) continue to increase in popularity, yet absent from the literature is evidence regarding awareness, knowledge, risk perceptions, intent to use, or actual use among racial/ethnic minorities. The purpose of this study was to examine race/ethnic differences in these constructs among current (76%) and former smokers (24%).

Methods: Participants (N=182) were recruited via internet-based and community ads from June-August 2014. Telephone administered surveys assessed demographics, ENDS awareness, risk perceptions, knowledge, intentions, and use. The sample was mostly middle aged, female (60%), single (62%), lower income (54%), and 31% White, 45% Black, and 21% Hispanic.

Results: 99% of participants reported ENDS awareness, and 44% were current users, with no race/ethnic differences. Several significant differences were found (p ≤ .05). Compared to Whites, Blacks were less likely to view ENDS as addictive, reported lower ENDS knowledge, and lower perceptions of health and safety risks. While Whites and Hispanics reported greater lifetime ENDS use and were more likely to know ENDS users, Blacks were more likely to report interest in use, and a greater likelihood of future ENDS use. Among current smokers, Whites were more likely to use ENDS for harm reduction or cessation, yet Blacks reported a greater propensity to use ENDS as a future cessation method. Among lifetime ENDS users, there were no differences in use of flavored ENDS, yet Blacks were more likely to smoke menthol ENDS. There were no differences between Whites and Hispanics.

Conclusions: Awareness of ENDS and current use was greater in this sample compared to previous surveys. Moreover, plans to continue ENDS use, and specifically as a tool for cessation were also notable. The introduction of menthol ENDS suggests that racial/ethnic minorities may face increased attention from manufacturers. Black current and former smokers reported high interest in ENDS, and may benefit from education on the state-of-the-evidence regarding health and safety, and their use as a smoking cessation strategy.

FUNDING: University of Miami

JUSTIFICATION: Findings from this study have the potential to inform e-cigarette campaigns and health education initiatives across racially/ethnically diverse populations.

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POS4-108
TOTAL EXPOSURE STUDY ANALYSIS CONSORTIUM: A CROSS-SECTIONAL STUDY OF TOBACCO EXPOSURES

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Background: The Total Exposure Study was a stratified, multi-center, cross-sectional study designed to estimate levels of biomarkers of tobacco-specific and non-specific exposures and of potential harm in U.S. adult cigarette smokers and tobacco product non-users. The study was sponsored by a tobacco company and implemented by contract research organizations in 2002-2003. Multiple analyses of smoking behavior, demographics, and biomarkers were performed. Study data and banked biospecimens were transferred from the sponsor to the Virginia Tobacco and Health Research Repository in 2010, and then to SRI International in 2012 for independent analysis and dissemination.

Methods: We analyzed data, biospecimen availability and genome-wide statistical power using contingency table, correlation and regression analyses and performed clinical chemistries for correlation with existing data.

Results: Vital signs, clinical chemistries, and laboratory measures of tobacco-specific and non-specific toxicants are available from 3,585 current cigarette smokers, and 1,077 non-users. Peripheral blood mononuclear cells, red blood cells, plasma and 24-hour urine biospecimens are available from a total of 3,073 participants (2,355 smokers and 719 non-users). In multivariate analysis participants with banked biospecimens were significantly more likely to self-identify as White, to be older, to have increased total nicotine equivalents per cigarette, decreased serum cotinine, and increased forced vital capacity, compared to participants without. Effect sizes were small (Cohen’s d-values: 0.11). Power to identify a prior serum cotinine-associated single nucleotide polymorphisms is 57% in non-Hispanic Black (N=340), and 96% in non-Hispanic White (N=1840), smokers.

Conclusions: Total Exposure Study clinical and laboratory assessments and biospecimens comprise a unique resource for cigarette smoke health effects research. The Total Exposure Study Analysis Consortium seeks to perform molecular studies in multiple domains and will share data and analytic results in public repositories and the peer-reviewed literature. Data and banked biospecimens are available for independent or collaborative research.

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JUSTIFICATION: Analysis of existing Total Exposure Study data and of biospecimens with current-omic technologies offers opportunities to identify biomarkers of susceptibility, and of response, to harmful and potential harmful constituents of cigarette smoke.

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POS4-109
EXPOSURE TO TOBACCO AND NICOTINE PRODUCT ADVERTISING: ASSOCIATIONS WITH PERCEIVED PREVALENCE OF USE AMONG COLLEGE STUDENTS

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Exposure to tobacco and nicotine product advertising (tobacco advertising) may have a norming effect, resulting in the overestimation of perceived prevalence of use of these products. The purpose of this study was to examine the relationships between tobacco product advertising and college student perceptions of prevalence of use on campus. Participants were 2,169 undergraduate students (mean age= 25.84 s.d= 9.97; 68.1% female; 76% White) from six four-year universities in Texas who completed an online survey in summer 2014. Exposure to e-cigarette, cigar, smokeless tobacco, and traditional cigarette advertising was measured with one item for each of the products (e.g., In the past thirty days, how often have you heard or seen ads (on the radio, TV, billboards, Internet, etc) for the following products?-Cigars). Prevalence of use on campus was measured with one item that assessed perceived prevalence for each product (e.g., Approximately what percentage of the student body do you think use the following products?-Cigars). Linear regression models were run to examine the associations between exposure to each type of tobacco product advertising and perceptions of use of each product on campus controlling for age, gender, and race. Results indicated that exposure to traditional cigarette advertising was associated with perceptions of the proportion of the student body who use traditional cigarettes [Beta=.53, p<.001], such that greater exposure to advertising was associated with greater perceived prevalence on campus. Similar associations were found between exposure to advertising for...
cigar products [Beta=.72, p<.001], smokeless products [Beta=.68, p<.001], and e-cigarette products [Beta=.25, p<.001] and perceived prevalence of each of these products on campus. This study is one of the first to explore cigar, smokeless, and e-cigarette advertising and its associations with perceptions of use among college youth. Given the normative effects of advertising on tobacco and nicotine use, future research should examine the various components of advertisements and how they may impact behavior.

**FUNDING:** No Funding

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**POS4-110**

**PERCEPTIONS OF NON-COMBUSTED TOBACCO PRODUCTS AND ELECTRONIC CIGARETTES AMONG PREGNANT WOMEN AND WOMEN PLANNING A PREGNANCY**

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**Background:** Perceptions of non-combusted tobacco products and electronic cigarettes are largely unknown among pregnant women and women of reproductive age.

**Methods:** Fifteen focus groups were conducted between September-November 2013 in four U.S. cities, to explore how women perceive noncombustible tobacco products, electronic cigarettes, and nicotine replacement therapy (NRT) use, including health risks in general and during pregnancy. Participants were 18-40 years of age and were segmented by tobacco use and pregnancy status as: pregnant smokers, pregnant quitters, or smokers planning a pregnancy. Responses were coded and analyzed to identify key themes using NVivo 10.0 qualitative software (QSR).

**Results:** A total of 93 women participated in the focus groups: 49% were Caucasian, 25% were African American, and 21% were Hispanic. Sixty-two percent had at least some college education. While snus was generally unappealing to women, dissolvables were viewed as discreet and useful to avoid stigma associated with smoking during pregnancy. NRT was viewed as being ineffective for cessation and having undesired side effects. Electronic cigarettes were thought to offer advantages over cigarettes, including use in smoke-free areas, lower cost, appealing flavors, and fewer health effects. Electronic cigarettes were seen also as a potential quitting aid for use before or during pregnancy; however, women worried about excessive use due to the convenience of the product. While some women felt electronic cigarettes might be safer during pregnancy than smoking, most women felt all tobacco and NRT products posed at least some harm to pregnant women. Nicotine was frequently identified as a harmful component of tobacco and NRT products.

**Conclusions:** Findings indicate that women seeking to reduce health risks or stigma-related to tobacco use may perceive non-combusted products and electronic cigarettes favorably. Findings can inform future research related to perceptions of non-combusted tobacco products and electronic cigarettes among women of reproductive age.

**FUNDING:** RTI Project Number 0211965.032 Contract 200-2008-27958- 0032

**JUSTIFICATION:** Women seeking to reduce health risks or stigma-related to tobacco use may perceive non-combusted products and electronic cigarettes favorably, which could undermine cessation in this population.

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**POS4-111**

**CIGARETTE AND NOVEL TOBACCO PRODUCT USE AMONG SEXUAL MINORITIES**

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**Introduction:** It is well known that the rate of cigarette smoking is higher among lesbian, gay, and bisexual (LGB) population than among heterosexuals. However, no researches thus far that we are aware has extensively investigated differences in the use of traditional and novel tobacco products within LGB population: whether (and to what extent) there exist demographic differences within LGB population and how they differ from the pattern among heterosexuals.

**Methods:** We conducted a national online survey about tobacco use behavior in 2013. Information about tobacco product use and sexual orientation along with demographics was collected. There are 956 respondents who identified themselves as lesbian, gay, or bisexuals in our data. We estimate proportions and odds ratios to look at the associations of tobacco product use and demographics. Survey weights are adjusted for all analyses.

**Results:** Of LGB respondents, 32% smokes cigarettes and 36% uses any tobacco products. Bisexual respondents have higher rate of smoking cigarettes (37%) than homosexual (29%) and heterosexual (20%) respondents. Unlike heterosexual respondents, female LGB respondents more likely to use tobacco products than male LGB respondents. Among LGB respondents, 37% of females smoke cigarettes, while 29% of males smoke. Prevalence of cigar/little cigar use for males is 3 times that of females among heterosexuals, while prevalence is about the same (15% for males and 16% for females) among LGB respondents.

**Discussion:** This is one of the first studies to explore the differences in tobacco product use among sexual minorities. Our results highlight important disparities with bisexual population at much greater risk of tobacco use as well as LGB population with low socioeconomic status and of younger age. Our findings provide important information to design tobacco prevention programs and researches that contribute to reduce the risks and disparities with sexual minorities.

**FUNDING:** U01-CA154254 from NCI

**JUSTIFICATION:** Sexual minorities are at greater risk of tobacco use and having consequent health issues. Our study provides important information to design tobacco prevention programs and researches that contribute to reduce the risk and disparity.

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**POS4-112**

**THE INDIRECT EFFECT OF EMOTION DYSREGULATION IN TERMS OF NEGATIVE AFFECT AND SMOKING-RELATED COGNITIVE PROCESSES**

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Smokers consistently report a belief that smoking helps them cope with emotional distress, and that negative affect reduction is a primary motivation for smoking (Brandon & Baker, 1991; Copeland et al., 1995). Negative affect is also considered one of the most powerful predictors of cessation success or failure. Given the importance of affect in smoking behavior, understanding the role of affect-relevant factors in the association between negative affect and smoking-related cognitive processes is an important next step in this area of research. Emotion dysregulation, or difficulties regulating one’s emotions, may be one important factor to consider in this regard as it is associated with negative affect reduction outcome expectancies and barriers to cessation (Gonzalez et al., 2008; Johnson et al., 2008). Thus, the goal of the current study was to examine the indirect effect of emotion regulation difficulties in terms of the association between negative affect and smoking-related cognitive processes in a sample of regular daily smokers (n = 126; 70.4% male; Mage = 36.5, SD = 13.1). Specifically, it was hypothesized that after controlling for daily smoking rate and gender, there would be a significant indirect effect of negative affect on negative affect reduction smoking motives, negative reinforcement smoking outcome expectancies, and internal barriers to cessation through emotion dysregulation. Results indicated that, as hypothesized, there was a significant indirect effect of negative affect on internal barriers to cessation (indirect effect = 0.09; SE = 0.03; 95% CI = 0.05 to 0.16) and negative affect reduction smoking motives (indirect effect = 0.01;
SMOKERS RESPOND TO RISING CIGARETTE PRICES

POS4-113
"CIGARETTES ARE PRIORITY": A QUALITATIVE STUDY OF HOW AUSTRALIAN SOCIOECONOMICALLY DISADVANTAGED SMOKERS RESPOND TO RISING CIGARETTE PRICES

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Purpose: Despite substantial modelling research assessing the impact of cigarette taxes on smoking rates among various income groups, there are few studies that examine the broader financial effects of tobacco prices on smokers in the lowest income groups. This study aimed to explore how very disadvantaged smokers manage smoking costs on limited budgets, and the impact this has on material deprivation, financial stress and cessation cognitions.

Methods: Qualitative semi-structured interviews were conducted with 20 smokers recruited from a Social and Community Service Organisation providing crisis welfare assistance to disadvantaged people in New South Wales, Australia. Interviews explored the perceived impact of tobacco costs among socially disadvantaged smokers, including the effects on essential household expenditure, smoking behaviour and quit cognitions. Interviews were audio-taped, transcribed verbatim and analysed using thematic framework analysis.

Results: Instances of smoking-induced deprivation and financial stress, such as going without meals, substituting food choices, and struggling to pay bills in order to purchase cigarettes were routine experiences among socially disadvantaged smokers and their community. Price-minimisation methods were used as strategies to maintain smoking, and not as long-term behaviours to save money. Participants reported tobacco price increases were good for preventing uptake, and that larger price rises and subsidised cessation aids were needed to help them sustain abstinence.

Conclusions: Socioeconomically disadvantaged smokers engage in behaviours that exacerbate deprivation to maintain smoking, despite the cost. Tobacco taxation policy should consider impact on the financial and material well-being of socioeconomically disadvantaged smokers who may find it difficult to quit unassisted.

FUNDING: This study was part of a project funded by a grant from the Hunter Medical Research Institute (G1101150). AG was supported by an Australian Postgraduate Award PhD Scholarship administered through the University of Newcastle. BB was supported by a Cancer Institute NSW Career Development Fellowship. CP was supported by Newcastle Cancer Control Collaboration funding.

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POS4-114
PERCEIVED BARRIERS TO SMOKING CESSION IN HIGHLY DISADVANTAGED GROUPS: WHICH BARRIERS ARE THE MOST IMPORTANT TO TARGET?

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Introduction: Understanding the barriers to quitting smoking faced by socially disadvantaged groups may help to improve their smoking cessation rates. This study aimed to identify the most frequently reported barriers to smoking cessation and the top three barriers to cessation ranked as most important within a sample of Australian welfare recipients.

Methods: A cross sectional survey of adult welfare recipients who were current smokers was carried out in two welfare agencies in NSW, Australia from October 2013 to July 2014. Smoking status, smoking related variables and barriers to cessation were assessed. Participants were presented with a randomised list of 38 barriers to quitting and asked to rate each item on a scale of zero (not a barrier) to three (large barrier). Of those barriers rated as “large,” participants were asked to rank the top three most important barriers to address in order for participants to quit smoking.

Results: In total, 384 current smokers consented (85% consent rate). Females made up slightly more of the sample (59%), mean age = 40 years. The most frequently reported “large” barriers were addiction to smoking (54%), smoking to deal with stress (47%), smoking to manage anxiety or depression (39%), too many stressful life events (39%) and smoking for relaxation (38%). The top three “large” barriers identified as most important in order for participants to quit smoking were addiction (38%), dealing with stress (12%) and enjoyment (8%). Factors related to endorsement of each barrier will be discussed.

Conclusions: By addressing addiction, stress and mental health when encouraging disadvantaged smokers to quit smoking, the primary perceived barriers to quitting will be tackled.

FUNDING: This research has been funded by a grant from the National Health and Medical Research Council (NHMRC) of Australia. Scholarship funding provided by the University of Newcastle and Cancer Institute NSW.

JUSTIFICATION: Understanding the barriers to smoking cessation in highly disadvantaged groups will allow the tailoring of smoking cessation programs that actively address these barriers.

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POS4-115
INTEGRATING SMOKING CESSATION INTO ROUTINE CARE IN HOSPITALS - A RANDOMIZED CONTROLLED TRIAL OF A PHARMACIST-LED INTERVENTION
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Background: Intensive smoking interventions initiated during hospitalization are effective, but currently not routinely provided in Australian hospitals. Integrating smoking cessation treatment into routine in-patient care may be beneficial. The efficacy of a pharmacist-led smoking cessation intervention was evaluated.

Methods: A randomized controlled trial of all consenting smokers was carried out in three Australian public hospitals. Usual care was compared with GIVE UP FOR GOOD, a pharmacist-led smoking cessation intervention comprising behavioral counselling and/or pharmacotherapy provided during hospitalization, on discharge and within 1 month post-discharge. Smoking status was assessed at baseline (before discharge), 1, 6 and 12 months. The primary endpoint was carbon monoxide (CO) validated 7-day prevalent abstinence at 6 months.

Results: The mean (±SD) age (n=600) was 51±14 years and 64% were male. The overall retention rates at 6 and 12 months were 74% and 72%, respectively. CO validated 7-day prevalent abstinence rates at 6 months were 12.9% in intervention and 13.6% in usual care group (adjusted odds ratio [OR] 1.01, 95% confidence interval [CI] 0.62 - 1.64). The self-reported 7-day prevalent abstinence was significantly higher in the intervention group at both 1 (OR 1.57, CI 1.10 - 2.25) and 6 months (OR 1.60, CI 1.06 - 2.42), but not significant at 12 months. Overall, the OR of self-reported 7-day prevalent abstinence was 1.52 (CI 1.10 - 2.09, p=0.011) in a longitudinal analysis using generalized estimating equations. A similar trend was observed with 24-hour point prevalence abstinence. Use of pharmacotherapy was higher in the intervention group, both during hospital stay (52% vs 43%, p=0.016) and between discharge and 6 months follow-up (57% vs 37%, p<0.001).

Conclusions: A pharmacist-led smoking cessation intervention was efficacious in short-term, but for long-term abstinence more intensive follow-ups and pharmacological support are required. Future interventions focusing on those already motivated to quit should include free full course of pharmacotherapy, and more formal engagement of primary healthcare providers following discharge from hospital.

FUNDING: This trial was funded by the Australian Research Council through the Linkage Scheme (LP110200724) and an investigator-initiated research (IIR) grant from Pfizer.

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POS4-117
FACTORS ASSOCIATED WITH SOCIAL CIGAR SMOKING AMONG YOUNG ADULTS IN THE U.S.
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Young adults have the highest prevalence of cigar use in the U.S. While data on this population indicate that cigars are often used socially, there is scant research on the characteristics of social cigar smokers and what factors influence social smoking of cigars. This study used data from Wave 1 (summer 2014) of Legacy's nationally representative truth® Longitudinal Cohort, focusing specifically on 18-21 year olds in the sample (n=7,591). Current cigar use was defined as cigar use on at least 1 day in the past 30 days. Social cigar smokers were defined as current cigar users who indicated that they only use cigars “when I’m out socializing with friends.” Logistic regression was used to determine the factors associated with social cigar smoking. A total of 7.5% of young adults (n=850) were current users. Among them, 66.5% were social cigar smokers and 33.5% used cigars either alone or alone and with friends. Social cigar smokers were mostly male (70.7%), non-Hispanic White (82.0%) and high income (56.6%). On average, social cigar smokers began smoking cigars at 16.8 years old. Most social cigar smokers smoked on 1 (48.4%) or 2 (23.4%) of the past 30 days and smoked less than 1 cigar per day (66.3%). Those who smoked 16+ total cigars in their lifetime were 45% less likely to be social cigar smokers (p<0.01) compared with those who had smoked fewer than 15 cigars in their lifetime. Non-Hispanic Whites were more likely (OR: 2.7, p<0.01) to be social cigar smokers compared with non-Hispanic Blacks and those with the highest incomes were more likely to be social cigar smokers compared with those with lowest incomes (OR: 2.7, p<0.01). Among current cigar users, social smoking is the most prevalent pattern of use. Results suggest that social cigar smokers tend to be less experienced cigar smokers. Future studies should monitor the smoking trajectory of social cigar smokers to understand how their patterns change over time.

FUNDING: No funding

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POS4-118
RELATIONSHIP BETWEEN FRIENDS’ SMOKING AND SOCIAL SMOKING ATTITUDES AMONG SMOKERS AND NONSMOKERS
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Introduction: Belonging to a smoking (vs. nonsmoking) group of friends has been linked to smoking initiation, but little is known about how friends’ smoking is linked to social smoking attitudes, an important consideration given how common social smoking is among young people. This study aims to understand how friends’ smoking is related to social smoking attitudes, and whether the relationship differs for nonsmokers vs. smokers.

Methods: Legacy’s cross-sectional Media Monitoring online questionnaire surveys 15-21 year olds weekly. This analysis includes data from summer 2014 (n=867). Friends’ smoking was captured by number of one’s four closest friends who smoke. Multivariate models examined the relationship between friends’ smoking and one’s attitudes towards social smoking, for current and noncurrent smokers.

Results: 21.2% of the sample were current smokers. 27.7% of current smokers and 11.0% of nonsmokers agreed that “If you only smoke when out with friends, you are not a real smoker.” 33.1% of current smokers and 9.8% of nonsmokers agreed that “Bumming a cigarette is a great way to start a conversation.” However, having close friends who smoke was associated with these attitudes only for nonsmokers. Nonsmokers with a majority of close friends who smoke were three times more likely than those with no close friends who smoke to agree social smokers are not real smokers (OR=3.1, p=0.003) and five times more likely to agree bumming a cigarette is a great way to start a conversation (OR=5.4, p=0.000).

Conclusions: Findings suggest that while more smokers agree with pro social smoking attitudes than nonsmokers, the influence of friends’ smoking on these attitudes is stronger for nonsmokers. Nonsmokers with friends who smoke may be more influenced by their close friends’ smoking than are smokers due to feeling isolated in a largely smoker friend group. This is consistent with research suggesting teens who are not accepted into a friendship group (vs. those that are)
are more influenced by their best friend's smoking. Further research is needed to understand these relationships, as they could be critical to informing youth and young adult tobacco prevention efforts.

FUNDING: Legacy

JUSTIFICATION: Understanding the differential relationship between friends’ smoking and social smoking attitudes among smokers and nonsmokers could be critical to informing youth and young adult tobacco prevention efforts.

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POS4-119
DO E-CIG USERS TRANSITION FROM FIRST GENERATION TO ADVANCED GENERATION DEVICES?

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Background: There is a wide range of electronic cigarettes (e-cigs) available to users, ranging from small devices shaped like a cigarette (first generation) to larger devices that have a button to press prior to inhalation (advanced generation). This study aimed to describe how users of e-cigs transition to different device types and highlight device characteristics potentially related to the transition.

Methods: Experienced e-cig users completed an online survey about their e-cig use, devices, and preferences. Respondents included in analysis were ever cigarette smokers who have used their e-cig at least 30 days in their lifetime and who reported the type of their first and current e-cig device. E-cigs devices the same size as a cigarette without a button were classified as first generation devices and e-cigs devices larger than a cigarette with a button were classified as advanced generation devices.

Results: The sample included 4421 participants. Among participants who began use with a first generation device (N=2603), 63.7% participants have since transitioned to an advanced generation device. Among participants who began use with an advanced generation device (N=1818), only 5.7% transitioned to a first generation device. This results in 76.3% (N=3373) of participants currently using a device with a button. 95% of participants using advanced generation devices, participants using advanced generation devices have used a device longer (13 months v. 8 months, p<0001) and purchased 4 e-cigs prior to their current e-cig (v. 2 e-cigs, p<00001). 95% of participants using advanced generation devices rated having a variety of flavor choices as important, 99% rated having a long battery life as important, and only 9% rated resemblance to a cigarette as important.

Conclusion: Experienced e-cig users are likely to begin use with a first generation device and transition to an advanced generation device, but not vice versa. The vast majority of advanced generation device users found having a variety of flavor choices and long battery life to be important. These characteristics may be related to why users transition to advanced generation devices.

FUNDING: This work was supported by an internal grant from Penn State Social Science Research Institute & Cancer Institute (PI: SW).

JUSTIFICATION: This study contributes to the currently limited knowledge about e-cigs by describing how users of e-cigs transition to different device types and identifying characteristics that may be related to why users transition.

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POS4-120
ADOPTING HOME SMOKING RESTRICTIONS AMONG AFRICAN AMERICAN PUBLIC HOUSING RESIDENTS

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Background: Smoking in multiunit public housing communities and the negative impact of secondhand smoke (SHS) are unrelenting public health issues. Efforts to implement smoke-free policies in multiunit housing, where residents who have instituted home smoking restriction (HSR) - limiting or banning smoking in the home - can still be exposed to SHS that enters their units from other units where smoking occurs. This study explored the predictors of adopting HSR among African American residents from four multiunit public housing communities in Pittsburgh, PA.

Methods: Data were analyzed from a survey designed to explore smoking patterns and smoking cessation behaviors of the residents. Each resident was asked, “Which statement best describes the rules about smoking inside your home?” The response options were, “No one is allowed to smoke anywhere,” “Smoking is allowed in some places or at sometimes,” and “Smoking is permitted anywhere, there are no rules.” Perceived risk was used with the adoption of HSR were analyzed using bivariate logistic regression, controlling for socio-demographic factors.

Results: Sixty-two residents completed the survey. Twenty-nine residents (46.8%) had instituted HSR; 22 women (35.5%) and seven men (11.3%). The perception of risk of harming others when smoking in the home (AOR: 7.44, 95% CI: 1.07-51.61) was associated with a higher likelihood of adopting HSR. Whereas, having more than four best friends who smoked (AOR: 0.03, 95% CI: 0.01-0.83), living with other smokers (AOR: 0.1, 95% CI: 0.01-0.81), and having a higher level of religious involvement (AOR: 0.77, 95% CI: 0.60-0.99) were associated with a lower likelihood of HSR. Having children present in the home, marital status, and readiness to quit were not associated with having HSR.

Conclusions: Research is needed that specifically examines which factors predict HSR adoption. This can lead to developing HSR adoption interventions for residents who would otherwise not have adopted HSR, especially in public housing communities; where the prevalence of smoking and SHS have adverse effects on residents with preexisting respiratory and cardiac conditions.

FUNDING: This work was supported by a grant from the National Cancer Institute (NCI): CA134939.

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POS4-121
STRESSFUL LIVING CONDITIONS AND SMOKING AMONG AFRICAN AMERICAN PUBLIC HOUSING RESIDENTS: RESULTS FROM FOCUS GROUPS

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Background: There is a limited availability of published data on the stress caused by certain ecological variables—e.g., isolated living conditions and household-level factors—and its influence on continual cigarette smoking experienced by African American public housing residents.

Methods: This study used a qualitative approach with the goal of identifying the psychosocial, neighborhood and social context factors associated with cigarette smoking. Nine focus groups were conducted with African American smokers (n=62) from four multiunit public housing communities in Pittsburgh, PA. Each focus group was audiotaped and transcribed verbatim. Both authors independently
JUSTIFICATION: Text messaging may offer a viable means to supplement a smoking cessation intervention, particularly among psychiatric patients and those who have made past quit attempts.

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POS4-123

EFFECT SMOKE-FREE PUBLIC HOUSING POLICY ON NON-SMOKERS’ EXPOSURE TO TOBACCO SMOKE

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Background: In Oct. 2012, the Boston Housing Authority (BHA) became the largest HA in the US to ban all indoor smoking. We evaluated a natural experiment assessing changes in personal and apartment-specific exposure to tobacco smoke pollution (TSP) in the BHA before and after the ban compared with the Cambridge Housing Authority (CHA, control site with no ban). Methods: Subjects were a sample of non-smoking HA residents living with non-smokers. At baseline (summer 2012) and follow-up (summer 2013) we deployed passive air nicotine monitors in subjects' apartments for at least 7d, collected saliva samples for cotinine analysis, and interviewed subjects on self-reported exposure to TSP at various locations within and outside the HAs. Detectable/non-detectable nicotine and cotinine, as well as levels were analyzed as outcomes (nicotine mass limit of detection (LOD)=0.005ug, cotinine LOD=0.02ng/mL). TSP exposures were evaluated using propensity-score-adjusted multivariable regressions with subject random effects.

Results: We enrolled 297 residents at baseline. Analyses were conducted on 229 (77%) residents reached at follow-up and confirmed to be non-smokers (158 BHA, 71 CHA). At baseline, apartment and personal TSP exposure were high in both HAs (detectable nicotine: 53% BHA, 62% CHA; geometric mean 0.022ug/m^3 BHA, 0.035ug/m^3 CHA; detectable cotinine: 49% BHA, 68% CHA; geometric mean 0.021ng/mL BHA, 0.030ng/mL CHA). At follow-up there were significant but similar declines in nicotine at both HAs (detectable: -38% BHA, -42% CHA, p<0.001 for change; mean: -0.021ug/m^3 BHA, -0.034ug/m^3 CHA, p<0.001 for change). However, at the BHA detectable cotinine rose (+17% BHA vs. -11% CHA, p=0.002 for difference), as did mean cotinine (+0.015ng/mL BHA vs. -0.008ng/mL CHA, p<0.002 for difference). Interview responses did not suggest that residents were increasingly exposed to TSP at other BHA sites (doorways, hallways, grounds) vs. CHA sites. Conclusions: During the study, apartment TSP declined at the HAs, but not due to the policy. The policy did not result in reduced individual-level TSP exposure. Non-HA sources of resident exposure may have been significant for BHA residents.

FUNDING: This study received support from the NIH/National Heart Lung and Blood Institute (R01-HL112212) and the Flight Attendants Medical Research Institute.

JUSTIFICATION: This study helps to illuminate the potential and the challenges of smokefree multiunit housing policies.

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POS4-124
THE HIGH PREVALENCE OF MISCONCEPTIONS ABOUT “LIGHT” CIGARETTES AMONG SMOKERS IN ZAMBIA: FINDINGS FROM THE ITC ZAMBIA SURVEY

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Background: Despite the fact that cigarette brands described as “light,” “mild,” or “low tar” are no less harmful, smokers continue to believe that they are. These descriptors have been banned in over 50 countries as called for by Article 11 of the WHO Framework Convention on Tobacco Control (FCTC). Although Zambia ratified the FCTC in 2008, there is currently no ban on these descriptors. This study assesses Zambian smokers’ perceptions of the harmfulness of “light” cigarettes.

Methods: Data were analyzed from the International Tobacco Control (ITC) Zambia Wave 1 Survey (2012)—a longitudinal cohort survey of a nationally representative sample. This study focuses on 688 smokers who reported having a brand they normally smoke. The survey included questions on perceived harmfulness of “light” (defined as “mild” or “extra mild”) cigarettes.

Results: 29% of Zambian smokers reported smoking “light” cigarettes. 52% wrongly believed that “light” cigarettes were less harmful. 60% believed that “light” cigarettes were smoother on the throat and chest. But importantly, those who believed that “light” cigarettes were smoother were much more likely to believe that they were also less harmful (rs=0.94), replicating Elton-Marshall et al.’s (2010) study in China that the smoothness of smoke leads to the mistaken belief about harmfulness. This is further supported by the finding that 64% of “light” smokers in Zambia believed that the harsher the cigarette smoke feels in the throat the more dangerous the smoke is likely to be. Smokers of “light” cigarettes tended to be younger than smokers of regular cigarettes and mostly cited taste and quality as a reason for choosing “light” cigarettes.

Conclusions: The majority of Zambian smokers wrongly believe that “light” cigarettes are less harmful—second highest level across 20+ ITC countries. These findings demonstrate the urgent need for educational and policy interventions to raise awareness of this fallacy, including full implementation of the FCTC Article 11 Guidelines, which call for bans on false, misleading, or deceptive terms such as “light,” “mild,” or “low tar” on tobacco brands and packaging.

FUNDING: The research reported in this article was funded by the Canadian Institutes of Health Research (151016). Geoffrey T. Fong was supported by a Senior Investigator Award from the Ontario Institute for Cancer Research (IA-004-0583020) and a Prevention Scientist Award from the Canadian Cancer Society Research Institute. Aninka C. Green was supported by a Doctoral Scholarship from the CIHR Training Grant in Population Interventions for Chronic Disease Prevention (PICDP).

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POS4-125
ADOLESCENTS’ AND YOUNG ADULTS’ KNOWLEDGE AND BELIEFS ABOUT CONSTITUENTS IN NOVEL TOBACCO PRODUCTS

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Background: Despite the fact that cigarette brands described as “light,” “mild,” or “low tar” are no less harmful, smokers continue to believe that they are. These descriptors have been banned in over 50 countries as called for by Article 11 of the WHO Framework Convention on Tobacco Control (FCTC). Although Zambia ratified the FCTC in 2008, there is currently no ban on these descriptors. This study assesses Zambian smokers’ perceptions of the harmfulness of “light” cigarettes.

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Conclusions: The majority of Zambian smokers wrongly believe that “light” cigarettes are less harmful—second highest level across 20+ ITC countries. These findings demonstrate the urgent need for educational and policy interventions to raise awareness of this fallacy, including full implementation of the FCTC Article 11 Guidelines, which call for bans on false, misleading, or deceptive terms such as “light,” “mild,” or “low tar” on tobacco brands and packaging.

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Results: Participants were familiar with arsenic, carbon monoxide, formaldehyde, and nicotine, but unfamiliar with acetaldehyde, acrolein, NNN, or NNN. Participants generally had negative associations with constituents, although users had positive associations with nicotine. They associated unknown constituents with similarly sounding words (e.g., acetaldehyde sounds like acetaminophen) and noticed words in the chemical names (when spelled out) of NNK and NNN (e.g., “nitro”). They associated known constituents with negative health effects and other products the chemical is found in (e.g., benzene is in fuel). In terms of which constituents most discouraged participants from using OTPs, multiple themes emerged, with some discouraged by long chemical names, and others by associations with adverse consequences. Additionally, non-users believed nicotine would most discourage OTP use, while users believed nicotine would least discourage use.

Conclusions: Participants’ knowledge and beliefs about particular constituents varied, especially between users and non-users. Further studies of OTP constituents are needed, and future risk messaging campaigns could capitalize on negative associations with HPHCs to discourage OTP use.

FUNDING: Research reported in this abstract was supported by grant number P50CA198097 from the National Cancer Institute and FDA Center for Tobacco Products (CTP). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH or the Food and Drug Administration.

JUSTIFICATION: Future risk messaging campaigns could capitalize on negative associations with HPHCs to discourage use of novel tobacco products among adolescents and young adults.

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**POS4-126**

**TOBACCO USE AND TIME OUT OF WORK AMONG JOB-SEEKERS IN CALIFORNIA**

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Background: State and national surveys indicate tobacco use and unemployment are associated, with greater smoking prevalence and lower quit rates among those who are out of work. Greater chronicity of unemployment challenges securing re-employment. The association between smoking status and time out of work has not been examined.

Method: In a cross-sectional study balanced on smoking status, we examined the association of tobacco use with unemployment duration among job-seekers recruited from two Employment Development Departments in the San Francisco Bay Area. Smokers (S) reported > 100 cigarettes in their lifetime, >1 cigarette/day currently, and had a breath sample of CO > 10 ppm. Nonsmokers (NS) denied tobacco use in the past year with CO < 9 ppm.

Results: The sample N=256 (53% smokers) was 66% male, 52% never married, 22% unhoused, with mean age 48 (SD=11); 38% identified as White, 36% Black, and 26% other; 29% reported prior alcohol/drug treatment; 20% a criminal history; and 72% had reliable transportation. By smoking status, chronicity of unemployment was 0-3 months (NS=43%, S=16%), 3-6 months (NS=13%, S=19%), 6-12 months (NS=21%, S=31%), and 1+ year (NS=24%, S=35%), gamma=0.34, p<.001. In an ordinal regression model, controlling for age, race/ethnicity, marital status, education, county, transportation, criminal history, drug/alcohol treatment, and homelessness, only current smoking (p=.013) and older age (p=.003) predicted longer duration of unemployment, full model X2=30.9, p=.009, R2=0.12. By age, 63% of adults 51+ were unemployed for 6+ months, compared to 56% aged 41-50, and 44% aged 20-40. Among smokers, smoking <30 min of waking vs. longer was associated with being out of work for 6+ months (71% vs. 47%), gamma=0.33, p=.034. Cigarettes/day, self-efficacy, and desire and intention to quit did not vary with unemployment duration.

Conclusion: Current smoking status was a stronger determinant of unemployment chronicity than education, homelessness, criminal history, or past drug/alcohol treatment. Further, greater dependence predicted greater unemployment duration. Tobacco addiction is a modifiable risk factor that should be treated among job-seekers.

FUNDING: TRDRP 21BT-0018

**JUSTIFICATION:** Current smoking status was a stronger determinant of unemployment chronicity than education, homelessness, criminal history, or past drug/alcohol treatment; tobacco addiction is a modifiable risk factor that can and should be treated among job-seekers.

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**POS4-127**

**ASSESSING TOBACCO USE AMONG COLLEGE STUDENTS: IMPORTANCE OF SPECIFYING THE CONTENT OF NON-CIGARETTE ALTERNATIVE PRODUCTS**

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Use of non-cigarette alternative products is increasing rapidly among young adults. Increasing prevalence, coupled with their common use as delivery devices for non-nicotinic substances (e.g. marijuana) creates challenges in the accurate assessment of these products. The purpose of this study was to refine measurements of non-cigarette alternatives and accurately assess their use by college students. Three rounds of cognitive interviews were conducted (n=25, age 19-32, 52% female). After each round, items were revised based on respondent feedback to more accurately capture the original intent of the question. Items were modeled after those in the Population Assessment of Tobacco and Health Study and the Behavioral Risk Factor Surveillance System. Retrospective probing focused on use of six products: cigarettes (including roll-your-own cigarettes), smokeless tobacco, hookah, cigars, and electronic nicotine delivery systems (ENDS). Confusion regarding product content was encountered with cigars, roll-your-own cigarettes, hookah, and ENDS. Specifically, respondents reported confusion as to whether smoking a cigar with marijuana inside, roll-your-own cigarette paper with tobacco and marijuana, or just marijuana still constituted "use" of the product. Confusion also existed with hookah, as one respondent who exclusively used hookah with marijuana was unaware that the product was intended for use with shisha tobacco. Difficulty with ENDS items pertained to the "vape pen" style, which has a reservoir for "e-liquid." Three participants raised questions as to whether these items were assessing use of ENDS products for delivering nicotine or also included use for the delivery of marijuana. This study identified common assessment errors when using traditional tobacco use measures in non-cigarette alternative products. Adding the term "as intended" eliminated most of the confusion regarding the content of the delivery device. Further, when assessing ENDS use, specifying "nicotine e-liquid" also eliminated confusion. Given the increasing prevalence of non-cigarette alternative products, additional research honing assessment of use of the product "as intended" is needed.

FUNDING: National Institutes of Health

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**POS4-128**

**COMMUNITY GUIDE SYSTEMATIC REVIEW ON THE EFFECTIVENESS OF COMPREHENSIVE TOBACCO CONTROL PROGRAMS IN REDUCING TOBACCO USE AND SECONDHAND SMOKE EXPOSURE**


Background: Tobacco use is the single greatest cause of preventable disease, disability, and death in the U.S. Over the last few decades, several states have implemented comprehensive tobacco control programs (CTCP) to reduce tobacco use and secondhand smoke (SHS) exposure. This Community Guide (CG) systematic review was conducted to examine CTCP effectiveness in reducing tobacco use and tobacco-related diseases and deaths.

Methods: A systematic search was conducted (search period Jan 2000-July 2014) to identify and abstract qualifying studies using standard CG systematic review methods. Summary measures were calculated when possible and narrative results were provided when effect estimates could not be pooled.

Results: The CG search identified 60 eligible studies; only results from the U.S. studies are reported here (55 studies). CTCPs reduced tobacco use prevalence among adults by a median of 2.8 percentage points (95% CI [interquartile range].
Conclusions: Based on CG criteria, there is strong evidence of effectiveness that CTCPs reduce tobacco use prevalence among adults and young people, reduce tobacco product consumption, increase quitting, reduce SHS exposure, and reduce tobacco-related diseases and deaths. These findings are broadly applicable to the U.S. settings and population groups.

FUNDING: No Funding

JUSTIFICATION: Comprehensive tobacco control programs are effective in decreasing tobacco use prevalence among adults and young people, decreasing tobacco product consumption, increasing quitting, decreasing SHS exposure, and decreasing tobacco-related diseases and deaths

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POS4-130
THE QUITCASH CHALLENGE: SERVICE UTILIZATION RESULTS FROM SIX YEARS OF QUIT AND WIN CONTESTS IN MINNESOTA

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Increasing the number of quit attempts made by smokers is a public health priority, and a Healthy People 2020 goal is 80% of smokers making a yearly attempt. Quit and Win contests provide one strategy to encourage population-level quit attempts. Combining quit contests with social media could enhance quitting by providing targeted access to cessation information, and by connecting a community of smokers who are attempting to quit at the same time. This presentation reviews the experiences of six consecutive Quit and Win contests in Minnesota with social media integrated to encourage participation.

ClearWay Minnesota offers free programs to help people quit smoking through QUITPLAN® Services. An extension of this is the annual statewide quit contest, the QuitCash Challenge (QCC). The QCC takes place over one month and offers a cash prize of $5,000 based on a lottery of all enrolled users who were able to quit for the entire contest period and could be verified as tobacco free.

Enrollment and service results from 2008 to 2013 were evaluated. Over six years more than 17,000 Minnesota smokers have participated, and nearly 90% were unique to each year. The initial contest in 2008 attracted more than 2,500 smokers. In subsequent years additional features have been layered into the contest including support-based text and email messaging, weekly opportunities to talk with a quit coach via the QCC Facebook page, simplified sign-up and enrollment, and reminder and support emails, which led to increased participation each year since 2010. Over six years, nearly 50% of smokers enrolled were under the age of 35, and participants were highly engaged with the social media options that QCC offered—particularly having text messages sent to their phone. Additional results discuss the association between smoking prevalence and rate of QCC enrollment by region of the state—including areas with very rural populations less likely to have access to a variety of stop-smoking services. Based on regional data, the authors consider how using social media for quit contests may capture a wider audience of younger smokers to participate in quit attempts or utilize cessation services.

FUNDING: Funded by ClearWay Minnesota

JUSTIFICATION: This study has the potential to impact public health by providing information and suggestions on using social media in Quit and Win contests to engage young smokers not currently served by a variety of cessation services.

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POS4-131
DEVELOPMENT AND PILOT TESTING OF AN OBSERVATIONAL STUDY EXAMINING THE ENDS INITIATION PROCESS: INTEGRATION OF EMA, GEOTRACKING, BIOSAMPLES, AND IN-DEPTH INTERVIEWS

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Introduction: Little is known about the cognitions and behaviors leading to or sustaining ENDS use. A better understanding of the e-cigarette initiation process will help identify both individual smoker and ENDS product characteristics that may predict future cigarette and ENDS patterns of use.

Methods: The Moment Study (1R21DA036472-01) is a multi-method, quasi-experimental study examining the environmental and psychological factors influencing ENDS initiation and cigarette displacement among adult smokers in Washington, D.C. The study is recruiting 100 e-cigarette naïve smokers without immediate plans to quit, stratified by race (non-Hispanic White and non-Hispanic Black) and menthol preference. Methods include ecological momentary assessment (EMA) to assess changes in cigarette and ENDS consumption; geotracking to assess the influence of the built and social environment on product choice; biosamples to assess changes in cotinine; and in-depth interviews to examine the meaning and utility of e-cigarettes. EMA data are collected via a 4-7 question text message surveys, distributed randomly 4 times per day over a 16-hour and delivered to participants’ own phones. Participants are followed for three weeks, then contacted 30-days later for an online follow-up survey. The protocol was piloted Summer 2014.

Results: In June 2014, 56 individuals completed the online screener, 12 were eligible for the study, and three were enrolled in the pilot: one non-Hispanic Black male menthol smoker, one non-Hispanic Black female menthol smoker, and one non-Hispanic White male non-menthol smoker. Results revealed that the EMA data collection and geotracking using participants’ own phones was acceptable. EMA incentives were adjusted to reduce missing data. EMA and geodata were successfully overlaid for two of the three participants due to the age of one participant’s phone.

Conclusion: This exploratory study will identify mechanisms promoting ENDS initiation and predicting ENDS use, including whether ENDS displace or are used concurrently with cigarettes. Lessons learned piloting a complex multi-method study will be presented.

FUNDING: This research is funded by NIDA/FDA CTP (1R21DA036472-01).
POS4-132
THE IMPACT OF A STATE-SPONSORED MASS MEDIA CAMPAIGN ON TELEPHONE QUITLINE AND WEB-BASED CESSATION SERVICE UTILIZATION

Background: The majority of U.S. smokers do not use evidence-based interventions as part of their quit attempts. Quitlines and Web-based treatments may contribute to reductions in population-level tobacco use if successfully promoted. Currently, few states implement sustained media campaigns to promote services and increase adult smoking cessation. This study examines the effects of Florida’s tobacco cessation media campaign and an intermittently airing national media campaign (CDC’s Tips From Former Smokers) on telephone quitline and web-based registrations to cessation services from November 2010 through September 2013.

Findings: Over 35 months, multivariable analyses found that 141,221 tobacco users registered for Florida cessation services through the telephone quitline, and 53,513 registered through their web-based service. Television media dose (TRPs) was positively associated with registrants to the quitline and web-based service (β = 6.8, p < 0.001 and β = 1.7, p < 0.001), and increasing levels affected registrants from multiple demographic subgroups similarly. During the time periods when state and national media campaigns aired simultaneously, approximately one-fifth of Florida’s quitline registrants came from the nationally advertised portal (1-800-QUIT-NOW). This evidence indicates that sustained, state-sponsored media campaigns featuring graphic and emotionally evocative personal testimonials can increase registrants to telephone quitlines and web-based cessation services. Federally funded media campaigns can increase the reach of cessation services within this context.

FUNDING: This study is funded by a contract from the Florida Department of Health, Bureau of Tobacco Free Florida.

POS4-134
DIFFERENCES IN PERCEIVED HEALTH AND SOCIAL RISKS AMONG ADOLESCENT MALE EVER-USERS AND NEVER-USERS OF CIGARETTES AND ELECTRONIC CIGARETTES
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Background: Adolescents’ cigarette use is associated with lower perceived risks from smoking. Perceptions regarding electronic cigarettes and their association with behavior have been less studied.

Objectives: (1) To expand an established instrument for measuring cigarette risk perceptions for the measurement of electronic cigarette risk perceptions; and (2) to calculate associations between perceived risks and product use.

Methods: Surveyed urban high school males (N=104) estimated the probability (0%-100%) that 14 social or health-related negative outcomes (e.g. bad breath, lung cancer, get in trouble) would happen to them if they hypothetically just began using cigarettes or e-cigarettes. We compared individual item adjusted means across products, as well as between ever-users and never-users within each product. Next, for cigarettes and e-cigarettes, we generated composite risk scores and fitted log-linear regression models to estimate associations between risk score and ever-use, adjusted for socio-demographics.

Results: E-cigarettes ever-users reported lower perceived risk probabilities for e-cigarette use than did cigarette ever-users for cigarette use (p<0.05 for 13 of 14 items). Never-users followed a similar pattern of lower perceived risks for e-cigarettes (p<0.05 for 11 items). For cigarettes, all 14 perceived risk probabilities were lower among cigarette ever-users versus never-users, but none statistically significantly. For e-cigarettes, differences in perceived risk between ever-users and never-users were larger than for cigarettes on all items, 12 statistically significantly. Each increasing quartile of perceived risk composite score was significantly associated with lower prevalence of e-cigarette use (PR: 0.3; 95% CI: 0.1, 0.6) but not statistically significantly associated with cigarette use (prevalence ratio, PR: 0.8; 95% CI: 0.5, 1.2).

Conclusion: In this sample, the expanded instrument captured comparable relationships between use and risk perception for cigarettes and e-cigarettes. Cigarettes were viewed as riskier than e-cigarettes, but the association between perceived risk and behavior was considerably stronger for e-cigarettes.

FUNDING: This research was supported by grant number 1P50CA180890 from the National Cancer Institute and Food and Drug Administration Center for Tobacco Products. Dr. Chaffee is supported by the National Center for Advancing Translational Sciences of the NIH under award number KL2TR000143. The information presented is solely the responsibility of the authors and does
Objective: Develop a novel method for comprehensive surveillance of point-of-sale tobacco that was fast and efficient, and determine differences in the ability to achieve comprehensive coverage by store type.

Methods: Tobacco products and advertisements from store interiors were photographed using wearable imaging glasses. Eight mega-pixel photos were taken at a rate of 1 photo per second. Photographs were reviewed for relevant content and, in some instances, stitched together to form panoramic images using Adobe Photoshop. ANOVAs with Bonferroni corrections assessed between store type differences in the number of photos and panoramas needed to acquire comprehensive coverage of all available tobacco products.

Results: A total of 54,371 photos were collected from 267 tobacco retailers in West Virginia. On average, 3.4 minutes were spent collecting photos from each store. Stores were categorized by North American Industry Classification System codes: supermarkets and grocery stores (n=81), pharmacies and drug stores (n=25), tobacco outlets (n=16), convenience stores (n=112), alcohol outlets (n=8), and gas stations (n=45). Tobacco outlets required significantly more photos to acquire comprehensive coverage of all tobacco marketing compared to all other store types (mean=17.96, p<0.00), while pharmacies required significantly fewer photos (mean=1.80) compared to gas stations (mean=4.76, p=0.017), convenience stores (mean=5.96, p=0.00), and alcohol outlets (mean=9.50, p=0.00). Pharmacies and drug stores had a significantly higher percent of panoramas to total photos needed for comprehensive coverage compared to all other store types (mean=87.67 percent, p=0.00).

Conclusions: Faster and more efficient than current surveillance practices, this project presents a novel method for assessing point-of-sale tobacco that allows for comprehensive coverage of all tobacco products and advertisements within a store. Significant differences in the number of photos needed for complete coverage and the percent of panoramas between store types suggests differences in the location and prevalence of tobacco products and advertisements among stores in different retail categories.

FUNDING: This work was funded by the American Legacy Foundation.

JUSTIFICATION: This project presents novel methods for point-of-sale surveillance that can be applied to other areas of public health.
29% men, 48% women, and 23% gender fluid; 52% college-degrees; 32% urban, 64% suburban, and 4% rural. Ever (37%) and current (8%) conventional cigarette use was less common than ever (55%) and current (17%) ENDS use.

Current ENDS use was more common among men (22%) and gender fluid responders (26%) than women (11%), p<.05. Ever conventional smokers were more likely to report ever (RR=1.6, 95% CI 1.2, 2.2) and current (RR=1.5, 95% CI 1.2, 1.8) ENDS use. Channels of hearing about ENDS were friends/peers (85%), online (43%), retail stores and social venues (both 41%), TV (30%), family (20%), print media (20%), and radio (10%). Among ENDS users, 50% identified fruit as their e-juice flavor, followed by candy (18%), and mint or menthol tobacco (14%). Participants reported using ENDS as a substitute when cannot smoke, to reduce tobacco or quit smoking, for fun, and socially.

Conclusions: In a sample of API young adults, ENDS use was more common than conventional cigarettes with current use highest among men and those identifying as gender fluid. ENDS were commonly discussed among peers and online and used in concert or to replace tobacco cigarettes, socially and for fun. Often regarded as a group at lower risk for smoking, the current findings suggest concern regarding API young adults’ ENDS experimentation and use.

FUNDING: No Funding.

JUSTIFICATION: Understanding E-cigarette use amongst Asian and Pacific Islander young adults in California will provide researchers and public health workers a better understanding on how to cater advocacy and health education programs towards the given population.

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POS4-138 SECONDHAND SMOKE EXPOSURE OF U.S. NONSMOKERS BY OCCUPATION: NHANES 2001-2010

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Background: The workplace has been one of the major locations outside of the home for the exposure of nonsmokers to secondhand smoke (SHS). With the continued implementation of new policies in many states and localities that restrict or prohibit smoking at work sites, updated information on current trends in the exposure of nonsmokers to SHS at work is needed.

Objective: The objectives of this study are to evaluate SHS exposure among US workers, and to identify those occupations with the highest risk of SHS exposure.

Methods: During the period from 2001-2010, 9649 participants from the National Health and Nutrition Examination Survey (NHANES) were identified as nonsmoking workers. Nonsmokers with no reported exposure in the home were first categorized into different working groups based on self-reported occupations, and SHS exposure among each group was then assessed using the workers’ serum cotinine concentrations.

Results: Serum cotinine levels had an overall decrease of approximately 26% in nonsmoking workers between NHANES 2001-2002 and 2009-2010. The largest decrease in SHS exposure was identified among food preparation workers (27%), although this group also retained the highest geometric mean (GM) for serum cotinine (0.080 (95%CI: 0.069, 0.094)) among all occupational groups. SHS exposure also remains higher among blue-collar workers, including those in the construction, extraction, production and transportation sectors. Disparities in SHS exposure levels were also detected among nonsmoking workers with different educational and income levels.

Conclusions: Our results indicate that disparities in SHS exposure remain significant among some occupation groups. In particular, targeted efforts are needed to decrease SHS exposure among blue-collar workers, and in food preparation/service workplaces.

FUNDING: No Funding.

JUSTIFICATION: Clinicians and policy makers can use the information from this study to identify workers that are at risk for elevated exposure to secondhand smoke due to their occupation.

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POS4-139 THE PERCEIVED RISK INSTRUMENT (PRI) TO MEASURE PERCEIVED RISKS ASSOCIATED WITH THE USE OF NICOTINE AND TOBACCO PRODUCTS


In light of the US Food and Drug Administration (FDA) draft guidance on Modified Risk Tobacco Product (MRTP) applications, and the lack of validated self-report instruments, Philip Morris International undertook the development of the Perceived Risk Instrument (PRI) to quantify consumers’ perceived risks of various types of nicotine and tobacco products (including conventional cigarettes, nicotine replacement therapies, and MRTPs).

A three-stage development was undertaken following best practice guidelines for self-report instruments. In the first stage, qualitative research was executed to inform upon the development of a conceptual framework and content for a pilot version of the PRI. Two stages of quantitative research (web surveys in US adults; N=2020 and N=1640, respectively) followed to define the final version of the instrument and assess its psychometric properties (based on Rasch Measurement Theory and traditional psychometric methods).

The final conceptual framework of the PRI included two main domains: health risk to self and addiction risk. Independent unidimensional scales (18-item Perceived Health Risk scale; 7-item Perceived Addiction Risk scale) were constructed for these domains, complemented by two global items assessing perceived harm to others. Each scale fulfilled Rasch and traditional psychometric criteria (including targeting, reliability based on person separation index and Cronbach’s alpha, and comparability across different populations based on smoking status).

The PRI fills an important gap in the research literature and provides a validated instrument for measuring and comparing the perceived risk of tobacco-related products from the consumer’s perspective. By quantifying important aspects of perceived risk, the PRI has the potential to support clinical and population-based studies and an evidence-based product assessment.

FUNDING: Philip Morris Products S.A., Neuchâtel, Switzerland

JUSTIFICATION: This new scale fills an important gap in the literature and has the potential to support clinical and population-based studies and an evidence-based product assessment.

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POS4-140 TOBACCO CONSUMPTION AND POSITIVE MENTAL HEALTH: AN EPIDEMIOLOGICAL STUDY WITH A POSITIVE PSYCHOLOGY PERSPECTIVE

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Introduction: Traditionally, clinical and epidemiological researchers have interpreted mental health as the absence of mental disorders. Using this perspective, several investigations have assessed the relationship between tobacco consumption and mental health. However, other positive facets of
A cross-sectional study was conducted using the PERU MIGRANT dataset. We analyzed the association of interest in three populations: rural (n=201) and urban (n=202) non-migrants and rural-to-urban migrants (n=591). We used an adapted version of the Global Health Questionnaire to measure Positive Mental Health indicators: happiness, resilience, self-efficacy and self-acceptance. Cumulative occurrence of tobacco use was the outcome variable. Covariates with potential confounding effects were sex, age, family income and education. Log-Poisson robust regression served to estimate the association of interest in crude and adjusted models.

Results: Cumulative occurrence tobacco use was relatively high in all groups: rural (61.7%), urban (78.0%) and rural-to-urban migrants (76.2%). After adjusting for confounders, our findings showed a significant negative association between Positive Mental Health and tobacco consumption in rural people (PR=0.93; 95%CI: 0.87-0.99; p=0.02) and a non-significant negative association in urban people (PR=0.97; 95%CI: 0.92-1.01; p=0.13). There was no evidence of this relationship in the migrant population (PR=1.00; 95%CI: 0.97-1.04; p=0.80).

Conclusions: Among rural people, positive psychological characteristics are negatively associated with smoking. This evidence supplies new information that could support improvements in prevention programs and psychotherapy for smoking cessation in developing country populations.

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POS4-141 SMOKERS WITH A GED WHO CALL A STATE QUITLINE
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The inverse association between educational attainment and smoking is well established; however, analyses with refined categories of educational attainment indicate those with a General Educational Development (GED) certificate do not fit this pattern and smoke at higher rates than even high school (HS) dropouts.

Oklahoma Tobacco Helpline registration data from July 1, 2012 to June 30, 2014 were used to compare age, income, tobacco use patterns, and past quit attempts among registrants with a GED compared to HS dropouts and HS graduates. Adult tobacco users ages 25 or older who enrolled in a single or multiple call intervention were included in analyses.

During the two year study period, 8.3% (n=3,823) of registrants ages 25 or older reported a GED as their highest educational attainment. Twenty-two percent (n=9,984) reported less than a HS diploma and 28.0% (n=12,946) had a HS diploma. Callers with a GED were significantly younger than both HS dropouts and graduates (45.9 years vs. 47.6 and 47.5 years, p<.0001). For each increase in education level, the proportion of callers with low income decreased steadily, with 88.9% of HS dropouts, 85.1% of adults with a GED, and 74.5% of HS graduates reporting an annual income of less than $25,000. Adults with a GED (29.4%) were less likely to smoke a pack or more cigarettes per day compared to HS dropouts (33.3%, p<.0001) and more likely than HS graduates (26.5%, p=.0004). There were no significant differences in the proportions of someday smokers (p=.80) or the number of previous quit attempts (p=.57).

Although recent smoking prevalence data indicate adults with a GED do not follow the education gradient established for smoking and have significantly higher rates than both HS graduates and HS dropouts, tobacco users with a GED who called the Helpline fell between HS dropouts and HS graduates for most characteristics and tobacco use patterns. More research is needed to determine what factors might contribute to higher smoking prevalence in the general population of adults with a GED and whether tobacco quitlines are effective in the GED population seeking treatment.

FUNDING: Oklahoma Tobacco Settlement Endowment Trust

JUSTIFICATION: More research is needed to further explain differences observed among smokers with a GED compared to high school dropouts and high school graduates.

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POS4-142 A COMPARISON OF ADOLESCENTS’ PERCEPTIONS OF TRADITIONAL CIGARETTES, E-CIGARETTES, AND BLUNTS: A QUALITATIVE PERSPECTIVE
Maria L Roditis*, Bonnie Halpern-Felsher, Stanford University

While rates of tobacco cigarette use among adolescents have remained constant, rates of marijuana and e-cigarette use are on the rise. Studies show knowledge and perceptions of risks and benefits of tobacco products impacts adolescents’ decisions to use or not use these products. However, little is known regarding adolescents’ knowledge and perceptions of risks of e-cigarettes and blunts nor how these perceptions are formed. This study fills these gaps by using qualitative techniques to assess adolescents’ perceptions of risks and benefits of traditional cigarettes, e-cigarettes, and blunts. A total of 24 adolescents (9 females and 15 males) from Northern California participated in 6 small group discussions. Adolescents were asked what they know about these products as well as what good or bad things might happen from using these products. To assess how perceptions and knowledge of risks and benefits of products were formed, they were asked where and from whom they had learned about these products. Among participants, 29.2% ever tried a cigarette, 50% ever used marijuana, 33.3% ever used a blunt, 16.7% ever used an e-cigarette, and 8.4% ever used an e-cigarette with marijuana. While adolescents were able to easily recall messages and saw little benefit to using cigarettes, they were less likely to recall messages regarding e-cigarettes. For example, one student said, “there are commercials saying about how marijuana and cigarettes are bad, but they never talk about e-cigarettes.” Adolescents were less knowledgeable and certain about health consequences of blunts or e-cigarettes, in one instance this resulted in a heated argument regarding whether or not smoking blunts could result in cancer. They also described situations in which teachers and parents were “outdated” or “completely oblivious” regarding new products such as e-cigarettes. Results from this study indicate adolescents have learned from multiple sources about risks of using traditional cigarettes, but they received much less and less clear information, or wrong information, regarding blunts and e-cigarettes and their perceptions of the risks related to these products are also much more ambivalent.

FUNDING: This research was supported in part by grants from California’s Tobacco-Related Disease Research Program, numbers 9KT-0072, 20GT-0099, and 21HT-0002, and the National Cancer Institute Grant CA-113710.

JUSTIFICATION: This research assesses adolescents perceptions of the risks and benefits of a traditional cigarettes, e-cigarettes, and blunts. This information is of critical importance for creating warning messages and interventions to prevent or stop use of these products among adolescents.

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USE OF ELECTRONIC CIGARETTES FOR QUIT ATTEMPTS IN OKLAHOMA

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Despite a lack of evidence for their effectiveness, electronic cigarettes have become popular among smokers as a cessation device. The aim of this study was to determine what percentage of smokers in Oklahoma used an electronic cigarette during their last quit attempt compared to other smoking cessation methods. A second aim was to determine what variables were associated with electronic cigarette use among current smokers and recent former smokers. In 2013, Oklahoma added questions to its Behavioral Risk Factor Surveillance System (BRFSS) to assess use of evidenced-based smoking cessation strategies and e-cigarettes during the most recent quit attempt. Current smokers with a quit attempt in the last year and recent former smokers (within the last 12 months) comprised the study population for this analysis. Weighted prevalence estimates were calculated and the relationship between use of e-cigarettes and covariates of interest was examined using methods appropriate for weighted data. A total of 919 individuals were included in this study: 777 smokers with a quit attempt during the previous 12 months and 142 recent former smokers. More than one-third (36.7%) of individuals used either electronic cigarettes only or in conjunction with other smoking cessation methods during their last quit attempt. This compares to 21.5% who used multiple methods not including e-cigarettes, 16.5% who reported using nothing at all, 3.2% who used the nicotine patch, and 0.32% who used a telephone quitline. Variables significantly associated with e-cigarette use for cessation in the population included female gender (OR = 1.67 with 95% CI = 1.04, 2.70), and white race (OR = 1.69 with 95% CI = 1.82, 33.33). This study demonstrates that smokers and recent former smokers use electronic cigarettes as a smoking cessation method to a greater extent than FDA approved evidenced-based strategies. While e-cigarettes may be perceived as an acceptable cessation strategy among smokers, more research is needed on the efficacy of e-cigarettes for smoking cessation.

FUNDING: No funding

JUSTIFICATION: This BRFSS study done in Oklahoma demonstrates that 36.7% of smokers in Oklahoma used electronic cigarettes alone or in conjunction with other cessation methods to quit smoking during 2013.

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MENDELIAN RANDOMIZATION STUDY OF THE CAUSAL RELEVANCE OF SMOKING BEHAVIOURS IN TYPE II DIABETES

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Observational studies have shown consistently positive associations between cigarettes smoked per day and risk of type II diabetes. On the other hand, smoking is also associated with lower body mass index and individuals who quit smoking are at increased risk of weight gain. We conducted a Mendelian randomization study to assess the causal relevance of smoking cessation and smoking initiation on type II diabetes risk, combining publically available genotype data catalogued by the NHGRI (National Human Genome Research Institute) with genotype data on 60,000 cases and controls from DIAGRAM (Diabetes Genetics Replication And Meta-analysis). For comparison, we also included genotype data on 180,000 cases and controls from the CARDIoGRAMplusC4D consortium and 27,000 cases and controls from the ILCCO/TRICL consortia to assess the causal relevance of smoking cessation and smoking initiation in coronary heart disease and lung cancer. The odds ratio per copy of the allele of rs3025343 associated with smoking cessation was 1.10 (95% confidence interval: 1.02 to 1.19) for type II diabetes, 0.96 (0.93 to 0.99) for coronary heart disease and 0.94 (0.88 to 1.00) for lung cancer. The corresponding odds ratios for smoking initiation, using rs6265 as a genetic proxy, were 1.02 (0.98 to 1.06) for type II diabetes, 1.04 (1.02 to 1.06) for coronary heart disease and 1.04 (0.99 to 1.09) for lung cancer. These results suggest harmful effects of smoking cessation on type II diabetes in contrast to protective effects for coronary heart disease and lung cancer. As genotypes are randomly determined at conception, and are therefore not generally susceptible to reverse causation bias and confounding, the association between smoking cessation and type II diabetes is compatible with causality. Interventions targeted towards weight gain, which is the most likely mediator of the association, could help ameliorate the harmful effects of smoking cessation on risk of type II diabetes.

FUNDING: The Roy Castle Lung Cancer Foundation

JUSTIFICATION: Our study informs the causal relevance of smoking behaviours in type II diabetes.

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REFINING A MODEL FOR IMPLEMENTING A TOBACCO INTERVENTION IN HEAD START PROGRAMS: A QUALITATIVE STUDY OF STAFF PERCEPTIONS

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Background: Low income communities experience disproportionately higher smoking prevalence, and have poor access to evidence based cessation services. Head Start programs provide a setting to engage parents of young children on tobacco cessation. Focus groups were conducted among Head Start staff to explore the perceived benefits and obstacles encountered in a pilot implementation project of a brief motivational intervention.

Methods: Head Start sites were randomized to receive basic tobacco education (n=2) or basic tobacco education plus Motivational Interviewing (MI) training (n=6). Focus groups were conducted with Managers (n=10) and Family Advocates (n=32). Groups included three to 12 participants and lasted an average of 40 minutes. Participants provided informed consent and completed a brief demographic survey. To help ensure collection of comparable qualitative data across focus group discussions, an interview guide listed specific questions and topics to be covered. Questions centered on staff perceptions of their discussions with families about cessation or SHS reduction in the home before and after the training, and staff suggestions for future successful implementation in other programs.

Results: MI was deemed a valuable tool for Family Advocates in their work with Head Start families. Despite expressed benefits of MI, participants identified several challenges to its implementation: (a) limited time to practice nascent MI skills; (b) limited institutional support for tobacco cessation and MI techniques; (c) perceived lower priority of a tobacco intervention among families with pressing social and financial concerns. Specific small modifications to the implementation strategy were identified which may promote successful utilization of MI for tobacco cessation efforts in federal programs such as Head Start.

Conclusions: Head Start offers an excellent setting to systematically implement a motivational intervention to engage families on tobacco use. Overall positive responses from Head Start staff lend support to broader implementation, while specific strategies to overcome obstacles and improve the efficiency of implementation were identified.

FUNDING: American Legacy Foundation

JUSTIFICATION: Findings from this work will facilitate the implementation of tobacco interventions in Head Start sites, to increase engagement among smokers from disadvantaged communities

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POS4-146
TOBACCO USE PATTERNS AMONG ADULT CURRENT AND EVER REGULAR E-CIGARETTE USERS

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The Total Tobacco Migration Tracker (TTM; 2008-present) and National Tobacco Behavior Monitor (NTBM; 2010-present) are cross-sectional surveys that collect national data on demographic characteristics and behaviors of adult tobacco users, including e-cigarette users. Data from both surveys are sourced from online panels and weighted to reflect U.S. census data. Analyses based on data from TTM (Q12013 and Q12014) indicate that 6.1% of survey respondents (n=683/11,173) self-define as current regular e-cigarette users. The vast majority of these e-cigarette users (91.1%; n=622/683) report ever regularly using traditional cigarettes, of which nearly all (97.1%; n=604/622) regularly used e-cigarettes after regularly using traditional cigarettes. Nearly one-quarter of those who regularly used e-cigarettes after regularly using traditional cigarettes (24.5%; n=148/604) no longer regularly use traditional cigarettes; and, less than 2% of current regular e-cigarette users (n=12/683) report transitioning to current regular use of traditional cigarettes. Similar findings are provided based on data from NTBM (2013-Q12014), with ever regular users defined as having used e-cigarettes and/or traditional cigarettes on 10 or more days during any 30-day period. Specifically, 8.7% of survey respondents (n=2,618/30,136) are ever regular e-cigarette users, with the vast majority (69.0%; 2,330/2,618) reporting ever regular use of traditional cigarettes; again, nearly all (n=2,119/2,183, with product order not determined for 147 respondents) report regularly using e-cigarettes after regularly using traditional cigarettes. Nearly one-quarter of those who regularly used e-cigarettes after regularly using traditional cigarettes (23.7%; n=503/2,119) no longer regularly use traditional cigarettes; and, less than 1.5% of ever regular e-cigarette users (n=35/2,618) report transitioning to current regular use of traditional cigarettes. Collectively, these data indicate that the vast majority of e-cigarette users regularly used traditional cigarettes prior to regularly using e-cigarettes; and, that regular e-cigarette use is not a significant gateway to regular use of traditional cigarettes.

FUNDING: RAI Services Company

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POS4-147
YOUTH SMOKING AND EDUCATIONAL ATTAINMENT IN YOUNG ADULTHOOD

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Objective: Adults with greater educational attainment tend to have better health throughout their lives compared to those with less education. This is likely a result of a complex of many environmental, societal, individual, and behavioral differences that vary with education. Cigarette use is a catastrophic health behavior with distinct disparities with respect to education. Smoking is more prevalent among less-educated adults and is typically seen as a symptom of low socioeconomic position (SEP). But cigarette use early in the life course may also be a force driving the development of SEP. In this present study, we aimed to determine how smoking during early adolescence relates to adult educational attainment.

Methods: The Minnesota Adolescent Community Cohort (MACC) study assembled a cohort of youth from 2000-2002 who were age 12-16 at the time of recruitment, and surveyed these participants about their tobacco use behaviors approximately biannually through 2013. We used these data to examine if early cigarette use (reporting at least one cigarette before age 15) and more intensive of cigarette use at age 16 (for instance, regular use, vs. experimental use) related to participants’ eventual educational attainment even after taking the adolescents’ parental educational attainment into account.

Results: Within each level of parental educational attainment, youth who reported early cigarette use or heavier smoking at age 16 were less likely to become college graduates during the course of the study. For instance, among those who had at least one parent who graduated from college, the probability of graduating from college for early smokers was 0.48 [95% CI = 0.40, 0.57] and 0.65 [95% CI = 0.60, 0.69] for those who were not early smokers.

Conclusions: These results raise the possibility that early smoking may be an early indicator or even contributor to a diminished socioeconomic position potential in adulthood.

FUNDING: This research was funded by the National Cancer Institute (R01 CA86191; Jean Forster, Principal Investigator).

JUSTIFICATION: This study highlights a potential route by early smoking may interfere with or contribute to youth not attaining higher levels of education.

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POS4-148
DEVELOPING PREVENTION MESSAGES ABOUT E-CIGARETTES: QUALITATIVE DATA ON ADOLESCENTS AND YOUNG ADULTS

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E-cigarettes are marketed aggressively in the United States and use rates are increasing among adolescents and young adults. Little is known about messages that attract youth to these products, and youth generated messages may provide insight for regulation and anti-tobacco media campaigns. We conducted 10 focus groups (N=69) with cigarette smokers and non-smokers in one middle school (MS; n = 16), one high school (HS; n = 24), and one college (n = 29) in CT. HS and college groups were stratified by gender and cigarette smoking status (non-smokers and past 30 day smokers) and MS groups were stratified by gender only due to low rates of cigarette smoking. Participants were 46% female and 36% smokers. Participants were asked to write a message to encourage teens/young adults their age to use e-cigarettes and a second message to discourage use. Messages were collected, entered, and reviewed by researchers to identify coding themes, with discrepancies discussed for consensus. Each message consisted of one to six different themes coded individually for a total of 11 themes. Chi-squares and logistic regression models were used to determine differences in the top three encouraging and discouraging message themes by gender (male/female), school level (MS/HS/college), and smoking status (smoker/non-smoker) and the impact of these variables on message themes. Messages about health effects, flavor, and convenience of using an e-cigarette were the top encouraging themes, while health effects, addictive potential, and the perceived similarity to cigarettes were the top discouraging themes. For encouraging messages, females preferred themes about flavors when compared to males (p=0.001) and HS students favored themes about health when compared to MS students (p=0.014). For discouraging themes, MS students preferred health themes when compared to HS students (p=0.006), and non-smokers preferred themes about addiction (p=0.037) and comparison to cigarettes (p=0.017). This is one of the first descriptions of both adolescents’ and young adults’ perceptions of message themes that might prevent use of electronic cigarettes that prove beneficial in the counter-advertising of electronic cigarettes.

FUNDING: National Institute on Drug Abuse grant P50DA009241.

JUSTIFICATION: Youth generated e-cigarette messages may provide insight for regulation and anti-tobacco media campaigns.

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POS4-149  ATTENTIONAL BIAS TO NEGATIVE STIMULI MODERATES THE ASSOCIATION BETWEEN NEGATIVE AFFECT AND SMOKING RELAPSE


Negative affect predicts failure to maintain abstinence during a smoking cessation attempt. Theory on negative affect and substance use argues that sensitivity or “attentional bias” to negative affective stimuli (i.e., the extent to which negative affect captures and holds attention) is an important component of negative affect’s impact on substance use and quitting (Baker et al., 2004). We hypothesized that attentional bias to negative stimuli moderates the association of negative affect with relapse during a smoking cessation attempt such that negative affect is a stronger predictor of smoking relapse when attentional bias to negative stimuli is high vs when attentional bias is low. Data were collected from smokers (N = 271) enrolled in a smoking cessation trial comparing a mindfulness intervention to standard treatment. At baseline, participants completed measures of negative affect, and two modified Stroop measures, for anxiety and depression, which were averaged to provide the measure of attentional bias. Participants attempted to quit four weeks after beginning treatment. Abstinence was biochemically verified following quit day, and 1, 2, 3, 4 and 26 weeks after quit day. A longitudinal growth curve model predicting abstinence was conducted with the time invariant predictors of negative affect, attentional bias, and their interaction. Age, gender, education, relationship status, average cigarettes per day, and time to first cigarette were included as controls. Preliminary analyses indicated that treatment condition did not significantly interact with any other predictors so it was included as a control. Both negative affect and the interaction term were significant predictors of relapse. The interaction indicates that negative affect is a stronger predictor of relapse for participants with a strong attentional bias. This supports the hypothesis that attentional bias moderates the association of negative affect with smoking relapse. Individuals with high negative affect and high attentional bias to negative stimuli are at particularly high risk of relapse.

FUNDING: NIDA grant R01DA018875

JUSTIFICATION: The finding that smokers trying to quit who have a strong attentional bias to negative affective stimuli are particularly vulnerable to negative affect as a cause of smoking relapse can inform clinical cessation interventions

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POS4-150  ENGAGEMENT IN A FACEBOOK SMOKING CESSATION INTERVENTION FOR YOUNG ADULTS: EFFECTS OF MOTIVATION AND MONETARY INCENTIVE

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Introduction: Social media offers great opportunity to deliver smoking cessation treatment to young adults; however, little is known about engagement in such an intervention, or whether incentivizing could enhance engagement. We examined the effects of readiness to quit smoking and a monetary incentive on user participation in a Facebook smoking cessation intervention.

Method: We analyzed data from 79 young adult smokers participating in a Facebook smoking cessation intervention. Participants were assessed for readiness to quit smoking (not ready, thinking, getting ready), randomized to one of three incentive conditions (personal: $50 gift card; altruistic: $50 donation to charity of choice; no incentive), then invited to join a private Facebook group tailored to readiness to quit for 3 months. Total posts were tallied, and ever-participation (yes/no) and degree-of-participation (total posts/comments) were calculated.

Results: A GLM found that ever-participation was impacted by readiness (F=3.54, p=.04), but not incentive (F=.28, p=.75). Interaction between readiness and incentive was significant (F=2.84, p=.03) such that engagement among those Not Ready was higher for those receiving any incentive (64%, personal,63% altruistic) compared to no incentive(40%), but this was not the case for those in Getting Ready or Thinking groups. In contrast, one-way ANOVA tests found degree-of-participation was impacted by incentive (p=.043), but not by readiness (p=.814). Degree-of-participation was higher for those receiving a personal (M=2.83 [28]) compared to an altruistic (M=1.82 [33]) or no incentive (M=1.78 [23]). There was no significant interaction between readiness and incentive (p=.72).

Conclusions: Monetary incentives can help young adults who are not ready to quit to have some level of engagement in a smoking cessation intervention, and are helpful for increasing amount of engagement among those at any readiness to quit. Personal incentives (e.g.,giftcards) appear to be more helpful than altruistic incentives (donations) in this population. Monetary incentives can be a useful adjunct to online smoking cessation treatment with young adults.

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POS4-151  CORRELATES OF HOOKAH USE AND PREDICTORS OF HOOKAH TRIAL IN U.S. YOUNG ADULTS

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Hookah or waterpipe tobacco smoking has increased among young adults (YAs) in the U.S., but few prospective studies have examined predictors of hookah use. The current study examined correlates of hookah use and predictors of hookah initiation at a six-month follow-up in a nationally-representative, prospective sample of YAs in the U.S. Data were drawn from a subset of participants aged 18-24 who completed Waves 5 and 6 of the Legacy Young Adult Cohort Study. Wave 5 was completed in July 2013 by 1,555 participants and 74% (n=1,150) completed follow-up six months later in January 2014. Weighted bivariate and multivariable analyses were conducted to estimate the prevalence and correlates of ever and past 30-day hookah use and to examine associations between baseline covariates and hookah initiation six months later. Almost a quarter of the sample had ever used hookah and 4% reported past 30-day use at baseline. Alcohol, marijuana, and cigarette use were more prevalent among ever and past 30-day hookah users relative to never users. Significantly more ever hookah users (50%) and past 30-day users (55%) reported hookah as “a lot” or a “little less” harmful than cigarettes relative to never users (22%). Eight percent of never users at baseline (Wave 5) reported trying hookah at the six-month follow-up. Significant predictors of hookah trial included college enrollment, alcohol, cigarette use, and perceptions that hookah is less harmful than cigarettes. Results highlight rapid transitions in hookah use and concurrent risk factors (i.e., alcohol and other tobacco use) that influence hookah trial. Findings also highlight lower harm perceptions of hookah relative to cigarettes as a likely antecedent of hookah use. Future studies should examine how to modify risk factors in interventions aimed at reducing tobacco use and initiation in this vulnerable age group.

FUNDING: This study was funded by Legacy.

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POS4-152
SECONDHAND SMOKE EXPOSURE: WHERE IS IT OCCURRING AND WHAT CAN BE DONE AFTER STATEWIDE SMOKE-FREE LAW IMPLEMENTATION?

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The harms of secondhand smoke (SHS) are well known and national goals have been set for reducing and eliminating exposure in both public and private environments. Proven strategies to reduce SHS exposure include lowering smoking prevalence, passing comprehensive state and local laws in worksites and public places, including bars and restaurants, and implementing voluntary smoke-free rules in private settings such as homes and vehicles. In the United States, SHS exposure has declined as states and localities have adopted smoke-free policies; however approximately 88 million U.S. nonsmokers continue to be exposed to SHS in areas not covered by smoke-free policies or rules. Questions remain regarding which additional strategies would best help to further reduce SHS exposure. This symposium shares recent SHS exposure findings in various settings, as well as general attitudes and perceptions toward the implementation of smoke-free policies. First, Dr. King will present findings on trends in smoke-free home rules at the state and national level over the past two decades. Next, Mr. Bohac will share findings on levels of particle matter (PM2.5) from SHS in outdoor settings. Dr. Betzner will then share qualitative data from smokers and nonsmokers in Minnesota regarding their perceptions of SHS exposure and attitudes towards adopting smoke-free policies. Finally, Dr. Haynes will share formative research findings and recommendations on the complexity of assessing SHS exposure using telephone-based data collection methods. Opportunities and challenges of reaching state exposure goals will be highlighted and discussed. Dr. Hyland will serve as the symposium discussant and will elaborate on the balance between declining levels of exposure and what additional rules or approaches are most appropriate in state’s where knowledge of the harm of SHS is high and clean indoor air laws have already been passed.

FUNDING: No funding.

JUSTIFICATION: This Symposium addresses secondhand smoke exposure at the state and national level and questions what strategies would be most useful for driving down exposure after a statewide smoke-free law has been passed.

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POS4-153
NATIONAL AND STATE PREVALENCE OF SMOKE-FREE RULES IN HOMES WITH CHILDREN: TWO DECADES OF PROGRESS

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Although many jurisdictions have implemented laws prohibiting smoking in public places, the home remains a major source of secondhand smoke (SHS) exposure, particularly for children. We used data from the 1992-1993 and 2010-2011 Tobacco Use Supplements to the Current Population Survey - a household survey of the civilian, non-institutionalized population - to assess prevalence of smoke-free home (SFH) rules in all 50 States and DC. Households were considered to have a SFH rule if all respondents aged ≥18 in the household reported that no one was allowed to smoke inside the home at any time. Households with children were defined as those with occupants aged ≤17. SFH rule prevalence was assessed nationally and by state. SFH rule prevalence increased from 43.0% in 1992-1993 to 83.0% in 2010-2011 (p<0.05). Among households with children, SFH rule prevalence nearly doubled from 44.9% to 88.6% (p<0.05), while SFH rule prevalence increased from 59.7% to 95.0% in households with no smokers and from 9.7% to 61.0% in those with ≥1 smokers (p<0.05). Among households with no children, prevalence of SFH rules increased from 40.8% to 81.1% (p<0.05), while prevalence of SFH rules increased from 53.4% to 90.1% in households with no smokers and from 6.3% to 40.9% in those with ≥1 smokers (p<0.05). An increase was observed in SFH rule prevalence in every state and DC (p<0.05), irrespective of whether a child lived in the home; however differences existed across states. In 2010-2011, among homes with ≥1 smokers and children, SFH rule prevalence ranged from 36.5% in West Virginia to 86.8% in California. These findings reveal that considerable progress has been made adopting SFH rules in the past two decades, particularly in homes with smokers and children. However, millions of children remain at risk for SHS exposure because their homes are not smoke-free. Efforts to educate the public about the dangers of SHS and to promote voluntary SFH rules are crucial to protect children from SHS. Also, efforts are warranted to expand smoke-free building policies to protect the nation’s 80 million multiunit housing residents, including 18 million children, from this preventable health hazard.

FUNDING: There were no sources of funding, direct or indirect, for the reported research.

JUSTIFICATION: Describe trends in the national and state prevalence of smoke-free home rules among U.S. households over the past two decades.

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POS4-154
SECONDHAND SMOKE PARTICULATE MEASUREMENTS AT BAR AND RESTAURANT OUTDOOR PATIOS

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Secondhand smoke (SHS) monitoring was conducted at outdoor patios of bars and restaurants in the Minneapolis/St. Paul metropolitan area. The monitoring included continuous photometer measurements of fine particles (PM2.5), customer counts, and smoking frequency. The unannounced visits were conducted during warm, dry summer conditions at a statistically representative sample of 50 venues that provided outdoor service and 50 venues that did not provide service. Two one-hour visits were completed to each of the 50 "service provided" venues on Friday and Saturday evenings. For the 50 "service not provided" venues 15 minute visits were completed during a breakfast, lunch, dinner, and evening period.

SHS particulate concentrations at outdoor locations typically increase abruptly during periods of active smoking and decrease shortly after smoking ends. Consequently, a long-term average is often not representative of higher, intermittent exposures. The short-term duration exposures were evaluated by computing the maximum 10, 30, 60 second and 5 minute average concentrations for each visit and the fraction of time that the concentration exceeded six different reference levels. Concentrations were adjusted for background particulate levels.

The study determined that slightly over 20% of bars and full service restaurants had outdoor seating areas with service where smoking was allowed. The fraction was only 5% for limited service restaurants, but 31% of those had outdoor smoking areas where they did not provide service. For the service provided areas the SHS odor threshold of 1.4 μg/m3 (Junker, 2001) was exceeded over half of the time and the irritant threshold of 4.4 μg/m3 was exceeded more than 20% of the time with the largest percentage of 27% for bar patios. While the average concentration for all monitoring at service provided venues was only 4.9 μg/m3, the average 10 second maximum was 80.6 μg/m3 for all venue types and the average 10 second maximum was 128.5 μg/m3 for limited service venues. The average concentrations at the patios where service was not provided were greater than those for service provided patios.

FUNDING: Funding for this research was made available through a grant with ClearWay Minnesota.

JUSTIFICATION: Secondhand smoke exposure at outdoor bar and restaurant patios typically increases abruptly during periods of active smoking and decreases shortly after smoking ends. Long-term average particulate concentrations only
average 5, but for many venues 10 second peak values are similar to indoor levels when smoking is permitted.

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POS4-155 PERCEPTIONS OF SECONDHAND SMOKE RISK AND RESTRICTIONS: CHALLENGES AND OPPORTUNITIES FOR NEW POLICIES

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Many communities have goals to reduce secondhand smoke (SHS) exposure. Proven strategies include comprehensive smoking bans and voluntary smoke-free rules. Minnesota implemented a comprehensive smoking ban in 2007. Over 85% of Minnesotans have smoke-free home rules, yet 37% of adults are exposed to SHS weekly. Additional strategies for further reducing exposure are not clear.

We conducted 14 focus groups during June-July 2013 to better understand Minnesotans’ perceived risk from SHS and beliefs about current restrictions (mode 6 participants/group). Equal numbers urban/rural, male/female, smokers/non-smokers were recruited from a marketing firm database.

CHALLENGES. Neither smokers nor nonsmokers considered brief, outdoor SHS exposure a substantial risk. Both groups agreed sustained, indoor exposure could cause serious harm including cancer, but believed their own exposure low, in part because of the existing ban. Smokers were more likely than nonsmokers to question scientific claims about SHS. Most participants felt current restrictions sufficient, and were skeptical of further restricting the rights of smokers in their homes or vehicles. Many participants viewed smokers as underdogs or victims.

OPPORTUNITIES. Smokers and nonsmokers supported the comprehensive ban. Of new policies discussed, restaurant patio bans had the most support. Participants supportive of outdoor area or car bans often cited protecting children as the rationale. Some participants initially opposed to bans in multi-unit housing changed to support after discussion. While there was sympathy for smokers, most non-smokers think smoking is disgusting. Smokers and non-smokers expressed contempt for people who smoke in cars with children present. Participants affirmed an overall norm of smoking as unacceptable, and smoke as unwelcome in public places.

Beliefs about SHS included low perceived risk and concerns about threats to freedom. Reactance Theory suggests individuals in such a context may be wary of new legal restrictions. Efforts to further reduce exposure should motivate behavior change, avoid over-stating harm from brief outdoor exposure, and respect personal autonomy within the home.

FUNDING: Funding was provided by a grant from ClearWay Minnesota

JUSTIFICATION: Participants will understand the challenges and opportunities afforded by asking survey items about duration and location of SHS exposure.

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POS4-156 MEASUREMENT OF SECONDHAND SMOKE EXPOSURE USING SELF-REPORT SURVEY METHODS: COMPLEXITIES, CHALLENGES, AND RECOMMENDATIONS

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As the accumulated scientific evidence of the harms of secondhand smoke (SHS) has been disseminated, restrictions on indoor smoking have increased. Robust associations of self-reported SHS exposure via questionnaires and serum cotinine measurements have been documented, providing evidence of criterion validity. However, among questionnaire-based assessments there is considerable variation in the items used to measure SHS exposure. This paper provides an assessment of survey items regarding SHS exposure location and duration. Two rounds of cognitive interviews were conducted with smoking and non-smoking Minnesotans to better understand the nature of their exposure. A sample of interviewees was selected across the following strata: smoking status, gender, level of completed education, and geography. A total of 20 non-smokers and 17 smokers participated.

Participants’ interpreted several survey items in divergent ways, suggesting a need for more explicit item wording. Items asking about exposure to SHS in the workplace were particularly problematic, while the phrase “in your work area” indicated only indoor areas for most respondents, one-quarter considered both indoor and outdoor areas. A small percentage of respondents considered thirdhand smoke when responding to items about location and duration of exposure. Participants commonly reported exposure at a place besides their home, workplace, or car, which highlights the importance of asking about specific locations of exposure. Many items, as originally constructed, measured smoking rules or behaviors instead of exposure. Pinpointing an accurate measure of duration of exposure also had its challenges, particularly with recall and the unit of measurement. Results illustrate that some survey items may be answered by respondents in ways that result in poor measurement of the intended construct. Further, given the increase in smoking bans across the country certain items as currently written may lead to an overestimate of exposure. Based on this testing, researchers developed a list of recommended survey items for efficiently and consistently measuring the location and duration of SHS exposure.

FUNDING: Funding for this research was made possible through a grant from ClearWay Minnesota.

JUSTIFICATION: Participants will understand the challenges and opportunities afforded by asking survey items about duration and location of SHS exposure.

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POS4-157 AWARENESS, USE, AND BELIEFS ABOUT NOVEL TOBACCO PRODUCTS AND THEIR TRENDS AMONG YOUNG ADULTS: FINDINGS FROM THE MACC STUDY

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Electronic cigarettes [ECs] and snus were introduced into the US market in 2007-2008 while the Minnesota Adolescent Community Cohort (MACC) Study was ongoing (2000-2013). Focus groups with young adults outside of the study were conducted in 2010 (aged 18-25) funded by an administrative supplement to the study. Findings from these focus groups were used to develop survey items to repeatedly assess beliefs about, awareness of, and use of ECs and snus and their changes over time in the ongoing MACC study data collection when participants were 20-28 years old (2010-2013, three waves of data collection). Focus group participants found EC and snus “modern” and “recreational”, were uncertain about whether these products could help people quit smoking, but concerned they would introduce youth to tobacco. MACC survey data showed consistent increases in the awareness and use of these products, especially for ECs. Specifically, between
2010 and 2013, the awareness of ECs increased from 7% to 91%, ever use from 7% to 16%, and current use from 1% to 4% (all p<0.001). Awareness of snus increased from 65% to 67%, and ever use increased from 15% to 16% (all p<0.01), but not in current use (from 3% to 2%; p=0.72). Over time, more participants believed that ECs can help quit smoking (from 44% to 55%) and are less harmful than cigarettes (from 27% to 28%; all p<0.001). Logistic regression models showed that young adults who held positive beliefs about ECs were subsequently more likely than those who did not to experiment with the product (p<0.05). In addition, young adult smokers who reported current use of ECs did not reduce their cigarette consumption over time, while those who did not use ECs reported significant reduction in cigarette consumption (p<0.05). Additionally, snus use predicted subsequent smoking among non-smokers and former smokers (p<0.05). In conclusion, while ECs and snus are both novel tobacco products, the popularity of ECs substantially increased among young adults in our sample, while the popularity of snus only modestly increased. Our data are consistent with the conclusion that both products may hinder the reduction in tobacco use among young adults.

FUNDING: This research was funded by the National Cancer Institute (R01 CA86191; Jean Forster, Principal Investigator) and ClearWay Minnesota (RC-2007-0018; Jean Forster and Debra Bemant, Co-Principal Investigators). Dr. Choi’s effort is supported by the Division of Intramural Research, National Institute on Minority Health and Health Disparities, National Institutes of Health. The data were collected while Dr. Choi was employed at the University of Minnesota.

JUSTIFICATION: Our data are consistent with the conclusion that both electronic cigarettes and snus may hinder the reduction in tobacco use among young adults.

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POS4-158
THE INCREASE IN NEW TOBACCO PRODUCT USE AMONG YOUNG PEOPLE: RIDING THE WAVE OR STEMMING THE TIDE?

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New tobacco products, including e-cigarettes, have been marketed as a means to help smokers quit or to switch to “safer” products. However, what happens when new products are introduced to populations that are considered vulnerable by virtue of their age and history of no prior use? Several recent cross-sectional studies have suggested that adolescents and emerging adults are particularly vulnerable to uptake of new tobacco products and that experimentation has been increasing at a rapid rate after 2010. The “wave” of increase may signal the re-emergence of a social norm for tobacco use that has been declining for several years as a result of tobacco prevention efforts. In a recent review, Chapman & Wu (2014) advanced three hypotheses to explain this rise, all of which draw from evidence from school-based surveys conducted in November 2013 (Time 1; n=4780) and June 2014 (Time 2; n=5152) in CT to examine use patterns as well as perceptions and attitudes towards e-cigarettes among adolescents.

The purpose of this study is to identify the trends of concurrent use of tobacco products and use of individual tobacco products, among current tobacco users, in a nationally representative sample of high school students from 1999 to 2013. Linear, quadratic, and cubic trends in individual and concurrent use of these products were tested using 8 repeated cross-sections of the National YRBS between 1999 and 2013. Analyses were limited to only those students reporting using at least one tobacco product in the past 30 days. Tests for effect modification of race/ethnicity and sex were conducted on each product or combination. Significant trends were detected for each individual tobacco product. Race/ethnicity was not an effect modifier for any of the observed trends. The prevalence of cigarette use decreased (p=0.0001), cigar use increased (p=0.0001), and SLT use increased (p=0.0001). Sex was an effect modifier of all three trends. Significant trends were detected for the concurrent use of all 3 tobacco products and the use of cigars with SLT. Neither sex nor race/ethnicity was identified as effect modifiers. A significant cubic trend was detected to describe the prevalence of the concurrent use of all 3 tobacco products (p=0.049). The concurrent use of cigars and SLT increased significantly (p=0.0001). Significant trends were not detected for the concurrent use of cigarettes and cigars or the concurrent use of cigarettes and SLT, however, sex was identified as an effect modifier. The prevalence of male concurrent use of cigarettes and cigars has decreased (p=0.0001), yet among females the prevalence has increased (p=0.0039). While the decrease in the youth prevalence of cigarette use is a public health success, there is concern about the increase in non-cigarette products. This study shows that there have been significant increasing trends in both cigar use and SLT use among students who already use at least one tobacco product. These trends further drive increases in the concurrent use of tobacco products, adding to the potential health burden. This study provides support to study trends in longitudinal populations, such as those within the Texas TCORS projects.

FUNDING: Funding for this study was provided by the Michael & Susan Dell Center for Healthy Living.

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POS4-160
PREDICTORS OF EMERGING E-CIGARETTE USE AMONG MIDDLE AND HIGH SCHOOL ADOLESCENTS

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Developing an understanding of use patterns and predictors of e-cigarette use behaviors among adolescents is important for tobacco regulation. We used evidence from school-based surveys conducted in November 2013 (Time 1; n=4780) and June 2014 (Time 2; n=5152) in CT to examine use patterns as well as perceptions and attitudes towards e-cigarettes among adolescents. Cross-sectional analyses at Time 1 indicated high rates of lifetime use (3.5% MS, 25.2 % HS) and current (past month) use (1.5% MS, 12% HS) of e-cigarettes. Among those who had not tried e-cigarettes, 26.4% of MS and 31.7% of HS

UNC TCORS research as it relates to these studies and will discuss how these findings can potentially inform future prevention efforts to “stem the tide” in tobacco product use among non-users and new users.

FUNDING: No funding.

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POS4-159
TRENDS IN MULTIPLE AND INDIVIDUAL TOBACCO PRODUCT USE AMONG CURRENT TOBACCO USERS, 1999-2013

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students reported being susceptible to future use. Males (OR=1.70, p<0.01), older students (OR=1.39, p<0.05), Caucasians (OR=2.01, p<0.001), students who had tried cigarettes but were not current cigarette smokers (ever smokers; OR= 13.04, p<0.001), and current cigarette smokers (OR= 85.11, p<0.001) were more likely to be lifetime e-cigarette users, and report greater susceptibility to future e-cigarette use (Males: OR=1.30; Caucasians: OR=1.14; Ever cigarette smokers; OR=3.85; Current Cigarette smokers; OR=9.81; p's<0.01-0.001). E-cigarette users also tended to have higher rates of use of other tobacco products as well as other substances like marijuana and alcohol. We also conducted longitudinal examinations with students surveyed at both time-points (n=2196) to examine predictors of continued and new use behaviors. Logistic regression analyses conducted among those who reported having never used e-cigarettes at Time 1, observed that that age (OR=1.28, p<0.001) and e-cigarette susceptibility at Time 1 (OR=5.06, p<0.001) predicted trying e-cigarettes at Time 2. Lifetime e-cigarette users endorsed the attractiveness of various novel aspects of e-cigarettes as the reason for initiation and use. While most e-cigarette use appear to be associated with anticipated predictors like cigarette use, there is also use among adolescent who are not cigarette smokers. This evidence will be used to discuss various proposed theories for the recent exponential rise in e-cigarette use among adolescents.

FUNDING: This research was supported by P50DA009241.

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POS4-161

NINTH-GRADE PREDICTORS OF EMERGING ADULT E-CIGARETTE USE AMONG LOS ANGELES HISPANICS

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E-cigarette use prevalence is increasing among adolescents and emerging adults. Little is known about the psychosocial predictors of e-cigarette use, especially among vulnerable populations such as Hispanics. Information about early risk and protective factors for e-cigarette use in emerging adulthood could inform the development of health education programs to reduce health disparities. Because psychological, social, and cultural variables are associated with use of other substances among Hispanic adolescents, we examined these variables as predictors of e-cigarette use. We used data from a longitudinal study of Hispanic adolescents in Los Angeles (N=2722) who were surveyed annually in high school (9th-11th grades) and again in emerging adulthood (mean age=20.4 years). Logistic regression analyses identified the predictor variables (measured in 9th grade) that predicted e-cigarette use in emerging adulthood. In the emerging adulthood survey, 9.5% of the respondents reported lifetime e-cigarette use. Risk factors included male gender (OR=2.11, 95% CI=1.55,2.87), past-month smoking in 9th grade (OR=1.66, 95% CI=1.04,2.63), friends’ smoking (1.38, 95% CI=1.24,1.53), and ethnic identity development (OR=1.32, 95% CI=1.13,1.53). Hispanic acculturation was protective against e-cigarette use (OR=0.75, 95% CI=0.65,0.87). U.S. acculturation, perceived discrimination, depression, and sensation-seeking in 9th grade were not significantly associated with e-cigarette use. Early experimentation with cigarettes and affiliation with friends who smoke cigarettes may be early indicators of risk for later experimentation with other tobacco products. Maintenance of Hispanic cultural orientation may be protective, but the contrasting effect of ethnic identity development indicates that culturally targeted prevention messages should be crafted carefully. Because some risk factors for polytobacco use in adulthood might first manifest during adolescence, health education interventions for adolescents should teach students about the risk of nicotine dependence from a variety of tobacco products.

FUNDING: This research was supported by NIDA-National Institute of Drug Abuse grant #R01DA16310 and grant #P50CA180905 from the National Cancer Institute and FDA Center for Tobacco Products (CTP).

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POS4-162

PREVALENCE AND BEHAVIORAL HEALTH OF ADOLESCENTS WHO EXPERIMENT WITH ELECTRONIC VERSUS COMBUSTIBLE CIGARETTES

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Background: Although the link between adolescent cigarette experimentation and poor behavioral health is well documented, the emergence of electronic cigarettes may necessitate a paradigm shift to accommodate new patterns of cigarette experimentation. This study examined behavioral health profiles (psychiatric and substance use syndromes and cross-syndrome psychiatric traits) in four experimentation patterns marked by lifetime use of: (1) neither electronic nor combustible cigarettes (NCE; N=2557); (2) combustible cigarettes only (CCO; N=152); (3) electronic cigarettes only (ECO; N=412); (4) electronic and combustible cigarettes (dual experimentation [DE]; N=189).

Method: 9th Grade students (M age = 14) completed in-classroom self-report measures in fall 2013. Mixed models analyzed experimentation pattern as a predictor of behavioral health controlling for demographics.

Results: ECO (12.4%) was more prevalent than CCO (5.7%) and DE (4.6%). CCO (vs. ECO) experimentation was associated with elevated emotional syndromes (i.e., major depression, generalized anxiety, panic, social phobia, and obsessive compulsive disorder) and traits (i.e., poor distress tolerance [capacity to withstand aversive states], anxiety sensitivity [fear of anxiety sensations], negative urgency [rush action during negative affect]); CCO and DE did not differ on emotional outcomes. Relative to NCE, any experimentation (ECO or CCO or DE) was related to poorer inhibitory control and impulsivity. A “dose” effect of DE vs. ECO experimentation vs. NCE was found for elevations in mania, positive urgency, and anhedonia (i.e., diminished pleasure). A “dose” effect of DE vs. ECO or CCO vs NCE was also found for drug use and abuse.

Conclusions: Teen electronic cigarette experimentation is more common and linked with better behavioral health in several domains than combustible cigarette experimentation, yet is also related to poorer behavioral health relative to no experimentation. Dual experimentation is particularly comorbid with drug misuse. Understanding disparate patterns of youth cigarette experimentation in the age of electronic cigarettes may inform mental illness and substance abuse prevention.

FUNDING: This research was supported by National Institutes of Health Grant RO1-DA033296.

JUSTIFICATION: This research identifies specific targets for mental illness and substance use disorder risk assessment and prevention in adolescents as a function of cigarette experimentation patterns.

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POS4-163

SUSCEPTIBILITY TO CIGARETTE USE IN ADOLESCENT E-CIGARETTE USERS

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Background: There is controversy concerning the use of e-cigarettes (e-cigs), reflecting gaps in the emerging evidence on potential benefits and harms of these products. There is concern that e-cigs may be used by adolescents and young adults who might not otherwise have used cigarettes, and that dual use
may follow. We evaluate the prevalence of e-cig use among adolescent users and non-users of cigarettes, and susceptibility to cigarette use among ever and current adolescent e-cig users.

Methods: Questionnaire data were obtained for adolescents attending schools in 12 communities included in the Southern California Children's Health Study (n=2100). Participants were in 11th or 12th grade at time of data collection between January-June 2014. To evaluate susceptibility to cigarette use, we modeled the odds of answering "Definitely yes" or "Probably yes" to each of four questions aimed at assessing likelihood of cigarette use in the near future, after adjusting for gender, ethnicity, community, and current or ever cigarette use.

Results: 502 participants (24.1%) reported having used an e-cig, and 196 (9.4%) reported having used an e-cig on at least 1 of the last 30 days. No history of cigarette use was reported by 42.2% (212/502) of ever e-cig users and 39.8% (78/196) of current e-cig users. Males were more likely to have ever used an e-cigarette (27.6% v. 20.5%) and to have used an e-cig in the last 30 days (11.2% v. 7.5%). Current e-cig users were about three times as likely as never users to answer affirmatively to at least one intent question (odds ratio [OR]=2.97; 95%CI: 1.92, 4.61); adolescents who had ever used an e-cig (but who were not currently users) were also more likely to answer affirmatively (OR=1.67; 95%CI: 1.15, 2.43). The pattern of associations was similar in analyses restricted to adolescents with no history of cigarette use.

Conclusions: The prevalence of e-cig use in this population-based sample of adolescents is high. Adolescent e-cig users, including those who were never cigarette smokers, may be at increased risk of cigarette use. Our research supports the theory that e-cigs may be a gateway to cigarette use.

FUNDING: Research reported was supported by grant number P50CA180905 from the National Cancer Institute and FDA Center for Tobacco Products (CTP).

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POS4-164 INCENTIVES, TEXT MESSAGES, AND E-CIGARETTES: EXAMINING THE EFFECTIVENESS OF DIFFERENT CESSATION EFFORTS ON SMOKING CESSATION IN THE VITALITY GROUP

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Strong evidence supporting the use of incentives for smoking cessation and the allowance granted by the Affordable Care Act for employers to use up to 30% of total premiums for outcomes-based rewards or penalties has led to an increase in use of financial incentives by employers. An estimated 82% of employers in 2013 used financial incentives to promote healthy behavior. How to most effectively arrange and implement these programs however, is still unknown.

New technologies for smoking cessation have recently become available, including e-cigarettes and motivational interventions delivered via text messages. The utility of these new tools in promoting smoking cessation however is not fully understood. Recent research supports claims that e-cigarettes can assist in maintaining abstinence or in reducing overall tobacco use while other research shows no benefit from using the device in a quit attempt. Conflicting published results on the efficacy of text messaging interventions also exists.

The Vitality Group offers a wellness program that rewards its members for getting healthier and is committed to reducing major risks to health in its membership. Within the Vitality US population 13% of members tested positive for tobacco use. In order improve the health of their beneficiaries The Vitality Group has collaborated with innovative researchers at CHIBE to launch a randomized, opt-out study on tobacco cessation using incentives and new nicotine technologies for 6,000 members across the US in January 2015. This presentation will provide an overview of this 5 arm randomized clinical trial, discuss the barriers of providing e-cigarettes and text messages to a high volume of participants, and will present results of the success and/or failures of using an opt-out design in an employee based population.

Findings of the study will be published and used for development of a smoking cessation program offerings by The Vitality Group. If successful this trial could serve as a model for other organizations interested in implementing a similar program.

FUNDING: Funded by The Vitality Group

JUSTIFICATION: This symposium will elaborate on ways academic institutes and wellness providers can design efficacious treatments for tobacco use, bringing evidence-based techniques for improving health related behaviors from the lab to company wellness programs.

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POS4-165 RISK FACTORS FOR SMOKING AMONG AFRICAN AMERICANS IN MIDDLE SCHOOL, HIGH SCHOOL, AND YOUNG ADULTHOOD

Leslie A. Robinson, PhD*, Jeanelle S. Ali, MS, The University of Memphis

It is well known that compared to Caucasians, smoking onset among African Americans is significantly delayed, with onset often occurring even in young adulthood. The reasons for this delay are not well understood, but may be related to strong parental restrictions against teen smoking among African American teens. Furthermore, the variables that prompt smoking onset at later ages among African Americans have rarely been examined. It seems reasonable to expect that risk factors for smoking onset might vary as young people move through the important developmental changes experienced in middle school, high school, and young adulthood.

The purpose of this study was to identify risk factors that correlate with smoking in a group of over 1,000 African Americans followed from seventh grade through young adulthood. These data were drawn from the Memphis Health Study, a longitudinal study of adolescent tobacco use. For this report, relations between risk factors and smoking were explored when the youth were in seventh grade, again when they were in twelfth grade, and four years after high school. Tobacco use was self-reported. A wide range of risk factors were measured at each time period, including gender, modeling influences, the perceived prevalence of smoking, rebelliousness, perceived parental reactions to smoking, the perceived benefits of smoking, dieting practices and BMI. Logistic regression was used to estimate relations between these risk factors and smoking practices at each of the three time points in the same African Americans measured throughout this developmental period.

Our results indicated that predictors of smoking do vary depending on the age of the African American cohort. For example, dieting was unrelated to smoking in middle and high school, but among young adults, those who dieted frequently were also more likely to smoke. Further research in needed to explore on the developmental period in which risk factors are influential. In addition, our findings indicate that studies of smoking onset among African Americans should not combine young people of different age levels, because of variation due to developmental differences.

FUNDING: This research was supported by a grant from NHLBI, HL50723.

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POS4-166
PERCEIVED DISCRIMINATION, ACCULTURATION AND TOBACCO USE AMONG MEXICAN-ORIGIN YOUTH IN SOUTHERN CALIFORNIA: A LATENT CLASS ANALYSIS
Tamika D. Gilreath, PhD*, Alice Cepeda, PhD, Alden Bunyan, BS, Jennifer B. Unger, PhD, Daniel Soto, MPH, Lourdes Baezconde-Garbanati, PhD, University of Southern California

Acculturative factors (e.g., perceived discrimination, acculturation, acculturative stress) have been found to be associated with tobacco use amongst Latino youth. Prior studies generally used variable-centered analyses and/or grouped youth from multiple national origins. Mexican-origin persons account for approximately 64% of the Latino population. Thus, the present study examines the associations of profiles of acculturative factors with tobacco use amongst Mexican-origin 9th graders. Analyses were conducted to identify latent classes of tobacco use separated from latent profiles of acculturative factors and perceived discrimination. Data from Project RED respondents who reported Mexican-origin (n=1,411) were utilized.

Analyses revealed three tobacco use classes. The majority of youth were non-smokers (93%). Followed by a low frequency current smoking class (5.3%); high probability of only smoking 1 or 2 days in the past 30) and frequent current smoking class (1.7%); high probability of smoking at least 6 or more days in the past 30). There were also three acculturative factors classes. The majority of youth were bicultural with high perceived discrimination (27.9%). The remaining youth were bicultural with low perceived discrimination (5.4%) and enculturated with high perceived discrimination (26.7%). Multinomial logistic regression revealed that those in the bicultural/low discrimination class were significantly more likely to be frequent current smokers than the bicultural/high discrimination class (OR=10.5, 95% CI=1.5-17.6).

Few studies have examined person-centered heterogeneity of acculturation and tobacco use amongst Mexican-origin adolescents. The results indicate that enculturation/sufficiency to US culture was not associated with increased risk for tobacco use compared to those who report being more bicultural. It is possible that the bicultural/low discrimination youth may be in a transition phase of their enculturation where their acculturative stress drives increased risk. Discuss will be the implications associated with understanding the tobacco use implications of a heterogeneous multi-dimensional acculturation process.

FUNDING: This work was supported by the National Institute on Drug Abuse (R01DA016510-03).

JUSTIFICATION: This study highlights profiles of increased risk for tobacco use amongst Mexican-origin youth which can be used to target preventive interventions.

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POS4-167
ARE WE WINNING? A CRITICAL EXAMINATION OF CURRENT STATUS AND CIGARETTE SMOKING TRENDS IN THE U.S. SINCE 1964
Saul Shiffman, PhD, University of Pittsburgh and Pinney Associates

A debate is raging about the role of harm reduction in tobacco control, exemplified by controversy about whether e-cigarettes are a positive or negative development. Arguments on both sides turn in part on views of the current state and progress of tobacco control efforts. Opponents of harm reduction argue that current strategies are succeeding and approaching a positive “end-game,” suggesting one should not disturb this positive momentum. Advocates for harm reduction argue that the current state and trajectory of tobacco use is unacceptable, requiring new strategies and justifying some risk. This presentation summarizes the current state of tobacco use in the US, and its implications for other jurisdictions. Tobacco control in the US has made enormous progress, with smoking prevalence at all-time lows, scientific knowledge and capabilities at all-time highs, and FDA jurisdiction holding promise for significant regulatory action to turn the tide. Teen prevalence in particular just achieved the Healthy People 2020 goal. At the same time, reductions in adult prevalence are slowing, and the absolute number of smokers in the US has remained essentially constant for ten years. Adult prevalence is higher than the level set as a target for the year 2000, much less the targets for 2020, and the current trajectory shows no signs of reaching those targets. The percentage of smokers making quit attempts has remained static for 15 years. And the number of tobacco-related deaths is increasing. Currently, almost half a million Americans die annually due to tobacco, and over 4.5 million are expected to die in the next decade. The rate of progress in reducing tobacco-related deaths pales next to the impacts of public health victories such as vaccination and auto safety (a classic case of harm reduction). Prospects are worse for LMICs that are at earlier stages of the tobacco epidemic. Globally, over one billion people are expected to be killed by tobacco in this century. Examination of the current status and trajectory of tobacco control suggests the need for stronger interventions and new strategies to limit the toll of tobacco-related death and disease on the population.

FUNDING: Dr. Shiffman provides consulting services for NJOY, Inc., a marketer of electronic cigarettes; and for GlaxoSmithKline Consumer Healthcare, a marketer of stop-smoking nicotine medications. He also owns an interest in a novel, not commercialized, nicotine medication. No commercial support was provided for the preparation of this symposium.

JUSTIFICATION: This session should stimulate thinking predominantly across public health and policy to challenge assumptions about reducing cigarette smoking and its resulting health consequences

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POS4-168
LESSONS FROM LOW-TAR, OTHER HARM REDUCTION EFFORTS FOR TOBACCO HARM MINIMIZATION—A WAY FORWARD?
Joe Gitchell, Pinney Associates

We have over one hundred years of history with manufactured and marketed combustion cigarettes from which to draw lessons. Overall, the experiences with efforts to presumably reduce harm associated with continuing combustion tobacco use behavior have been frustrating and disappointing. Filters and low-yield technologies have not demonstrated any meaningful reduction in harm and may have actually increased net population harm than if they had not been introduced. In contrast, noncombustion forms of tobacco or nicotine delivery carry substantially less inherent toxicity than combustion forms and thus could deliver true reductions in harm to continuing users. This talk will focus on relevant characteristics across behavior and policy for both the low-yield debacle and the current range of inhaled nicotine products. Examples of characteristics for analysis include: inherent product toxicology and its interactions with user behavior; extent, possession and dissemination to the public of salient information; and the incentives of the range of stakeholders with the potential to influence outcomes. This analysis will highlight how low-yield and inhaled nicotine products are only superficially similar but that a deeper analysis yields different evidence of substantial differences. The talk will conclude with potential implications for policy, communications, and research as a result of this analysis.

FUNDING: Mr. Gitchell provides consulting services for NJOY, Inc., a marketer of electronic cigarettes; and for GlaxoSmithKline Consumer Healthcare, a marketer of stop-smoking nicotine medications. He also owns an interest in a novel, not commercialized, nicotine medication. No commercial support was provided for the preparation of this symposium.

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POS4-169
SAFETY EVALUATION OF ELECTRONIC CIGARETTES
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Electronic cigarettes are a new tool in tobacco harm reduction. Being a recent development, epidemiological studies on long-term safety are lacking. Thus, the main evidence comes from chemical and toxicological studies, while few clinical studies on short term use have been performed, evaluating respiratory
and cardiovascular function. In this presentation, evidence from studies on safety of electronic cigarette use will be presented. Initially, evaluation of chemical composition of electronic cigarette liquids and aerosol will be presented. Most studies have evaluated liquids, but some of them have also assessed aerosol composition. Studies on second-hand exposure to electronic cigarette aerosol will also be presented. The presentation will then move to toxicological evidence of electronic cigarette ingredients and aerosol. A small proportion of studies have evaluated aerosol toxicity, but this is important since the intended use is through aerosol inhalation. The presentation will include discussion about methodological issues, electronic cigarette use topography and methods of producing aerosol to be tested on cultured cells. Finally, novel findings from a study evaluating the temperature of the atomizer and how it is affected by varying puff topography and power delivery will be presented.

FUNDING: No funding provided for this presentation. A minority of my studies were performed using funds provided to the institution (Onassis Cardiac Surgery Center) by e-cigarette companies.

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**POS4-170**

**EFFECT OF SMOKING ABstinence AND REDUCTION IN ASTHMATIC SMokers SWITCHING TO ELECTRONIC CIGARETTES: EVIDENCE FOR HARM REVERSAL**

Riccardo Polosa, Department of Clinical and Molecular Biomedicine, University of Catania, Catania, Italy

Electronic cigarettes (e-cigs) are marketed as safer alternatives to tobacco cigarettes and have shown to reduce their consumption. Here we report for the first time the effects of e-cigs on subjective and objective asthma parameters as well as tolerability in asthmatic smokers who quit or reduced their tobacco consumption by switching to these products. We retrospectively reviewed changes in spirometry data, airway hyper-responsiveness (AHR), asthma exacerbations and subjective asthma control in smoking asthmatics who switched to regular e-cig use. Measurements were taken prior to switching (baseline) and at two consecutive visits (Follow-up1 at 6 (±1) and Follow-up2 at 12 (±2) months). Eighteen smoking asthmatics (10 single users, eight dual users) were identified. Overall there were significant improvements in spirometry data, asthma control and AHR. These positive outcomes were noted in single and dual users. Reduction in exacerbation rates was reported, but was not significant. No severe adverse events were noted. This small retrospective study indicates that regular use of e-cigs to substitute smoking is associated with objective and subjective improvements in asthma outcomes. Considering that e-cig use is reportedly less harmful than conventional smoking and can lead to reduced cigarette consumption with subsequent improvements in asthma outcomes, this study shows that e-cigs can be a valid option for asthmatic patients who cannot quit smoking by other methods.

FUNDING: Lega Italiana AntiFumo (LIAF)

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**POS4-171**

**POPULATION EFFECTS OF THE USE OF NICOTINE DELIVERY DEVICES WITHOUT COMBUSTION INSTEAD OF CIGARETTES**

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The conventional cigarette is still the dominating nicotine delivery device, but Alternative Nicotine Delivery Devices (ANDD) without combustion are now emerging: dissolvable tobacco products, smokeless tobacco (SLT) and Electronic Nicotine Delivery Devices (e-cigarettes). Since ANDDs do not deliver combustion products, individual users will generally gain health benefits by lower exposure to harmful toxins, while population effects depend both on the toxicity of each specific ANDD and its interaction with cigarette use by influences on initiation and cessation of smoking. If ANDDs are increasing initiation of smoking and hampering cessation, population effects could be negative. If ANDDs are hampering initiation of smoking and increasing cessation, population effects should be positive. With respect to SLT these matters have been investigated by large population representative studies in Norway and Sweden, where use of the Swedish low-toxicity SLT, ‘snus’, has been widespread for a long time. One Swedish study found that among boys with previous daily snus use just 18% ever initiated daily snuk smoking, compared to 46% of boys without previous daily snus use. Moreover, among male daily smokers who later took up daily snus use 78% quit smoking completely, and about a third of them eventually quit snus use as well. Among those who never took up snus use just 53% quit smoking completely. With respect to e-cigarettes there are studies demonstrating similar patterns, no gateway to cigarettes but aid to quit smoking. The above findings form a basis for the assumption that low-toxicity ANDDs can yield beneficial population effects. This assumption is supported by a recently published analysis of data from the WHO Global Report: Mortality Attributable to Tobacco presenting evidence that the snus use among men in Sweden has served as an important factor behind the fact that men in Sweden have lower mortality attributable to tobacco than men in any other European country. To replicate this development we need both product regulation to ensure low toxicity and objective public education/information to encourage use of ANDDs instead of cigarettes.

FUNDING: No funding

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**POS4-172**

**ODORLESS AND COLORLESS, BUT NOT HARMLESS: CARBON MONOXIDE LEVELS WITHIN HOOKAH BARS**

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Background: Hookah smoking is a communal form of tobacco smoking. Hookah bars are primarily located around college campuses. Young adults indicate that hookah smoking is a social event and these individuals are mostly unaware of the negative health effects associated with hookah smoking. Carbon monoxide (CO) is emitted from the burning charcoal. CO exposure from smoking diminishes the uptake of oxygen in the blood, therefore limiting the oxygen transported to the vital organs of the body.

Methods: Measurements of CO in the Environmental Tobacco Smoke (ETS) were conducted with a digital CO detector in ten hookah bars in Florida. Measurements were taken every half hour over 4-hour period for a total of 8 consecutive measurements. Hookah bar characteristics were recorded concurrently and included the number of patrons who were actively smoking, number of ventilation systems, and the amount of time that doors remained open.

Results: The overall mean (standard deviation) of the ten bars was 45.4 (34.0) parts per million with a median (interquartile range) of 39.0 (20-65) parts per million. Seven of the ten bars had a CO concentration above 35 parts per million at any time within the duration of air sampling. One hookah bar displayed a maximum concentration at 186 parts per million, far exceeding acceptable environmental protection indoor standards.

Conclusion: Carbon monoxide inhalation at high levels with the absence of proper ventilation can result in negative health effects. The high exposure of carbon monoxide from hookah smoking, as evidenced from this study, further supports the need for regulation and control to protect from occupational and patron exposure.

FUNDING: This research was funded by the American Lung Association.

JUSTIFICATION: This research will aid in informing policy makers of the hazards related to hookah bar patrons in communities.

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POS4-173
ATTITUDES AND SOCIAL INFLUENCES ON COLLEGE HOOKAH SMOKERS

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Background: Hookah smoking continues to be a popular form of socialization during college years. The lower age limit for admittance into hookah bars tends to draw younger students into an environment that simulates a traditional bar atmosphere. It is important to understanding the impact of both attitudinal and social influences on hookah smoking intention

Methods: Two consecutive years of online survey data were collected at a private university in Southeast U.S. Duplicate student survey entries were removed to yield a final sample size of 1539 participants. The theory of reasoned action served as theoretical model for survey development and understanding intention to smoke. The data was entered into SAS software program for analysis.

Results: The sample consisted of mostly White (77%), females (70%) between the ages of 18 to 20 years (70%). The majority of respondents (64%) reported having ever smoked hookah. Of those who ever smoked hookah, 34% were current smokers. Approximately one in four reported that smoking hookah was safer than smoking cigarettes and nearly 40% expressed low levels of perceived threat of lung cancer as a result of smoking hookah. There was a high perception that hookah smoking would make one more social. And even though subjective norms were perceived to be somewhat negative toward hookah smoking (M=3.59; SD=1.22; Range =1-7), one third of respondents perceived that their friends would approve of them smoking. Among the perceived benefits of hookah smoking explored, two of the strongest correlates of recent smoking (previous 30 days) were the beliefs that smoking hookah would help them to think more clearly (OR=1.48; 95% CI: 1.34-1.63) and to stay more focused (OR=1.54; 95% CI: 1.39-1.70).

Discussion: In general, college students do not perceive themselves in danger of long-term negative health effects from smoking. Rather, students’ perception of more immediate benefits from smoking may help to explain intention to smoke among college students and help to contribute to programs aimed at deterring use.

FUNDING: No Funding

JUSTIFICATION: Programs on college campuses can be informed by understanding influences of hookah smoking.

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