SYM1 SYMPOSIA

SYM1A NICOTINE ENHANCES CONDITIONED INHIBITION IN A SERIAL BUT NOT A COMPOUND FEATURE NEGATIVE DISCRIMINATION TASK IN RATS: IMPLICATIONS FOR DEFICITS IN INHIBITORY BEHAVIOR IN PSYCHIATRIC ILLNESS

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Disorders such as Attention-Deficit/Hyperactivity Disorder (ADHD) and schizophrenia are characterized in part by deficits in impulse control, such as difficulty inhibiting responses to environmental stimuli. Administration of nicotine alleviates deficits in behavioral inhibition in persons with ADHD. Moreover, both ADHD and schizophrenia commonly co-occur with excessive use of nicotine-containing compounds. These findings support the notion that these clinical populations may use nicotine to self-medicate and alleviate cognitive symptoms and/or dysfunctional brain circuitry involving nicotinic acetylcholine receptors (nAChRs). We have recently carried out a series of studies to better our understanding of the potential role of nAChRs in mediating inhibitory behavior. Using a serial feature negative discrimination procedure that has procedural similarities to tasks used to measure behavioral inhibition in humans (e.g., Stop Signal and Go-No/Go tasks), we found that nicotine enhances conditioned inhibition in rats. Rats received training sessions consisting of two types of trials: on reinforced trials, presentation of a 5-second tone was followed immediately by food reward. On the other trials, presentation of a visual stimulus before the tone indicated that food would not be delivered on that trial. Nicotine enhanced the discrimination between the two trials by reducing conditioned responding to the tone specifically on the non-reinforced trials, an effect similar to that observed in humans. A further study extended this work by examining the effect of nicotine on a compound feature negative discrimination. In this version of the task, the light and tone are presented simultaneously, instead of serially, on the non-reinforced trials. Nicotine did not affect conditioned responding during presentation of the tone on either type of trial, and discrimination was comparable between nicotine-treated rats and control rats. Interestingly, lesions of the hippocampus affect serial but not compound feature negative discrimination, suggesting that nAChRs located in the hippocampus may contribute to the effects of nicotine on conditioned inhibition.

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SYM1B LEARNING, THE HIPPOCAMPUS, AND NICOTINE ADDICTION

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The abuse liability of nicotine is comparable to or greater than that of a variety of addictive substances. However, the reinforcing and/or rewarding properties of addictive substances other than nicotine far outweigh the reinforcing and/or rewarding effects associated with nicotine use. These data suggest that, in addition to the intrinsic reinforcing effects of nicotine, other factors may contribute to nicotine addiction. One such factor is the ability of nicotine to alter learning and memory processes that may underlie addiction. The hippocampus is a structure critically involved in plasticity and the formation of long-term declarative memories. In addition, this structure is highly interconnected with areas critically involved in addiction. Thus, we have examined the behavioral processes, neural substrates, and cellular and molecular substrates that underlie nicotine-associated alterations in hippocampus-dependent contextual learning in mice. Acute nicotine, chronic nicotine, and withdrawal from chronic nicotine produced different effects on hippocampus-dependent learning; acute nicotine enhanced learning but no enhancement was seen with chronic administration. Furthermore, withdrawal from chronic nicotine was associated with a disruption of learning. These changes in learning were mediated by changes in hippocampal function. All three effects of nicotine on learning, the enhancement of learning, the development of tolerance, and withdrawal-related disruption of learning, could contribute to nicotine addiction. The identification of the hippocampus as a necessary and sufficient site for the behavioral effects of nicotine on contextual learning allows for identification of the cellular, molecular, and genetics substrates of these changes.

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SYM1C INTERACTIVE CLINICAL AND BASIC SCIENCE ADVANCEMENT OF UNDERSTANDING NICOTINIC INVOLVEMENT IN COGNITIVE FUNCTION

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Nicotinic acetylcholine receptor systems have been shown to be involved in cognitive function. Understanding the specific roles of nicotinic receptor subtypes in various aspects of learning, memory and attention is important not only for understanding the neural bases of cognitive function but also treatment of cognitive dysfunction. Nicotine and nicotinic agonists administered systemically have been found in many studies to improve memory and attentional performance in humans and experimental animals. There are complexities to nicotinic drug response. Some of this complexity may derive from the variety of brain areas with nicotinic receptors. Nicotinic alpha4beta2 and alpha7 nicotinic receptors are located in brain areas important for cognition such as the hippocampus, frontal cortex and related areas such as the thalamus and amygdala. Local infusion of nicotinic antagonists into these areas has helped advance the geographic understanding of nicotinic involvement in cognitive function. In a complementary fashion, imaging studies in humans are helping to determine which nicotinic receptors in which brain regions are important for cognitive function and dysfunction. Advancements in experimental animal studies can help determine the cause-and-effect relationship of the neurobehavioral correlations of studies of human brain imaging. The basic-clinical research interactions are not unidirectional. Rather, discoveries in each arena can serve as a foundation for further advancements in the other, increasing our ability to understand how these systems work, how they can fail, and how better treatments for illness can be made.

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SYM1D NICOTINIC CHOLINERGIC ACTIVITY AND COGNITIVE AGING: EFFECTS OF HORMONAL MILIEU

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Approximately 20 years after the discovery of nicotinic receptor involvement in neurodegenerative disorders and the potential for nicotinic treatment of cognitive impairment, significant advances continue to be made in both the understanding of the role of nicotinic systems and cognition. This presentation reviews efforts in our laboratory to examine the role of nicotinic receptor function in specific cognitive operations utilizing pharmacological probes, domain-specific cognitive assessment, and functional brain imaging (fMRI). Studies will be presented that examine the interaction of nicotinic cholinergic system activity and the presence or absence of gonadal sex steroids on attention and memory processes. We examined the effects of anti-nicotinic and anti-muscarinic agents on working memory using functional magnetic resonance imaging (fMRI). Nicotinic blockade produces a specific pattern of activation and deactivation during task performance that differs from that seen during muscarinic blockade, providing preliminary evidence for separable cortical circuitry for muscarinic and nicotinic systems involved in working memory. A second study examined the role of specific gonadal steroid modulators of cholinergic function on attention and episodic memory in post-menopausal women. We examined the effects of estradiol treatment relative to placebo treatment to attenuate the impairment seen on memory tests after anticholinergic and antimuscarinic challenge in postmenopausal women. We found differential effects of ability of estradiol to attenuate the antinicotinic and antimuscarinic impairment on tests of attention and episodic memory in younger relative to older postmenopausal women. These studies suggest that nicotinic and muscarinic cholinergic system activity, particularly during aging must be examined within the context of other neurobiological changes, particularly to the hormonal milieu of the brain. These results will be placed in the context of current models of cholinergic system functioning as well as the potential for the development of nicotinic cognitive therapeutics.

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SYM1E THE EFFECTS OF ACUTE NICOTINE ON BEHAVIORAL INHIBITION IN ADHD

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ADHD is associated with disruptions in several cognitive domains. Adolescents and adults with ADHD smoke cigarettes at twice the rate of people without ADHD. Nicotine has been shown to improve attention and clinical symptoms in ADHD raising the possibility that patients with ADHD may smoke as self-medication for their ADHD cognitive symptoms. However, it is unknown what specific cognitive deficits in ADHD are affected by nicotine. Two separate studies both using single-dose, acute, double blind, drug challenge designs assessed the effects of transdermal nicotine (NIC) and placebo on cognitive performance in non-young adults (n=15: 8male, 7 female in study 1, n=12: 4 male, 8 female in study 2) diagnosed with DSM-IV-ADHD Combined type. Behavioral inhibition was measured using the Stop Signal Task. Results found that stop signal reaction time, an estimate of the speed of inhibiting, was significantly (p<0.05) improved following NIC treatment for both groups compared to placebo. Neither “go” reaction time nor accuracy showed any effect of drug, supporting the theory that behavioral inhibition is specifically improved by nicotine. Female subjects showed larger baseline deficits in behavioral inhibition than did male subjects, and a larger improvement following acute nicotine. These results confirm that acute nicotine administration has positive effects on impulsivity (behavioral inhibition) in ADHD. Further, these results indicate that gender may be significant factors in influencing the response to nicotinic stimulation in ADHD.

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SYM2 DEFINING THE ROLE OF NICOTINIC RECEPTORS IN THE DEVELOPMENT OF NICOTINE DEPENDENCE

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Over 20% of the United States population currently smokes, despite knowledge that smoking is the largest contributor to preventable mortality. Failed smoking cessation is strongly predicted by nicotine dependence. Although environmental components are critical to the development of dependence, it is well established that biologic factors also play an important role. The goal of this symposium is to present new findings of the role of nicotinic receptors in the risk of a smoker transitioning to nicotine dependence. A large-scale case control study of nicotine dependence has identified several nicotinic receptor variants that predict the development of dependence. The non-synonymous SNP rs16969968 in the CHRNA5 gene, a distinct locus marked by rs578776 in CHRNA3, and a third locus in the CHRNA3-CHRNA6 gene cluster are significantly associated with nicotine dependence. To follow up genetic studies, further analyses can refine the phenotypic and genotypic associations. The genetic variants in the nicotinic receptor genes CHRNA5 (rs16969968) and CHRNA3 (rs578776) are associated with withdrawal symptoms and craving in nicotine dependent cases, while the genetic variant in CHRNA3-CHRNA6 (rs13277254) is not. It appears that genetic variation in the nicotinic receptors contributes to different aspects of the nicotine dependence phenotype. In vitro functional assays and mouse models can study biological mechanisms that underlie how variability in nicotinic receptor subunits contribute to altered addiction liability. In vitro studies indicate that the high-risk variant of CHRNA5 leads to reduced receptor function. Data from mice support this model of reduced receptor function increasing the risk of developing nicotine dependence. Animals with significantly reduced expression of alpha 5 consume more nicotine than mice with the normal expression of this subunit. In summary, findings from laboratory experiments, animal models, and human genetic and phenotypic studies are improving our understanding of the biologic role of nicotinic receptors in nicotine dependence development. This work can hopefully improve the future pharmacologic treatment for smoking.

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SYM2A  INDEPENDENT AND INTERACTING NICOTINIC RECEPTOR VARIANTS INFLUENCE NICOTINE DEPENDENCE RISK

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Human genetic studies can help elucidate the biological basis of vulnerability to nicotine dependence. Our study has surveyed genetic variation across the complete family of 16 nicotinic receptor (CHRN) genes, which encode the nicotinic acetylcholine receptor (nAChR) subunits, and discovered multiple variants that significantly alter risk for nicotine dependence. We analyzed 119 single nucleotide polymorphisms (SNPs) for association with nicotine dependence in the NICSNP consortium sample of 1050 nicotine dependent cases and 879 non-dependent controls. These Caucasian subjects were recruited from the United States and Australia and assessed using Fagerstrom criteria. For the CHRN genes, we extended the findings of a large-scale genome-wide association and candidate gene study by analyzing interaction effects for biologically motivated gene groupings, by analyzing haplotypes, and by applying different thresholds to investigate our primary findings in more severe cases. After Bonferroni correction for the number of SNPs tested across this gene family, our single-SNP analyses of cases and controls found significant association for the non-synonymous SNP rs16969968 in CHRNA5, for a distinct associated locus tagged by rs578776 in the neighboring gene CHRNA3, and for a third locus in the CHRNA3-CHRNA6 gene cluster. Expanded analyses of nAChR subunits known to combine in receptors with the alpha5 subunit demonstrated that the non-synonymous SNP rs16969968 interacts with exonic SNPs in CHRNA4 to further influence risk for nicotine dependence. Nominally significant single-SNP association was detected in the gene cluster CHRNA5-CHRNA7 and in CHRNA4 and CHRNA1. In summary, our sample reveals strong evidence for three distinct loci that each influence the transition from smoking to nicotine dependence. One of these, a non-synonymous variant in CHRNA5, interacts with SNPs in CHRNA4 to further influence risk. These findings should inform future efforts to improve smoking cessation treatment.

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SYM2B  WITHDRAWAL AND CRAVING SYMPTOMS AMONG NICOTINE DEPENDENT SMOKERS: A CANDIDATE GENE STUDY OF NICOTINIC RECEPTOR GENES

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Withdrawal symptoms and craving following abstinence from or reduced consumption of tobacco are important indicators of nicotine dependence, are associated with smoking relapse, and may partially mediate Nicotine Replacement Therapy’s effect on abstinence. Our recent genome-wide association and candidate gene studies demonstrate a robust association between nicotine dependence and three independent single nucleotide polymorphisms (SNPs) tagging the nicotinic receptor genes CHRNA5 (rs16969968), CHRNA3 (rs578776), and CHRNA6 (rs13277254).

We have now tested for associations between these SNPs and both withdrawal symptoms and craving among 797 currently nicotine dependent smokers (FTND greater than or equal to 4) from the Collaborative Genetic Study of Nicotine Dependence. DSM-IV withdrawal symptoms were assessed retrospectively by self-report in relation to time(s) respondents had quit or cut down. Craving was assessed by the question: “often had a desire to smoke that you couldn’t resist or had difficulty thinking of anything else.” The mean number of withdrawal symptoms was 4.20 (SD = 2.07; range 0-8) and 74.4% of smokers reported craving. SNP rs16969968 was associated with a 6% increase in withdrawal symptoms per risk allele (Incident Risk Ratio = 1.06, p = 0.03) adjusting for level of nicotine dependence and gender. Though not statistically significant, the association of rs16969968 with craving was in the expected direction (OR = 1.20, p = 0.13). SNP rs578776 was associated with a 6% decrease in withdrawal symptoms per risk allele (IRR = 0.94, p = 0.08), and a 26% decreased risk of craving per risk allele (OR = 0.74, p = 0.03) adjusting for level of dependence and gender. Haplotype analysis of rs16969968 and rs578776 did not strengthen these results. SNP rs13277254 was not associated with withdrawal symptoms (p = 0.94) or craving (p = 0.74). SNPs tagging variation in the nicotinic receptor genes CHRNA5 and CHRNA3 may play a role in withdrawal symptoms and craving independent of nicotine dependence: rs16969968 increasing withdrawal; rs578776 decreasing withdrawal and craving.

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SYM2C  CHRNA5, NACHR FUNCTION AND NICOTINE SENSITIVITY IN MICE

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Chrna5 encodes the alpha5 subunit of the neuronal nicotinic acetylcholine receptor (nAChR) family. Although alpha 5 is neither a ligand binding or structural nAChR subunit, it contributes to several nAChR subtypes in the central and peripheral nervous systems. In the brain, the alpha 5 subunit predominantly contributes to alpha5alpha4beta2 nAChRs that participate in modulating the release of the neurotransmitters dopamine and GABA. Recently, Bierut and colleagues have reported that genetic variability in CHRNA5 is associated with altered risk in liability to nicotine dependence. Humans that possess the N398 variant of CHRNA5 are at higher risk of nicotine dependence than individuals who carry the D398 variant. We are utilizing in vitro functional assays and several mouse models of Chrn5 in order to understand the biological mechanisms that might explain how variability in CHRNA5 leads to altered addiction liability. In the in vitro studies indicate that the high-risk variant of CHRNA5 leads to reduced nAChR function as compared to the low risk variant. This finding suggests that reduced function of alpha5 nAChRs leads to increased risk of nicotine dependence. Data from mice with a null mutation in Chrn5 support this possibility. Animals with significantly reduced or no expression of alpha5 consume more nicotine by choice than do mice with normal expression of this subunit. Utilizing C3.D2Chrn5 and D2.C3Chrn5 congenic mouse strains that possess different alleles of Chrn5, we also have found that mice with a Chrn5 allele-dependent reduction in alpha 5 expression are less sensitive to the excitotoxic effects of nicotine. The sum of these data indicate that the N398 variant of CHRNA5 may lead to increased risk of nicotine dependence due to a reduced sensitivity to the aversive affects of nicotine.

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INTEGRATING LABORATORY, FIELD, AND OBSERVATIONAL METHODS TO EXAMINE THE SOCIAL-EMOTIONAL CONTEXTS OF ADOLESCENT SMOKING

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The goal of this symposium is to examine in-depth contextual factors that may influence adolescent smoking, with an emphasis on the social-emotional contexts of adolescents’ lives. This symposium will present data from a large program project grant, comprised of three research studies, each of which utilizes different study-of-study methodologies to examine different aspects of adolescent smoking and smoking-related contexts and how they influence longitudinal smoking patterns among a cohort of 1,263 adolescents. Across the three studies presented, investigators use ecological momentary assessments to examine real-time moods and social contexts surrounding smoking, psychophysiological assessments of emotional responsivity to smoking and affective stimuli, and real-time observations of parent-adolescent discussions, to examine more thoroughly than has been done before a multi-layered perspective on adolescent smoking. Drawing from a common cohort of adolescents, most of whom are in the experimental phase of smoking, each of the three studies presented describes a unique aspect of the emotional context of smoking and affective stimulation and real-time observations of child-parent communication to distinguish youth at different levels of smoking experience. The Chair of this symposium will first present an overview of the recruitment of the cohort of high-risk youth, distinguishing youth at different levels of smoking experience. The Chair of this symposium will then present unique baseline data from the various data collection methods highlighted in the three studies. The discussant will discuss the intersecting etiological pathways to smoking dependence presented by these studies, what we learn from both pre-clinical to clinical aspects of the research methodologies and results, along with implications for intervention.

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THE ACUTE EFFECTS OF CIGARETTE SMOKING ON SELF-REPORT AND PHYSIOPSYCHOLOGICAL MEASURES OF AFFECT IN ADOLESCENT SMOKERS


Although it is commonly thought that early smoking is governed more so by peer and social factors than by attempts at mood regulation, there are few data to support these assumptions. The extent to which smoking exerts genuine mood-enhancing effects in young, adolescent smokers could ultimately shed light on factors contributing to the development of nicotine dependence, as well as inform prevention efforts. As such, the goal of the present study was to assess the acute effects of cigarette smoking on both positive (PA) and negative affect (NA) using both self-report and a well-validated psychophysiological index of emotion. Seventy-five smokers and 35 never-smokers (grand mean age = 15.6; 53% female) were assessed in these preliminary analyses. Smokers smoked an average of 9.5 days in the past month, and 3 cigarettes a day. Over the course of 2 lab visits, separated by 6 weeks, smokers were randomized to Smoke (ad libitum) and No-Smoke conditions. For each session’s outset, two electrodes were placed on the orbicularis occuli muscle group, just under the participants’ right eye, allowing for assessment of startle eyelid blink magnitude (SEM), elicited by loud bursts of white noise presented over headphones. The SEM varies as a function of an individual’s affective state, being larger in states of negative affect (NA) and smaller when experiencing positive affect (PA), thus providing a relatively objective index of emotion. The PANAS was also used to assess NA and PA. Thus, both measures (SEM and PANAS) were taken before and after smoking a cigarette (or after 10 mins. had passed for those who did not smoke). Analyses revealed a significant effect of smoking on SEM (p<.05); smokers who smoked evidenced a marked decline in SEM relative to smokers who did not smoke. Similarly, as assessed with the PANAS-NA, smoking resulted in marked decreases in NA, yet had no effect on PA. Potential moderators of these observed effects will also be discussed. Thus, findings will be considered in terms of their importance toward understanding reinforcing mechanisms governing adolescent smoking.

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INTRAPERSON MOOD VARIABILITY AND SMOKING AMONG ADOLESCENTS: EVIDENCE FOR THE DEVELOPMENT OF TOLERANCE

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Although much attention has been paid to the relation between mean levels of mood and smoking, very little research has focused on within-person mood variability and smoking. Intraindividual variability in mood may be important both for understanding whether smoking helps individuals to regulate mood, and also, whether subjective mood responses to smoking change (decrease) as a function of the development of tolerance and dependence. This study used ecological momentary assessments to examine teen smokers’ real time reports of mood during both smoking events and random prompts. The goal of the study was to assess the degree to which smoking changes with smoking, controlling for overall level of smoking and the effect on overall mood; 3) whether smoking level and other covariates moderate any smoking-associated changes in mood; and 4) whether smoking level influences smoking-related changes in mood variation (e.g., do heavier smokers experience greater mood stabilization when smoking than do lighter smokers). Examining changes in mood variation among teens may give us insights into the development of dependence. Participants were 234 9th and 10th graders (54% female) who recorded at least one smoking event (along with responses to random prompts) during 7 days of data collection. A mixed model approach was used to examine within-subject variances allowing the covariates to influence random subject effects. The 234 participants provided an average of 30 random prompts and 5 smoking events per person, for a total of 8,179 events analyzed. Both positive affect (PA) and negative affect (NA) were assessed at each smoking or random prompt. Results indicated that both PA and NA variances were significantly reduced for smoking episodes compared to random prompts (r's < .05), and importantly, smoking level significantly decreased the variance of both PA and NA. Smoking-related mood responses (both PA and NA) were significantly decreased for more frequent smokers, compared to less frequent smokers. This diminishment of the mood effects of smoking as smoking level increases may be a sign of the development of tolerance in these adolescent smokers.

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“WHAT I SAY AND WHAT I DO”: WHAT CAN WE LEARN FROM DIRECT OBSERVATION OF FAMILY DISCUSSIONS ABOUT SMOKING

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This paper introduces a family smoking communication paradigm and presents initial data using this methodology from the Family Talk Study. The Family Talk Study is comprised of 348 teens who have experimented with smoking (mean age=15.6) and their parents and is ethnically and socioeconomically diverse. The paradigm utilizes observer and self-report methods to capture smoking-related attitudes and experiences of smoking (Wakschlag et al., 2006) as a means of assessing quality of family communication about risk behavior. Smoking-specific codes were as follows: (1) Level of disapproval of smoking; (2) Quality of personal disclosure about smoking (3) Smoking expectancy, (4) Establishment and elaboration of consequences for teen smoking. Correlations of smoking communication behaviors within- and across interactional partners were small to moderate (r's = .11 - .33). Parents and teens also provided information on their current smoking status. Not surprisingly, mothers who smoked themselves displayed less disapproval (F = 29.97, p < .001) and less elaborated consequences for smoking than non-smoking mothers (F = 5.128, p < .05). Teens’ smoking status was also related to several of the coded smoking discussion behaviors. For example, smoking teens displayed less disapproval for smoking (F = 3.83, p < .05) than did non-smoking teens. Parents' reports on standard questionnaire measures of antismoking socialization (messages, reactions and frequency of communication) were also examined in relation to observed communications about smoking. Associations were in the expected direction. In fact, parents who demonstrated higher quality personal disclosure about smoking also reported having more discussions with their teens about smoking (r = .16, p < .05). However, these correlations were modest. These preliminary findings provide initial evidence of the validity of this observational paradigm for assessing family discussions, and suggest that direct observations capture unique aspects of family communications about smoking that may importantly inform understanding of family influences on youth smoking trajectories.

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SYM4A

METHODS FOR ASSESSING MEDIATION IN SMOKING CESSATION TREATMENT


Mediation analysis helps provide information on how smoking cessation treatments achieved their effects or failed to achieve effects. For example, a smoking cessation program may seek to achieve beneficial effects by increasing the social support available to participants or by reducing nicotine cravings with medication. The purpose of this presentation is to provide an overview of statistical and experimental mediation analysis for smoking cessation research. The substantive background of a mediation model for smoking cessation is described including two critical links for the model: (1) an action theory link corresponding to theory on how a smoking cessation treatment changes a hypothesized mediator and (2) a conceptual theory link explaining how the mediator(s) are related to rates of relapse or other measures of smoking cessation. Mediation analysis is important whether or not there was a statistically significant overall effect of a smoking cessation program on smoking behavior because it can localize sources of weakness in action or conceptual theory. In this presentation, statistical analysis of the single mediator model is shown first, and then special aspects of mediation for smoking cessation research are discussed. Limitations of common methods to assess mediation are briefly outlined and new statistical tests for mediation are described including methods based on the asymmetric distribution of the mediated effect. Statistical methods to assess mediation are also presented for models with a binary outcome such as smoking relapse or no smoking relapse during the period of study. Mediation models for longitudinal data such as reports of smoking status over time are shown, and experimental design approaches to investigating mediation including designs that block or enhance action of a mediating mechanism are demonstrated. Finally, unique aspects of assessing mediation in smoking cessation research are considered and the importance of programs of research for identifying mediators is emphasized.

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SYM4B

MECHANISMS AND MEDIATORS OF NRT EFFICACY

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Nicotine replacement therapy (NRT) works, but the mechanisms by which it improves outcome are not well-documented. We examined mechanisms of action among 324 smokers randomized to receive active high-dose (35 mg) nicotine patches or placebo. Using electronic diaries for ecological momentary assessment (EMA), subjects monitored symptoms and smoking in real time for 2 weeks before and 5 weeks after treatment. To examine how NRT assists smokers achieve enduring abstinence, we evaluated its effects on achieving initial abstinence (24 hours), preventing initial lapses, and preventing progression to relapse. In survival analyses, NRT independently affected all three outcome milestones: it increased the daily probability of initial abstinence by 30%, decreased the daily risk of lapsing by 40%, and decreased the daily risk of progression to relapse by 86%. It is striking that NRT had its biggest effect on preventing progression to relapse after a lapse, as this effect has not been studied, and smokers often discontinue NRT after a lapse, thus foregoing this potential benefit of treatment. We also examined whether NRT-induced reductions in nicotine craving and withdrawal mediate NRT’s prevention of lapses. NRT nearly eliminated withdrawal and craving, and reduced symptom severity was associated with reduced lapse risk. Mediation analyses confirmed that NRT’s effect on withdrawal and (particularly) craving mediated its effect on lapse risk, but the mediation was incomplete, accounting for less than half of NRT’s effects on abstinence. This suggests that other, as yet unidentified, mechanisms account for part of NRT’s effectiveness. These analyses and findings demonstrate the potential utility of detailed process and outcome analyses using EMA data to shed light on the mechanisms of treatment.

NIDA grant DA008084. SS & SF consult to GlaxoSmithKline exclusively on smoking cessation. SS is also a partner in a company developing a nicotine medication and in invivodata, Inc. (electronic diaries for research).

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SYM4C

MEDIATORS OF BUPROPION TREATMENT EFFECTS

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Bupropion is an efficacious smoking cessation treatment that has been shown to more than double a smoker’s chances of quitting. However, little is known about the mechanisms underlying this treatment effect. To understand possible underlying mechanisms, mediation analyses were conducted. Mediation analyses not only allow researchers to examine whether a particular factor mediates treatment effects, but also the degree to which the treatment influences the mediator as well as the degree to which the mediator affects cessation outcome. Using data from 608 adult smokers (52% women; mean age = 42) who participated in a randomized double-blind placebo-controlled study (active bupropion n = 453; placebo n = 155), possible mediators of bupropion’s treatment effects were examined. Mediation analyses focused on dynamic patterns of theoretically relevant variables such as craving, total withdrawal, and positive affect as potential mediators of bupropion’s effects on relapse at one week, the end of treatment and six months post-quit day using data collected from study visits and ecological momentary assessment assessments. Results from structural equation models, as well as a stage-sequential approach to mediation, suggest that bupropion supports smoking cessation by reducing the amount of withdrawal and craving individuals report in the first week post-quit and, to a limited degree, by preventing the decline in positive affect over this time period. Examination of the individual mediation pathways reveals that craving and withdrawal do predict cessation outcomes and that bupropion is only partly successful in blunting abstinence-linked increases in these symptoms. The results also show that a decrease in positive affect plays a role in relapse, and that bupropion provides only weak benefit regarding this factor. The results illustrate how mediational analysis can be used both to test a particular model of nicotine dependence and to show where current treatments can be improved.

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**SYM5D**

**COGNITIVE AND BEHAVIORAL MEDIATORS OF BUPROPION SR AND INDIVIDUAL SMOKING CESSATION COUNSELING EFFECTS IN A RANDOMIZED CLINICAL TRIAL**

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Data from a randomized, placebo-controlled clinical trial of bupropion SR and individual smoking counseling among 403 adult daily smokers were submitted to mediational analyses. Subjects were randomly assigned to receive 9 weeks of either bupropion SR or placebo, and either 8 brief individual counseling sessions or no counseling. We predicted that bupropion SR effects on abstinence one-month post-quit would be mediated by reduced withdrawal and craving, and enhanced positive affect during the first week of the quit attempt, whereas counseling effects would be explained by differences in enhanced motivation to quit, self-efficacy, and coping. Real-time data were collected using ecological momentary assessment. Mediation hypotheses were tested using structural equation modeling and hierarchical linear models. Data were adjusted post-hoc for study center effects. At short-term follow-up, SR efficacy is mediated by craving reduction and enhanced positive affect, depending on whether affect and craving ratings were assessed on a momentary or daily basis. Data did not support the role of reduced withdrawal as a mediator of bupropion SR effects. Counseling did not increase motivation to quit or self-efficacy, but SR effects on self-efficacy were mediated by craving reduction and enhanced positive affect during the first week of the quit attempt. Similarly, counseling did not predict greater motivation to quit or enhanced quitting self-efficacy during the first week of the quit attempt. Bupropion SR, in contrast, appeared to influence abstinence rates through reduced withdrawal and craving. Also, in contrast to the access-reduction model, increased NSA rates observed during reduction in dose generally did not persist when the baseline unit dose was restored. The present findings suggest that baseline rate of NSA is the best predictor of compensation in rats. These studies provide preliminary animal models that may be useful for examining potential mechanisms underlying compensation in the context of nicotine regulation.

**SYM5A**

**ANIMAL MODELS FOR NICOTINE EXPOSURE REDUCTION: PREDICTORS OF COMPENSATORY NICOTINE SELF-ADMINISTRATION**

Mark G. LeSage, Ph.D.†,*; Minneapolis Medical Research Foundation

Nicotine regulation (i.e., reducing nicotine levels in tobacco products) is being considered as a means of tobacco control in order to reduce the addictiveness of tobacco products and the disease burden that their use incurs on society. Because compensatory increases in smoking behavior can occur when nicotine levels in cigarettes are reduced, compensation could be a obstacle to achieving these goals. Thus, understanding the mechanisms underlying compensation may be valuable in efforts to maximize the viability of nicotine regulation. Our laboratory has recently developed two animal models of nicotine exposure reduction and has used them to examine potential behavioral and pharmacokinetic predictors of compensation. In one model, the duration of access to nicotine self-administration (NSA) was reduced without changing the unit dose that was available. In the other model, the unit nicotine dose was reduced without changing duration of access. Rates of NSA during reduction phases were compared to NSA rates prior to reduction to compute a compensation index (CI). In both models, significant compensatory increases in NSA have been observed during reduction, with considerable variability in the CI between rats. The magnitude of variability in compensation has been similar to humans undergoing going smoking reduction or brand-switching protocols. Baseline NSA rates were negatively correlated with compensation, such that rats with higher NSA rates exhibited less compensation. Some differences in between the models have been observed. For example, higher nicotine clearance was moderately associated with greater compensation during reduced access to nicotine, but not when the nicotine dose was reduced. Also, in contrast to the access-reduction model, increased NSA rates observed during reduction in dose generally did not persist when the baseline unit dose was restored. The present findings suggest that baseline rate of NSA is the best predictor of compensation in rats. These studies provide preliminary animal models that may be useful for examining potential mechanisms underlying compensation in the context of nicotine regulation.

**SYM5B**

**SMOKING BEHAVIOR AND BIOMARKERS OF EXPOSURE WHEN USING A REDUCED NICOTINE PREP**

Andrew A. Strasser, Ph.D.†,*; Kathy Z. Tang, Ph.D., Caryn Lerman, Ph.D., University of Pennsylvania

Smokers may use reduced nicotine content cigarettes as a means to reduce nicotine intake, as an initial step toward cessation, or due to their belief the product is less harmful. Therefore, it is important to understand how people use these products and to assess how this relates to levels of harm exposure. Previous reduced-nicotine products, such as filter-ventilated light cigarettes, have not reduced carcinogen exposure, disease or mortality, because compensatory smoking can negate any potential reduced exposure. Compensatory smoking can include taking bigger, more frequent puffs, or increasing daily cigarette intake. Quest cigarettes are one type of potential reduced exposure product that uses genetically modified tobacco to provide progressively lower nicotine levels (0.6 mg, 0.3 mg, 0.05 mg), and are marketed as a means to enjoy nicotine-free smoking. Our research of initial exposure to Quest cigarettes has reported increased smoking behavior, measured as total puff volume, and increased harm exposure, assessed by carbon monoxide boost and filter tar stains, when nicotine level decreased, suggesting the potential for increased harm exposure. The reported study uses a within-subject, open label design where smokers use progressively decreasing nicotine level cigarettes for successive 10-day periods, after smoking their own brand cigarette as a 5-day control period. Smoking behavior, specifically total puff volume and daily cigarette use, and carbon monoxide boost were routinely assessed to examine temporal changes in smoking behavior and exposure. Subjective ratings of the reduced nicotine cigarettes were assessed every 5 days to examine preferences toward the product. Urine biomarkers indicative of nicotine and carcinogen exposure were obtained from exhaled breath samples were assessed after every 10 days of smoking each nicotine level. Results suggest compensatory smoking occurs in the form of both increased smoking topography and number of daily cigarettes. Further, biomarkers of harm exposure do not diminish, and in some instances increase, as a function of decreased nicotine level.

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SYM5C

NICOTINE AND CARCINOGEN EXPOSURE WITH SMOKING OF PROGRESSIVELY REDUCED NICOTINE CONTENT CIGARETTES

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Reducing the nicotine content of cigarettes to make them non-addictive has been widely discussed as a potential strategy for tobacco regulation. A major concern with nicotine reduction is that smokers will compensate for reduced nicotine by smoking more cigarettes and/or smoking more intensively, thereby increasing their exposure to tobacco smoke toxins. This study examined whether gradual reduction in nicotine exposure increases exposure to tobacco smoke toxins. A 10-week longitudinal study of 20 healthy smokers involved smoking their usual brand followed by different types of research cigarettes with progressively lower nicotine content, each smoked for one week. Subjects were followed for four weeks after returning to smoking their usual brand (or quitting). Smoking behaviors, chemical biomarkers of tobacco smoke exposure, and cardiovascular effect biomarkers were measured. Intake of nicotine declined progressively as the nicotine content of cigarettes was reduced, with little evidence of compensation. Cigarette consumption and markers of exposure to carbon monoxide and polycyclic aromatic hydrocarbons, as well as cardiovascular biomarkers remained stable, while urinary 4-(methyltriosaminoo)-1-(3-pyridyl)-1-butanol (NNAL) excretion decreased. Twenty-five percent of participants had spontaneously quit smoking four weeks after completing the research cigarette taper. Our findings with reduced nicotine content cigarettes differ from those of commercial low-yields for which compensatory smoking for lower nicotine delivery is substantial. Our data suggest that the degree of nicotine dependence of smokers can be lowered without increasing their exposure to tobacco smoke toxins. Gradual reduction of nicotine content of cigarettes appears to be feasible and should be further evaluated as a national tobacco regulatory strategy.

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SYM5D

DENICOTINIZED CIGARETTES AS A TOOL TO PROMOTE SMOKING CESSATION

Jed E. Rose, Ph.D., Duke University

Denicotinized cigarettes offer a potential tool for reducing smokers’ dependence on nicotine, as a prelude to quitting smoking. This presentation will review evidence from laboratory behavioral studies, brain imaging studies, and smoking cessation trials that support the usefulness of incorporating denicotinized cigarettes into a smoking cessation program. Denicotinized cigarettes provide many of the sensory and habit aspects of cigarette smoking, thereby relieving withdrawal symptoms. At the same time, by degrading the reinforcement contingency linking smoking to nicotine administration, the conditioned reinforcing effects of smoking-related sensory cues are weakened over time through extinction. In addition to using denicotinized cigarettes alone, some evidence suggests that it may be more efficacious to use denicotinized cigarettes in conjunction with nicotine skin patch treatment (or possibly other NRT). Co-administration of nicotine addresses pharmacologic withdrawal symptoms and increases compliance with use of denicotinized cigarettes. Moreover, by providing nicotine apart from smoking behavior, the behavioral contingency between smoking and nicotine reward may be further weakened.

The studies to be discussed were supported by funding from the National Institute on Drug Abuse, the Medical Research Service of the Department of Veterans Affairs, Vector Tobacco, Philip Morris USA, and Philip Morris International.

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SYM6

PHARMACOGENETICS OF NICOTINE ADDICTION TREATMENT

Neal L. Benowitz, M.D.*; Division of Clinical Pharmacology, Department of Medicine, University of California San Francisco, Caryn Lerman, Ph.D., Department of Psychiatry, University of Pennsylvania, Rachel F. Tyndale, Ph.D., Department of Pharmacology, University of Toronto, Andrew Bergen, Ph.D., SRI International, David Conti, Ph.D., Department of Preventive Medicine, University of Southern California

Much of the individual variability in susceptibility to and severity of nicotine addiction is genetically determined, and it is likely that the same is true for response to smoking cessation pharmacotherapy. Speakers in this symposium, who are members of the NIDA-supported Pharmacogenetics of Nicotine Addiction Treatment Research Program, examine two NCI-funded pharmacogenetic trials — an open label nicotine replacement therapy trial and a placebo-controlled bupropion trial — and provide evidence of genetic variation in nicotine dependence and response to cessation treatment, describing advances in understanding the genetics of nicotine addiction and its treatment. The rate of metabolism of nicotine is determined to a great extent by the activity of the liver enzyme CYP2A6. Wide individual variability in CYP2A6 activity exists, and the CYP2A6 gene is highly polymorphic. Dr Lerman describes research showing that the ratio of 3'-hydroxycotinine to cotinine, a phenoxy marker of the rate of nicotine metabolism, is a strong predictor of treatment outcome in smoking cessation trials using nicotine and bupropion. In light of these findings, Dr Tyndale reviews studies on how genetic variation in the drug metabolizing enzyme genes CYP2A6 and CYP2B6 is related to smoking behaviors, nicotine addiction and response to smoking cessation pharmacotherapy. Dr Bergen reports on a candidate gene study of nicotine dependence, assessed using the FTND, in 1155 smokers seeking treatment in clinical trials of nicotine or bupropion. Significant associations were found with genes coding for the dopamine transporter, and the dopamine D2, cannabinoid 1 and alpha 2 nicotinic cholinergic receptors. Dr Conti presents results from a phenotype-based candidate gene analysis of the same treatment group. The genetic impact on smoking abstinence at the end of treatment and at six months follow-up, as well as time to relapse, is examined. The implications of testing numerous SNPs within a biologic pathway in pharmacogenetic studies are discussed. This symposium provides insight into how genetic testing might be used to personalize and optimize smoking cessation pharmacotherapy.

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SYM6A

PERSONALIZING TOBACCO DEPENDENCE TREATMENT USING THE NICOTINE METABOLITE RATIO

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Nicotine is metabolized to cotinine, and cotinine is metabolized to 3'-hydroxycotinine (3-HC), by the liver enzyme CYP2A6. The ratio of 3'-hydroxycotinine (3-HC) to cotinine, derived from cigarette smoking, provides a reliable measure of nicotine metabolism rate. This presentation will review results from two clinical trials that have examined whether the nicotine metabolite ratio predicts smoking cessation and response to pharmacotherapy. In the first trial, participants (n=480) were randomly assigned to receive eight weeks of either transdermal nicotine or nicotine nasal spray (open label). The odds of quitting with transdermal nicotine were reduced by 30% with each increasing quartile of the nicotine metabolite ratio (OR=0.72, C.I.=0.57-0.90, p=0.05). That is, faster metabolizers of nicotine were less successful in quitting than slow metabolizers. The ratio did not predict cessation in the nicotine spray group, in part, because participants were able to titrate dosing. To identify an efficacious alternative therapy for smokers with faster nicotine metabolite ratios who performed poorly using transdermal nicotine, we examined the predictive validity of the nicotine metabolite ratio in a placebo-controlled randomized clinical trial of bupropion. Results from this trial (n=414) showed a significant interaction between the continuous nicotine metabolite ratio and treatment (p=0.04). Among smokers in the 4th quartile of nicotine metabolite ratio (fastest metabolizers), there was significant effect of bupropion therapy at the end of treatment (quit rates of 10% vs. 34% for placebo and bupropion, respectively; OR=4.56, 1.54-13.53, p=0.006 at 8 weeks and 6.02 vs. 30.006, at 3 months; OR=4.56, 1.54-13.53, p=0.006 at 8 weeks and 6.02 vs. 30.006, at 3 months; OR=4.56, 1.54-13.53, p=0.006 at 8 weeks and 6.02 vs. 30.006, at 3 months; OR=4.56, 1.54-13.53, p=0.006 at 8 weeks and 6.02 vs. 30.006, at 3 months). That is, faster metabolizers of nicotine were less successful in quitting than slow metabolizers. The odds ratio did not predict cessation in the nicotine spray group, in part, because participants were able to titrate dosing. To identify an efficacious alternative therapy for smokers with faster nicotine metabolite ratios who performed poorly using transdermal nicotine, we examined the predictive validity of the nicotine metabolite ratio in a placebo-controlled randomized clinical trial of bupropion. Results from this trial (n=414) showed a significant interaction between the continuous nicotine metabolite ratio and treatment (p=0.04). Among smokers in the 4th quartile of nicotine metabolite ratio (fastest metabolizers), there was significant effect of bupropion therapy at the end of treatment (quit rates of 10% vs. 34% for placebo and bupropion, respectively; OR=4.56, 1.54-13.53, p=0.006 at 8 weeks and 6.02 vs. 30.006, at 3 months; OR=4.56, 1.54-13.53, p=0.006 at 8 weeks and 6.02 vs. 30.006, at 3 months). Those data suggest that a pretreatment blood test to determine smokers’ nicotine metabolism rate might be useful in screening smokers to determine likely success with the two most widely used forms of pharmacotherapy. This research was supported by NCI AND NIDA GRANTS P50CA/DA84718, RO1CA63562 and U01DA020830.

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**SYM6B**

**PHARMACOGENETICS OF DRUG METABOLISM IN TREATMENT OF NICOTINE DEPENDENCE**

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"Pharmacogenetics" is the study of inherited differences in response to drugs; we have applied this to the study of smoking behaviors and cessation. CYP2A6 metabolically inactivates ~90% of nicotine to cotinine and ~100% of cotinine to 3OH-Cotinine. Dr. Leventhan has just shown you that slow CYP2A6 metabolism increases smoking cessation responses to nicotine patch but that slow metabolizers derive little benefit from bupropion beyond their high placebos response. In contrast, fast metabolizers with poor ones traits on buproprion have a long-term advantage on smoking cessation. In attempting to understand these effects we have shown that compared to normal metabolizers those with slower rates of nicotine inactivation, like non-treatment seekers, smoke fewer cigarettes per day and smoke with reduced intensity to compensate for the slower metabolism. They also take a longer time to their first cigarette in the morning. Similar to the reduced number of cigarettes, slow metabolizers on nicotine spray used lower amounts per day while attaining similar nicotine plasma levels; they had similar cessation rates as normal metabolizers. In contrast, for slow metabolizers on the nicotine patch, usage was similar (non-titratable form) but that slow metabolizers derived little benefit from bupropion beyond their high placebo response. In contrast, fast metabolizers with poor ones traits on buproprion have a long-term advantage on smoking cessation. These data suggest our improvement of how genetically variable drug metabolism can alter smoking behaviors and cessation outcomes, moving the field towards optimization/personalization of treatment.

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**SYM6C**

**GENETIC EPIDEMIOLOGY OF NICOTINE DEPENDENCE**

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The Fagerstrom Test for Nicotine Dependence (FTND) assesses quantity of cigarettes smoked and time- and place-dependent characteristics of smoking behavior. The FTND subscales, and the FTND total score, have been studied as the outcome in genome-wide and candidate based linkage and association analyses using family-based or community-based datasets. Multiple chromosome regions and candidate genes have demonstrated either linkage and/or association, which will be briefly reviewed. The present analysis included samples from individuals (n = 1155; 55% female) enrolled in either of two smoking cessation trials and who completed at least one clinic visit. In this sample, the mean (SD) FTND assessed at baseline (before quitting) was 5.3 (2.1), and, in multivariate analysis, FTND was significantly (p<0.01) associated with smoking cessation, time to quit, age, race, sex, education and study site, but not with self-identified race or marital status. Germline and whole genome amplified (WGA) DNA from was genotyped at 1303 single nucleotide polymorphisms (SNPs) at 57 monomeme, neupeptide, nicotine and intracellular signaling candidate genes. SNPs with a genotype completion rate < 95% in genomic DNA, < 90% in WGA DNA samples or minor allele frequencies 1%, and individual DNA samples with genotype completion rates <80% were excluded from further analysis, resulting in an analytic sample of N=1102 individuals and N=1265 SNPs. Multivariate logistic regression analysis of association to FTND including age, depression, education, self-identified race, sex, study site, and SNP genotype, was performed. Results from the present study are consistent with previous results and point to a role for nicotinic and dopamine D2 receptor, the cannabinoid receptor 1. and the alpha 2 nicotinic acetylcholine receptor were significantly (p<0.01) associated with FTND in the entire sample. In this sample, the impact of demographic (age, sex, and site), medical (depression) and social (education) factors is greater than the impact of individual candidate gene SNPs investigated at these particular candidate genes on baseline FTND.

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**SYM6D**

**A PATHWAY-BASED CANDIDATE GENE ASSOCIATION STUDY OF RESPONSE TO SMOKING CESSATION PHARMACOTHERAPY**

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While the efficacy of pharmacotherapies such as bupropion and nicotine replacement has been previously demonstrated for tobacco dependence, there is substantial variability among individuals in cessation response and time to relapse. Biologic knowledge suggests that genetic variation within genes concentrated around the dopamine system may be a suitable target for investigation. Here, we present results from a pathway-based candidate gene study of 1,303 single nucleotide polymorphisms (SNPs) in 57 genes and their role in response to pharmacotherapy for tobacco dependence in two randomized clinical trials. The first is an open label trial of transdermal nicotine vs. nicotine nasal spray. The second is a double-blind placebo-controlled trial of bupropion. The selection of candidate genes was guided by biologic knowledge and complemented with biostatisticians’ expertise. We then performed genome-wide association screening for each treatment arm, and path and pathway characterization. Within each candidate gene, putative functional variants were supplemented with tagSNPs selected to capture variation within bins of high linkage disequilibrium. Furthermore, an additional 233 SNPs were genotyped to estimate ancestral admixture within each individual to control for confounding by population substructure. These data suggest the utility of association for gene x treatment interactions, as well as tests of each SNP independently. For each trial, we examine the genetic impact on smoking abstinence at the end of treatment and after a six-month follow up. Additionally, we investigate the time to relapse to examine if the longitudinal patterns of treatment response are altered as a function of genetic variation. Finally, we discuss the implications for testing numerous SNPs within a biologic pathway and our future work on pathway-based analysis.

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**SYM7**

**UNDERSTANDING ALCOHOL-TOBACCO ASSOCIATIONS: AN EPIDEMIOLOGICAL PERSPECTIVE**

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Alcohol and tobacco use are highly correlated with recent epidemiological evidence suggesting high rates of nicotine dependence (34.5%) among individuals with alcohol use disorders (Grant et al., 2004). Despite these statistics, there are few empirically validated interventions for treating these concurrent behaviors. In order to develop interventions for these co-occurring behaviors, it is important that we first develop a better understanding of the associations between these behaviors. In this symposium, associations between alcohol and tobacco use will be examined using diverse methodologies and perspectives. Dr. Pamela Madden will present results from genetic analyses of a large cohort of twins that suggests that the genetic association between alcoholism and nicotine dependence among those who smoke cigarettes is due to the onset of regular smoking, rather than to genes specific for dependence on one substance. Dr. Sherry McGuire will present cross-sectional data from the National Epidemiologic Survey on Alcohol and Related Conditions. Finally, we discuss the implications of the study for understanding the mechanisms of these associations and for the development of smoking cessation interventions for the population of smokers who also drink heavily.

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SYM7A  FAMILY HISTORY, IMPULSIVE SENSATION SEEKING AND CURRENT ALCOHOL AND TOBACCO USE IN ADOLESCENTS

Ty S. Schepis, Ph.D.*, Rani Desai, Ph.D., M.P.H., Dana A. Cavallo, Ph.D., Anne E. Smith, Ph.D., Thomas Liss, B.A., Amanda McFetridge, B.A., Marc N. Potenza, M.D., Ph.D., and Suchitra Krishnan-Sarin, Ph.D.

Adolescents who use both tobacco and alcohol are at elevated risk for future problems (Schmid et al., 2007). Alcohol and tobacco use may be influenced by having a family history of alcoholism (Warner et al., 2007) or other substance use disorders (SUD; Keller et al., 2002). In turn, family history is associated with elevated sensation seeking (Finn et al., 1992) and impulsivity (Petry et al., 2002). A statewide survey of adolescents (n = 4,523) was used to evaluate the contribution of family history and impulsive sensation seeking to alcohol and tobacco use. Variables examined included past month tobacco use, past month alcohol use, having a biological parent with an alcohol problem, having a biological parent with a non-tobacco SUD, and score on the impulsive sensation seeking (ImpSS) scale from the Zuckerman-Kuhlman Personality Questionnaire - Form III (Zuckerman et al., 1993). Few participants used tobacco only (3.3%), with greater frequencies of non-use (52%), only alcohol use (28.3%) or of both (16.4%). Having a biological parent with an alcohol problem was associated significantly with increased likelihood of use of tobacco only (OR=5.5, 95%CI=3.6-7.9), use of alcohol only (OR=3.8, 95%CI=1.4-7.2) and use of both (OR=7.0, 95%CI=5.6-8.7), when compared to non-users. Similarly, an increased likelihood was conferred by having a biological parent with another SUD (tobacco only: OR=2.29, 95%CI=1.39-3.78; alcohol only: OR=1.5, 95%CI=1.2-2.0; both: OR=3.8, 95%CI=1.01-3.9). Adolescents who used both substances had the highest ImpSS scores (12.8 ± 4.0), and non-users had the lowest (8.7 ± 4.4). Users of tobacco only (11.1 ± 4.8) or alcohol only (10.8 ± 4.2) were intermediate. When evaluating whether impulsive sensation seeking mediates the relationship between family history and current use of alcohol and/or tobacco, using procedures outlined in Barron & and family history, we found to independently associate with the use of both tobacco and alcohol. These independent factors appear important for the co-occurrence of alcohol and tobacco use in adolescents and can inform prevention and treatment efforts.

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SYM7B  ASSOCIATIONS BETWEEN NON-DAILY SMOKING AND ALCOHOL MISUSE AMONG YOUNG ADULTS: FINDINGS FROM THE NESARC

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Non-daily smoking and heavy alcohol use are prevalent behaviors among young adults, with non-daily smoking occurring primarily in the context of alcohol use. Although the relationship between drinking and daily smoking has been well characterized in young adults, few epidemiological investigations have investigated the association between non-daily smoking and drinking behavior. To this end we examined the first wave of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC; Grant et al., 2003; n=43,093). Young adults (age 18-25; n=5,838) were stratified on current smoking behavior (daily, non-daily, and never smokers) and differences in weekly quantity and frequency of alcohol use, frequency of binging drinking behavior, rates of NIAAA-defined hazardous drinking, and rates of DSM-IV alcohol diagnoses were investigated. 32% of the sample were current smokers and of these, 22% were smoking on a non-daily basis. Across all measures of alcohol use there was a significant effect of smoking status, with daily smokers having greater alcohol use patterns, compared to non-daily smokers, with never-smokers consuming the least. However, with regard to indices of alcohol misuse, non-daily smoking conferred the greatest risk, followed by daily smokers with never-smokers as the reference group. Multinomial logistic regression demonstrated that the odds of being a hazardous drinker were 15 times greater (95% CI 10.30 - 23.44) in a non-daily smoker compared to a never-smoker, whereas the odds for a daily smoker was increased by 7-fold (95% CI 5.94 - 8.51). A similar pattern of results was demonstrated for DSM-IV alcohol diagnoses. The increased risk of problematic alcohol use conferred by non-daily smoking supports findings that non-daily smoking and heavy episodic alcohol use are highly concomitant behaviors. Results such as these suggest that interventions which disengage alcohol and cigarette use patterns (e.g., smoking bans in alcohol venues) may serve to limit the occurrence of alcohol misuse among young adults who are at heightened risk for this behavior.

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SYM7C  ALCOHOL USE AND SMOKING CESSATION IN THE INTERNATIONAL TOBACCO CONTROL (ITC) FOUR COUNTRY SURVEY

Christopher W. Kahler, Ph.D.*, Center for Alcohol and Addiction Studies, Brown Univ.; Ron Borland, Ph.D., The Cancer Council Victoria; Andrew Hyland, Ph.D., K. Michael Cummings, Ph.D., Roswell Park Cancer Institute; Sherry A. McKee, Ph.D., Yale Univ. School of Medicine

It has been well established across multiple countries that cigarette smokers drink more alcohol than non-smokers. Results from community studies, self-quitter studies, and clinical trials also have suggested that greater alcohol use is associated with reduced odds of successful smoking cessation. However, there have been relatively few longitudinal epidemiologic studies that have rigorously examined the association between alcohol use and smoking cessation. The measurement and classification of alcohol use has varied widely across these studies, and results have been inconsistent. The purpose of the present study was to examine the ability of different indices of alcohol use to predict smoking cessation over the course of 1 year among participants in the International Tobacco Control (ITC) Four Country Survey. Weighted, multivariate logistic regression analyses were conducted with data from 4,595 participants from Australia, Canada, the United Kingdom, and the United States. Results indicated that the odds of having quit smoking for 1 month or more at a 1-year follow-up was significantly related only to frequency of heavy drinking (i.e., ≥4+5+ drinks for women and men, respectively), with those drinking heavily more than 1 once a week having less than half the odds of quitting smoking as those drinking heavily less frequently or not at all. Drinking frequency and drinks per week did not show significant associations with smoking cessation. Although frequent heavy drinking was associated with less education, less intention to quit, and less self-efficacy for quitting, none of these variables mediated the effect of frequent heavy drinking on smoking cessation. The association between heavy drinking and smoking cessation was not moderated by country. Frequency of heavy drinking did not predict the odds of making a quit attempt, only the odds of making a successful attempt. These findings suggest that frequent heavy drinking is a significant risk factor for smoking cessation failure and may require interventions that target both smoking and alcohol use.

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SYM7D
ALCOHOL AND NICOTINE USE AND DEPENDENCE: SHARED GENETIC AND OTHER RISK FACTORS
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Risk of alcoholism is strongly associated with regular cigarette smoking, and especially nicotine dependence. However, a review of published linkage studies finds only limited overlap between findings for tobacco and alcohol. An exception, the linkage analysis of data from over 400 Finnish and Australian families participating in an international consortium known as the 'Nicotine Addiction Genetics (NAG) project' finds suggestive linkage for measures of nicotine dependence in the same approximate location where the Collaborative Studies on the Genetics of Alcoholism (COGA) has reported positive findings for "habitual smoking" and an alcoholism phenotype, and other measures that may be characterized as impulsive/behavioral undercontrol. A clue to this unexpected observation may be found in results from the genetic analysis of a cohort of more than 6,000 Australian twins, which suggest that across measures on the use and dependence of tobacco and alcohol, (i) genetic association is strongest between regular cigarette smoking and alcohol dependence, and (ii) among regular smokers, environmental factors largely determine the co-occurrence of dependence on alcohol and nicotine. In summary, the limited overlap of findings for dependence on nicotine and alcohol in recent linkage analyses may in part be because the genetic association between alcoholism and nicotine dependence among those who smoke cigarettes is due to the onset of regular smoking, rather than to genes specific for dependence on these two substances.

SYM8A
THE STOP (STOP SMOKING THERAPY FOR ONTARIO PATIENTS) STUDY: EFFECTIVENESS OF FREE NICOTINE REPLACEMENT AND WITHOUT COUNSELING
Sarwar Hussain, M.Sc., Laurie Watzertalo, Ph.D., Rosa Dragoneotti, M.Sc., and Peter Selby, M.D., Centre for Addiction and Mental Health, Toronto, Ontario, Canada

Nicotine Replacement Therapy (NRT) and cessation counseling are effective interventions for tobacco dependence. As part of a comprehensive effort to identify the most effective methods of delivering NRT to smokers in Ontario, we examined these two interventions in various combinations to treatment seeking smokers. The objective was to evaluate cessation outcomes for each combination. Treatment seeking adult smokers from the Greater Toronto Area smoking at least 10 cigarettes daily, self-selected for treatment for 10 weeks plus one of the following: semi-structured counseling from a counselor (CO model), or a pharmacist (PH model), counseling from a doctor (TX model), follow-up only either in person (CS model) or by telephone (PM model). 852 participants were recruited in all models: average age was 44 (±12) years, 55% male (p<0.001), 68% smoked more than 20 cigarettes per day, 74% with at least a high school diploma, and the median household annual income was between 20 and 40 thousand dollars. These variables did not differ significantly between the different models. Outcomes of this cohort indicated significant disparity in the choice of models (p<0.001). CS and PM models (NRT alone) were selected by 68% of participants, while 24, 5 and 3% selected the CO, TX and PH models, respectively. Due to low numbers at follow-ups, the TX and PH models were dropped from the analyses. At end of treatment, 77.6% of participants were smoking less than 15 cigarettes/day. A total of 401 subjects (32.5% 43%) (n=292). There was a non-significant trend toward a higher rate in the CO model compared to the CS and PM models (49 % vs. 42 and 41%, respectively, p=0.6). More than 25 cigarettes per day at baseline predicted a decreased rate of 7-day prevalence. At 3-month follow-up, the overall quit rates were comparable, however, a significantly smaller rate was observed in the CO model (13%) compared to the NRT-only models (19 and 28% in CS and PM model, respectively), p<0.004. While combination of NRT with counseling from a counselor seems to have greater efficacy in smoking cessation and preventing relapse, this method of intervention delivery may have limited impact due smokers' reluctance to enroll in such programs.

This study was funded by the Ontario Ministry of Health Promotion, Pfizer Consumer Health Care and Johnson and Johnson Consumer Health Care.

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SYM8B
THE STOP (STOP SMOKING THERAPY FOR ONTARIO PATIENTS) STUDY: EFFECTIVENESS OF FREE NICOTINE REPLACEMENT AND BRIEF COUNSELING PROVIDED BY COMMUNITY PHARMACISTS
Mary-Jean Costello, M.Sc., Beth Sproule, Pharm.D., Laurie Watzertalo, Ph.D., Rosa Dragoneotti, M.Sc., and Peter Selby, M.D., Centre for Addiction and Mental Health, Toronto, Ontario, Canada

Purpose: Nicotine Replacement Therapy (NRT) is an effective smoking cessation strategy that can double chances of quitting smoking. In order to increase the number of smokers accessing this treatment, the STOP Study examined whether free NRT available to smokers can be an effective strategy to increase quit rates. Many programs can be used to reach smokers but there are thought to be trade-offs between reach and effectiveness. Moreover, implementation, adoption, maintenance, time and funding of such programs also affect their impact. Dr. Peter Selby will provide an overview of the STOP (SMOKING TREATMENT FOR ONTARIO PATIENTS) Study. Over 35,000 smokers have been recruited to use NRT through different health care providers, the telephone and internet. The evaluation and methodological issues involved in implementation, recruitment and follow up will be described and the overall impact of the program using the REAIM framework to evaluate the impact of each arm of the program to guide public policy and funders. Dr. Laurie Watzertalo will describe the 12-month effectiveness of 5 weeks of NRT through a mass distribution to 14,000 smokers in Ontario. Rosa Dragoneotti will describe the effectiveness of NRT distribution through mobile clinics in small towns and cities. Sarwar Hussain will describe the effectiveness of NRT with and without counseling by a healthcare provider through a tertiary care hospital. MaryJean Costello will present the results of a randomized controlled trial of one vs. three sessions of counseling by a pharmacist with smokers dispensed 5 weeks of NRT. The discussant, Dr. Michael Cummings, will describe the New York State quit line experience, which has distributed NRT to over 100,000 smokers using various modalities and compare their results with the experience in Ontario. Taken together, these unique studies demonstrate for the first time how the effectiveness of pharmacotherapy can be modulated by how smokers are recruited into programs offering free NRT.

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SYM8C
REAIM NRT: THE REACH, EFFECTIVENESS, ADOPTION, IMPLEMENTATION, AND MAINTENANCE OF DIFFERENT METHODS OF FREE NRT DISTRIBUTION

The efficacy of NRT is well established. However, most smokers do not use evidence-based therapy due to multiple barriers including the cost of NRT. Making free NRT available to smokers can be an effective strategy to increase quit rates. Many programs can be used to reach smokers but there are thought to be trade-offs between reach and effectiveness. Moreover, implementation, adoption, maintenance, time and funding of such programs also affect their impact. Dr. Peter Selby will provide an overview of the STOP (SMOKING TREATMENT FOR ONTARIO PATIENTS) Study. Over 35,000 smokers have been recruited to use NRT through different health care providers, the telephone and internet. The evaluation and methodological issues involved in implementation, recruitment and follow up will be described and the overall impact of the program using the REAIM framework to evaluate the impact of each arm of the program to guide public policy and funders. Dr. Laurie Watzertalo will describe the 12-month effectiveness of 5 weeks of NRT through a mass distribution to 14,000 smokers in Ontario. Rosa Dragoneotti will describe the effectiveness of NRT distribution through mobile clinics in small towns and cities. Sarwar Hussain will describe the effectiveness of NRT with and without counseling by a healthcare provider through a tertiary care hospital. MaryJean Costello will present the results of a randomized controlled trial of one vs. three sessions of counseling by a pharmacist with smokers dispensed 5 weeks of NRT. The discussant, Dr. Michael Cummings, will describe the New York State quit line experience, which has distributed NRT to over 100,000 smokers using various modalities and compare their results with the experience in Ontario. Taken together, these unique studies demonstrate for the first time how the effectiveness of pharmacotherapy can be modulated by how smokers are recruited into programs offering free NRT.

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**SYM8D**

**DISTRIBUTING FREE NRT TO SMOKERS IN NEW YORK: WHAT HAVE WE LEARNED?**

K. Michael Cummings, Ph.D., M.P.H., Chairman, Department of Health Behavior, Roswell Park Cancer Institute, Buffalo, New York

The New York State Smokers’ Quitline has distributed free starter kits of nicotine medications to over 100,000 smokers since 2003. Our research has demonstrated that many smokers are interested in obtaining free medications and that the offer of free nicotine replacement therapy (NRT) can be a cost-effective means to induce large numbers of smokers to call a telephone quitline for quitting assistance. What is less clear, however, is how much NRT is needed to be given to smokers who respond to the offer of free medications and whether quit success among those getting the free NRT is affected by the context in which smokers get their free NRT. We have previously shown that giving smokers who call a quitline and get free NRT have higher quit rates compared to those receiving counseling support without the offer of NRT measured a year later. However, recent studies that have compared smokers who received different amounts of NRT after they called the quitline have failed to show a clear cut dose response relationship between the number of free nicotine patches sent to smokers and smoking outcomes. We have also observed large differences in quit success associated with people registering to get their medications by calling a quitline or going online to sign up for the free patches. However, we have seen lower quit success in community programs where free NRT has been distributed through health fairs and worksites with little quit support provided. The mechanism and level of quit support provided to smokers enrolled in free NRT programs is another area where we are now investigating. Preliminary data comparing follow-up support calls using computerized interactive voice recognition program against live counselor calls will be presented.

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**SYM9**

**WHAT EFFECTS HAVE “FIRE SAFER” CIGARETTE LAWS SHOWN?**

Gary A. Giovino, Ph.D., M.S., University at Buffalo, Richard J. O’Connor, Ph.D., Roswell Park Cancer Institute, Vaughan Rees, Ph.D., Harvard School of Public Health, Hillel Alpert, M.Sc., Harvard School of Public Health, Christopher Banthin, J.D., Public Health Advocacy Institute, Gregory N. Connolly, D.M.D., M.P.H.*, Harvard School of Public Health

Cigarettes that are “fire-safer,” that is, having a reduced ignition propensity, are now required in 22 U.S. states and nationwide in Canada. More states and countries are expected to move such regulations forward, in order to reduce the burden of fire-related deaths and property loss caused by burning cigarettes. However, little data exists on the effectiveness of such laws. Some have raised concern that passing such laws may increase risky behaviors such as smoking in bed. Others have been concerned that changes in cigarettes in order to reduce ignition propensity might actually increase toxicity. The goals of this symposium are to examine the evidence base for effects of cigarette ignition propensity laws on smokers and their cigarettes. Dr. O’Connor will present longitudinal data on 435 Ontario smokers’ responses to the Canadian law enacted in late 2005, examining changes in fire-risk behaviors, smoking behaviors, and exposures. This will comprise reports on a telephone survey and an associated laboratory-based study. Dr. Rees will discuss an experimental evaluation where 70 Massachusetts smokers were switched to the “fire-safe” version of their cigarettes brand for 2 weeks, compared to 80 New York smokers habitually smoking the “fire-safe” version, focusing on puffing parameters and exposure data. Mr. Alpert will present results of ignition performance tests on leading international brands from jurisdictions with and without regulations. Mr. Banthin will present on the legal environment within which “fire-safer” cigarette laws exist. He will discuss the key regulatory elements of current cigarette fire-safety laws, including administration, enforcement and streamlined procedures for improving regulatory functionality. Dr. Connolly, as discussant, will speak to the impact of scientific evidence on the progression of ignition propensity regulation.

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**SYM8C**

**THE STOP (STOP SMOKING THERAPY FOR Ontario PATIENTS) STUDY: EFFECTIVENESS OF FREE NICOTINE REPLACEMENT THROUGH COMMUNITY WORKSHOPS**

Rosa Dragonetti, M.Sc.*, Sarwar Hussain, M.Sc., Laurie Zawertailo, Ph.D., and Peter Selby, M.D., Centre for Addiction and Mental Health, Toronto, Ontario, Canada

Accessing smoking cessation treatment remains a challenge for those living in rural areas or small towns, perhaps because smoking cessation clinics are highly specialized and usually located in large city centers, and smoking cessation guidelines are not adequately implemented by physicians and healthcare providers. We explored the feasibility and effectiveness of an innovative method for delivering smoking cessation resources to these underserved populations in Ontario. Participants attended a half-day workshop, completed study-related forms, attended a brief interactive presentation and self-selected one of three types of NRT (patch, gum or inhaler) for ten weeks. The presentation informed smokers of available treatment options and cessation strategies. Workshops were held across Ontario, in collaboration with Public Health Units and Smokers Helpline. Between January 30 and March 31, 2007, 50 workshops were conducted. 1447 smokers participated, with a 48% follow-up rate at end-of-treatment. The participants were on average 47 (±1) years old and predominantly female (78%), all with at least 15 and 30 cigarettes per day, 78% had at least a high school diploma, and the median annual household income was between 40 and 60 thousand dollars. The choice of NRT type varied significantly (p<0.001), with patch being the most popular (78%) followed by inhaler (19%) and gum (3%). At the end of treatment, the 7-day point prevalent quit rate was 27.9%. Among those who did not quit, 72% decreased daily cigarette consumption, 23% remained unchanged and 5% increased. Male gender and fewer baseline cigarettes per day were significant predictors of increased rates of abstinence (p<0.001). Age, level of education, number of previous quit attempts and NRT type were non-significant predictors. In conclusion, it is logistically feasible and effective in terms of smoking cessation outcome, to deliver NRT and brief education in the format of workshops to underserved areas. This method of delivering smoking cessation intervention can be an important component of a geographically large region-wide initiative. Six-month follow-up data will also be presented.

This study was funded by the Ontario Ministry of Health Promotion, Pfizer Consumer Health Care and Johnson and Johnson Consumer Health Care.

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**SYM8E**

**THE STOP (STOP SMOKING THERAPY FOR ONTARIO PATIENTS) STUDY: EFFECTIVENESS OF FREE NICOTINE REPLACEMENT THROUGH A MASS DISTRIBUTION PROGRAM: 12-MONTH FOLLOW-UP RESULTS**

Laurie Zawertailo, Ph.D.*, Rosa Dragonetti, M.Sc., Peter Selby, M.D., Addictions Program and Nicotine Dependence Clinic, Centre for Addiction and Mental Health, and Departments of Pharmacology, Family Medicine, Faculty of Medicine, University of Toronto, Toronto, Canada

There are currently 1.6 million smokers in the province of Ontario, Canada, of which approximately 50% would be eligible for nicotine replacement therapy (NRT). Provision of free NRT to smokers via the mail may overcome barriers to accessing effective pharmacotherapy. We hypothesized that mass distribution of NRT across Ontario would be an effective method of increasing overall quit attempts and long-term quit rates at 12 months post-treatment. Of the 13,158 individuals who were sent NRT in the mail, 4,575 subjects were randomly selected to be contacted by telephone at 12 months to assess the use of the NRT and smoking behavior. Of the 4,475 people in the sample, telephone interviews were completed for 2,166 (47% response rate). There were 781 males (36.1%) and 1,385 females (63.9%). While the sample for the 12-month survey was randomly selected, 1,558 individuals in this sample also participated in both the 6-month and the 12-month follow-up interview. However, of those participants reporting having quit smoking at the time of the 12-month interview, 41% and 51% of all participants (19.4% of males and 18.1% of females) reported no smoking, not even a puff for the past 30 days. Of those who participated in both the 6-month and the 12-month interview, 85.5% (8.5% of males and 8.6% of females) of those reporting smoking at 6-months report having quit at the time of the 12-month interview. This demonstrates a delayed benefit of STOP Study participation. In addition, 82.8% of study participants (78.8% of males and 84.95 of females) who reported smoking at the 6-month interview, reported making a quit attempt or having quit by the 12-month follow-up interview. However, of those participants reporting having quit completely at their 6-month follow-up interview (n=364), 19.8% report having relapsed (12.5% of males and 24.6% of females) at the 12-month interview.

This study was funded by the Ontario Ministry of Health Promotion, Pfizer Consumer Health Care and Johnson and Johnson Consumer Health Care.

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SYM9A
DID FIRE RISK-RELATED BEHAVIORS, SMOKING BEHAVIORS, OR EXPOSURES CHANGE IN RESPONSE TO THE CANADIAN CIGARETTE IGNITION PROPENSITY REGULATION?
Richard J. O’Connor, Ph.D.**, David Hammond, Ph.D.†, Amy M. Van Deusen, M.P.H., Carla Parkinson*, Gary A. Giovino, Ph.D.‡, M.S. Roswell Park Cancer Institute, \*University of Waterloo, \*University at Buffalo

Fires caused by smoking materials are the leading cause of fire-related death in Canada. In October 2005, Canada became the first country to make two-week reduced ignition propensity (RIP) cigarettes nationwide. Tobacco manufacturers have opposed the legislation on the grounds that the law might encourage careless smoking, and that design changes may make RIP cigarettes more toxic to smokers. A random digit dialed telephone survey of 435 Ontario smokers was conducted in 2005 and then again in 2006 to explore changes in beliefs and behaviors in response to the law. We found post-law that more smokers reported cigarettes going out often (3.7% vs. 14.7%, p<0.001), and noticing changes in taste (15.7% vs. 26.1%, p<0.001). We observed a drop in the belief that smokers would handle cigarettes more carefully (51.9% vs. 42.5%, p=.002), and an increased belief that smokers would smoke less because of the law (18.0% vs. 28.1%, p<0.001). Pre-law, smokers were much more optimistic that fires would be reduced than post-law (62.2% vs. 38.4%, p<0.001). We saw no evidence of increased risk taking in terms of leaving lit cigarettes unattended (26.4% vs. 22.4%, p=.12) or smoking in bed (14.7% vs. 14.6%, p=.52). A contemporaneous study collected smoking behavior and exposure data on 42 Ontario smokers before and after the introduction of Canada’s LIp law. Participants smoked their usual cigarette brands through a CRESSmicro device for a 24-hour period, provided an exhaled breath carbon monoxide (CO) sample, and completed a brief questionnaire at baseline and follow-up. No significant changes were observed in CO boost (10.7 vs. 10.5, p=.30), puff interval (31.1s vs. 35.3s, p=.29), or puff velocity (4.3ppm vs. 4.4ppm, p=.80), smoke volume (608.0mL vs. 641.1mL, p=.09), puff count (10.7 vs. 10.5, p=.30), puff interval (31.1s vs. 35.3s, p=.29), or puff velocity (4.3ppm vs. 4.4ppm, p=.80). Smoking participants maintained on their usual RIP brand throughout. Outcome measures included smoking behavior, beliefs, and their impact on fire risk.

SYM9B
SHORT-TERM EFFECTS OF SWITCHING TO CIGARETTES WITH REDUCED IGNITION PROPENSITY

It has been proposed, particularly by tobacco manufacturers, that RIP cigarettes may increase toxicity from smoking due to changes in smoke chemistry and smoke behavior. To address this, we designed a study to evaluate, experimentally, the effects of switching from a conventional to RIP cigarette with the RIP version of their current brand over a 2-week period. Data were compared with a comparison group of smokers who were accustomed to smoking RIP cigarettes. Participants in Boston, MA (N=70) were switched from the conventional to the RIP version of their usual brand matched for length and flavor (Marlboro, Marlboro Lights, Marlboro Ultra Lights; Newport; Camel; Camel Light), while participants in Buffalo, NY (N=60) were maintained on their usual RIP brand throughout. Outcome measures included smoking topography (puff number, volume, duration and interval), salivary cotinine, urinary PAH and TSNA metabolites, and alveolar CO boost. The protocol for Boston participants required 4 visits, comprising 2 conventional tests, followed 2 weeks later by 2 RIP tests. Buffalo participants followed the same protocol, but smoked RIP cigarettes throughout. Boston participants were male (61.4%), White (90%), with a median age of 30.5, and smoked a median of 17.0 cigarettes per day, while Buffalo participants tended to be female (58.3%), Black (55%), with a median age of 41.5 years, and smoked a median of 17.5 cigarettes per day. As expected, Buffalo participants showed no change in CO boost over the 4 visits (p=.88). Similarly, the Boston group showed no increase in CO boost following smoking an RIP cigarette compared with a conventional brand (p=.00). Furthermore, the number of cigarettes smoked by the Boston group did not vary after switching to the RIP brand (p=.77). Analysis of topography data and biomarkers for both groups is ongoing. Preliminary data suggest that switching from a conventional to RIP version of the same cigarette brand is not associated with changes in cigarettes smoked or increased CO exposure.

SYM9C
EVALUATING CIGARETTE IGNITION PERFORMANCE ACROSS COUNTRIES
Hillel Alpert, M.Sc.*, Harvard School of Public Health

Since adoption of the New York State Fire Safety Standard for Cigarettes, 21 other U.S. states passed similar laws and many others are considering passage of laws requiring the New York standard. Canada required reduced ignition propensity (RIP) cigarettes in 2005, and Australia is expected do so this year. The European Union, South Africa, Thailand and New Zealand are actively considering RIP laws. The WHO Framework Convention on Tobacco Control calls for member states to regulate tobacco products. Testing of local cigarette brands for RIP and comparing the results for the same brand sold to New York has proven to be effective for educating the public, media and policymakers regarding the need for RIP policies. Testing of RIP brands following passage of laws also helps to monitor compliance. This project will test cigarettes for RIP in nations (Australia, United Kingdom, Thailand, Malaysia, China, Greece, Mexico, South Africa, and Brazil) that have passed or are considering passing RIP policies. Brands to be tested will be Marlboro Lights in addition to one or two market leaders in each country. Ignition propensity is measured for forty cigarettes of each brand in accordance with American Society for Testing and Materials standard E-2187-04. The results will be compared with those of states and countries with laws. RIP findings are also compared with data already collected by RPCI, U.S.CDC, and with other data sources regarding physical design parameters and smoke emissions of the cigarettes. Certain design characteristics may contribute to RIP, including burn length, burn time, peak temperatures, mass burn rate, heat generated, paper permeability, band placement, and citrate additive. Brands tested from Thailand exhibited 96%-100% full length burns (FLB), from Australia 88%-100% FLB, in contrast to those from New York, which exhibited 2.5% to 30% FLB. Thousands of fire-related deaths may be prevented in the U.S. and worldwide if RIP laws are widely adopted.

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SYM9D
LEGAL ENVIRONMENT FOR CIGARETTE IGNITION PROPENSITY REGULATIONS
Christopher Banthin, J.D.*, Public Health Advocacy Institute

The enactment of New York’s fire safety regulation for cigarettes in 2004 was a turning point in law. The New York regulation was the first in the United States to regulate any aspect of tobacco product design and illustrates the depth and breadth of state public health authority under the federalism system in this country. The New York law also pushed several other states and countries to act. Over 20 states and several countries, most of them in the last two years, have adopted cigarette firesafety laws. This presentation will examine the legal environment within which cigarette fire-safety laws exist. The key regulatory elements of current cigarette fire-safety laws, including administration, enforcement and streamlined procedures for improving regulatory functionality will be discussed. Proposals to mandate fire-safety standards at the federal level in the United States and the potential impact of the proposed Food and Drug Administration tobacco oversight will also be examined. Finally, claims, defenses and outcomes of tobacco litigation related to cigarette-caused fires will be explored. As technology improves, regulation continues, and the public’s awareness changes, the legal landscape regarding injuries suffered by cigarette-caused fires also changes. Litigation can operate as an important tool for protecting the public’s health by holding companies responsible when their products harm consumers and others.

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SYM9E BUILDING THE EVIDENCE BASE FOR “FIRE-SAFTER” CIGARETTES

Gregory N. Connolly, D.M.D., M.P.H.*, Harvard School of Public Health

In July of 2004, New York required only cigarettes in the state that reduced ignition propensity ending 30 years of lobbying effort at the federal and state level. However, the New York actions were unique and not necessarily due to science and there was no expectation that other states or countries would follow suit. Shortly after passage of the law, research was conducted to counter tobacco industry claims that the law would not reduce fires, cost consumers more money, increase cigarette toxicity and result in unacceptable cigarettes. Within four months of passage, pilot research found these assertions not true and subsequent research validated the findings. Scientific symposiums were convened to review the findings and develop a scientific consensus that the NY law had a strong health benefit. Legislators, fire and public health officials and advocates attended the conferences and an organized system for bringing the science to the state legislators was established. Within three years of passage, the New York Reduced Ignition Propensity Standard was adopted by twenty states and Canada. Without the science and active involvement of the scientific community with public health and fire officials and advocates, it is doubtful if the progress would have been achieved. This model has application to other policy issues related to tobacco products including regulation of products as drug delivery devices.

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SYM10 ADVANCES IN TOBACCO PRODUCT LABELING AND HEALTH WARNINGS: EVIDENCE TO INFORM FTC ARTICLE 11

David Hammond1, Geoffrey T. Fong1, Ron Borland2, Hua-Hie Yong2, *Dept. of Health Studies & Gerontology, University of Waterloo, 2Cancer Council Victoria

Tobacco labeling policies represent a policy domain in which regulatory practice and the evidence base are rapidly evolving. International standards are currently being developed under the WHO’s FCTC—the first international treaty devoted to public health. Whereas labeling policies have traditionally been limited to information on the health risks of smoking, Article 11 of the FCTC will also dictate the information that can be communicated by manufacturers in terms of prohibitions on misleading information and product disclosure. Given that a majority of 149 FCTC parties must revise their labeling regulations within the next two years, there is an urgent need for evidence to guide policy in this critical area. Our symposium presents new evidence on the impact of labeling policies in each of the three domains covered by FCTC Article 11: the provision of health warnings, the removal of misleading information, and product disclosure on the package in terms of emission information. Borland et al. will begin by presenting data from the ITC 4-Country study, a cohort survey of over 8,000 smokers in the UK and Australia during Waves 3 and 5, respectively. Fong will then examine the effectiveness of health warnings in lower and middle-income countries using ITC data from China, Thailand, Malaysia, and Uruguay. Finally, Hammond will present laboratory findings that help to define potentially misleading brand descriptors, package design, as well as how smokers interpret emission information. Overall, this symposium will provide an overview of current issues in tobacco product labeling, as well as new findings to help inform the development and implementation of FCTC Article 11. These findings also have implications for new labeling guidelines proposed within the U.S. FDA bill, as well as the 2006 Federal Court Order to remove misleading information from U.S. cigarette packaging.

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SYM10A CROSS-COUNTRY COMPARISONS OF THE IMPACT OF WARNING LABELS: FINDINGS FROM THE ITC PROJECT

Geoffrey T. Fong

The International Tobacco Control Policy Evaluation Project (the ITC Project) is a collaboration of tobacco control researchers from 14 countries who have come together to conduct rigorous evaluation of policies of the Framework Convention on Tobacco Control (FCTC). The ITC Surveys are conducted by telephone or by personal interviews in each country, the respondents are representative cohorts of adult smokers. The ITC Surveys contain measures of impact for each of the FCTC policy domains. The design and the measures included in the ITC Surveys are guided by the same conceptual framework and allow the possibility of testing the impact of each of the FCTC policies as they are implemented—across different countries, and across different groups within a country and over time. The ITC Surveys together constitute a multinational evaluation system, which allows cross-country comparisons of smoking behavior, the predictors of smoking behavior, policy impact, and natural history of smoking and quitting-rellevant measures over time. This presentation provides an overview of research findings on the impact of warning labels across the ITC countries and over time, with a particular focus upon lower and middle-income countries, including China, Thailand, Malaysia, and Uruguay. The findings demonstrate the huge potential of warning labels and affirm the importance of Article 11 of the FCTC on labeling to inform the public of the harms of smoking and to motivate thoughts about quitting. Comparisons across the ITC countries demonstrate that the potential of warning labels remains unfulfilled in those countries with smaller text-only labels. For example, Thailand’s introduction of graphic warnings led to substantial increases in important outcome measures of thinking about quitting and about the health harms of smoking. The importance of strong warning labels may be even higher in those countries with fewer other sources of information about the harms of smoking. These findings call for the implementation of the strongest possible warnings under the FCTC.

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SYM10B THE RELATIVE EFFECTIVENESS OF GRAPHIC AND TEXT BASED HEALTH WARNINGS: FINDINGS FROM THE ITC-4 COUNTRY STUDY

Ron Borland1, David Hammond2, Geoffrey T. Fong1, Hua H. Yong3, Warwick Hosking1, 1Cancer Council Victoria, 2University of Waterloo, 3University of Waterloo

Australia introduced graphic warning labels on cigarette packs from March 2006. The warnings cover 30% of the front of the pack and 90% of the back. This paper uses 5 waves of data (2002-2006) from the international Tobacco Control (ITC) Policy Evaluation 4-country cohort survey to evaluate the impact in comparison to Canada, which introduced larger graphic warnings in 2001 (before the surveys started); the UK, which introduced text warnings in covering at least one third of the front and back 2003; and the USA where the small side of pack warnings has remained unchanged for more than two decades. Respondents were asked a series of questions designed to assess different levels of processing of the warnings as well as cessation activity. G.E.E. models were used to analyze data from over 8,000 participants in each wave. The findings indicate that, in the first wave after their introduction, the new Australian graphic warnings had smaller effects than the introduction of the UK text warnings on measure on noticing and “reading or looking closely at”, but markedly higher levels of warning avoidance. Increases in refraining from smoking due to the warnings were similar, but reports of the warnings motivating quitting were higher for the graphic Australian warnings. The paper relates these activities to quitting activity by testing a series of theoretically driven mediational models. The results suggest different models for the effects of cognitive versus affective information.

National Cancer Institute of the United States (R01 CA100382 and P50 CA111236 (Roswell Park Transdisciplinary Tobacco Use Research Center), Canadian Institutes of Health Research (57897 and 79551), Robert Wood Johnson Foundation (045734), National Health and Medical Research Council of Australia (265903), Cancer Research UK (C312/A3726), Canadian Tobacco Control Research Initiative (014578), Centre for Behavioural Research and Program Evaluation, National Cancer Institute of Canada/Canadian Cancer Society.

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The Impact of Brand Descriptors, Package Design, and Emission Information on Risk Perception

David Hammond*

In contrast to the growing evidence base in support of large pictorial warning labels, there is considerably less evidence to direct policy on misleading package information and the disclosure of emission and constituent information on packages. The current study sought to examine how smokers perceive: 1) potentially misleading brand descriptors, such as “light” and “mild”, as well as terms such as “smooth” that have been used as substitutes; 2) potentially misleading package designs, including the use of colors and imagery; and 3) numerical and descriptive approaches to presenting emission information on packages that are currently being used in Canada, Australia, and the UK. Approximately 300 smokers and 300 non-smokers were presented with cigarette packages that systematically varied each of these elements. Participants were asked to report perceptions of risk, taste, and tar delivery. The findings indicate that participants rated packages with descriptors such as “light”, “mild”, “smooth”, and “silver” as having lower tar delivery and lower health risk. Participants also rated packages with lighter colors and other design elements as having lower health risk and lower tar delivery. “Plain” packages were rated as less appealing and lower quality than the original packages designs. Participants also rated the numerical Canadian emission information as easiest to understand and most useful; however, participants were also more likely to use the Canadian information to erroneously identify “lower risk” brands. Participants were least likely to interpret the descriptive emission information from Australia as indicators of taste, risk, or tar delivery. Overall, the findings suggest that many of the packaging elements currently used by manufacturers are inherently misleading to consumers and provide strong support for the effectiveness of “plain packaging.” The findings also indicate that descriptive emission information is less likely to be erroneously interpreted by smokers as an indicator of risk and should replace the numerical emission information mandated by regulators.

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Impact of the Removal of Misleading Package Labelling on Smokers’ Beliefs About Light cigarettes: Findings from the ITCC-4 Country Study


In compliance with tobacco product packaging and labeling requirement (article 11) of the FCTC, a number of ratifying countries have banned the use of misleading brand descriptors such as Light and Mild on cigarette packaging as these terms are thought to mislead consumers into thinking that these products are healthier. Some investigators have also called for the removal of machine generated tar, nicotine and carbon monoxide emission figures on packs and in advertising since the numbers do not reflect human exposure and may cause smokers to believe there are real differences in exposures between cigarette brands when this is not the case. This study evaluated how smokers’ beliefs about cigarettes changed in Australia (AUS) and the United Kingdom (UK) in response to the removal of “Light” and “Mild” labeling compared to smokers in Canada (CA), the United States (US) where the labeling was not changed. AUS also removed the ISCI yield figures from cigarette packs. The labeling changes occurred in the UK in 2002, in AUS in 2003, and in CA in 2006. Data from annual surveys of adult smokers sponsored by the International Tobacco Control Policy Consortium. The cohort survey includes data on over 9,000 adult smokers in five surveys conducted between 2002 and 2006 in each of the four countries—AUS, UK, CA, US. Misperceptions about Light cigarettes, which were common among smoking women in all four countries at baseline, have declined over time. The reduction in misperceptions in the UK was significant after the ban but was not sustained over time. Significant reduction in AUS was also observed but this was not any greater than those seen in the US and CA in response to the removal of “light” and “mild” labeling, was not necessarily responsible for the change in beliefs about light cigarettes. The results suggest that bans on “light” and “mild” are insufficient on their own. Broader restrictions on other brand descriptors and package design may be necessary to reduce these misperceptions further. Engineering features that mask the harshness of smoke and generate misleading sensory perceptions should also be considered for regulation.

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Addressing Challenges in Special Populations Research

Lisa Sanderson Cox, Ph.D.*, Ana-Paula Cupertino, Ph.D., University of Kansas School of Medicine; Dennis R. Trinidad, Ph.D., M.P.H., University of Southern California; James Thrasher, Ph.D., M.A., M.S., University of South Carolina; Belinda Borrelli, Ph.D., Rashelle Brown, Ph.D., Brown Medical School; David W. Wetter, Ph.D.*, Discussant, MD Anderson Cancer Center

Tobacco use is a primary determinant of health disparities. It is increasingly recognized that a critical factor contributing to health disparities is the common disconnection between discovery, development, and delivery, which translates into barriers in reaching and treating underserved groups. Within this symposium, we will concentrate on addressing challenges in special populations research and considering disparities in tobacco use and innovations in tobacco control research; examples will be drawn across the discovery, development, and delivery continuum. Dr. Trinidad will provide a context for this discussion with data from the 2003 Current Population Survey showing U.S. smoking cessation behaviors by race/ethnicity. Dr. Thrasher will present cross-cultural survey data to address key methodological considerations in assessment to ensure valid comparative analyses across cultural and national contexts. Dr. Cupertino will discuss the development, feasibility, and acceptability of a computer-based smoking cessation decision aid tool designed to address access, language, and literacy barriers and to enhance treatment within the context of community safety-net clinics. Dr. Borrelli will present main outcome data from a study of two theory-based smoking cessation interventions tailored for Latino caregivers of children with asthma and will discuss challenges in recruiting and retention. Dr. Brown will examine factors associated with participant retention, addressing concerns about the relationship between minority status and early termination from community-based research. Finally, an interactive discussion led by Dr. Wetter will speak to the implications of these findings for advancing special populations research and addressing tobacco-related health disparities.

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SYM11A  SMOKING CESSATION BEHAVIORS ACROSS RACE/ETHNIC GROUPS IN THE U.S.

Dennis R. Trinidad, Ph.D., M.P.H.*, Univ. of Southern California; Eliseo J. Perez-Stable, M.D., Univ. of California, San Francisco; Sherry L. Emery, Ph.D., M.B.A., Univ. of Illinois, Chicago

Little research exists detailing smoking rates and cessation specific behaviors across race/ethnic groups based on nationally representative data. Adult (20-64 yrs) data from the 2003 Tobacco Use Supplement to the Current Population Survey were analyzed for behaviors related to smoking cessation by race/ethnicity. Approximately 52% of African Americans (AA), 22% of Asian/Pacific Islander Americans (API), 25% of Hispanics/Latinos, and 44% of non-Hispanic whites (WH) were ever smokers (lifetime 100+ cigarettes). Of these, 49% of AAs, 38% of APIs, 37% of HLs and 44% of WHs were current daily smokers (CDS); 16% of AAs, 16% of APIs, 21% of HLs, and 9% of WHs were current non-daily smokers (CNDS). Among CDS, 59% of AAs, 60% of APIs, 60% of HLs, and 69% of WHs had ever stopped smoking for at least 1 day in an attempt to quit. Among CNDS 42% of AAs, 34% of APIs, 29% of HLs, and 43% of WHs did so. Logistic regressions adjusted for sex, age, education, income, marital status, smoking level, and seeing a health professional in the past 12 months suggest that HLs were less likely to be advised by a health professional to quit smoking odds ratio(OR)=0.80; 95% confidence interval[CI]=0.69-0.92) compared to WHs. AAs(OR=0.52; 95% CI: 0.38-0.71) and HLs (OR=0.27; 95% CI: 0.19-0.40) were also less likely to report using nicotine replacement therapy (NRT) compared to WHs. Higher rates of CDS among AAs were accompanied by lower rates of successful quitting and a lower likelihood of using NRT compared to WHs. Despite the larger proportion of CNDS among HLs, fewer CNDS reported stopping at least 1 day because they were trying to quit. HLs were also less likely to be advised by a health professional to quit smoking and use NRT compared to WHs. Despite the smaller proportion of CNDS among WHs, a larger proportion of CDS have tried to quit at least 1 day, and more have quit successfully compared to other groups. Results suggest differences in the smoking cessation process between groups and highlight the need for further research.

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SYM11B  A PILOT STUDY OF A DECISION-AID TOOL FOR SMOKING CESSATION AMONG LATINOS

Ana-Paula Cupertino*, Kimber Richter, Lisa Sanderson Cox, and Edward Ellerbeck, University of Kansas Medical Center

Introduction: Many Latinos obtain their health care from community safety net clinics, where health care providers have limited time and resources to promote smoking cessation. The purpose of this pilot study is to assess the feasibility and preliminary outcomes of the Decidete decision aid software tool to improve knowledge and utilization of smoking cessation resources among Latino patients in safety-net clinics.

Methods: Decidete, is a computer-based smoking cessation decision aid kiosk in Spanish and English. Decidete queries participants about smoking behaviors and attitudes, presents options for learning more about cessation pharmacotherapies and behavioral treatments, and guides them through the process of making decisions about whether they want to quit and what treatments they want to use. Decidete was implemented at two safety net clinics. Smokers were identified during triage at each clinic. Healthcare providers invited patients to participate (n=24), collected verbal consent, administered pre-post surveys to assess five dimensions of the Decidete software.

Results: After reviewing Decidete, there was an increase in participants' knowledge about smoking cessation resources, pros and cons of using pharmacotherapy, and state-funded behavioral counseling. Overall, participants reported high satisfaction with the software. Participants rated content highly and the vocabulary easy to understand. Data downloaded from Decidete indicated that 90% of participants made a decision to quit smoking in the next thirty days. On the Stop Quit line, only two participants were not interested in using smoking cessation pharmacotherapy to support their quit attempt.

Conclusion: Successful completion of this pilot study suggests that Decidete will increase knowledge, utilization of smoking cessation resources, and open a new avenue to overcome barriers addressing smoking cessation among Latinos.

Health Care Foundation of Greater Kansas City.

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SYM11C  MOTIVATING LATINO PARENTS OF CHILDREN WITH ASTHMA TO QUIT SMOKING


Children exposed to Environmental Tobacco Smoke (ETS) have greater chance of developing and worsening asthma. Most interventions target ETS reduction rather than smoking cessation. We contrasted two theory-based interventions to motivate cessation in Latino smokers with children with asthma. Caregivers (N=131; M age=36, 73% female, 59% < high school education, M=10.8 cigs/day) were randomly assigned to one of two nurse-delivered interventions provided over 3 home visits: 1) Behavioral Action Model (BAM), based on AHRQ guidelines, or 2) Precaution Adoption Model (PAM), which uses Motivational Interviewing to deliver feedback on smoker’s Carbon Monoxide exposure and children’s ETS exposure. Free nicotine patches were provided to those motivated to quit. ETS was assessed by passive air samplers; one in home and one worn by the child. Smoking status was biochemically verified. Intent to treat analyses showed that 20.5% of PAM and 9.5% of BAM were continuously abstinent at 2 months (p=0.08; Cohen’s d = .31); at 3 months, these rates were 19.2% for PAM and 12.7% for BAM (Cohen’s d = .18). Using all available cases at 2 months, 31.8% of PAM were continuously abstinent vs. 14.6% of BAM (p=0.06; Cohen’s d = .41); at 3 months, these rates were 28.2% for PAM and 18.1% for BAM (Cohen’s d = .24). Asthma morbidity decreased from baseline to 3 month follow-up (p<0.04), and BAM showed greater decreases than BAM (p<0.08). Both ETS and nicotine patch requests were significantly different between baseline and 3 month follow-up (p<0.05); BAM had significantly greater decreases than PAM (home monitor only). Motivation to quit increased over time for both groups (p<0.05), but PAM had larger increases than BAM. Results will help tailor interventions to this population and identify mechanisms of behavior change.

Funded by The Robert Wood Johnson Foundation to B. Borrelli.

SYM11D  PREDICTORS OF RETENTION IN A CULTURALLY SPECIFIC SMOKING CESSATION TRIAL AMONG LATINO SMOKERS

Rashelle Brown, Ph.D.*, Brown Medical School and The Miriam Hospital; Christina Lee, Ph.D., Brown University; Elizabeth McQuaid, Ph.D., Bradley/Hasbro Children’s Research Center & Rhode Island Hospital; Belinda Borrelli, Ph.D., Brown Medical School and The Miriam Hospital

Few studies examine factors that predict completion of both intervention and follow-up assessments among minorities in smoking cessation treatment. We examined factors associated with participant retention in a culturally tailored home-based smoking cessation intervention for Latino smokers with children with asthma. Participants (N=131; M age=36.8, 73% female, 59% < high school education, M=10.8 cigs/day) were randomly assigned to receive one of two nurse-delivered smoking interventions provided over 3 visits. Participants did not have to want to quit smoking to be in the study, but free nicotine patches were given to those wanting to quit. Follow-up assessments were given by a research assistant at the end of treatment, and at 2 and 3 months later. Analyses controlled for treatment condition. 81.7% of participants completed all 3 home visits and 61.8% completed 3 home visits plus 3 follow-up assessments. Completion of 3 home visits was associated with greater perceived social support (OR = 1.10, 95% CI 1.006-1.19), less pros of smoking (OR = .87, 95% CI .787-.970), nicotine patch request (OR = 7.19, 95% CI 7.6-723.6), and no previous pharmaceutical intervention for smoking cessation (OR = .13, 95% CI .022-.726). Completion of all 3 follow-up assessments (vs. none) were associated with older age, (OR = 1.09, 95% CI 1.01-1.17), less pros of smoking (OR = .88, 95% CI .799- .995), nicotine patch request (OR = 101.5, 95% CI 10.6-971.8). Greater overall completion (home visits + assessments) was associated with greater age (B = 0.039, p<0.05), no prior pharmaceutical use for smoking cessation (B = -.746, p<.05), nicotine patch request (B = 1.81, p<.001). Free nicotine patches may help retain Latino smokers in smoking cessation treatment and follow-ups.

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SYM11E  ENSURING VALID CROSS-CULTURAL COMPARISONS IN SURVEY RESEARCH ON TOBACCO

James Thrasher*, University of South Carolina, USA; Instituto Nacional de Salud Publica, Mexico; Anne C. K. Quah, University of Waterloo, Canada; Ron Borland, Cancer Council of Victoria, Melbourne, Australia; Rahmat Awang, Maizarah Omar, National Poison Centre, Universiti Sains Malaysia, Malaysia; Bupha Sirirasmamee, Mahidol University, Thailand; Marcelo Boado, Universidad de la Republica, Montevideo, Uruguay; Kristen Miller, National Center for Health Statistics, USA; Ashlee Watts, University of South Carolina, USA; Ana Dorantes Alonso, Instituto Nacional de Salud Publica, Mexico

Research to explain ethnic, socioeconomic, and international disparities in tobacco use often involves comparison of survey data from disparate groups. Conclusions regarding which factors explain disparities are strengthened when researchers can rule out the influence of systematic measurement error due to cultural differences across the populations. Cognitive interviewing techniques assess the type and extent of measurement error, yet existing literature is only suggestive on the use of this methodology across cultural and linguistic contexts. We will describe a cognitive interviewing protocol developed for four linguistic groups in six countries (US, Australia, Malaysia, Thailand, Mexico, Uruguay), to determine differential comprehension and meaning of tobacco survey questions among adult smokers. We will emphasize: 1) definitions of study constructs that make sense across the cultural settings; 2) multiple bi-lingual partners in each linguistic/cultural group involved; 3) developing structured probes that anticipate concerns about question comprehension and meaning; 4) audio recording of interviews to capture open-ended responses; 5) addressing translation issues; 6) coordination of analysis. Results include analyses of cognitive interviews with convenience samples from each participating country. This protocol can inform future attempts to ensure valid comparative analyses across cultural and national contexts, a critical step towards identifying the foci for efforts to reduce tobacco-related disparities.

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SYM12  A DIFFERENT “UNLEVEL PLAYING FIELD” — THE RELATIVE EVIDENCE BASES FOR NRT VS. TOBACCO PRODUCT REGULATION

Mitch Zeller, J.D., Pinney Associates, Bethesda, MD; Jonathan Foulds, Ph.D., University of Medicine and Dentistry of New Jersey, School of Public Health, New Brunswick, NJ; Dorothy Hatsukami, Ph.D., University of Minnesota, Minneapolis, MN; Scott Leischow, Ph.D.*, University of Arizona, Arizona Cancer Center, Tucson, AZ

Much has been said and written about the so-called “unlevel playing field” between tobacco products and nicotine replacement therapy (NRT). Some call it ironic that the most dangerous form of nicotine delivery—cigarettes—is subject to no science-based product regulation, while the cleanest and safest—NRT—is subject to extensive regulation. This symposium will highlight a different sort of “unlevel playing field.” It will focus on the extensive evidence base establishing the safety and efficacy of NRT and how “standard” safety and toxicity issues with medicines are moderated by the reality that the patient population is already being exposed to very high levels of more addictive forms of nicotine, and a host of toxins, via cigarette smoke. A new regulatory philosophy will be examined that is built on the premise that continued tobacco use is an unacceptable public health outcome for smokers concerned about their health. Regulatory implications will be explored, including whether NRT should be made readily available to smokers for a host of indications. This session will also feature how relatively little is known about how to regulate tobacco products (more is known for non-combusted than for combusted, but still with considerable uncertainty) and the implications that flow from that stark reality. Discussion will focus on how scientists can be prepared to advocate for more progressive and liberal regulation of NRT products while also contributing to building the science base for regulating tobacco products. Participants will include the following individuals: Chair: Mitch Zeller, NRT evidence base presenter; Jonathan Foulds, Tobacco evidence base presenter; Dorothy Hatsukami, Discussant: Scott Leischow.

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SYM12A  THE EVIDENCE BASE FOR THE SAFETY AND EFFICACY OF NICOTINE REPLACEMENT THERAPY AND REGULATORY BARRIERS TO BROADER USE

Jonathan Foulds, Ph.D.*, University of Medicine and Dentistry of New Jersey, School of Public Health, New Brunswick, NJ

There is considerable evidence showing that NRT is underutilized by smokers trying to quit, and that smokers overestimate the risks from NRT relative to the risks from tobacco. NRT is regulated as a medicine and therefore requires solid evidence to support use indications and full disclosure of all potential risks. There is very solid evidence demonstrating that a standard course of nicotine replacement therapy is both safe and effective in reducing nicotine withdrawal symptoms and craving, and helping smokers to stop smoking. Evidence also suggests that NRT is safe for long term use, use for smoking reduction, and when combined with other NRTs. Evidence for improved efficacy when used in these ways is less conclusive but broadly supportive. Unlike most medicines, however, NRT is competing not against a virus or a bacteria, but against another legal consumer product subject to quite different and less cautious regulatory controls. In this context a very cautious approach to NRT labeling (that does not allow consideration of the relative risks from tobacco) may act against public health. It may be appropriate for a single specific branch of consumer product regulation to regulate all nicotine delivery products, taking a broad view of the public health impact.

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SYM12B  TOBACCO PRODUCTS: EVIDENCE BASE FOR REGULATION

Dorothy Hatsukami, Ph.D.*, University of Minnesota; Peter Shields, M.D., Georgetown University

The evidence base for tobacco products regulation is extremely limited. Currently, unlike the significant regulations and monitoring associated with the marketing of nicotine replacement treatments, tobacco companies are free to manufacture products aimed at developing and sustaining addiction (e.g., manipulation of nicotine content in the product and enhancement of systemic delivery of nicotine by addition of flavorants or changing product characteristics to enhance palatability and sustain use). These products, in addition to nicotine, contain thousands of chemicals, some of which are toxic to humans. Furthermore, tobacco companies are not required to have pre-marketing approval for tobacco products and are allowed to advertise the use of products, "anytime, anywhere" and in any way, with the exception of use for cessation. Some of the critical components of tobacco product regulation would include: a) reduction in toxicant emissions to the lowest level technologically possible; 2) the reduction in abuse liability of tobacco products; 3) approval of advertising and marketing claims; and 5) post-marketing surveillance. The current ongoing efforts and research results directed at each of these components will be described. These include the recommendations from a Strategic Dialogue on Tobacco Harm Reduction and guidelines published by World Health Organization Study Group on Tobacco Product Regulation and by the European Union. In addition, initiatives and research conducted at Georgetown University and other sites under a R&D contract from the National Cancer Institute and the results from the University of Minnesota’s Transdisciplinary Tobacco Use Research Center will be discussed. Finally, key future research directions will be described.

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PA1-1

THE IMPORTANCE OF SEX DIFFERENCES IN ADOLESCENT-ONSET NICOTINE SELF-ADMINISTRATION IN RATS

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Important sex differences in tobacco addiction have been documented in smokers. Particularly important may be sex differences in nicotine reinforcement during the adolescent period when the great majority of tobacco addiction begins. The neurobehavioral bases for these differences can be studied in animal models of nicotine self-administration. We have conducted a detailed analysis of sex and age differences in adolescent vs. adult-onset nicotine self-administration in Sprague-Dawley rats. Overall adolescent rats self-administer significantly more nicotine per body weight than rats beginning in adulthood. Compared with female rats, adolescent male rats have a greater increase in nicotine self-administration vs. adult-onset rats. However, as the adolescent rats age into adulthood, the males decrease their nicotine self-administration to levels of males that started in adulthood, whereas adolescent-onset female rats show a greater persistence of higher nicotine self-administration into adulthood. A particularly vulnerable age of onset for female rats appears to be six weeks of age, mid-adolescence. Important sex-differences can be seen in the rat model of adolescent-onset nicotine self-administration. Hormonal and neurobehavioral changes in mid-adolescent females may underlie particular vulnerability to nicotine addiction.

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PA1-2

DEVELOPMENTAL AND SEX DIFFERENCES IN THE EXPRESSION OF KEY MOLECULAR TARGETS DURING NICOTINE WITHDRAWAL

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Previous work has shown that the aversive effects of nicotine withdrawal are behaviorally different depending on the developmental stage and sex of the rat. However, little is known about the cellular mechanisms that mediate developmental and sex differences produced by nicotine withdrawal. Thus, this study compared the expression of gene targets associated with nicotine dependence and withdrawal in female and male adolescent (PND 42) and adult (PND 60) rats. Animals were prepared with subcutaneous pumps that delivered saline or a dose of nicotine that produces equivalent nicotine plasma levels in these age groups. After 14 days, the pumps were removed and 24 hours later the nucleus accumbens (NAcc) and amygdala were removed. RNA was isolated, and eight genes of interest were analyzed based on their role in development (BDNF and GrnRh), estrogen conversion (CYP19), nicotine binding (alpha4, beta2 and alpha7 subunits), catecholamine innervation (dopamine D1 and D2 receptors), and stress (CRH). Differential expression of these targets was measured using quantitative PCR technology. Our results revealed several instances where nicotine withdrawal produced differential expression of genes that was age-, sex- and brain region-dependent. The most profound effect of nicotine withdrawal was observed in a high expression of CRH in the amygdala of adolescent females relative to all other treatment groups. In addition, the expression of CYP19, which converts androgens to estrogen, was up-regulated in female rats of both ages and in adolescent but not adult male rats. Finally, the effect of withdrawal on expression of the alpha4 subunit showed significant age-specific differences. Taken together, these data suggest factors such as stress, estrogen regulation, and differential expression of nicotinic targets likely mediate differential sensitivity to nicotine withdrawal that may confer enhanced vulnerability to nicotine in females during the adolescent period of development.

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PA1-3

A PROMISING NEW TREATMENT AVENUE FOR SMOKING CESSATION: NICOTINIC RECEPTOR DESSENSITIZATION: DECREASED NICOTINE SELF-ADMINISTRATION IN RATS WITH SAZETIDINE-A

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Nicotinic receptors have long been the focus of developing treatments to aid smoking cessation. Nicotinic agonist or antagonist treatments have been tested and do provide some help. Nicotinic receptors are known to be easily desensitized, but the potential role of desensitization in modulating reinforcement is largely unexplored. Recent development of a class of drugs that desensitize nicotinic receptors without stimulating them has allowed the testing of the role of receptor desensitization in nicotine self-administration. Sazetidine-A is a novel compound that provides potent desensitization of alpha4beta2 nicotinic receptors with little or no receptor activation. The current study was conducted to determine if sazetidine-A would reduce nicotine self-administration in rats. Male Sprague-Dawley rats (N=10) were allowed to self-administer nicotine at a dose of 0.03 mg/kg/infusion, IV. After initial food pellet training and nicotine self-administration training, the rats were administered sazetidine-A (1 or 3 mg/kg, SC) or the saline vehicle, in a repeated measures, counter-balanced order. This initial phase of study found that sazetidine-A at the 3 mg/kg dose before the nicotine self-administration sessions significantly (p<0.025) decreased nicotine self-administration relative to performance of the same rats after saline injections. Nicotinic receptor desensitization may play a critical role in modulating nicotine self-administration. This line of research is directed at developing a better understanding of the neurobehavioral roles of nicotinic receptor desensitization for nicotine reinforcement, and development of new nicotinic receptor desensitization-based treatments for tobacco addiction.

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PA1-4  RAT NICOTINE METABOLISING CYP2B ENZYME IS INDUCED IN THE BRAIN BY CHRONIC NICOTINE TREATMENT: INDUCTION AND RECOVERY TIME COURSE

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CYP2B1 is the major nicotine-metabolizing enzyme in rats. Human CYP2B6 can also metabolize nicotine as well as other drugs and psychoactive chemicals such as bupro- triazol, selegiline, ecstasy, and serotonin. CYP2B6 is higher in brains of human smokers, and chronic nicotine treatment increases rat and monkey brain CYP2B. Rat CYP2B is significantly induced in the brainstem, frontal cortex, striatum, and olfactory bulb, but not in the liver. Since the time of peak induction and the duration of induction are unknown, we investigated the time-course of rat brain CYP2B. Rats were treated daily with 1 mg base/kg, s.c. nicotine or saline, for 7 days, and sacrificed at 30 min- utes to 36 hours after the last dose. Brain regions were assayed for CYP2B protein levels using western blotting. High levels of CYP2B protein were observed 8 hours after the last nicotine treatment in the brainstem (1.0 fold, p<0.005) versus 4 hours after the last treatment in the frontal cortex (1.7-fold, p<0.05). CYP2B levels remained significantly elevated at 24 hours after the last treatment in both regions (1.8-fold to p<0.05 and 1.6-fold, p<0.05 respectively) returning to baseline by 36 hours. In con- trast, the cerebellum showed virtually no effect of nicotine (1.2-fold maximum) at any time-point. We have shown that nicotine can selectively induce CYP2B protein levels in the rat brain, and hence, induce its own metabolism, and have characterized the temporal pattern of this induction. This increase in the metabolism of nicotine, as well the changes in nicotine metabolite levels could play a part in the development of cen- tral tolerance to nicotine seen in both animals and humans. These results also sug- gest that nicotine is one component of cigarette smoke that contributes to the higher levels of brain CYP2B6 seen in human smokers compared to non-smokers. Active and passive smokers and people undergoing nicotine therapy might have higher brain CYP2B levels and increased in-situ metabolism of centrally acting CYP2B substrates such as nicotine and buproprion. This change in brain metabolism could result in altered therapeutic response, brain levels of neurotransmitters and/or neurotoxicity.

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PA1-5  BOTH THE EFFECTS OF ACUTE NICOTINE AND WITHDRAWAL FROM CHRONIC NICOTINE ON CONTEXTUAL LEARNING ARE MEDITATED BY HIGH AFFINITY NICOTINIC ACETYLCHOLINERGIC RECEPTORS IN THE HIPPOCAMPUS

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Background: Learning clearly plays an important role in addiction. The develop- ment of maladaptive drug-context associations could lead to drug seeking behavior and the disruption of learning about other drug-taking situations could lead to relapse. The present studies investigated the neural substrates involved in the effects of acute nicotine and withdrawal from chronic nicotine on contextual learn- ing.

Methods: The effects of direct injection of either nicotine, the α7 nicotinic acetylcholinergic receptor (nAChR) antagonist methyllycaconitine (MLA), the β2 nAChR antagonist dihydro-B-erythroidine (DHBE) or vehicle into the hippocampus prior to con- ditioning was assessed in C57BL/6 mice. For experiments in which MLA or DHBE was infused, nicotine was given systemically. For chronic treatment, nicotine was infused into the hippocampus for 12 days. Mice were trained in contextual learning using two co-terminating conditioned stimulus (CS); 30 second, 85 dB white noise)—uncondi- tioned stimulus (US) was a 2 second, 85 dB aversive sound—after conditioning for (1.8-fold to p<0.05 and 1.6-fold, p<0.05 respectively) returning to baseline by 36 hours. In con- trast, the cerebellum showed virtually no effect of nicotine (1.2-fold maximum) at any time-point. We have shown that nicotine can selectively induce CYP2B protein levels in the rat brain, and hence, induce its own metabolism, and have characterized the temporal pattern of this induction. This increase in the metabolism of nicotine, as well the changes in nicotine metabolite levels could play a part in the development of cen- tral tolerance to nicotine seen in both animals and humans. These results also sug- gest that nicotine is one component of cigarette smoke that contributes to the higher levels of brain CYP2B6 seen in human smokers compared to non-smokers. Active and passive smokers and people undergoing nicotine therapy might have higher brain CYP2B levels and increased in-situ metabolism of centrally acting CYP2B substrates such as nicotine and buproprion. This change in brain metabolism could result in altered therapeutic response, brain levels of neurotransmitters and/or neurotoxicity.

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PA2-1  FUNCTIONAL MAGNETIC RESONANCE IMAGING (fMRI) OF ALCOHOL-INDUCED RESPONSE TO VISUAL SMOCKING CUES

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While there is a strong association between alcohol drinking and cigarette smoking, little is known about neurobiological substrates underlying alcohol-induced desire to smoke. This study utilized functional magnetic resonance imaging (fMRI, 3T GE scanner, reverse-spiral sequence: TR=2s, TE=25ms) in order to measure Blood Oxygen Level-Dependent (BOLD) signal changes in response to alcohol or placebo in the presence of visual smoking and neutral (e.g., non-smoking) cues. Subjects [N=12; 10 males] were young adult habitual binge social drinkers (i.e. consumed 5+ drinks/occa- sion, 1-4 times weekly) with light smoking patterns (1-50 cigarettes/week). In a dou- ble-blind, randomized design, subjects participated in two sessions with pre-adminis- tration of either alcohol (0.8 g/kg) or placebo beverage consumed over a 13-minute period prior to fMRI scanning. Approximately 30-60 minutes after the start of beverage consumption, participants engaged in a block-related fMRI task design involving view- ing smoking-related and neutral images (64 smoking, 64 neutral). During various inter-vals, subjects responded to the question ‘I have a desire for a cigarette right now’ on a 1-7 scale (strongly disagree to strongly agree). Results showed that alcohol, com- pared with placebo, significantly increased ratings of desire to smoke (5.2 vs. 4.0, p<0.05). During the placebo session, smoking (>=neutral) cues increased activation in the rostral anteri- or cingulate cortex (ACC), posterior cingulate cortex (PCC), bilateral middle frontal gyrus (MFG), and pons (all p<0.05). Further, alcohol (>=placebo) significantly enhanced activation in the mid-temporal regions (ACC, PCC, MFG) during processing of visually salient smoking cues. The results suggest a potential neurobiological mecha- nism underlying alcohol's effects on increasing smoking urges and behavior.

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PA2-2  SEX DIFFERENCES IN ALCOHOL-INDUCED INCREASES IN SMOKE TOPOGRAPHY FOR NICOTINIZED AND DENICOTINIZED CIGARETTES

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Alcohol has been shown to increase smoking urges and smoking behavior. However, alcohol’s effects on specific components of smoking behavior for nicotine versus non-nicotinic factors, and potential sex differences in this response, have not been investigated. Participants were male (n=22; mean age 25.6) and female (n=20; mean age 25.8) social smokers. Cigarettes were smoked in a placebo capsule and were randomized to either alcohol (0.8 g/kg; n=29) or placebo (n=13) pre-treatment groups (between subjects factor). All nicotine (0.6 mg/cig) or denicotinized (<0.5 mg/cig) cigarettes were administered in each of the two lab sessions (within subjects factor) and cigarette type order was counterbalanced for the alcohol and placebo groups. One hour after the start of bev- erage consumption (and at 30-minute increments for a total of 3 hours), participants were given the opportunity to smoke each optional cigarette. Smoking behavior was examined via a smoking topography device. Subjects also completed the Brief Questionnaire on Smoking Urges at various intervals. Results showed that alcohol (>=placebo) increased smoking urge (group x time, p<0.01) and this increase was similar between the sexes. Independent of cigarette type, in men, but not in women, alcohol significantly increased all smoking topography components, including num- ber of puffs, puff volume, duration, average flow, peak flow rate and time, as well as increasing inter-puff interval (group x sex, p<0.05). In conclusion, in men, alcohol increased smoking behavior, indicating that co-use of alcohol and cigarettes may be the result of a direct pharmacological effect of alcohol. In contrast, in women, smoking- increased smoking behavior regardless of cigarette type, indicating that the mechanisms underlying co-use of these substances may be more complex.

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PA2-3 LONGITUDINAL PREDICTORS OF SMOKING CESSATION IN A COMMUNITY SAMPLE OF MARRIED COUPLES


Among married couples, spouses tend to have similar smoking and drinking patterns. Previous published findings from a longitudinal community sample of married couples suggest that spouses influence each other’s smoking patterns, particularly on relapse, with nonsmoking wives being more likely to resume smoking if their husbands smoked. The purpose of this study was to expand previous research by investigating the longitudinal influence of spousal and individual heavy drinking and heavy smoking on smoking cessation within the first seven years of marriage. Couples (N = 634) past year smoking (yes/no and usual number of cigarettes per day), frequency of past year alcohol problems, and past year heavy drinking were assessed at the time they applied for their marriage license and then again at the first, second, fourth, and seventh anniversaries. An event history analysis identified the effect of these individual and partner factors on smoking cessation. Husbands and wives were both more likely to quit smoking if their spouse was a non-smoker. For individuals, rather than couples, spousal and partners’ smoking frequencies per day were more likely to predict smoking. A statistically significant effect emerged for men, indicating those who engaged in episodes of heavy drinking several times a month but no more than once a week (p = .022) and those who engaged in episodes of heavy drinking more than once a week (p = .021), were less likely to quit smoking when compared to those with no episodes of heavy drinking. Similar patterns emerged for women with heavy drinking episodes occurring more than once a week (p = .064). Spousal and one’s own smoking and one’s own heavy drinking decreased the likelihood of cessation. Participants with the most frequent episodes of heavy drinking, compared to those with no heavy drinking, were less likely to quit. These findings demonstrate complex relationships between spousal and individual substance use patterns and that frequent heavy drinking is a barrier to smoking cessation.

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PA2-5 SMOKING CESSATION DURING ALCOHOL TREATMENT FOR ALCOHOL DEPENDENT SMOKERS USING COMBINATION NICOTINE PATCH AND GUM

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Tobacco use among alcohol dependent smokers is a significant public health problem. Smoking cessation interventions delivered concurrent with alcohol treatment often yield low smoking quit rates. A randomized clinical trial was conducted comparing two smoking interventions delivered concurrent with an early phase of outpatient alcohol treatment. All subjects received 16-one hour manually guided CBT sessions for alcohol and tobacco abstinence. One study arm received active nicotine patch and 2 mg nicotine gum, while the other arm received active nicotine patch and placebo gum dispensed using double blind procedures. Participants were instructed to use patch for 12 weeks and gum for 26 weeks. Recommended gum use was 5 to 20 pieces per day with instructions to gradually taper use after 12 weeks. The primary outcomes were carbon-monoxide confirmed prolonged smoking abstinence and 30-day point-prevalence alcohol abstinence at 3, 6, and 12 months after target smoking quit date. A total of 96 alcohol dependent smokers were randomized and randomly assigned to either the nicotine patch/placebo gum arm or placebo patch/nicotine gum arm. There were no significant differences between study arms at any time point on abstinence outcomes. Mean reported gum use per day was as follows: 6.1 pieces at two weeks, 5.1 pieces at six weeks, and 3.4 pieces at three months, with nonsignificant differences in gum use between active and placebo gum conditions. Reported adverse medication effects differed only in the rate of the percent reporting mouth sores/bleding gums (15.8% active gum vs. 4.8% placebo) and aches in jaw muscles (11.8% active gum vs. 0% placebo). Results suggest minimal risk and a modest long-term benefit from combination nicotine replacement containing patch plus gum when used in smoking cessation delivered concurrent with outpatient alcohol treatment.

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PA2-4 ALCOHOL INVOLVEMENT AND OTHER RISK FACTORS FOR RELAPSE IN SMOKING CESSATION

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Little is known about the impact of alcohol involvement on smoking cessation or possible mechanisms for these associations. We examined these issues using data from a randomized clinical trial of two types of framed messages (gain vs. loss) in combination with 7 weeks of open label sustained-release (SR) bupropion (Toll et al., in press) (N = 249). Participants were categorized according to whether or not they engaged in episodes of heavy drinking following quit attempts. Implications of these findings for smoking cessation treatment will be discussed.

This research was supported in part by National Institutes of Health grants K12-DA0167, K05-AA01715, P50-DA13334, P50-AA15632, T32-DA007238 and by the State of Connecticut, Department of Mental Health and Addictions Services.

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PA3-1 CANDIDATE GENE FINDINGS FOR DSM-IV NICOTINE WITHDRAWAL: OPRM1, CHRNA3-CHRNB4, AND CHRNA2

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Evidence from previous twin analyses suggests that genetic factors influence nicotine withdrawal (NW; heritability estimates up to 45%). Based on reports using animal models and findings from smoking cessation studies in humans, we tested whether the OPRM1, CHRNA3, and CHRNA2 are associated with NW. PDT association analyses included data from 507 families (N = 1845 individuals) from a gene-mapping study of Australian families targeted for heavy smoking index-cases and ascertainment through the Australian twin registry. Given that CHRNA3-CHRNB4 form a gene cluster, we considered SNPs from CHRNA3 and CHRNA2 as well. Significant associations emerged for 7 SNPs within OPRM1. These SNPs were highly correlated and had r-square values ranging from 0.23-0.99. One SNP each in CHRNA3 and CHRNA2 were also significantly associated with NW and were also highly correlated with an r-square = .85. SNPs tested within CHRNA2 were not significantly associated within NW. These gene association findings suggest that NW may be an important phenotype to explore within a gene-mapping framework, and point to the combined use of animal models and humanized models in order to probe these and other candidate genes of smoking behavior.


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**PA3-2**

**INTERACTIVELY AND JOINTLY CONTRIBUTION OF CHRNA4, CHRN2, BDNF AND NTRK2 TO TOBACCO DEPENDENCE**

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1Univ. of Virginia, Charlottesville, VA, 2Case Western Reserve Univ., Cleveland, OH Extensive epidemiological data indicate that vulnerabilities to nicotine dependence (ND) are complex traits influenced by genes, environments, and their interaction. Recent evidence supports a genetic association of the nicotinic receptor alpha 4 subunit (CHRNA4), brain-derived neurotrophic factor (BDNF), and neurotrophic tyrosine kinase receptor 2 (NTRK2) with ND. Although the interacting effects of BDNF with NTRK2 and CHRNA4 with CHRN2 have been established experimentally using in vitro and animal models, no human genetic study is reported demonstrating that BDNF interacts with NTRK2 or CHRNA4 with CHRN2 affecting smoking behavior. To determine if the four genes are affecting ND, we genotyped 6 SNPs for CHRNA4 and BDNF, 5 SNPs for NTRK2, and 4 SNPs for CHRN2 in a case-control sample containing 275 unrelated smokers with a FTND score of 4.0 or more and 348 unrelated nonsmokers. By using a newly developed algorithm by this group, called generalized multifactor dimensionality reduction method, we found highly significant gene interaction effects on ND for the gene pairs of CHRNA4 and CHRN2, CHRNA4 and NTRK2, CHRN2 and NTRK2, and BDNF and NTRK2. Furthermore, we found a significant gene interaction of CHRNA4 and BDNF on ND. No significant interaction was detected for the gene pair BDNF and NTRK2. This study provides evidence on the presence of interaction among the four genes in affecting ND. Although CHRN2 alone was not associated with ND in several previously reported association studies on ND, we found it affects ND through interaction with CHRNA4 and NTRK2.

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**PA3-3**

**THE D398N VARIANT OF CHRNA5, NICOTINE DEPENDENCE, AND OTHER ADDICTIONS: A RISK ALLELE FOR NICOTINE DEPENDENCE IS A PROTECTIVE ALLELE FOR COCAINE DEPENDENCE**

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A non-synonymous coding variant of the CHRNA5 gene (D398N), which encodes the alpha-5 subunit of the nicotinic cholinergic receptor (nAChR) has been found to be associated with nicotine dependence (Saccone et al Hum Mol Genet 16, 36-49, 2007). The goal of the present study is to determine whether this variant is specifically associated with nicotine dependence, or is more generally associated with addiction liability. In an analysis of 504 European-American cases and controls participating in the Family Study on Cocaine Dependence (FSCD), there was a significant association with cocaine dependence (OR=0.67 per allele, p=0.0045, assuming an additive genetic model), but in the reverse direction compared to that previously observed for nicotine dependence. Multivariate analyses were conducted to simultaneously model the association with nicotine dependence; these analyses resulted in an increased magnitude of the protective effect for cocaine dependence, while simultaneously demonstrating the previously documented association between CHRNA5 D398N and nicotine dependence (OR=2.14, p=0.017). Both of these findings were replicated in an independent sample derived from the Collaborative Study on the Genetics of Alcoholism (COGA). These findings support a “common and specific” effects model for liability to nicotine addiction, which invokes nicotine-specific effects in addition to common genetic contributions to liability for multiple addictions, over a general-addiction liability model. As new pharmacological treatments for addictions emerge, it will be essential to consider such phenomena as potential contributors to unintended side effects.

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**PA3-4**

**CANDIDATE REGIONS CONTRIBUTING TO COTININE PHARMACOKINETICS ARE LOCATED ON CHROMOSOMES 9 AND 11**

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Object: To search the human genome for regions which contribute to cotinine pharmacokinetics.

Method: A total of 224 healthy adults composed of a minimum of three members per family who met inclusion criteria participated in the nicotine metabolism study. 2 mg of deuterium-labeled nicotine and 10 mg of deuterium-labeled cotinine were orally administered after an overnight fast. Saliva samples were collected before dosing and at 6, 12, 24, 36, 48, and 60 hours following dosing. Saliva cotinine concentration was measured using gas chromatography/mass spectrometry. Genotypes were determined for 739 autosomal microsatellite polymorphisms. Quality of all available genotypes was carefully checked and for each Mendelian inconsistency, genotypes for the family were removed before further analysis. Multipoint linkage analysis was performed with area under the plasma cotinine concentration-time curve and two different approaches implemented in MERLIN.

Result: Using the Kong and Cox exponential model, the most significant linkage peak was located at 135cM of chromosome 9 with LOD score 2.81 and p= 0.0002, and with LOD score > 2 spanning 17cM from 126 to 143cM. Two additional interesting linkage regions appeared on chromosome 11. Using the variance components model, results were similar to those previously reported at this meeting, with the strongest linkage peak on chr11p.

Discussion: Regions of chromosomes 9 and 11 have been identified as related to the risk of cigarette smoking in previous linkage analyses of pedigrees collected originally to study panic disorder, substance dependence, and heart disease. Our finding in a community-based, non-treatment seeking sample suggests that genes in the above candidate regions may play critical roles in the metabolism of cotinine, however, the discordance between methods reduces enthusiasm for fine mapping. Trait non-normality and a small sample size are two potential reasons for divergent linkage results. We plan to use a non-parametric transformation method and variance components to test for linkage and evaluate the results of all three methods before moving to fine mapping or candidate gene genotyping.

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PA4-3

NICOTINE METABOLISM: ADDITIVE GENETIC INFLUENCES ON THE 3'-HYDROXYCOCAINE/COCAINE RATIO IN PLASMA AND URINE

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The 3'-hydroxycoctaine/coctaine (3HC/COT) ratio is a marker of CYP2A6 activity, an important determinant of nicotine metabolism. 3HC/COT is gaining increased interest as a predictor of response to smoking cessation treatments. This analysis sought to conduct a combined genetic epidemiologic and pharmacogenetic investigation of 3HC/COT in plasma and urine in twins. One hundred thirty nine twin pairs (110 monozygotic [MZ] and 29 dizygotic [DZ]) underwent a 30-minute infusion of stable isotope-labeled nicotine and its major metabolite, cotinine, followed by an 8-hour in-hospital stay. Blood and urine samples were taken at regular intervals for analysis of nicotine, cotinine, and metabolites. DNA was genotyped to confirm zygosity and for variation in the gene for the primary enzyme involved in nicotine metabolism, CYP2A6 (variants genotyped: *1, *2, *4, *7, *8, *9, *10, *12). Two hundred fifteen individuals were homozygous for the wildtype variant. Univariate biometric analyses quantified genetic and environmental influences on each measure in the presence and absence of covariates, including measured CYP2A6 genotype. There was a substantial amount of variation in 3HC/COT in plasma (6 hours post-infusion) attributable to additive genetic influences (67.4%, 95% CI = 47.5%-71.4%). The heritability estimate was reduced to 61.0% and 51.3%, respectively, after taking into account the effect of covariates and CYP2A6 genotype. In urine (recovered over 8 hours), the estimated amount of variation in the ratio attributable to familial influences was reduced and could not be definitively linked to additive genetic sources (47.2%, 95% CI = 0.0%-67.2%). Heritability estimates were reduced to 44.6% and 39.5%, respectively, after adjusting for covariates and CYP2A6 genotype. These results suggest that additive genetic factors are prominent in 3HC/COT in plasma but less so in urine and that uncharacterized or novel CYP2A6 alleles as well as other genes in the nicotine-cotinine metabolic and/or excretion pathway remain to be identified.

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PA4-4

DO SMOKERS CRAVE SOME CIGARETTES MORE THAN OTHERS? SITUATIONAL CORRELATES OF CRAVINGS WHEN SMOKING

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Craving is an important determinant of smoking, but variations in craving within smoking occasions have not been examined. We examined differences in craving when people were smoking in a variety of real-world, smoking situations. Using Ecological Momentary Assessment, 394 smokers recorded smoking, craving (0-10 scale), and smoking context in real-time on electronic diaries over 2 weeks of ad lib smoking. The analyses focused on 21,035 smoking episodes. Mixed modeling was used to analyze associations between craving and situational variables (e.g. smoking restricted vs. allowed). Though differences in craving between contexts were small (<1 point on the scale), craving varied systematically across smoking situations. Craving was higher during smoking when smoking was restricted (vs. allowed (F (2/4) = 22.51, p < .0001)). After controlling for environmental restrictions, craving while smoking was higher when individuals were eating or drinking (vs. not eating or drinking (F(1/3) = 33.64, p < .0001), during work or chores (vs. leisure activities (F(2/8) = 5.05, p = .025)), and during any kind of activity (vs. inactivity (F(2/22) = 4.42, p = .037)). In addition, craving was higher for cigarettes smoked in the morning than the rest of the waking day (F(3/4) = 38.20, p < .0001). No differences in craving were observed for drinking alcohol (vs. not drinking alcohol), caffeine (vs. not drinking caffeine), being at work (vs. home), being at a bar or restaurant (vs. all other locations), interacting with others (vs. not interacting with others), or other people smoking (vs. no others smoking). Overall, results demonstrate variations in craving among smoking occasions, and indicate that high craving is not necessarily associated with all smoking events or smoking situations.

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PA4-2

CRAVING AND RESTLESSNESS, BUT NOT NEGATIVE AFFECT, PRECEDE AD LIB SMOKING AND ARE REDUCED AFTER SMOKING

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In nicotine-regulation models of smoking, increases in withdrawal symptoms are expected to lead to increases in smoking, and smoking is expected to decrease withdrawal symptoms. The temporal relationship between craving, negative affect, withdrawal, and smoking has seldom been studied in naturalistic contexts. In this study, we examined craving, negative affect, and restlessness (which has been proposed as a distinct withdrawal symptom) as antecedents of smoking, and the effect of smoking on these symptoms. Using electronic diaries for Ecological Momentary Assessment (EMA), 351 daily smokers monitored their smoking and withdrawal symptoms in real time for 17 days. Daily smoking, craving, negative affect, and restlessness data were aggregated into 2, 2-hour blocks (16 waking hours). Cross-sectionally, within these 2-hour blocks, smoking correlated with craving (r= -0.22, p<0.001), but not affect (r= -0.03, ns) or restlessness (r=.01, ns). We also examined lagged, longitudinal relationships between subsequent 2-hour time blocks. Block with higher levels of craving were followed by blocks with more smoking in the subsequent 2 hours (B=0.23, p<.002), and blocks with more restlessness followed by blocks with higher craving (B=0.01, p<.001). Similarly, higher levels of restlessness were followed by more smoking (B=0.11, p<0.002), and higher levels of smoking were followed by lower levels of restlessness (B=-0.03, p<.01). No longitudinal relationship between NA and smoking was observed, challenging the oft-hypothesized relationship between affect and smoking. Based on Granger criteria for causality, findings suggest that craving and restlessness cause smoking, and in turn, causes reductions in symptoms, consistent with the role of withdrawal in the nicotine-regulation model of smoking. The findings suggest that the relationships between smoking and withdrawal symptoms play out over larger time periods, rather than just moment-to-moment, and they illustrate the utility of EMA for analyzing such phenomena.

This work was sponsored by the National Institute on Drug Abuse under grants DA00684 to Dr. Shiffman and DA00684-09S1 to Dr. Chandra. Dr. Shiffman is a co-founder of invivodata, inc., which provides electronic diary services for clinical trials.

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PA4-3

CUE-REACTIVITY IN THE NATURAL ENVIRONMENT: A NEW TOOL FOR STUDYING CIGARETTE CRAVING

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The cue-reactivity paradigm has been used extensively to assess smokers' craving responses to smoking-related stimuli. Although this paradigm has advanced our understanding of craving processes, there has been no experimental research of the impact of smoking cues on smokers' craving in their natural environment. We have recently completed formative research on a new procedure that allows us to assess smokers' reactions to smoking cues presented in the natural environment of the smokers. This research combines cue-reactivity (CR) procedures with Ecological Momentary Assessment (EMA) — the latter has been used successfully to study a variety of behaviors in real time using handheld personal digital assistants (PDAs). The participants were 43 daily cigarette smokers (19 female/24 male; average age - 40; cigarettes per day - 23; CO - 31 ppm). Each smoker was exposed to cue-reactivity/ecological momentary assessment (CREMA) trials via a PDA 4 times each day for 8 consecutive days. Each CREMA trial included pre-cue assessment of the smoker's craving level, emotional state, perceived cigarette availability, and opportunity to smoke. Cues (smoking-related and smoking neutral) were presented via brief imagery sentences and photographic stimuli. Ratings of craving, affect, and cue relevance were collected after each cue trial. Smokers were also asked to record each cigarette they smoked. The smokers were highly compliant with the CREMA procedure, completing, on average, 91% of the 32 possible trials. Presentation of smoking-related cues produced significantly greater craving and perceived cigarette availability than presentation of neutral cues. These effects were somewhat greater with photographic stimuli than with imagery stimuli, though the cue effects across either presentation mode were at least as strong as cue-reactivity effects observed in conventional laboratory-based studies of cue-reactivity. The impact of moderator variables on these cue effects (such as time of day, cigarette availability, smoking permissible, and baseline craving) will be presented. Further, the potential of the CREMA procedure for studying craving processes in natural settings will be discussed.

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PA4-4

TRANSDERMAL NICOTINE DIFFERENTIALLY INFLUENCES DISTRACTION FROM NEGATIVE AND POSITIVE AFFECTIVE AND SMOKING-RELATED PICTURES IN ABSTINENT HABITUAL SMOKERS AND NEVERSMOKERS DURING A MODIFIED, CUED-SPATIAL ATTENTION TASK

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Theory and evidence suggest that nicotine influences attentional biases for affective and smoking-related stimuli in habitual smokers, with implications for relapse prevention. However, less is known about nicotine’s effects on attentional processing of negative information, and there is a paucity of research comparing these effects in smokers and neversmokers. We tested the hypothesis that nicotine differentially influences distraction by negative, positive, and smoking-related stimuli. Following 12 hours of biochemically verified smoking abstinence, 42 habitual smokers and 54 neversmokers received transdermal nicotine patch on one day and a placebo patch on another day in a counterbalanced double-blind design. Participants were tested twice on each of the two days with a modified, cued spatial-attention task that included negative, positive, and smoking picture distractors that occurred immediately following a centrally presented spatial cue indicating the likely left vs. right visual field spatial location of an immediately subsequent target asterisk. For smokers, but not neversmokers, negative pictures were significantly more distracting than positive pictures in the placebo condition, and that distraction was significantly reduced by nicotine so that there was no difference between positive and negative distractors in the nicotine condition. In contrast, smoking pictures were significantly less distracting than positive pictures in the nicotine condition and more distracting than positive pictures during placebo for the smoker group only. Nicotine had no effect on distraction by positive pictures. In summary, these findings suggest that nicotine differentially impacts attentional bias for different types of affective stimuli for smokers but not neversmokers, with implications for understanding relapse in abstaining smokers. The results are discussed in terms of attention, affect, and smoking literatures.

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PA4-5

VALIDATION OF A SET OF STIMULI TO ASSESS REACTIVITY TO MULTIPLE SMOKING CUES

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Cue-reactivity is a promising methodology for studying and treating tobacco dependence. While cues related to smoking itself (e.g., lit cigarettes) have been studied, other stimuli (e.g., mood) may also cue craving and smoking. Standardized cue sets are available for a variety of stimuli, but variability in their designs impedes comparisons across stimuli. We developed and validated standardized, visual cue sets for 6 types of cues: Smoking (SM), Alcohol (AL), Negative Affect (NA), Positive Affect (PA), Neutral (NU), and Non-Smoking (NS) (i.e., cues to not smoke). The cue sets were comprised of images from IAPS (NA, PA, NU), ISIS (Gilbert, 2007; SM), Tiffany (unpublished; SM, NU), stock-photo libraries (NU, SM, AL, NS), and original photos (SM, AL, NS). Cues were presented as still photos in a slide show. Daily smokers (n=33) attended 6 separate sessions in which they saw one of 6 stimulus sets consisting of 30 photos displayed for 6 sec each (3 min total cue exposure). Craving (QSU) was rated immediately before and after exposure, and affect was rated 15 min post-exposure. Several variations of cues were tested. Data support the validity of the final set of cues: Exposure to SM t(22) = 2.31, p<0.02 and AL t(21) = 2.46, p<0.01 cues led to greater increases in craving (pre-to-post cue) than exposure to NU cues. NS cues had no effect on craving t(33) = 1.93, ns. Positive affect was greater after PA cues than NU cues t(18) = 1.88, p<0.04, and negative affect was greater after NA cues than NU cues t(9) = 1.65, p>0.07 (all one-tailed). This image-based multi-domain cue set was brief, simple to administer, and preliminary data suggest that it elicited patterns of cue-reactivity in the expected direction and range of intensity. It also permitted direct comparisons of varying stimulus types on cue-reactivity and smoking.

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PA5-1

SECOND HAND SMOKE EXPOSURE AND ENDOTHELIAL PROGENITOR CELL DEPLETION IN CHILDREN

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Background: Few studies have investigated the relationship between SHS exposure and cardiovascular disease (CVD) in children. Many forms of chronic CVD are initiated in childhood: at least one quarter of children in the United States are exposed to SHS. The vascular endothelium is a key mediator for maintaining the cardiovascular status; it maintains vascular tone and hemostasis, and is replenished by circulating endothelial progenitor cells (EPCs). Decreases in circulating EPCs have been noted in adult patients with coronary artery disease and in adult smokers. Levels of circulating EPCs may be a surrogate biological marker for vascular function and cumulative cardiovascular risk.

Hypothesis: SHS is related to EPC depletion in children.

Methods: Children ages 2-5 and 9-14 with varying levels of SHS exposure were recruited. SHS exposure is measured by the number of adult smokers a child is exposed to in a typical 24-hour period. EPC levels are measured using two variables: total EPC count and average percent of total EPC count. EPC levels were measured by the flow cytometry. A volume of 50µL anticoagulated peripheral blood was incubated with 50µL 3% BSA in PBS (without Ca++ and Mg++) at room temperature for 30 min. It was then labeled with following fluorescence-conjugated antibodies: PE-AC133, FITC-CD34, and PECy5-CD45 for 30 min. After incubation, red blood cells were lysed with FACS lysis solution. Samples are then analyzed on a FACS caliber flow cytometer. EPCs were defined as AC133+CD34+CD45- cells. Unstained cells were used as controls.

Results: Results suggest that the relationship between SHS and EPC dysfunction differs between the two age groups. Among children ages 2-5, a negative relationship is found between SHS and average percent EPC (r=-.2943, p<.05). However, among children ages 9-14, low levels of SHS exposure increases total EPCs (r=.2247, p<.05) and average percent EPC (r=.2207, p<.05) and high levels of SHS exposure decrease total and average percent EPCs.

Conclusions: These findings represent the first evidence that there is a relationship between tobacco smoke exposure and EPC prevalence in children.

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PA5-2
THE EFFECT OF A HOUSEHOLD SMOKING BAN ON ADOLESCENT SMOKING INITIATION: A COHORT STUDY
Alison B. Albers, Ph.D.;1 Michael Siegel, M.D., M.P.H.;2 Debbie M. Cheng, Sc.D.;3 Lois Biener, Ph.D., M.P.H.;1 Nancy A. Rigotti, M.D.*3;1Boston University School of Public Health,2Center for Survey Research, University of Massachusetts Boston,3Tobacco Research & Treatment Center, Harvard Medical School
Background: Household smoking bans (HSB) are recommended to reduce children’s secondhand smoke exposure (SHS), but they may have the additional benefit of denormalizing tobacco use and thereby discouraging youths from starting to smoke. A HSB might especially discourage smoking initiation among youths who are at high risk because their parents smoke. No longitudinal study has tested this hypothesis. Methods: We tested whether adolescents living in households with a HSB at baseline subsequently had less SHS exposure and were less likely to start smoking, using a 4-year, 3-wave longitudinal study of a representative sample of 3,834 Massachusetts youths aged 12-17 in 2001-02, of whom 2,791 (72.8%) were interviewed at 2 years and 2,217 (57.8%) were interviewed at 4 years. A 3-level HLM model assessed the relationship between HSB at baseline and 3 outcomes at follow-up: any home SHS exposure, progression from nonsmoking to experimentation, and progression to established smoking. Analyses adjusted for individual-level covariates (age, sex, race, baseline smoking status, household income and education, smoker in home, friend who smokes) and town-level covariates (% youth, % white, and a proxy for town anti-smoking attitude).
Results: Youths living in a home with no HSB had greater odds of reporting any home SHS exposure at follow-up, whether they lived with a smoker (OR=1.70) or did not live with a smoker (OR=2.91). Among youths not living with a smoker, those in a home with no HSB were more likely to transition from nonsmoking to early experimentation (OR=1.63; 95%CI 1.14-2.34). There was no effect of a HSB on progression to experimentation for youths who lived with a smoker. A HSB had no effect on progression to established smoking, whether or not a youth lived with a smoker.
Conclusions: Household smoking bans protect children from SHS exposure and reduce progression to smoking experimentation, but only in youths who do not live with smokers. In a home with a smoker, a HSB appears to be insufficient to counter the pro-smoking influence of parental smoking on youth smoking initiation, although a HSB does protect these youths from SHS exposure.
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PA5-3
DO SMOKING BANS HAVE DIFFERENTIAL EFFECTS ON HOSPITALITY BUSINESSES BY POLICY TYPE?
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Background: Over the past fifteen years, smoking restrictions in workplaces, called clean indoor air (CIA) policies, have been established in many cities, counties, states, and countries. Yet, despite the benefits of protecting employees from secondhand smoke; and smokers used unwritten rules, local knowledge, and social and physical cues to determine where smoking is acceptable. Although most people in the smoking group felt more comfortable smoking away from non-smokers, convenience, weather, social reward and visibility were key factors that influenced where they smoked. Smokers tended to gravitate towards specific areas, often close to doorways, which became self-selected smoking areas. Both smokers and non-smokers supported outdoor smoking restrictions around entrances, but observations revealed that compliance was an issue. Providing clear and consistent rules for smoking around building entrances may benefit both non-smokers and smokers, resulting in positive implications for public health. However, compliance and the movement of smoking to sidewalks and other areas present challenges. In this presentation we also explore policy and design issues regarding the creation of DSAs, the location of DSAs in crowded urban settings, and the likelihood they will be utilized and effective.
This study was conducted at the Ontario Tobacco Research Unit. Supported by the National Cancer Institute of Canada, Canadian Cancer Society Research Grant #014072.
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PA5-4
MOVING SMOKING AWAY FROM DOORWAYS: POLICY ISSUES AND CHALLENGES
Pamela Kaufman, Ph.D.;1 Kara Griffin, M.A., Roberta Ferrence, Ph.D., Joanna Cohen, Ph.D., Ontario Tobacco Research Unit, University of Toronto; and Nathan Perkins, Ph.D., University of Guelph
Issues around smoking in outdoor public places have captured increasing attention as indoor smoking restrictions become more established and dangers associated with exposure to outdoor second hand smoke become better known. In high-density urban landscapes, restricting smoking around entrances and providing outdoor designated smoking areas (DSAs) is key policy issues. We conducted direct observations outside 12 government, university and office buildings in downtown Toronto, and 35 face-to-face interviews with smokers and non-smokers recruited from observation sites. We found that in the absence of enforced rules for smoking in outdoor public places, non-smokers used avoidance strategies to reduce exposure to second hand smoke; and smokers used unwritten rules, local knowledge, and social and physical cues to determine where smoking is acceptable. Although most people in the smoking group felt more comfortable smoking away from non-smokers, convenience, weather, social reward and visibility were key factors that influenced where they smoked. Smokers tended to gravitate towards specific areas, often close to doorways, which became self-selected smoking areas. Both smokers and non-smokers supported outdoor smoking restrictions around entrances, but observations revealed that compliance was an issue. Providing clear and consistent rules for smoking around building entrances may benefit both non-smokers and smokers, resulting in positive implications for public health. However, compliance and the movement of smoking to sidewalks and other areas present challenges. In this presentation we also explore policy and design issues regarding the creation of DSAs, the location of DSAs in crowded urban settings, and the likelihood they will be utilized and effective.
This study was conducted with funds from the Ontario Tobacco Research Unit (Policy Grant) and from a graduate research grant from the Canadian Institutes of Health Research.
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PA5-5
TOBACCO SMOKE POLLUTION ON OUTDOOR PATIOS—AN EXPERIMENTAL EVALUATION OF THE SMOKE-FREE ONTARIO ACT
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Background: Jurisdictions around the world have legislated smoking restrictions to protect the health of workers and their citizenry from Tobacco Smoke Pollution (TSP) as called for by the Framework Convention on Tobacco Control. Most legislation efforts have focused on indoor environments. A handful of laws have begun to tackle the issue of exposure to TSP in outdoor places, largely focused on the hospitality sector (e.g. restau-tants). In Ontario, the Smoke-Free Ontario Act (2006) permits smoking on patios provided they are “open air” meaning no roof structure. Awnings and umbrellas are permitted with restrictions. This study was designed to quantify how different patio structures and their configurations may affect TSP concentrations on a patio or the movement of TSP to adjacent indoor areas.
Methods: Researchers used hand-held syringes to sample tobacco smoke (8 cigarettes according to Health Canada’s cigarette testing protocol (55mL puff drawn over 2 seconds every 30 seconds) for 20-minute periods. Air quality measurements (PM2.5) were recorded in the centre of the patio and in the adjacent indoor environment using a TSI Sidepak Aerosol Monitor calibrated for TSP. Experiments were conducted on the same patio when it was open air (no roof structure), with an awning and with patio umbrellas (both touching and not touching). No patrons were present during the experiments and no cooking took place inside the venue during the experiments.
Findings: 1) In each scenario studied, PM2.5 levels were “very good” or “good” at baseline (using the Ontario Air Quality Index). During open-air tests with no structures, PM2.5 levels increased to “moderate” or “poor” levels (average reading of 55micromg/m^3). 2) Scenarios with patio umbrellas produced the highest PM2.5 levels, with readings in the “poor” range (average reading of 82micromg/m^3). 3) The presence of awnings also increased PM2.5 levels whether or not smokers were present, reducing from 65micromg/m^3 to 82micromg/m^3. Outdoor patio smoking caused concomitant increases in indoor PM2.5 levels with the location of DSAs in crowded urban settings, and the likelihood they will be utilized and effective.
This study was conducted with funds from the Ontario Tobacco Research Unit (Policy Grant) and from a graduate research grant from the Canadian Institutes of Health Research.
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RECRUITING AFRICAN-AMERICAN SMOKERS INTO INTERVENTION TRIALS: THE RELATIONSHIPS BETWEEN RECRUITMENT STRATEGY AND PARTICIPANT CHARACTERISTICS

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The under-representation of African-Americans in smoking cessation trials may contribute to pervasive health disparities. The present study examined (1) results of an extensive 9-month recruitment campaign to enroll African-American smokers into a randomized clinical trial and (2) correlates of proactive, reactive, and combination (proactive + reactive) recruitment approaches. African-American smokers (N = 249) completed assessments of readiness to quit smoking, decisional balance, the processes of change, and acculturation. Proactive recruitment consisted of efforts to make personal contact with potential participants. Reactive recruitment consisted of public notices about the study, which required smokers to call the project's telephone number to enroll. Combination recruitment utilized both proactive and reactive methods. Results indicated 43% of smokers were recruited via proactive approaches, followed by proactive (31%) and combination (26%) recruitment. Most participants (76%) completed at least a high school education. The sample was notably low-income, smoked an average of 17 cigarettes per day (cpd) for 23 years, and was moderately nicotine dependent. We found several recruitment trends, indicating that different populations were recruited by each method. As hypothesized, the reactive recruitment strategy was associated with individual-differences, including higher income (b = .31, p = .006), heavier daily smoking (b = .86, p <.001), lower nicotine dependence (b = .38, p = .002), greater readiness to quit (b = .28, p = .002), and greater acculturation (b = -.77, p <.001). These findings highlight the importance of using multiple recruitment strategies to obtain a representative sample of African-American smokers. Moreover, individual determinants of research participation and smoking outcomes are related to the recruitment approach. Reactive recruitment approaches appear to enhance accrual rates (over shorter period of time); however, this approach produces a sample that may not be representative of African-American smokers. Future efforts should use this information to develop culturally-specific recruitment strategies.

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INCLUSION OF WOMEN AND ETHNIC MINORITIES IN CLINICAL TRIALS OF FDA-APPROVED PHARMACOTHERAPY FOR SMOKING CESSATION

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Inadequate inclusion of ethnic minorities in tobacco research has been well established, and despite recent increases in the recruitment of women, more research is needed focusing on gender differences in tobacco use and addiction. Adequate representation of these groups in smoking cessation clinical trials is crucial since each has shown group-specific adverse effects in tobacco-related health outcomes. A review was conducted to assess the extent to which women and ethnic minorities are included in FDA-approved pharmaceutical treatments for smoking cessation. Particular attention was paid to the question of whether changes were observable after the 1994 NIH Revitalization Act was signed into law requiring adequate inclusion of women and minorities in NIH-funded clinical research. Forty-seven of the 80 trials included in this review (58.8%) reported racial data. While Caucasians predominated in these trials, a small, but significant improvement was observed in ethnic minority participation in trials initiated after the 1994 law (15.4%) compared to trials initiated before the law (13.8%). Female participation in these trials pre- and post- 1994 was greater than male participation; however, the number of studies which examined sex differences in response was relatively small. Analyzing all trials, Bupropion SR trials had a significantly higher representation of ethnic minority participants (20.3%) in comparison with nicotine replacement therapy (NRT) trials (14%), and NRT-sponsored trials had a significantly higher proportion of ethnic minority participants (18%) in comparison with pharmacologically-sponsorsd trials (9.1%). Although an improvement in the representation of ethnic minorities in these trials was observed after the 1994 NIH Revitalization Act, overall ethnic minority inclusion continues to be below population levels. Further improvements may be realized with enhanced minority recruitment strategies, increased cultural competency within the research matrix, reduction of logistical barriers that prevent these groups from participating, and review of inclusion criteria which often limit the ability of these groups to participate in these trials.

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SMOKING CESSATION INTERVENTION FOR FEMALE PRISONERS: ADDRESSING AN URGENT PUBLIC HEALTH NEED

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We tested the efficacy of a combined pharmacological and behavioral smoking cessation intervention delivered to women incarcerated in a state prison in the southern U.S. The study design was a randomized controlled trial with a wait-list control group (6-month wait-list). The intervention was a 10-week group intervention tailored for delivery to an incarcerated population. All participants received nicotine replacement therapy according to manufacturer’s instructions for dosing and duration. Two hundred and fifty-two women participated. The intervention group (133) versus the wait-list control group (69) received the control condition (a total of 539 participants with cross-over between control and treatment conditions). Assessments occurred at baseline, end of treatment, and 3, 6, and 12 months. Abstinence was verified by using a CO cutoff of less than 3 ppm. The sample was evenly split between white (44%) and non-white (56%) participants. The mean age was 33.8 years (SD = 9.0 years). Most participants were not married (85%) and most had a high school (41%) or higher (32%) level of education. The majority reported that they had been treated for a mental illness (67%) or substance abuse (38%) problem in their lifetime. GWAS analyses examined. In the Northern Plains differences between the two groups across time. The group intervention combined with nicotine replacement was efficacious compared to the wait-list control group. Sustained quit rates for the intervention group were 18% at end of treatment, 17% at 3-month follow-up, and 12% at 12-month follow-up, quit rates that are consistent with outcomes from community smoking cessation intervention. This was the first clinical trial of smoking cessation with prisoners and demonstrated that female prisoners are interested in smoking cessation. Further, prisoners achieved smoking sustained quit rates similar to community samples when provided with a community standard smoking cessation intervention. Incorporating tobacco control policies and smoking cessation interventions has the potential to meet a significant public health need for incarcerated smokers.

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CIGARETTE SMOKING INITIATION PATTERNS BETWEEN THE SOUTHWEST AND NORTHERN PLAINS TRIBES

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Problem/Objective: Examined the patterns of age of smoking initiation between two distinct American Indian tribal groups.

Methods: A log rank comparison and Cox proportional hazard regression model on data from a population-based, prospective study of Southwest and Northern Plains American Indian and Alaskan aged 18-82.

Results: Forty one percent of Northern Plains and 20% of Southwest tribal participants are current smokers, with 17% and 16%, respectively, classified as former smokers. The cumulative incidence of smoking initiation for those who started smoking before 25 years old among the Northern Plains (56%) is much higher than the Southwest (34%; p<0.01). In the Southwest, men are more likely to initiate smoking at a younger age than are women (p<0.01); in the Northern Plains there is no difference between men and women in the rate of smoking initiation (p<0.16). The influence of smoking initiation on smoking behavior is also examined. In the Northern Plains, both men and women initiate smoking at an earlier age in more recent birth cohorts compared to those born in older birth cohorts. In the Southwest men and women differ in the pattern of smoking initiation across birth cohorts as evidenced by the significant test for interaction (p=0.02). The age of smoking initiation in Southwestern men is fairly constant across birth cohorts, but in women those born in more recent birth cohorts initiate smoking earlier compared to those born in later birth cohorts.

Conclusions: There are regional differences among American Indian tribal groups in age of smoking initiation as well as the age of smoking initiation among American Indians continues to be a major public health concern.

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**PA6-5**

**USE OF PHARMACEUTICAL AIDS IN SMOKING CESSATION: DIFFERENCES BETWEEN LATINOS AND NON-LATINO WHITES**

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Few studies examine differences between Latinos and Non-Latino Whites (NLWs) on use of cessation strategies. We compared Latinos and NLWs (n=1178) on 1) intervention strategies used in prior quit attempts and 2) nicotine patch use during a smoking cessation trial and baseline predictors of use. Participants (n=257; 49% Caucasian, 51% Latino, 80.5% female, M = 13.7 cigs/day) were enrolled in a trial on motivating cessation among caregivers with children with asthma. The nicotine patch was provided free during the intervention to those who wanted to quit. At baseline, Latinos were significantly less likely than NLWs to use the following in prior quit attempts: any pharmacological aid (26.7% vs. 45.6%), Zyban (2.1% vs. 23.3%), hypnosis (1.1% vs. 10.9%), and gradual reduction (8.5% vs. 28.7%). During the trial, more Latinos vs. NLWs (57.3% vs. 37.9%, p <0.05) requested the nicotine patch. However, more Latinos than NLWs self-reported using the patch (53.2% vs. 35.1%, p<0.05). Among Latinos, baseline predictors of requesting the patch were: less pros of smoking (OR = .93, 95% CI .88-.97), being born in the US (OR = 28, 95% CI .09-.81), and greater perceived benefits of quitting for their child’s asthma (OR = 1.4, 95% CI 1.04-1.9); use of the nicotine patch was predicted by: greater motivation to quit (OR = 1.2, 95% CI 1.01-1.3), more past quit attempts (OR = 1.09, 95% CI 1.0-1.2), and being the only smoker in the household (OR = 49, 95% CI 24-99). Among NLWs, greater perceived benefits of quitting related to the child’s asthma (OR = 1.4, 95% CI 1.01-2.05) predicted requesting the patch, while increased perceived personal vulnerability to illness (OR = 1.12, 95% CI 1.0-1.3) predicted patch use. Use of smoking cessation medications and predictors of use differ between Latinos and NLWs.

**PA7-1**

**INCREMENTAL LIFETIME LUNG CANCER RISK: COMPARISON OF EPIDEMIOLOGIC DATA WITH RISKS COMPUTED FOR CARCINOGENIC BAP AND TWO TOBACCO-SPECIFIC NITROSAMINES**

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The International Agency for Research on Cancer (2004) reports that out of approximately 4000 chemicals identified in mainstream cigarette smoke (MCS), 69 chemical carcinogens had been identified by the year 2000. Few investigators have attempted to quantitatively predict cancer risks from smoking on a chemical-specific basis, and most used MCS carcinogens emissions obtained via FTC machine smoking protocols, which do not reflect human smoking topography. Topography-based data exist for three human carcinogens: benzo[a]pyrene (BaP), N-nitrosomethylurea (NNN), and 1-(3-pyridyl)-1-butanone (NNK) that have been determined area and spent cigarette filters, cigarette consumption data, 24 hour urine, plasma and saliva samples were collected. Diet was controlled to avoid potential interferences with biomarkers and ongoing health checks conducted. Mouth level exposure estimates for nicotine, NNK and pyrene showed a dose response in line with ISO tar yield smoked, with 10mg > 4mg > 1mg > NS, and for acrolein 10mg > 4mg > 1mg > NS. The exposure estimates from biomarkers also showed a clear dose response in line with ISO tar yield smoked with 10mg > 4mg > 1mg > NS in all cases. It was found that there were significant correlations between mouth level exposure and appropriate biomarker levels for all smoke constituents. The adjusted R2 values were 82.9% (nicotine), 57.2% (NNK), 76.3% (acrolein) and 56.6% (pyrene). In conclusion, in this study, smokers of lower yield products were exposed to lower levels of the smoke constituents as determined by filter analysis and by biomarkers of exposure and the estimates from the two methods were well correlated.

**PA7-2**

**TOXIC COMPOUNDS IN WATERPIPE (HOOKAH) TOBACCO SMOKE**

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Waterpipe (WP) smoking is widely practiced in the Middle East and North Africa, and is gaining popularity in Europe and North America. Both ancient lore and popular belief posit that WP smoking is less hazardous than smoking cigarettes, but little is known about WP smoking and human exposure to its toxins. Differences in design and usage of WPs and cigarettes are so profound that data available on cigarette smoke composition and toxicity cannot be extrapolated to WPs. For instance, WP tobacco is heated indirectly (~450°C) at about the temperature of a lighted cigarettte (~900°C), and heating is accomplished by placing a burning charcoal disk and screen on top of the tobacco. Variations in both components and operating conditions of the WP may contribute to changes in exposure to smoke toxins. Studies on chemical composition, toxicity, and carcinogenicity of WP smoking are sparse, and there are no reports of actual uptake and respiratory deposition of WP smoke constituents. We have developed methods to generate smoke composition and human exposure data specific to the WP. Experiments were conducted to establish a standardized protocol for measuring WP smoke emissions by determining which WP components (e.g., tobacco blend, heating source, water content) are responsible for the greatest variation in emissions. Preliminary results indicate that carbon monoxide, benzene, and most of the ultrafine particles (<0.1 µm) measured in the mainstream smoke come from the burning charcoal. However, the heated tobacco accounts for most of the 1,3-butadiene, acetaldehyde, and other volatile organics present in the smoke. Results obtained using a standardized WP to determine a range of puffing protocols among actual users will be discussed, and we will present preliminary estimates of human exposure to WP emissions.

**PA7-3**

**A STUDY TO ESTIMATE AND CORRELATE CIGARETTE SMOKE EXPOSURE AS DETERMINED BY FILTER ANALYSIS AND BIOMARKERS OF EXPOSURE**

C.J. Shepperd, D.C. Mariner, M. McEwan, D. O'Reilly, A. Eldridge

A clinical study conducted in Germany compared two methods of estimating exposure to cigarette smoke. Estimates of mouth level exposure of nicotine, NNK, pyrene and acrolein were obtained by chemical analysis of spent cigarette filters followed by reference to laboratory-derived calibration curves (“Filter Analysis”). Simultaneous estimates of smoke constituent uptake were achieved by analysis of urinary biomarkers for nicotine (total nicotine equivalents), NNK (total NNN), pyrene (1-hydroxy pyrene) and acrolein (3-hydroxypropyl-mercaptopurine acid (3-HPMMA)) plus the nicotine metabolite cotinine in both plasma and saliva. The prime objective of this study was to establish the relationship between the exposure estimates obtained by the two methods. 200 Volunteer subjects were recruited into the 19-day study; 50 smokers of each of 1-2mg, 4-6mg and 9-10mg ISO tar yield cigarettes and 50 non-smokers. Smokers underwent two periods of home smoking, each followed by confinement in a clinic. In the clinical setting, smoking was permitted ad lib in a designated area and spent cigarette filters, cigarette consumption data, 24 hour urine, plasma and saliva samples were collected. Diet was controlled to avoid potential interferences with biomarkers and ongoing health checks conducted. Mouth level exposure estimates for nicotine, NNK and pyrene showed a dose response in line with ISO tar yield smoked, with 10mg > 4mg > 1mg > NS, and for acrolein 10mg > 4mg > 1mg > NS. The exposure estimates from biomarkers also showed a clear dose response in line with ISO tar yield smoked with 10mg > 4mg > 1mg > NS in all cases. It was found that there were significant correlations between mouth level exposure and appropriate biomarker levels for all smoke constituents. The adjusted R2 values were 82.9% (nicotine), 57.2% (NNK), 76.3% (acrolein) and 56.6% (pyrene). In conclusion, in this study, smokers of lower yield products were exposed to lower levels of the smoke constituents as determined by filter analysis and by biomarkers of exposure and the estimates from the two methods were well correlated.
PA7-4 EVALUATING ORAL, NON-COMBUSTIBLE POTENTIAL REDUCED EXPOSURE PRODUCTS FOR SMOKERS

Thomas Eisenberg, Ph.D.*, Virginia Commonwealth University

Several orally-administered, non-combustible potential reduced exposure products (PREPs) are marketed to reduce smokers' exposure to tobacco toxics such as carbon monoxide (CO) and tobacco specific nitrosamines (TSNAs). For example, Star Scientific markets Ariva, a "snuff hard" tablet, while R.J. Reynolds markets Camel Snus, a moist snuff sold loose or in small bags. However, if these or other oral PREPs for smokers fail to suppress cigarette abstinence symptoms, their potential to reduce smoker toxicant exposure may not be realized. This report describes the toxicant exposure and abstinence suppression associated with the use of oral, non-combustible PREPs for smokers. Smokers (N = 20) completed four, 5-day conditions that differed by product used: Ariva, Camel Snus, own brand cigarettes, or no tobacco. On days 1, 3, and 5 of each condition, toxicant exposure was assessed with expired air CO and urine cotinine (metabolite of nicotine) and NNAL (metabolite of the TSN NNK), while abstinence symptoms were assessed with computerized questionnaires. Relative to own brand cigarettes, all conditions were associated with less CO exposure, but, by day 5, only no tobacco use decreased urine cotinine and NNAL levels significantly. Most abstinence symptom ratings increased significantly from day 1 to day 5 in the no tobacco condition, while ratings on several abstinence symptoms (e.g., urge to smoke, impatience, irritability/frustration/anger) also increased from day 1 to day 5 in the Ariva and/or Camel Snus conditions. While oral, non-combustible tobacco products may be able to reduce exposure to CO and some other toxics, their inability to suppress abstinence symptoms in cigarette smokers may limit their effectiveness as PREPs. Clinical study of PREP-associated toxicant exposure and abstinence symptom suppression is a valuable part of any comprehensive PREP evaluation strategy.

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PA7-5 REVERSING NICOTINE DEPENDENCE: EVIDENCE FROM STUDIES OF TOBACCO REDUCTION OR SUBSTITUTION WITH POTENTIALLY REDUCED HARM PRODUCTS

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Interest in reducing tobacco use or substituting potentially reduced harm products (PREPS), as an endpoint or prelude to cessation, has recently increased. Given the association between lower nicotine dependence (ND) and successful cessation, the possibility of smoking reduction or PREP substitution reducing ND warrants evaluation. We used data from two trials: (1) Study 1 (N = 107), a smoking reduction facilitated with nicotine replacement therapy (NRT); (2) Study 2 (N = 68), substitution of smoking with Quest cigarette (.3 mg or nicotine free, .05 mg). We assessed changes in ND through the Fagerstrom Test of Nicotine Dependence (FTND, with and without cigarettes/day[CPD]) and smoking topography. Sample demographics were: Study 1, 52.3% female, Age (M = 46.5, SD = 10.1), CPD (M = 16.6, SD = 11.9), FTND (M = 5.8, SD = 1.5); Study 2, 50% female, Age (M = 38.9, SD = 14.5), CPD (M = 20.3, SD = 7.2), FTND (M = 5.1, SD = 2.0). In Study 1, the FTND score, without including CPD in the score, declined significantly over 6 weeks, p<.0001. Three items contributed to this decline, latency to first cigarette on awakening, difficulty refraining from smoking, and smoking when sick in bed, p<.01. In addition, over the 6-week reduction period, time of first cigarette increased by 80 minutes, p<.0001. In study 2, FTND scores based on smoker's own brand and after 6 weeks of Quest cigarettes, decreased more in the .05 mg condition than the .3 mg condition, p<.0001. The results of the current analyses suggest that cigarette reduction with NRT or use of a PREP can produce decreases in some elements of nicotine dependence. Further research is needed in this area.

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PA8-1 ADOLESCENT ORGANIZED ACTIVITY INVOLVEMENT AND ADOLESCENT SMOKING: EXAMINING EXPOSURE TO SMOKING PEERS AS AN EXPLANATORY MECHANISM

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Engagement in organized, out-of-school activities is frequently associated with lower risk of adolescent problem behaviors, such as smoking. However, little is known about mechanisms by which such engagement in activities and smoking patterns are linked. Here we test the hypothesis that the relationship between organized activities and smoking is mediated by time spent with smoking friends. Participants were 1283 9th and 10th graders (Mean age = 15.6, 57% Female, 73% White) recruited for a longitudinal study of social emotional influences on adolescent smoking experience. Adolescents reported on the types of organized activities in which they were involved. Factor analysis yields, 5 activity domains: coached sports, non-coached sports, extracurricular activities, music activities, and religious activities. Adolescents also reported the number of cigarettes they had smoked per day during the past 30 days. Additionally, adolescents were asked how often they were with friends while they were smoking. Analyses indicated that involvement in coached sports (Beta = .07, p < .05), extracurricular activities (Beta = .11, p < .001), and religious activities (Beta = -.18, p < .001) was associated with lower levels of smoking.

Next, a series of analyses was conducted to test whether peer-smoking exposure mediated the relationship between adolescents’ organized activities and their smoking behaviors (Baron and Kenny, 1986). Sobel's tests indicated that exposure to smoking peers mediated the relationship between all forms of activity involvement and smoking behavior (all p values < .01). Interestingly, however, the relationship of religious involvement and adolescent smoking was not fully mediated by exposure to smoking peers (Beta = -.06, p < .05). These findings suggest that examining the developmental implications of adolescent engagement in non-school activities, especially sports and extracurricular activities, may be better understood from the perspective of the broader social context.

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PA8-2 THE EFFECT OF PHYSICAL ACTIVITY ON SMOKING BEHAVIOR IN HIGH-SCHOOL: A LATENT GROWTH CURVE MEDIATION MODEL THROUGH GLOBAL PHYSICAL SELF CONCEPT AND PEER SMOKING

Daniel Rodriguez, Ph.D.*, and Janet Audrain-McGovern, University of Pennsylvania

A previous cross-sectional study found that global physical self-concept (GPSC) mediates the relation between physical activity (PA) and team sport participation, and adolescent smoking. However, it is unclear whether those effects would persist beyond high school into young adulthood. Moreover, as peer smoking is a key correlate of adolescent smoking, it is another potential mediating mechanism; it is possible that adolescents involved in team sport, an environment eschewing smoking, will be less likely to affiliate with peers who smoke, therefore less likely to smoke. Expanding upon the findings of past research, we tested these possibilities in a four wave latent growth curve model (LGCM), assessing indirect paths from 12th grade PA and team sport participation to baseline smoking and smoking trend through peer smoking and GPSC in a sample of 985 young adults (age 18 at baseline). The LGCM fit the data quite well, chi-square=110.94, p = .0001, CFI=.98, RMSEA=.03, WRMR=.69. As expected, both team sport and PA had significant negative indirect effects on baseline smoking through GPSC. However, only team sport had a significant negative indirect effect through peer smoking. Only one variable had a significant indirect effect on smoking trend. GPA had a significant negative effect on smoking trend via peer smoking and then baseline smoking level. The findings of this study are consistent with the past cross-sectional findings, suggesting that GPSC indeed mediates the relationship between PA and smoking. The findings also suggest an alternative pathway through peer smoking. Engaging in alternative environments precluding smoking, such as team sport, may indeed protect by reducing exposure to smokers. Moreover, although not initially hypothesized, GPA is a key predictor of reduced smoking beyond high school.

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PA8-3

EFFECTS OF A COMPREHENSIVE CHARACTER EDUCATION PROGRAM ON STUDENT SMOKING: FINDINGS FROM 4 STUDIES

Brian R. Flay, D.Phil.*, Oregon State University

Background: The Positive Action program (PA) is a comprehensive character education program that teaches students to be aware of how they feel about themselves when they do various behaviors, how these feelings influence thoughts, and how thoughts influence behavior. The author has conducted multiple evaluations of the program in elementary schools. Outcomes investigated include academic achievement, multiple behaviors and character. This presentation focuses on tobacco use outcomes, but will include others when of direct interest.

Methods: I report results from 4 studies. Study 1 was an intensive case study of program implementation in a rural elementary school where variation in teacher delivery was related to student smoking among 159 4th and 5th graders. Study 2 used archival student behavior data from 93 elementary schools a matched-control study followed into middle/high schools. Studies 3 and 4 were school-based randomized trials in Hawaii and Chicago which 20 and 14 schools, respectively, were randomly assigned from pairs of schools matched on archival school-level data, and students were surveyed at baseline and at the end of grade 5 after 3 years of PA.

Results: Study 1 found a dose-response relationship between amount of PA received and likelihood of smoking initiation (chi square = 12.6, p<.01). Study 2 found a dose-response relationship between the proportion of middle or high school students who had received PA in elementary school and smoking incidents in middle school (ANOVA one-tailed p=.03) and high school (ANOVA one-tailed p=.04). In study 3, students in PA schools were 30% less likely to report ever smoking (p=.012, combined substance use). In study 4, students in PA schools were 29% less likely to report ever smoking (p=.023, combined substance use).

Discussion: The replicated results from 2 randomized trials of Positive Action suggest that it can routinely reduce the onset of smoking by about 30% by the end of grade 5. Data from quasi-experimental studies suggest 1) strong dose-response relationships by level of program implementation and 2) that the effects are maintained, and may even increase, as students move through middle and high school.

Studies 1 and 2 were unfunded and conducted while the author was at the University of Illinois at Chicago. Study 3 was funded by NIH/NIDA grant #R01-DA13474 to Brian Flay, first at the University of Illinois at Chicago and then at Oregon State University. Study 4 was funded by the U.S. Department of Education grant #R305L030072, first at the University of Illinois at Chicago and then at Oregon State University.

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PA8-4

SEQUENCING OF DSM-IV CRITERIA OF NICOTINE DEPENDENCE IN ADOLESCENCE

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Objective: To identify the sequencing and staging of DSM-IV symptoms and criteria of nicotine dependence in adolescence.

Methods: The data are from five waves of household interviews in a multistate cohort of adolescents (mean age 14.1 years at W1) interviewed at 6-month intervals. The analytical sample of 353 new tobacco users started to use tobacco within 12 months preceding W1 or between W1 & 5. At each interview, detailed monthly histories of DSM-IV dependence symptoms were ascertained to define the 7 DSM-IV dependence criteria. Log linear models for parametric event sequence analysis previously applied to the identification of stages in drug use (Kandel & Yamaguchi, 1993; Yamaguchi & Kandel, 1996) were estimated to identify potential patterns of progression in criteria of dependence experienced over time.

Results: Tolerance (22.6%) and impaired control (20.6%) are more likely to be experienced than withdrawal (14.7%), great deal of time spent using (4.6%), unsuccessful attempts to quit (4.5%), use despite negative consequences (2.8%), and neglect of other activities (2.3%). A number of adolescents experience multiple criteria within the first month of experiencing any criterion. Tolerance and impaired control precede withdrawal or other criteria; withdrawal precedes other criteria. Alternate progression models are discussed, as well as differences and similarities across gender and racial/ethnic subgroups.

Conclusion: This is the first report in the literature of an attempt to sequence criteria of nicotine dependence in adolescence. The sequencing tendency appears to be relatively weak.

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PA8-5

LONGITUDINAL PATTERNS OF QUITTING IN YOUTH SMOKERS

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Background: Most smokers (80%) begin smoking before the age of 18. Further, 23% of high school seniors report smoking in the past month. Youth smoking is a serious public health issue, and efforts to reduce smoking by youth are essential, including prevention and cessation. However, little information is available about whether youth are attempting to quit smoking, and what factors predict or influence youth quitting behavior.

Data: As part of the Minnesota Adolescent Community Cohort (MACC) study, data were collected from 2000 to 2006 from over 4,000 teens. Phone interviews were completed every six months regarding smoking and related behaviors. Survey data included age at smoking onset, gender, race, parental smoking status, and region of the state; psychosocial data included opinions about tobacco, parental awareness of smoking and quit intentions.

Methods: Teens who reported past month smoking were defined as regular smokers, then at each time point following were dichotomized as smoking or quitting, based on past month smoking. Only teens who reported smoking at least once in the past month at any time point were included in this analysis.

Analysis: A latent class growth analysis was performed to determine the patterns and number of distinct classes of quitters that were present in the sample of MACC youth over time. Multinomial logistic regression was used to characterize class membership by psychosocial and demographic patterns.

Results: After adjustment for age at onset of regular smoking, region of residence, and gender, four latent classes of quitting behavior were defined among 1,154 regular smokers. The majority of the sample was never quitters (49%), followed by eventual quitters (19%), relapers (18%), and successful quitters (14%). Membership within latent classes varied significantly by parental awareness, quit intentions, and other psychosocial factors.

Conclusion: Youth in the MACC study engaged in numerous patterns of quitting behavior, varying by demographic and psychosocial factors. Applications to youth cessation interventions will be discussed.

National Cancer Institute.

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PA9-1

DEVELOPMENT OF PROCEDURES FOR EARLY SCREENING OF CESATION MEDICATIONS

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Ideal medical screening procedures are those that quickly and cheaply evaluate the clinical efficacy of medications, so that promising drugs proceed to large-scale clinical trials and unpromising drugs do not. We sought to develop a quick and inexpensive procedure to detect medication efficacy by combining features of laboratory studies (e.g., a within-subjects, cross-over design) with those of clinical trials (e.g., abstinence as the dependent measure). Further, we manipulated both intrinsic (treatment seeking) and extrinsic (reinforcement) quit motivation to identify procedures with optimal sensitivity to detect medication (nicotine vs. placebo patch) effects on smoking abstinence. Subjects were 136 adult smokers who either intended to quit permanently within the next month (‘treatment seekers’, n=45) or to not quit within the next 6 months (‘non-seekers’, n=91). All smoked ad lib during weeks 1 and 3, and were instructed to quit during weeks 2 and 4 while using nicotine (21 mg) or placebo patch, with patch order between weeks 2 and 4 counter-balanced across subjects. In addition, half of each group was randomly assigned to receive monetary reinforcement for abstinence ($12 for each abstinent day) or no reinforcement. Abstinence was verified daily by CO<5 ppm. Results showed that nicotine (vs. placebo) patch increased days of abstinence in treatment seekers but not in non-seekers (p<.005 for interaction of nicotine x treatment seeking). Monetary reinforcement had a strong main effect on abstinence (p<.001) but did not interact with nicotine or treatment seeking status. The data suggest that type of quit motivation is an important factor in medication testing. We conclude that a 4-week, within-subjects procedure involving a relatively small group of smokers interested in quitting soon may provide a sensitive test of efficacy of cessation medications.

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PA9-2

VALIDATION OF A PARADIGM FOR SCREENING MEDICATIONS FOR NICOTINE DEPENDENCE
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Research to improve pharmacotherapy for nicotine dependence is hindered by a lack of validated early screening paradigms to predict likely efficacy in the clinical setting. This within-subject behavioral pharmacology study sought to validate a paradigm to assess medication effects on smoking relapse following a programmed lapse (based on the paradigm by Juliano, Stitzer and colleagues). Using varenicline as a positive control, 48 smokers completed two 21-day experimental phases separated by a 7-day wash-out period. Treatment order (varenicline vs. placebo) was randomized. Each experimental period included medication run-up (days 1-10), monitored abstinence (days 11-13), programmed smoking lapse (day 14), and observation days (15-21) during which participants were encouraged to stay quit. Primary outcomes were number of days abstinent during the 7-day observation period and 7-day abstinence, both confirmed by CO. Secondary outcomes were changes in negative affect, smoking urges, and withdrawal symptoms during monitored abstinence (day 13 - day 10). In the mixed effects model of number of days to relapse, there was a significant effect of order interaction (p<0.01). Among participants receiving varenicline first, mean days to relapse were 4.1 and 5.0 for the varenicline and placebo phases, respectively; among those receiving placebo first, mean days to relapse were 4.7 and 2.7 for varenicline and placebo. There was also a significant drug by order interaction for smoking urges, and withdrawal symptoms during monitored abstinence (day 13 - day 10). In the mixed effects model of number of days to relapse, there was a significant effect of order interaction (p<0.01). Among participants receiving varenicline first, abstinence rates were 52% for varenicline and 22% for placebo. There was also a significant drug by order interaction for smoking urges, and withdrawal symptoms during monitored abstinence (day 13 - day 10). In the mixed effects model of number of days to relapse, there was a significant effect of order interaction (p<0.01). Among participants receiving varenicline first, abstinence rates were 52% for varenicline and 22% for placebo. Main effects of treatment were observed for abstinence-induced changes in negative affect (p<0.01), and total withdrawal symptoms (p<0.05); effects on smoking urges were marginal (p=0.08). These data indicate that this paradigm is sensitive to medication effects on abstinence; however, the observed drug by order interaction suggests that a between-subjects design may be preferable for early screening of medication effects on abstinence.

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PA9-3

THE COMBINED USE OF DENICOTINIZED CIGARETTES AND TRANSDERMAL NICOTINE IN OUTPATIENT, NON-TREATMENT SEEKING SMOKERS
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Sensorimotor smoking stimuli are important determinants of cigarette use as illustrated by recent laboratory work demonstrating persistent smoking in inpatient participants exclusively smoking denicotinized (DN) cigarettes and clinical research illustrating DN cigarettes as an adjunct therapy in individuals receiving transdermal nicotine (TDN). The present study aimed to determine whether DN cigarettes lose their reinforcing and/or subjective effects in outpatient volunteers over a 9-day period and to assess whether TDN alters the effects of smoking DN cigarettes. Seventy-two daily smokers completed a 12-day outpatient study. After a preferred brand assessment period, participants were randomly assigned to one of four conditions based on the dose of TDN and the type of cigarettes available: 0mg/DN, 7mg/DN, 21mg/DN, 0mg/Nicotine-containing (NC). The number of DN cigarettes smoked in the natural environment and during a laboratory self-administration test was similar to NC cigarettes and neither changed significantly over days. DN cigarettes reduced the total volume of smoke inhaled, but this was relatively stable over days. Participants smoking DN cigarettes reported greater nicotine withdrawal and reduced positive and increased negative cigarette ratings. Compared to placebo, transdermal nicotine decreased the number of denicotinized cigarette smoked, reduced the total volume of DN cigarette smoke inhaled, reduced nicotine withdrawal, but had little effect on the subjective effects of smoking DN cigarettes. This indicates that factors driving continued use of DN cigarettes, whether their use subsides as withdrawal dissipates, and whether they address motives for smoking distinct from current pharmacotherapy.

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PA9-4

PRELIMINARY EVIDENCE OF EXTINCTION OF SMOKING BEHAVIOR WITH BUPROPION
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In clinical trials bupropion doubles long-term smoking cessation rates. Nevertheless, most smokers using bupropion relapse back to smoking within the first few weeks of cessation. Bupropion has been hypothesized to help smokers to quit in part by reducing the reinforcing effects of smoking during the typical 1-week pre-quit prepping treatment phase. Learning theory and previous basic animal and human research support the hypothesis that a longer duration of bupropion treatment before a targeted quit date (TQD) will promote extinction of smoking behavior, yielding greater decreases in the number of cigarettes smoked per day (CPD) before quitting, as well as reduced lapses and higher rates of continuous abstinence after quitting. To test these predictions, regular smokers were randomized to a brief run-in group (3 weeks of placebo, followed by the typical week of pre-TQD bupropion; n=37) and an extended run-in group (4 weeks of pre-TQD bupropion; n=33). Both groups received 7 weeks of post-TQD bupropion and 6 sessions of group behavioral counseling (3 pre-TQD sessions). Preliminary analyses suggest that, as predicted, the pre-quit decrease in CPD was reliably greater among the extended run-in group (mean=38%) than the brief run-in group (mean=22%; p < .01). In addition, survival analyses demonstrated significantly greater time to first lapse among the extended than the brief run-in group (p < .03). Finally, though the study was not adequately powered to detect differences in outcome, continuous abstinence at 3-month follow-up was similar in the predictors: for brief run-in, 59% of the extended run-in groups, respectively; OR = 1.86, p = .27. These preliminary results are generally consistent with an extinction mechanism for bupropion and suggest straightforward methods for improving cessation with bupropion, which might also be applicable to other smoking cessation drugs (e.g., NRT and varenicline). Further analyses will consider the impact of pre-cessation duration on withdrawal, craving, and the subjective effects of smoking, as well as relationships between pre-cessation effects of bupropion and post-quit clinical outcomes.

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PA9-5

MEDICATION ADHERENCE AND SMOKING TOPOGRAPHY AMONG AFRICAN-AMERICAN SMOKERS IN A PHARMACOKINETICS STUDY
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The current study assessed the effects of bupropion on smoking topography in a sample of 48 African-American smokers enrolled in a pharmacokinetics study. During the pharmacokinetics period, participants were instrumented with nicotine status monitors and were instructed not to quit smoking during the first 2 weeks of this period. We examined whether bupropion intake and cigarette type (menthol vs. non-menthol) impacted topography. Bupropion was dispensed with Medication Event Monitoring System (MEMS) caps; adherence verification data was downloaded from the device. Participants smoked one cigarette of their usual brand using a hand-held topography device at baseline again at 2 weeks after starting bupropion. Topography data included average puff counts, puff volume, puff durations, interpuff intervals, and average flow and peak flow. Carbon monoxide boost was measured by assessing alveolar carbon monoxide (CO) levels 2 minutes before and after smoking a cigarette. Paired t-tests were used to compare differences in smoking topography and CO boost before and during the use of bupropion. Participants mean age was 50 years (SD=7.7) and BMI 29.9 (SD=7.0). Twenty-eight (58%) participants were female and mean age of initiation of smoking was 17 years (SD=4.4). Participants smoked an average of 14.4 cpd (SD=5.4) and had smoked for an average of 33 years (SD=10.1). There was no change in cpd before and during the use of Bupropion (mean cpd 14.4 SD=5.4 vs. 13.3 SD=5.4 p=0.374). Participants were 80% adherent to their medication regimen. There was a significant reduction in the interpuff interval from 33.4 seconds (SD=21.6) prior to the use of bupropion to 25.1 seconds (SD=12.32) during the use of bupropion (p=0.003). Similarly there was significant reduction in pre-cigarette CO and post-cigarette CO from 17.4 SD=17.1 to 12.1 SD=12.8 (p=0.001) and 21.6 SD=15.0 to 16.5 SD=8.8 (p=0.001) respectively but there was no change in CO boost. No differences were found in puff counts, puff volume, puff duration, average flow and peak flow. This data suggests that 2 weeks of bupropion does not significantly affect smoking topography.

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PA10-1  IMAGING ENDOGENOUS MU OPIOID RECEPTORS AFTER TOBACCO SMOKING

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Mean whole brain receptor availability (binding potential) data were obtained via positron emission tomography (PET) from healthy normal male tobacco smokers. The radioligand [11C]carfentanil was used as the radiotracer. Coronal, horizontal, and sagittal brain scan slices were taken in x,y,z coordinates per the Talairach-Tournoux (1988) brain atlas before and after smoking. The location of endogenous opioid receptors (predominately mu) throughout the human brain is impressive! Major brain areas include gray matter in the frontal cerebral cortex, cingulate gyrus, thalamus, ventral basal ganglia, amygdala, posterior cerebellum, and ptilary gland. Smoking average nicotine cigarettes decreased the binding potential of [11C]carfentanil in the gray matter of the cerebral cortex and anterior cingulate gyrus. Smoking increased the binding potential in the thalami, amygdala and ventral basal ganglia. The increases and decreases in the binding potential were calculated by subtracting the before and after average tobacco smoking scans. Changes in the binding potential of a radioligand are usually interpreted as displacement by the endogenous transmitter. The present pilot PET study suggests that nicotine not only enhances the release of endogenous brain opioids, it primarily reduces their release in the endogenous brain distribution.

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PA10-2  IMAGING OF NICOTINE OCCUPANCY OF BRAIN BETA-2 NICOTINIC ACETYLCHOLINE RECEPTORS AFTER SMOKING LOW NICOTINE AND NICOTINE-FREE QUEST CIGARETTES

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The addictive properties of tobacco smoking are mediated by the actions of nico-otine at beta2-nicotinic acetylcholine receptors (beta2-nAChRs) in brain. To reduce the addictive properties of tobacco smoking, persistent efforts have been made to pro-duce nicotine-free cigarettes. Quest cigarettes, which are made from genetically modified tobacco, were developed to help smokers reduce their exposure to nicotine. These cigarettes are marketed as low nicotine (0.8mg), extra low nicotine (0.3mg), and nicotine-free (0.05mg). Despite being marketed as nicotine-free cigarettes, recent studies have demonstrated that smokers compensated for the lower nicotine levels by increasing their puff volume, suggesting that they may be getting more nico-tine into their brain than desired. We used [123I]I-85380 SPECT imaging to measure the amount of nicotine delivered to brain beta2-nAChRs after smoking low nicotine ciga-rette, nicotine-free cigarette, or using nicotine inhaler, which subjects used every 20secs. The availability of brain beta2-nAChRs was measured at ~7 days abstinence. [123I]I-85380 SPECT scans were obtained both prior to and after nicotine challenge using one of Quest cigarettes or a nicotine inhaler. Cigarettes were attached to a flow meter device to assess inter-individual differences in smoking topography. Arterial and venous nicotine levels were measured and area under the curve was cal-culated to quantify the amount of nicotine delivered to brain. There were no substan-tive differences in smoking topography between the two cigarette conditions. Plasma nicotine levels were higher for the low nicotine cigarette compared to the nicotine inhaler and nicotine-free cigarette. After smoking a low nicotine cigarette or using the nicotine inhaler, 4-fold number of beta2-nACHRs (30-46%) were occupied than after smoking a single nicotine free cigarette (7-16%). These preliminary findings suggest that while no compensatory behavior was exhibited in the nicotine free group, smoking Quest low nicotine cigarette results in 3-fold higher occupancy than nicotine free Quest cigarettes, but similar occupancy as for inhaler.

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PA10-3  REGULATION OF BETA2 NICOTINIC ACETYLCHOLINE RECEPTORS IN LIVING TOBACCO SMOKERS DURING ACUTE AND PROLONGED ABSTINENCE: A [123I] I-85380 SPECT IMAGING STUDY

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Preclinical and clinical studies demonstrate a nicotine-induced upregulation of nicotinic acetylcholine receptors (nACHRs), which may be reversible; however, the exact timing of the normalization upon abstinence is unknown. One caveat of imag-ing living human smokers is the potential for interference from residual nicotine that may block measurement of beta2-nAChR availability during early abstinence. Our preclinical data suggested that at least 7 days of abstinence were necessary for nicotine to completely clear from brain. Thus, we imaged smokers at 7 days of abstinence and demonstrated significantly higher beta2-nAChR availability throughout the brain in smokers compared to nonsmokers. In this study, human tobacco smokers were imaged during early (1 day) and prolonged abstinence (up to 12 weeks) using [123I]I-85380 SPECT to examine beta2-nAChR availability. To date, 18 smokers (10 women, 8 men; 41.2 ± 9.2 years old) have been studied. At the time of admission, tobacco smokers smoked 20.8 ± 8.5 cigarettes/day. Smokers were imaged at either 24 h, 1 wk, 2 wks, and 4 wks of abstinence, or at 1 wk, 4 wks and 12 wks of abstinence. They were helped to quit smoking with contingency manage-ment. 5-IA was administered i.v. as a bolus and constant infusion for 8 h and sub-jects were scanned between 6-8 h. Preliminary results suggest that compared to 1 wk abstinence, e.g., when beta2-nAChR availability is higher than nonsmokers, 5-IA uptake was, on average, lower at 24 h (14-22%), 4 wks (7-12%) and 12 wks (18-27%) abstinence, but not different at 2 wks (0.4-6%) of abstinence in the striatum, cerebellum, and cortical brain areas. Lower beta2-nAChR availability at 24 h absti-nence is likely due to residual nicotine in brain blocking 5-IA binding whereas the decrease in beta 2-nAChR availability at 12 wk abstinence reflects receptor nor-malization. Collectively, this suggests that residual nicotine from tobacco smoke takes about 1 week to clear from the brain, and that beta2-nAChR availability decreases progressively over 12 weeks of abstinence.

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PA10-4  GENOME-WIDE LINKAGE SCAN FOR NICOTINE DEPENDENCE IN EUROPEAN-AMERICANS AND ITS CONVERGING RESULTS WITH AFRICAN-AMERICANS

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In this study, we conducted a genome-wide scan in 629 individuals representing 200 nuclear families of European-American (EA) origin of the Mid-South Tobacco Family cohort with the goals of identifying vulnerability loci for nicotine dependence (ND) in the EAs and determining converging regions between the EA and African-American (AA) samples. We examined 385 autosomal microsatellite markers for ND, which was assessed by smoking quantity (SQ), the Heaviness of Smoking Index (HSI), and the Fagerstrom Test for ND (FTND). We found eight regions on chromo-somes 2, 4, 9-12, 17, and 18 that met the criteria for suggestive linkage to ND in the EA sample. Of these, the region on chromosome 4 showed suggestive linkage to indexed SQ, HSI, and FTND, and the region on chromosome 9 showed suggestive linkage to HSI and FTND. Additionally, we analyzed a combined AA and EA sample and found that the region on chromosome 12 near marker D12S372 showed signifi-cant linkage to SQ and six regions on chromosomes 9-11, 13, and 18 that showed suggestive linkage to ND. When we compared the linkage peaks detected for ND across different ethnic samples, we found that four regions on chromosomes 9 (two regions), 11, and 18 overlapped. On the other hand, we identified five regions on chromosomes 2, 4, 10, 12, and 17 that showed linkage to ND only in the EA sample, and two regions on chromosomes 10 and 13 that showed linkage to ND only in the AA sample.

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PA10-5

BILOGICAL PRIORITIZATION AFTER A GENOME-WIDE ASSOCIATION STUDY: AN APPLICATION TO NICOTINE DEPENDENCE

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Genome-wide association studies will advance the field of nicotine dependence genetics by simultaneously discovering causal variants in known biological targets as well as nominating novel candidate genes. One challenge for interpretation is to balance the evidence from a prior biological literature. We introduce a general method for prioritizing SNPs for further study after a genome-wide association study. Our method is based on a simple data-mining model designed for maximum interpretability and incorporates information from a variety of sources such as molecular biology, evolutionary conservation, linkage disequilibrium and prior results on genetic linkage and association. In the application of our method to nicotine dependence, one component is a three-tiered collection of candidate genes for nicotine dependence derived from a method we introduce for querying the Kyoto Encyclopedia of Genes and Genomes (KEGG). Also included in the model is a recent linkage finding from the Nicotine Addiction Genetics (NAG) study, which is on chromosome 22 for a heavy smoking quantitative trait. We apply this method to the combined set of 33,918 SNPs from a recent genome-wide and candidate gene association study of nicotine dependence known as the NICSNP project. The result is that highly relevant biological targets, such as a nonsynonymous SNP in a CHRNAS, are highlighted by our algorithm, while stronger signals in lower priority genomic regions, are also among the top prioritized signals. We demonstrate how the method can be used to select a set of 1,536 SNPs for genotyping in a replication sample. For use with future genetic association studies of nicotine dependence, we have developed prioritization scores for a comprehensive set of over 11 million SNPs from dbSNP, including the commercial Illumina and Affymetrix one million SNP chips. These can be easily integrated into other association studies to prioritize SNPs for further study. American Cancer Society grant IRG-58-010-50, National Institute on Drug Abuse (NIDA) grants 1R01DA019963, 2R56DA12854, 1K02DA021237, NIDA contract N01DA-0-7079, National Institute of Alcohol Abuse and Alcoholism grant 1R01DA019963, 2R56DA12854, 1K02DA021237, NIDA contract N01DA-0-7079, National Institute of Alcohol Abuse and Alcoholism grant 1U1OA008401, and National Institute of Mental Health grant SU24MH68457.

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PA11-1

A TAXOMETRIC ANALYSIS OF NICOTINE DEPENDENCE IN A NATIONALLY REPRESENTATIVE SAMPLE

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Although conventional diagnostic systems propose that dependent smoking is categorically distinct from nondependent smoking, most contemporary theories maintain that smokers do not fall into categories, but rather vary quantitatively in their degree of dependence. This is the first investigation using taxometric procedures to determine whether nicotine dependence is best conceptualized as a dimensional or categorical (i.e., taxonic) phenomenon. Using data from the 2003 National Survey on Drug Use and Health (NSDUH; N = 11,441), results from the MAMBAC, MAXEIG, and LMODE taxometric analyses provided strong evidence that nicotine dependence has a taxonic latent structure. Members of the dependent taxon, which constituted approximately 48% of those who reported any smoking in the past 30 days, consumed a higher number of cigarettes per day, had stronger craving to smoke, higher levels of tolerance to nicotine, more rigid smoking patterns, and shorter latencies to first and most recent quit attempts of at least 3-mo duration. Factor analysis on aggregate ratings of symptoms, without determining that these measures adequately represent sensitivity to withdrawal, to address this limitation, we applied the psychometric Rasch modeling approach to estimate an underlying latent construct (withdrawal sensitivity) in 1,049 smokers who had quit at least twice. Respondents completing the Lifetime Tobacco Use Questionnaire rated (5-point scale) the severity of symptoms (irritability, restlessness, increased appetite, depression, difficulty sleeping, craving for tobacco, anxiety, and difficulty concentrating) experienced in their first and most recent quit attempts of at least 3-mo duration. Factor analysis on psychometric correlations established that one latent variable accounted for 74% of the variability in symptom scores Rasch modeling with a single latent factor fit the symptoms well, except for increased appetite. Rasch modeling indicated that an endorsement of higher levels of some symptoms (e.g., depression) were less likely to occur at a given level of sensitivity than endorsement of similar levels of other symptoms (e.g., craving). Rasch analysis estimated the sensitivity of each individual at each quit attempt; sensitivity scores were then standardized to have a mean of zero (and standard deviation of 1.71). The Expected A Posterior (EAP) estimate of sensitivity has a one-to-one relationship to the total score across all symptoms for individuals who responded to all symptoms. The standard error for the EAP estimates was a function of the estimated sensitivity and followed a U-shape with moderate values (0.3 to 0.6) for individuals with a sensitivity in the range of -1.7 to +1.7. For 57.6% of respondents, sensitivity scores decreased modestly (mean = 0.16, SD = 1.08) between first and most recent quit attempts. Education, gender, and ethnicity were not related to changes in sensitivity. Age at first quit and number of cigarettes per week just before the first quit were statistically significant, but each accounted for only about 1% of the variability in sensitivity change.

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PA11-2

EVALUATING THE VALIDITIES OF DIFFERENT CONCEPTUAL CONSTRUCTS OF NICOTINE DEPENDENCE

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The Diagnostic and Statistical Manual (4th ed.) (DSM-IV) provides a widely used measure of nicotine dependence with considerable face validity. However, very few data support the validity of DSM-IV criteria as predictors of key smoking-related characteristics or treatment outcome. In anticipation of the DSM-V, it would be advantageous to explore modifications of nicotine dependence criteria. The primary objective of the current study was to compare the validities of two novel and empirically-derived sets of DSM-IV criteria for nicotine dependence to the validity of the full DSM-IV criteria. The first set of criteria was based on the notion that Withdrawal, Difficulty Controlling Use, and Use Despite Harm are specific to nicotine dependence (Hughes, 2006). The second set of criteria was garnered from classic theory that underscores the significance of Tolerance and Withdrawal in the etiology of dependence. Two samples of cigarette smokers (Ns = 810 and 322) were derived from three randomized clinical trials of DSM-IV modified criteria. Both sets of criteria were analyzed separately, providing for the replication of our findings among diverse groups of participants and varying treatment contexts. DSM-IV nicotine dependence criteria were assessed at baseline with the Diagnostic Interview Schedule for DSM-IV (DIS-IV), a scoring algorithm. DSM institution (FTND), and Fagerstrom Test of Nicotine Dependence (FTND) were used to assess sample (N = 11,265) and within male (N = 5,889) and female (N = 5,552) subgroups.

E MAP'S SRNT SYMPOSIUM ON NICOTINE DEPENDENCE

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PA11-3

EXAMINING WITHDRAWAL SENSITIVITY WITH RASCH MODELING OF LIFETIME TOBACCO USE QUIT ATTEMPT RATINGS

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Traditional examination of withdrawal symptoms involves calculating individual aggregate ratings of symptoms without determining that these measures adequately represent sensitivity to withdrawal. To address this limitation, we applied the psychometric Rasch modeling approach to estimate an underlying latent construct (withdrawal sensitivity) in 1,049 smokers who had quit at least twice. Respondents completing the Lifetime Tobacco Use Questionnaire rated (5-point scale) the severity of symptoms (irritability, restlessness, increased appetite, depression, difficulty sleeping, craving for tobacco, anxiety, and difficulty concentrating) experienced in their first and most recent quit attempts of at least 3-mo duration. Factor analysis on psychometric correlations established that one latent variable accounted for 74% of the variability in symptom scores Rasch modeling with a single latent factor fit the symptoms well, except for increased appetite. Rasch modeling indicated that an endorsement of higher levels of some symptoms (e.g., depression) were less likely to occur at a given level of sensitivity than endorsement of similar levels of other symptoms (e.g., craving). Rasch analysis estimated the sensitivity of each individual at each quit attempt; sensitivity scores were then standardized to have a mean of zero (and standard deviation of 1.71). The Expected A Posterior (EAP) estimate of sensitivity has a one-to-one relationship to the total score across all symptoms for individuals who responded to all symptoms. The standard error for the EAP estimates was a function of the estimated sensitivity and followed a U-shape with moderate values (0.3 to 0.6) for individuals with a sensitivity in the range of -1.7 to +1.7. For 57.6% of respondents, sensitivity scores decreased modestly (mean = 0.16, SD = 1.08) between first and most recent quit attempts. Education, gender, and ethnicity were not related to changes in sensitivity. Age at first quit and number of cigarettes per week just before the first quit were statistically significant, but each accounted for only about 1% of the variability in sensitivity change.

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PA11-4

TWO-MONTH TEST-RETEST RELIABILITY OF LIFETIME TOBACCO USE QUESTIONNAIRE


The Lifetime Tobacco Use Questionnaire (LTUQ) assesses all forms of tobacco use across the lifespan with retrospective questions and an interactive timeline. We examined the two-month test-retest reliability of the Web-based LTUQ in N=1,229 smoker respondents, aged 18 to 85, participating in an invitation-only Web panel (Time 1: 51.6% females; mean age, 44.0 years; sd=11.9; more than high school education, 98.9%; White, 87.6%). Respondents self-administered the password-controlled questionnaire in 2006. Respondents (n=24) whose self-reports of gender and age varied across the test-retest interval and whose grid-question completion times were in the lowest percentiles were excluded. Time 1 reporting of age at first tobacco use was 15.5 years (sd=3.5); first tobacco tried was cigarettes, 94.2%; and age started weekly smoking, 17.3 years (sd=4.2). Reported percent of time alcohol use was accompanied by tobacco use, 59.6%; > monthly cigar use, 2.0%; smokeless tobacco, 1.3%. We calculated kappa statistic or correlation for demographics (education level, kappa=88; race/ethnicity, kappa=86); tobacco use milestones (age at first use, r=.82; amount first used, kappa=.38; age started smoking weekly, r=.85; smoked >99 cigarettes lifetime, kappa=.81), and 5-point ratings of 13 subjective responses to first tobacco (kappas, 21 to 28). Specific situational questions yielded moderate to strong reliability: limitations on smoking first cigarette of day (kappa=52), when smoked first cigarette of day (kappa=43), age smoked most cigarettes (r=.87), and amount smoked at peak use (r=.85). Self-reports of percent of time tobacco and alcohol were used jointly (r=.78) and amount of alcohol used at peak use (r=.76) also were reported reliably across time. Reliability differed by gender on self-reported age at first tobacco use (males, r=.84; females, r=.79) and age at first cigarette use (males, r=.85; females, r=.79). (All reported kappas and correlations were p<.0001.) The strength of these measures indicates that many behaviors and influences associated with tobacco use can be examined reliably with a self-report, self-administration instrument.

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PA11-5

THE LOSS OF AUTONOMY OVER SMOKING CHECKLIST

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The Hooked On Nicotine Checklist is currently the only available measure of the loss of autonomy over tobacco. It is currently in use worldwide in at least 10 languages. The HONC has some recognized limitations and our goal was to create a second-generation instrument to be used to assess how smokers lose autonomy over smoking and regain it after they quit. A symptom checklist was produced through a process involving item generation, focus group evaluation, item winnowing to optimize psychometric performance in adults, followed by confirmatory evaluations with adults and adolescents. The final 15-item checklist demonstrates excellent reliability (alpha coefficient =.92 in adults and .97 in adolescents) with a one-factor solution explaining 49% of the variance in adults and 69% in adolescents. Symptom counts were associated as expected with age of smoking initiation, lifetime use, smoking frequency, cigarette consumption, and history of failed cessation. Unique advantages of the new instrument over the Hooked On Nicotine Checklist are that it (1) measures symptom intensity; (2) can evaluate the resolution of symptoms over time; and (3) can independently assess tobacco withdrawal, cue-induced craving and psychological dependence on cigarettes.

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PA12-1

PRE-CESSATION TREATMENT WITH NICOTINE GUMS FOR SMOKING CESSATION: A RANDOMIZED TRIAL

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Aims: To test whether a pre-cessation treatment of 4 weeks of mg nicotine gums improved smoking abstinence rates, compared with treatment starting after cessation only.

Participants: 314 daily smokers were enrolled through the Internet, by ads in newspapers and by a letter send to all physicians in private practice in Switzerland, in 2005-2006.

Measurements: Self-reported abstinence rates at the end of treatment. Intervention: In the pre-cessation treatment condition, participants received nicotine gums (4 mg) by mail during 4 weeks before and 8 weeks after their target quit date, and they were recommended to decrease their cigarette consumption by half before quitting. In the post-cessation nicotine condition, participants received nicotine gums (4 mg) during 8 weeks after their target quit date and were instructed to quit abruptly. In both groups, participants were instructed to use 10 gums per day. Instructions were limited to a booklet sent by mail.

Results: 8 weeks after the quit date (end of treatment), self-reported 7-day abstinence rates were 44% in the pre-cessation condition and 42% in the post-cessation condition (p=.68).

Conclusions: Starting NRT 4 weeks before the target quit date was not more effective than starting on the quit date.

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PA12-2

A PLACEBO-CONTROLLED TRIAL TO ASSESS THE EFFICACY OF EXTENDED DURATION NICOTINE PATCH TREATMENT

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The transdermal nicotine patch is the most widely used form of tobacco dependence treatment and current guidelines recommend 8 weeks of treatment. However, there has been a growing recognition that tobacco dependence is a chronic relapsing disorder that may require long-term treatment. In this double-blind placebo-controlled trial, 379 smokers were randomized to: (1) standard therapy (8 weeks 21mg nicotine patch, 16 weeks of placebo patch), or (2) extended therapy (24 weeks of 21mg nicotine patch). The primary outcome was biochemically verified 7 day point prevalence abstinence at week 24. Secondary outcomes included continuous abstinence, time to relapse, and processes of relapse. Abstinence was also verified at week 28. At 24 weeks, point-prevalence abstinence rates were significantly higher in the extended vs. standard therapy arm (32% vs. 20%; OR = 3.53 [1.40-8.92], p = .008). Extended therapy also produced higher rates of prolonged and continuous abstinence (ps < .05). During treatment, extended therapy promoted recovery to abstinence following a smoking lapse (p < .05), but had no effect on initial lapse events. Survival analysis indicated a reduced relapse hazard with extended therapy by the end of treatment (HR = 0.42 [0.27-0.68], p = .0003), with a rebound effect 4 weeks after treatment was discontinued (HR = 2.51 [0.54 11.78], p = .24). These data support the use of extended or even maintenance therapy with transdermal nicotine for tobacco dependence and encourage a reconceptualization of nicotine dependence as a chronic disorder.

Study support: Transdisciplinary Tobacco Use Research Center grant from NC/NIDA (CA PS04718).

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Previous studies have reported that smokers who are misinformed about the safety of Nicotine Replacement Therapy (NRT) are less likely to use NRT. Nicotine patches have been shown to be more effective than placebo in smoking cessation studies. However, there is little information about the factors that influence the use of NRT among smokers who have misperceptions about its safety.

We conducted a survey of 900 smokers in the US to assess the relationship between misperceptions about the safety of NRT and intention to use NRT. The survey included questions about the safety of NRT and smoking while wearing the nicotine patch. The survey also included questions about the use of NRT and smoking cessation.

Results: We found that smokers with misperceptions were less likely to have used NRT in the past. Smokers with misperceptions were more likely to think that smoking while wearing the nicotine patch does not cause heart attacks. Approximately half the smokers were less likely to have used NRT in the past. Smokers with misperceptions were more likely to think that smoking while wearing the nicotine patch does not cause heart attacks. Approximately half the smokers were less likely to have used NRT in the past. Smokers with misperceptions were more likely to think that smoking while wearing the nicotine patch does not cause heart attacks.

Conclusion: Our findings suggest that smokers who have misperceptions about the safety of NRT are less likely to use NRT. This may be due to a lack of information about the safety of NRT. Future research should focus on improving the safety perception of NRT among smokers.

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PA12-5

OCCURRENCE OF VARENICLINE-RELATED SIDE EFFECTS AND IMPACT ON TREATMENT IN A REAL WORLD SETTING


Background: While varenicline has been shown to be safe and effective for the treatment of tobacco dependence in clinical trials, no studies to date have evaluated the use of the drug in a real world setting. Varenicline-related side effects reported by participants in published clinical trials include nausea, vomiting, constipation, insomnia, abnormal dreams, flatulence, dysgeusia (altered taste) and headaches. In the trials, 24-52% of active drug subjects reported nausea, compared to 8-19% of placebo controls, and 2-29% discontinued medication due to any health event, compared with 1-17% of controls.

Method: 746 smokers in a randomized effectiveness trial took part in a telephone survey approximately 28 days after beginning varenicline and were asked if they experienced a variety of symptoms or side effects during their treatment.

Results: Similar to the trials, nausea was the most commonly reported side effect, seen in 58% of subjects. Other frequently reported symptoms included flatulence (58%), abnormal dreams (56%), dysgeusia (48%) and difficulty sleeping (42%). A total of 136 participants (18%) had discontinued varenicline by the time of the 4-week survey, with 81 (60% of those who discontinued and 11% of total subjects) due to adverse health events or other symptoms. Although there was no difference between men and women in the rate of discontinuing the medication, women reported higher frequencies of nausea, retching, vomiting, constipation, flatulence, dysgeusia, difficulty sleeping, irritability/anger and tension/agitation (all p<0.05). Many of these symptoms were associated with decisions to discontinue the medication, especially when severity of the symptom was taken into account. Negative expectations related to varenicline at baseline were associated with both increased health event reporting and discontinuation of medication, while self-reported health status, depression and level of addiction were not.

Conclusions: Symptoms commonly experienced by smokers using varenicline appear to lower rates of medication compliance. This study identifies factors that can be addressed to help mitigate side effects and improve tolerance of varenicline treatment.

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PA13-1

MARKERS OF FETAL NICOTINE EXPOSURE AND NEONATAL NEUROBEHAVIOR: THE NATIONAL COLLABORATIVE PERINATAL PROJECT

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We previously showed effects of self-reported smoking during pregnancy on infant neurobehavior in the National Collaborative Perinatal Project. Here, we investigate dose response associations between two markers of fetal nicotine exposure (maternal cotinine; maternal nicotine metabolism) and infant neurobehavior in a subset of our original sample with third trimester serum samples. Participants were 161 mothers (mean age 24±6, 52% active smokers) and their healthy infants. Cigarettes per day (CPD), serum cotinine (COT) and serum trans-3’-hydroxycotinine (3HC) were assessed at 31-36 weeks gestation. Infant neurobehavior was assessed at days 0-3 using irritability and muscle tone subscales derived from the Graham-Rosenblith Behavioral Exam. After inclusion of significant covariates, multiple linear and logistic regression analyses revealed significant associations between increased maternal cot and increased infant irritability (OR=1.01, CI=1.0, 1.01, p<0.03) and muscle tone (Beta=.21, p<.007, R2=.14). Infants of active smokers (COT>10ng/mL; n>78), we explored the role of nicotine metabolism (quantified as COT/COT) in associations between maternal smoking and infant neurobehavior. Continuous associations between nicotine metabolism and infant irritability trended toward significance, with greater irritability associated with slower nicotine metabolism (rho=-.22, p=.06). While no continuous associations between nicotine metabolism and infant muscle tone emerged, we found a significant interaction between CPD and nicotine metabolism in predicting infant muscle tone (Beta=.25, p<.02, R2=.14). Infants of moderate smokers (<20 CPD) with slower nicotine metabolism were similar to infants of heavy smokers (>20 CPD) with faster nicotine metabolism. Results reveal evidence for dose response effects of maternal nicotine and influences of maternal nicotine metabolism on two measures of infant neurobehavior. Results highlight the importance of fetal nicotine exposure in modifying effects of maternal smoking on infant neurobehavior and have implications for understanding links to long-term behavioral dysregulation.

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PA13-2

POSTPARTUM SMOKING RELAPSE IS RELATED TO CHANGES IN MOOD AND WEIGHT GAIN CONCERNS

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The majority of women who quit smoking during pregnancy relapse postpartum. Concerns about body weight and depressive symptoms are common during the postpartum period and may prompt postpartum relapse. Thus we sought to examine the potential relation between weight concerns, depressive symptoms and postpartum smoking. Pregnant women (N = 127) who had quit smoking were recruited and completed assessments during the third trimester of pregnancy and at approximately six weeks and three months postpartum. At each assessment women provided an expired-air CO sample, were interviewed about smoking and completed measures of mood and weight concerns. On average, women were 24.1 ± 5.4 years old and had smoked 13.8 ± 8.6 cigarettes daily prior to quitting. The majority (70.9%) reported a yearly household income of less than $30,000, and 75.3% had quit prior to or during the first trimester. By three months postpartum, 48% of women relapsed to smoking. Women who remained abstinent through the third month postpartum had more self-efficacy to manage weight without smoking (t [78] = 2.3, p = .02), fewer depressive symptoms (t [78] = 2.1, p = .04) and less concern about weight gain (t [78] = 3.6, p = .001) than did those who resumed smoking. Repeat measure comparisons also indicated that women who relapsed had increasing concerns about their weight (F [2, 148] = 3.3, p = .04) and depressive symptoms (F [2, 152] = 2.3, p = .10), and results of linear regression analyses, controlling for race, partner’s smoking status, current breastfeeding, prepregnancy nicotine dependence and motivation for postpartum abstinence, indicated that increasing weight concerns (b = -7.5±3.6, p = .05) and perceived stress (b = 1.7±0.3, p = .03) between pregnancy and the first six weeks postpartum were associated with shorter time to relapse over the first three months postpartum. Together, results suggest that changes in mood and weight concerns between pregnancy and the early postpartum period are related to postpartum smoking relapse. Treatments designed to prevent relapse following childbirth may need to address women’s mood and weight concerns to prevent postpartum smoking.

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PA13-3

THE RELATIONSHIP BETWEEN POST-PARTUM DEPRESSIVE SYMPTOMS AND POST-PARTUM RELAPSE TO SMOKING: PREGNANCY RISK ASSESSMENT MONITORING SYSTEM, 2004

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Despite successfully quitting smoking during pregnancy, many women relapse after giving birth. In the general population, smokers with depressive symptoms are more likely to relapse from an otherwise successful quit attempt. Little is known about the relationship between depressive symptoms and relapse to smoking during the post-partum period. The aim of this study was to assess the relationship between post-partum relapse to smoking and the presence of post-partum depressive symptoms. We analyzed 2004 Pregnancy Risk Assessment Monitoring System (PRAMS) data from 16 states. Analysis was restricted to women who reported actively smoking three months prior to pregnancy and reported smoking abstinence during the last three months of pregnancy (n=2,566). Using SAS-callable SUDAAN, chi-square tests were computed and a logistic regression analysis estimated the adjusted odds ratio for relapsing to smoking during the post-partum period among women experiencing post-partum depressive symptoms. Approximately half (50.3%) of the women relapsed to smoking within 2-6 months of delivery. Among the women who relapsed, 23.4% had post-partum depressive symptoms; whereas 14.1% of women who maintained their quit status had post-partum depressive symptoms (chi-square=12.05, p=0.0005, df=1). Women who experienced post-partum depressive symptoms were at 1.86 (95% CI: 1.31, 2.65) higher odds for post-partum relapse compared to women who did not experience post-partum depressive symptoms. Women who successfully quit smoking during pregnancy may be more likely to relapse if they experience depressive symptoms during the post-partum period. Treatment of post-partum depressive symptoms should be investigated as a method of prevention for post-partum relapse.

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PA13-4

THE ROLE OF NEGATIVE MOOD IN POSTPARTUM RELAPSE TO SMOKING

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Background: Two-thirds of women who quit smoking during pregnancy relapse by 6 months postpartum. Depression and stress are triggers for relapse, yet little research has examined their impact in the postpartum period. The goal of this study is to examine whether negative affect predicts postpartum resumption of smoking.

Method: A cohort of women who quit smoking during pregnancy was recruited soon after delivery at a Boston hospital for a repeated-measures, mixed-methods observational study. Surveys at baseline, 2, 6, 12, and 24 weeks postpartum assessed smoking status (7-day point prevalence) and mood (depression (BDI), anxiety (Spence anxiety (SAS)), stress (PSS)) in-depth interviews were conducted when women reported smoking.

Results: 65 women enrolled (52% White, 20% Black, and 22% Hispanic; mean age=29 yrs; mean 8.4 cigarettes/day before pregnancy). Although 91% initially reported a high desire to stay quit, 51% smoked 24 weeks postpartum (10% by 2 weeks, 25% by 6 weeks, 36% by 12 weeks). No mood or stress measure (at baseline, prior to reported smoking) predicted smoking resumption. Factors associated (p<.05) with resuming smoking by 12 or 24 weeks were lower education, a prior delivery, ambivalence about the pregnancy, shorter duration of antepartum abstinence, lower confidence and emotional support, undergoing counseling for mood during pregnancy, and ever having struggled with depression. However, in-depth interviews revealed that nearly every woman attributed her relapse to negative affect or stress. Half reported seeing no one to help them stay quit and, at postpartum clinical visits, only 42% had been asked about their mood and 23% had had a discussion about their smoking.

Conclusion: Half of an ethnically diverse group of women who quit smoking in pregnancy and wanted to stay abstinent postpartum resumed smoking within 6 months. Psychosocial deficits appear to be important. There was discrepancy in qualitative and quantitative results about the role of negative affect. More detailed assessments of mood might clarify what role mood plays a role in postpartum relapse and allow more effective interventions to be designed to prevent it.

Robert Wood Johnson.

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PA13-5

 PATTERNS OF NICOTINE REPLACEMENT THERAPY (NRT) USE AMONG PREGNANT SMOKERS

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Background: The few studies that evaluated use of NRT during pregnancy have achieved comparable cessation rates; however, little is known about the relationship of patterns of NRT use with cessation.

Methods: 1) To reflect descriptive patterns of NRT use among pregnant smokers enrolled in a trial testing the efficacy of NRT + cessation counseling compared to counseling alone. 2) To examine the relationship between patterns of adherence and NRT use.

Results: Overall, 43% used NRT as directed in the first 48 hours after a quit attempt, whereas only 29% used NRT for the recommended 6 weeks. Use of NRT as instructed during the first 48 hours was less in Non-whites than Whites (21% vs. 79%, p<0.02) and gum/lozenge users than patch users (9% vs. 91%, p<0.00001). Using NRT for 6 weeks was related to attending more counseling sessions (p<.02); No demographic characteristics were related to using NRT for the 6 weeks. There was a trend towards an association between adherence and cessation; however, these results were not statistically significant. 56% of women who quit used NRT as directed in the first 48 hours compared to 44% who did not use it as directed. 48% of women who quit used NRT for 6 weeks compared to 52% who used it for less than 6 weeks.

Conclusion: Although 40% of the women randomized to NRT quit smoking, the majority did not use NRT as directed, either for the first 48 hours or for the recommended 6 weeks. More research is needed to determine the best definition of NRT adherence for pregnant smokers. In addition, clinicians could increase adherence by closely monitoring use of NRT and providing counseling focused on adherence.

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PA14-1 HELPING CLINICIANS DO THE RIGHT THING: RESULTS OF THE FIRST FIVE YEARS OF THE SMOKING CESSATION LEADERSHIP CENTER

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Established in 2003 by a grant from RWJF, the SCLC was created to expand the range of clinicians who help smokers quit, as well as to provide technical assistance to make that happen. Initially we planned to market the SCLC to professional societies. It became apparent, however, that few health professionals were aware of the PHS Guideline, and fewer still felt they had the time or energy to use it. Thus, we embarked on an alternate strategy that involved at a minimum accepting responsibility to refer every smoker to a telephone quit line. To date we have partnered with 10 health professional organizations and 14 institutions. Our work was enhanced by the establishment of a national routing quit-line number. Because no resources were devoted to marketing that number, we developed a plastic, wallet-sized quit card that we provide at cost and without branding. Over three million of these are now in circulation. Results to date include: dental hygienists report increasing referral rates of smokers from 25% to 56%; the VA has embarked on a telephonic cessation effort that includes 100 of its 158 hospitals; Northern California Kaiser Permanente dropped its adult smoking prevalence from 12.2% to 9.2% in just 3 years; the Joint Commission on Accreditation of Healthcare Organizations offered technical assistance through our center to low performing hospitals on its cessation criteria, and has established a Wiki site that has 1,600 registrants in just 3 months; 26 major mental health organizations representing provider and consumer groups formed a partnership in 2007 to mainstream smoking cessation into mental health care; psychiatric hospitals have accelerated their rates of going smoke-free from 20% to 50%+ have reached that status; the American Academy of Family Physicians documented a significant increase in cessation activity among its members; the American College of Emergency Physicians completed a successful trial of the efficacy of distributing quit cards and increasing referrals at 8 facilities and is now attempting a national launch of this effort; and the American Association of Anesthesiologists is undergoing a similar feasibility trial.

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PA14-2 A RANDOMIZED TRIAL OF A PAY-FOR-PERFORMANCE PROGRAM TO INCREASE CLINICIAN REFERRAL TO A STATE TOBACCO QUITLELINE

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Context: Tobacco quitlines are free to patients and widely available providing clinicians with a means to connect individuals attempting to quit with evidence-based treatments. Innovative strategies are needed to increase clinician referral to quitline services.

Objective: To investigate the effects of a pay-for-performance program on the rate of clinician referral to a state tobacco quitline.

Design, Setting, and Patients: From September 2005 through June 2006, forty-nine adult primary care clinicians in Minnesota were randomly assigned to usual care (n=25) vs. a pay-for-performance program (n=24) targeting clinician referral to quitline services. Patients were eligible for referral if they visited a participating clinic, currently smoked cigarettes, were age 18 or older, and intended to quit within the next 30 days. Intervention: Pay-for-performance clinics received a $5,000 performance bonus for referring 50 smokers to quitline services during the study period. In addition, clinics received an additional $25 for each referral beyond the initial fifty. Intervention clinics received monthly updates on their referral numbers.

Results: Pay-for-performance clinics referred 11.4% of smokers (SD=8.2%, total referrals=1483) compared to 4.2% (SD=6.5%, total referrals=441) for usual care clinicians (p=0.0001). The greatest benefit of the pay-for-performance program was seen among clinics with a history of being less engaged with quality improvement activities. The patient contact rate after referral was 60.2% (SD=35%) and the rate of enrollment after contact was 49.5% (SD 21.5%) with no difference between usual care or intervention clinics. In intervention clinics, the marginal cost per additional referral was $83 and the cost per additional quitline enrollee as $300.

Conclusions: Health plans interested in improving tobacco treatment should consider implementing pay-for-performance programs encouraging quitline referrals by health care providers. The marginal cost per additional enrollee for this program is comparable to media promotion of phone counseling.

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PA14-3 A PILOT STUDY OF THE EFFECTIVENESS AND ACCEPTABILITY OF AN EMERGENCY DEPARTMENT SMOKING CESSATION INTERVENTION

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Background: The prevalence of tobacco users who frequent the emergency department (ED) is disproportionately higher than the national average rates of tobacco use. Thus, it is advised that the emergency department be utilized as an important venue to provide tobacco cessation screening, counseling, and cessation advice to adult tobacco users.

Objective: This pilot study evaluated the effect of a brief tobacco cessation intervention for tobacco users presenting to an ED.

Methods: A prospective randomized control trial design was used. Participants were either given usual care or a brief intervention using tobacco cessation advice to quit based on the first 5 of the 5A’s of the Clinical Practice Guidelines and fax referral to the state telephone-based Tobacco Quitline. The primary outcome was self-reported repeated point prevalence of tobacco use at 6 weeks and 3 months following the intervention. Secondary aims included number of quit attempts and increases in readiness to quit.

Results: At 3 month follow-up, compared to the control group, intervention participants were more likely to: have quit (23% vs. 11%; p<0.05); have made at least 1 quit attempt (59% vs. 34%; p<0.01), be seriously thinking about quitting (68% vs. 38%; p<0.001), have increases in Ladder scores (6.2 vs. 5.3; p<0.05). Conclusions: Even with a modest cessation rate such as that reported in our intervention, the public health impact of a brief tobacco-use cessation intervention would be significant. The results of our pilot study suggest that further research in this area is warranted.

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PA14-4 AN EVIDENCE-BASED TOBACCO TREATMENT CURRICULUM FOR PSYCHIATRISTS IN TRAINING: IMPACT ON KNOWLEDGE, ATTITUDES, AND CLINICAL BEHAVIORS

Judith Prochaska, Ph.D., M.P.H.*, Sebastien Fromont, M.D., Sharon Hall, Ph.D., Desiree Leek, B.S., Alan Louie, M.D., Marc Jacobs, M.D., University of California, San Francisco, Department of Psychiatry; and Karen Suchanek Hudmon, Dr.P.H., R.P.H., Purdue University School of Pharmacy & Pharmaceutical Sciences

Smokers with mental illness and addictive disorders account for nearly 1 in 2 cigarettes sold in the US and are at high risk for smoking-related deaths and disability. Psychiatry residency programs provide a unique arena for disseminating tobacco treatment guidelines, impacting professional norms, and increasing access to tobacco cessation services among smokers with mental illness. The current study evaluated the 4-hour Rx for Change in Psychiatry curriculum emphasizing evidence-based, patient-oriented, cessation treatments, relevant for all tobacco users, including those not yet ready to quit. The curriculum was informed by comprehensive literature review, consultation with an expert advisory group, faculty interviews, and a focus group with psychiatry residents. This study reports on evaluation of the curriculum in 2005-2006, using a quasi-experimental design, with 55 residents in three psychiatry residency training programs in Northern California. The curriculum was associated with improvements in psychiatry residents’ knowledge, attitudes, confidence, and counseling behaviors for treating tobacco use among their patients, with initial changes from pre- to post-training sustained at 3-months follow up (p<0.05). Residents’ self-reported changes in treating patients’ tobacco use were substantiated through systematic chart review (N=1204). The evidence-based Rx for Change in Psychiatry curriculum is offered as a model tobacco treatment curriculum that can be implemented in psychiatry residency training programs and disseminated widely, thereby effectively reaching this vulnerable and costly group of smokers.

Study supported by Tobacco-Related Disease Research Program (#13KT-0152) and National Institute on Drug Abuse (#K23 DA018691 and #P50 DA09253).

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TOBACCO CESSATION IN PUBLIC DENTAL CLINICS: SHORT-TERM OUTCOMES


Introduction: Public health dental clinic patients use tobacco at disproportionately high rates. The purpose of this study was to evaluate a tobacco cessation program delivered via public health dental practitioners.

Method: 14 public dental clinics in three states (Mississippi, New York, and Oregon) were randomized to either a Delayed Training Control or Intervention Condition. All practitioners in the Intervention Condition were trained to provide a brief cessation intervention based on the Clinical Practice Guideline: Treating Tobacco Use and Dependence, plus provision of free nicotine replacement therapy for patients setting a quit date. Follow-up assessments were conducted at 6 weeks, and 3 and 6 months post-enrollment.

Participants: All are at or below the federal poverty level. Approximately 20% of the participants reported being Hispanic/Latino; 40% African American; 38% White; 12% Other; 55% female; and an average of 40 years old.

Results: At 6-week follow-up, respondents in the intervention condition were more likely to report quitting than those receiving usual care (10.8% vs. 4.6%, p<.001). Quit rates varied as a function of ethnicity, with African Americans in the intervention condition reporting the highest quit rates vs. those in the control condition (14.4% vs. 3.3%; p<.001). Full sample characteristics and detailed results by ethnicity will be presented.

Discussion: The short-term results suggest that dental practitioners in public health settings can be effective in helping their patients to quit tobacco. In addition, preliminary 6-month data indicate that the effect of the intervention strengthens over time, providing further evidence to support the efficacy of dental office interventions for this underserved population of tobacco users.

This study was funded by a grant from the National Cancer Institute (R01-CA107442).

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NIPA-2

SMOKING ABSTINENCE RESULTS IN DECREASED SUSTAINED BUT INCREASED TRANSIENT BRAIN ACTIVITY DURING A CONTINUOUS WORKING MEMORY TASK

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Smoking abstinence results in deficits of continuous working memory (CWM) and previous research has shown that decreases in frontal brain activity are related to these deficits. However, previous neuroimaging studies of CWM deficits have examined sustained brain activity during task performance. Thus, the effects of smoking abstinence on transient brain activity associated with the identification of targets during CWM are not known. To evaluate the hypothesis that event-related CWM activity is altered by abstinence, we measured task-related fMRI-BOLD signal in dependent smokers (n=15; mean cigarettes/day = 18.01; SD = 2.63) on two occasions: after usual smoking and after 24 hr abstinence. During scanning, participants completed a CWM task in which a stream of single digits was presented on the screen at a rate of 100 digits/minute. During some blocks, participants were required to press a button after seeing three even or three odd numbers in a row (RVIP); while in other blocks they were required to respond upon seeing the number 0 (Control). We examined CWM-related brain activity at both the block (i.e., RVIP blocks – Control blocks) and event-related (i.e., response to correct RVIP targets – correct Control targets) levels. A dissociation was observed such that compared to the satiated condition, abstinence resulted in decreased sustained activity but increased transient activity. Specifically, abstinence was associated with decreased sustained activity in right hemisphere structures including precuneus (BA 7), medial occipital gyrus (BA 19), and a region bordering pre and post central gyrus. In contrast, abstinence increased transient activity in structures including two distinct areas within right dorsolateral prefrontal cortex (BA 6 and 8) and posterior thalamus. These findings shed new light on abstinence-induced CWM deficits by suggesting they are the net effect of 1) decreased sustained activity in sensory and attention areas and 2) increased transient activity frontal executive areas. The observed increases in transient frontal brain activity following abstinence potentially reflect recruitment of brain areas to compensate for decreased sustained activity.

Research funded by a grant from the National Institute on Drug Abuse (K23DA017261; FJM).

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NIPA-3

THE DEPLETING EFFECT OF RESISTING TEMPTING FOODS AND THE IMPLICATIONS FOR SMOKING BEHAVIOR

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Tobacco cessation treatment guidelines specifically discourage efforts at weight control through caloric restriction when quitting smoking out of concern that cessation efforts will be compromised with the competing behavioral demands (Fiore et al., 2000). More generally, the self-control strength model (Muraven & Baumeister, 2000) posits that self-regulation relies on a limited resource or strength, and this strength can be consumed with use and thus impair subsequent attempts at self-regulation. In a controlled randomized experiment, we examined the effect of resisting tempting sweets on subsequent smoking behavior. Based on the self-control strength model, we hypothesized that resisting the urge to eat tempting sweets would lead to a greater likelihood of subsequent smoking behavior. Participants were 100 smokers (54% male, 41% female, 5% transgender; age M=42; 41% non-Hispanic Caucasian) recruited from the San Francisco Bay Area using flyers and a community website for a study on resisting temptations. Participants were each tested once, individually, in sessions lasting approximately one hour. Participants' baseline exhaled carbon monoxide (CO) levels were measured using a Bedfont smokerlyzer. Participants were then randomly assigned to resist eating either from a tempting plate of sweets or from a plate of less tempting vegetables. They were then given a 10-minute recess, while the experimenter prepared the next part of the study. Participants' CO levels were re-checked to determine if they chose to smoke during the break. Based on changes in CO levels from baseline, 41% of the sample smoked during the break. As predicted, participants who resisted sweets were more likely to smoke during the break (47.1%) than those who resisted vegetables (34.7%), F (1, 98) = 4.47, p < .05. These findings support the self-control strength model and may have important implications for tobacco cessation interventions. In particular, although concerns with weight gain may lead to an increased desire to resist sweets while quitting smoking, there may be detrimental immediate consequences for relapse.

Study supported by the State of California Tobacco-Related Disease Research Program (#16FT-020) and #13KT-0152 and the National Institute on Drug Abuse (#T32 DA007250, #K23 DA018691 and #P50 DA09253).

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NEW INVESTIGATORS

NIPA-1

THE SMOKING N-BACK: A MEASURE OF ATTENTIONAL BIAS TO SMOKING CUES

David E. Evans, Ph.D.*, Christine Craig, B.S., Jason Oliver, B.A., and David J. Drobes, Ph.D., Moffitt Cancer Center & Research Institute at the University of South Florida

Recent work has emphasized attentional bias to drug-related cues as an important cognitive feature of drug addiction. We modified a working memory task (i.e., N-back) to assess attentional bias to smoking words in the context of executive attention. In particular, we examined whether an attentional bias to smoking words would facilitate or interfere with working memory performance, as a function of task complexity. We compared 21 heavy smokers and 15 nonsmokers on the smoking N-back. Smoking-related and control words were presented individually in pseudorandom order within each of three blocks. Participants were instructed to press one of two response keys related and control words were presented individually in pseudorandom order within each of three blocks. Participants were instructed to press one of two response keys to indicate whether the currently presented word matched the word presented N trials previously. Separate 1-, 2-, and 3-back (i.e., easy, moderate, and difficult, respectively) versions of the task were performed in order of increasing difficulty. Overall, findings for the 1-back task indicated greater accuracy for smoking word matches, relative to control words, yet poorer accuracy for smoking word mismatches. This effect was more pronounced among smokers. For the 2-back task, smokers showed poorer accuracy for smoking word matches, whereas this effect was not present for nonsmokers. Although there were significant effects among smokers on the 3-back, these effects were also observed among nonsmokers. Overall, these findings suggest that the psychological processes necessary to perform the 1-back (vigilant attention) versus the 2-back (attentional shifting) result in attentional bias exhibiting opposite effects on performance. It may be that the additional task complexity (attentional shifting) necessary to process smoking words on the 2-back task interfered with memory performance. This research contributes to a better understanding of the role of attentional bias among smokers, by examining the influence of cue processing on working memory. Further research will be needed to determine if this task provides a useful predictor of treatment outcome.

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THE CLINICAL EFFORT AGAINST SECONDHAND SMOKE EXPOSURE

Jonathan Winickoff, M.D., Harvard Medical School

This year’s recipient of the 2008 Jarvik-Russell Award (formerly the SRNT Young Investigator Award) is Dr. Jonathan Winickoff. Dr. Winickoff will deliver a 25-minute lecture on his emerging program of research. Dr. Winickoff’s award will be presented to him at the Opening Reception and Awards Ceremony, which will be held on Wednesday, February 27, from 5:30 p.m. to 7:00 p.m.
POS1-1  LEVELS OF TOBACCO-SPECIFIC NITROSAMINES AND POLYCYCLIC AROMATIC HYDROCARBONS IN MAINSTREAM SMOKE FROM DIFFERENT TOBACCO VARIETIES

Yan S. Ding*, Liqin Zhang, Ram B. Jain, Ntasha Jain, Richard Wang, David L. Ashley, Clifford H. Watson, Emergency Response and Air Toxics Branch, Division of Laboratory Sciences, National Center for Environmental Health, Centers for Disease Control and Prevention

It has been estimated that one in every five cancer deaths worldwide results from tobacco use. The known human carcinogens contained in tobacco products contribute to various types of cancer. According to International Agency for Research on Cancer (IARC), 10 polycyclic aromatic hydrocarbons (PAHs) and eight tobacco-specific nitrosamines (TSNAs) along with at least 45 other compounds or substances found in tobacco smoke are potential human carcinogens. We evaluated the levels of PAHs and TSNAs in cigarette mainstream smoke as a function of the tobacco variety used in the product to examine whether a relation exists between these two major classes of carcinogens. To investigate the role tobacco filler contributes to the levels of these chemicals in mainstream smoke without confounders such as filter design, filter ventilation, and paper porosity, we used custom-made, research-grade, unfiltered cigarettes, containing bright, burley, oriental, reconstituted or blended tobacco. In addition to nicotine, TSNAs and PAHs in cigarette mainstream smoke, we measured the nitrate content in the tobacco filler. The analyses of the results were based on tobacco weight. Regression analysis was used to evaluate the relations between TSNAs, PAHs, nicotine and nitrate. Our results indicated that smoke nicotine, TSNAs and PAH deliveries were influenced by tobacco type. A relation between nitrate content in the filter and formation of NNK was observed. Nitrate also influenced PAH deliveries in mainstream smoke. However, the influence of nitrate on NNK and PAHs were of different magnitude and direction. Our results also indicated an inverse relation between the delivery of NNK and the IARC 10 carcinogenic PAHs and a direct relation between NNN and nicotine among the different type of tobacco fillers.

No funding.

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POS1-2  NICOTINE METABOLIC RATIO AND DIMENSIONALITY OF TOBACCO DEPENDENCE


Some but not all research shows an association between the rate of nicotine metabolism and tobacco dependence. This study investigated the relationship between nicotine metabolic rate estimated by the trans-3’-hydroxycotinine to cotinine ratio (3HC/COT) in urine and saliva and multiple dimensions of tobacco dependence. Evidence that women metabolize nicotine more rapidly than men and have lower levels of dependence prompted investigation of sex differences. To identify dimensions of dependence principal components analysis (PCA) was conducted on items from five self-report measures (FTND, Nicotine Dependence Scale, Early Smoking Experiences, Positive Reinforcement Scale, and Reasons for Smoking) in a sample of 294 lifetime regular smokers (mean age 37.7 ± 13.0 SD). 3HC/COT in urine/saliva was estimated following oral administration of nicotine and cotinine. The relationships between tobacco dependence component scores and saliva/urine ratios were examined using multivariate linear regression, adjusting for age, sex, and body weight. Sex effects were tested by including interaction terms for sex and each tobacco dependence component. PCA identified 10 components. Smoking for the stimulant/attention-enhancing effects of cigarettes was related to higher 3HC/COT urine ratio (more rapid metabolism) however this effect was not significant in the model with sex interaction terms. Significant interactions with sex were seen for the unpleasant initial subjective reactions and for the smoking for social/recreational reasons component. Women, lower saliva and urine 3HC/COT ratios were associated with stronger unpleasant reactions and lower urine ratio was related to lower likelihood of smoking for social/sensory reasons. No significant relationships were observed in men. Three dimensions of smoking—smoking for the stimulant/attention-enhancing effects of cigarettes, smoking for the social/sensory aspects of cigarettes, and experiencing unpleasant subjective reactions to the first cigarettes—may be related to the rate of nicotine metabolism, as estimated using the 3HC/COT ratio in urine/saliva. Sex may be an important mediator of this relationship.

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POS1-3  PERCEIVED SOCIAL NORMS, EDUCATION AND TOBACCO CESSATION

Jennifer Stuber*, University of Washington, Sandro Galea, University of Michigan, Jennifer Ahern, Berkeley

In the United States over the past few decades, substantial progress has been made in fighting the tobacco epidemic. However, smoking rates are different across socioeconomic groups with education emerging as the strongest predictor of smoking patterns. The rate of smoking cessation is substantially lower among persons with less education as compared to persons with more education. Several explanations have been proposed to explain the link between education and smoking cessation. One prominent explanation especially, in light of the increased social unacceptability of tobacco use in the United States, pertains to differences in individuals’ normative environments, which are organized in part, by level of educational attainment. In this study, we developed a rich definition and measure of perceived social norms whereby three types of perceived norms (injunctive norms, descriptive norms and rule-based norms) were measured at three levels (at the family/peer level, at the employment level, and at the neighborhood level) to determine the types and levels of perceived social norms that matter the most to reducing educational disparities in tobacco use. Data were collected in a cross-sectional RDD telephone study of 4000 adults (age 18 or older) in New York City. Bivariate and multivariate analyses were used to determine how the various types and levels of norms relate to educational level and to tobacco cessation. We found that perceived descriptive and rule based norms at the family level strongly mediate the association between education and smoking cessation and that by contrast, perceived employment and neighborhood norms do little to narrow the gap. Contrary to what we expected, injunctive norms (the belief that significant others find tobacco use unacceptable) and perceived smoke-free air laws at places of employment and in bars were also not a factor in narrowing the gap. These findings have implications for extending the normative concept to increase its predictive power in behavioral research, but also for tobacco control efforts aimed at eliminating health disparities attributable to education.

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Intermittent smokers (ITS) who do not smoke daily constitute a substantial and fast-growing proportion of US smokers: 25% of US adult smokers are ITS, up 40% over 5 years. Authors have typically portrayed ITS as “social” or “party” smokers, implying smoking primarily in the evenings, with other smokers, and with alcohol. However, no study has ever examined ITS smoking patterns. We used ecological momentary assessment to collect real-time data on the temporal and situational patterns of ITS smoking, 28 ITS (smoking at least weekly, but <29 days of last 30) used cell phones to record each instance of smoking for three weeks, with an automated system capturing time and date, and voice mail messages allowing for subsequent coding of the circumstances of smoking. ITS smoked on 75% (SD=24%) of study days, averaging 3.6 cigarettes/day (1.5), on those days. The data contradicted expectations of ITS as social or party smokers in several ways. ITS smoked 23% of their cigarettes in the morning; 81% of subjects smoked before 10 am. Conversely, 41% of cigarettes were smoked after 6 pm. Only 8% of ITS cigarettes were smoked when others were smoking; 74% were smoked when alone. Only 17% of cigarettes were smoked when drinking alcohol, but this was subject to wide variation: while 18% of subjects smoked the majority of their cigarettes with alcohol, another 21% never reported smoking when drinking. On 47.2% of smoking occasions, the subject seemed to be transitioning between activities. ITS sometimes smoked in “runs”-21% of cigarettes were smoked within an hour of another cigarette, and such “runs” were much more likely to occur when the subjects were drinking alcohol (OR=3.5; 95% CI: 1.2, 10.0). These data provide initial insights into the smoking patterns of ITS, and contradict the expectation that ITS are typically social or party smokers. Interests: SS is a partner in invivodata, inc. (electronic diaries for research).

NIDA grant DA02074.

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POS1-5
SECONDHAND SMOKE EXPOSURE IN BOTH CHILDHOOD AND ADULTHOOD AND THE RISK OF ADVERSE PREGNANCY OUTCOMES

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Background: A large percentage of the population continues to be exposed to secondhand smoke (SHS). While studies have consistently linked active smoking to a number of adverse pregnancy outcomes (APO), results from the few studies examining SHS exposure and APO have been inconsistent.

Methods: Approximately 4,800 women who visited Roswell Park Cancer Institute between 1982 and 1997 and reported being pregnant at least once were asked about their childhood and adulthood exposure to secondhand smoke on a self-report questionnaire. These women also reported on prior APO, which included spontaneous abortions (SA) (< 5 months after conception), stillbirth (≥5 months after conception), difficulty becoming pregnant, difficulty becoming pregnant >1 year, and difficulty becoming pregnant requiring a doctor’s consult.

Results: Fourteen% of women reported difficulty becoming pregnant, 11.3% reported reporting at least one spontaneous abortion, 12.9% reported multiple spontaneous abortions, 5.8% reported a stillbirth, while 40.2% reported any adverse pregnancy outcome and 21.1% multiple adverse pregnancy outcomes. Women exposed to SHS during childhood from their parents were more likely to report difficulty becoming pregnant (OR=1.26, 95%CI 1.07-1.48) and this difficulty lasting >1 year (OR=1.34, 95%CI 1.12-1.60). Women exposed to SHS in both child and adulthood had a greater rate of stillbirths (OR=1.49, 95%CI 1.05-2.12), SA (OR=1.34, 95%CI 1.12-1.60). Women exposed to SHS during childhood from their parents were more likely to report difficulty becoming pregnant, difficulty becoming pregnant >1 year, and difficulty becoming pregnant requiring a doctor’s consult.

Conclusions: Women exposed to SHS during child and adulthood had a greater rate of stillbirths (OR=1.49, 95%CI 1.05-2.12), SA (OR=1.34, 95%CI 1.12-1.60). Women exposed to SHS in both child and adulthood had a greater rate of stillbirths (OR=1.49, 95%CI 1.05-2.12), SA (OR=1.34, 95%CI 1.12-1.60). Women exposed to SHS during childhood from their parents were more likely to report difficulty becoming pregnant, difficulty becoming pregnant >1 year, and difficulty becoming pregnant requiring a doctor’s consult.

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POS1-6
THE IMMUNOLOGIC EFFECTS OF SMOKING ON TUBERCULOSIS PATHOGENESIS

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Introduction: Tuberculosis (TB) is a key public health problem in many low- and middle-income countries. It causes an estimated two million deaths per year worldwide, mainly in densely populated areas. A high proportion of TB patients are smokers and active and passive smoking increase the risk for TB infection, morbidity, and mortality. Although research on how tobacco smoking influences tuberculosis pathogenesis is quite limited, the published literature on the smoking effects to the immune system and on the immunology of tuberculosis suggests a causal link.

Methods: Literature review: tuberculosis, “smoking”, “immunology”, “pathogenesis”. Results: Tobacco smoke impairs most immunological mechanisms linked to tuberculosis. Smoking induces ultrastructural ciliary abnormalities and enhances bacterial binding to epithelial cells, thus reducing the mucociliary clearance, which prevents bacteria from reaching the alveoli. Tobacco smoke decreases the phagocytic and bactericidal activity of pulmonary alveolar macrophages (AM), facilitating cell invasion by M.tuberculosis (Mtbb) and replication, thus advancing TB infection and reactivation. Smoking also directly affects the adaptive immune response by reducing the number of dendritic cells, which prevent replication of Mtbb, and natural killer cells, which activate phagocytic cells, lyse TB pulsed cells and control microbial resistance.

Discussion: The mechanisms described suggest an explanation for delayed spu-
tum smear conversion time among smokers, an important indicator of reduced treatment effectiveness, persistent infectivity, and relapse. The immunologic effects of smoking suggest the suppression of both the innate and the adaptive immune response to Mtbb. The effects on the alveolar macrophages, could explain the increased rate of TB morbidity and reactivation among smokers, while the reduced adaptive immune response might increase the risk of multi drug resistance.

Conclusion: As most immunologic abnormalities attributable to tobacco smoke are reversible within a period of years, smoking cessation counseling and Nicotine Replacement Therapy could be an effective supplement to TB treatment.

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POS1-7
EFFECTS OF SMOKING ON SKIN CONDITION

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Background: Smoking has long been known to cause health problems, which can affect virtually every organ system in the body. Although not usually highlighted, the cutaneous effects of smoking are many and affect multiple parameters of skin health. Whereas, the deterioration of the skin associated with smoking has been assessed in several studies especially in older smokers, how early in a smoker’s life the deteri-
oration of skin condition occurs has not been previously addressed.

Methods and Results: The study assessed the facial skin condition of independent groups of 30- through 49-year-old female smokers and non-smokers using visual, tactile, and instrumental assessment. The subjects were controlled for sun exposure, cosmetic aging procedures, and second hand smoke exposure (for non-smokers) to minimize confounding factors. Parameters assessed included lines/wrinkles, skin color, radiance and glow, dryness, texture and elasticity. In this study, smoking associ-
ated changes that were significant included skin color, radiance and glow, dryness and elasticity, and were driven by the amount an individual smoked. The changes associated with aging were limited to lines/ wrinkles and skin elasticity.

Conclusions: Smoking is associated with deterioration of skin condition, over and above the effects of aging, with some of these changes occurring in smokers when they are in their thirties.

All work was funded by GlaxoSmithKline Consumer Health Care.

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POS1-9 LINKING QUANTITY/FREQUENCY PROFILES OF CIGARETTE SMOKING TO THE PRESENCE OF NICOTINE DEPENDENCE SYMPTOMS AMONG ADOLESCENT SMOKERS: FINDINGS FROM THE 2004 NATIONAL YOUTH TOBACCO SURVEY

Ralph S. Caraballo, Ph.D.*; Centers for Disease Control and Prevention; Scott Novak, Ph.D., Katherine Asman, M.S., RTI International

Identifying trajectories of cigarette smoking based on usage patterns has become an important approach to elucidating the various pathways leading from initiation to nicotine dependence. This task has involved various methods to identify different smoking patterns based on defining use by either quantity or frequency smoked. However, few studies have attempted to identify smoking profiles by studying, considering past-to-present non-smokers (n=4236), adolescents who smoked 1-2 days the past month (n=221) were more likely to believe that (a) smokers have more friends (38% vs. 24%; p < .001), (b) smoking makes young people look cool (27% vs. 14%; p < .001), (c) it is safe to smoke for a year or two and then quit (28% vs. 12%; p < .001), but were less likely to think that (d) people can get addicted to tobacco as easily as to cocaine or heroin (80% vs. 90%; p < .001), and (e) smoking 1-5 cigarettes per day is harmful (84% vs. 89%; p < .001). Across most of these attitudinal variables, those who smoked 1-2 days in the past month were similar to more frequent smokers, including those who smoked daily. Convergent findings were found when lifetime exposure to smoking was assessed, indicating that adolescents who smoked 1-5 cigarettes in their lifetime were significantly dissimilar from never smokers. Latent class analysis revealed three distinct typologies of attitudes towards smoking that varied with smoking behavior. Among non-smokers, 74% had distinctly negative views of cigarette smoking. -5% recognized the dangers of smoking but dismissed social benefits to it, and 11% had no clear opinion of smoking, but were also dissimilar from any social benefits. In contrast, among adolescents who smoked 1-2 days within the past month, corresponding patterns of belief were 53%, 29%, and 18% (p < .001). Our data suggest 1) minimal levels of cigarette use are associated with favorable views of smoking, and 2) adolescents with minimal level of cigarette use resemble chronic smokers in several key ways. Adolescents at very early stages of cigarette use are at significant risk for chronic use.

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POS1-10 TIMELINE AND EPISODIC PATTERNS OF ALCOHOL AND CIGARETTE USE IN YOUNG ADULT SMOKERS

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Binge drinking and non-daily cigarette smoking are behaviors that are both problematic and prevalent in young adults. Alcohol is often paired with cigarette smoking, particularly in those experimenting with smoking. Although the relationship between drinking and smoking has been categorized, the intersection between drinking and smoking in non-daily smokers has not been heavily researched. In particular, little research has examined episodic patterns of alcohol and cigarette use. Two studies are reported here. The first study examined patterns of alcohol and cigarette use in college students, a highly educated, socioculturally diverse, multi-ethnic sample. The second study analyzed data from the 2005-2006 South Carolina Youth Tobacco Survey, a state-wide random sample of high school students. Cohorts were identified who smoked 1-5 cigarettes per day (CPD) but with increasing number of days smoked. These nationally representative findings point that both quantity and frequency are important markers of nicotine dependence symptoms in this age group, although frequency appears to be a better predictor of the likelihood of the presence of nicotine dependence symptoms.

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POS1-11 PARENTAL DISAPPROVAL, CHURCH ATTENDANCE, AND SCHOOL PERFORMANCE AS CORRELATES OF ADOLESCENT SMOKING

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Adolescent smoking has been related to demographic, intrapersonal, and sociocultural variables. We aimed to 1) identify correlates of smoking among urban African-American and white adolescents and 2) examine interactions between these factors and gender and ethnicity on adolescent smoking status. A survey assessing demographic, psychosocial, and family factors was administered to adolescents attending an urban pediatric clinic in the Midwest during clinic appointments. Children reported their performance at school, frequency of church attendance, the extent of home smoking restrictions, the depressive symptoms they experienced, the extent to which they perceived that their parents disapproved of them smoking, and their smoking status; parents reported personal smoking status. Of the 193 participants, 64.25% were females, and 60.10% were African American. The mean age was 14.91 years (SD = 1.76). The prevalence of current smoking (i.e., having smoked in the past 30 days) was 10.36%. Bivariate analyses indicated that being older and current smoking were risk factors for nicotine dependence, while parent education had a protective effect. The final multivariate model predicting adolescent smoking status included lower self-reported school performance (OR 2.54, 95% CI 1.09-5.92), less frequent church attendance (OR 0.36, 95% CI 0.15-0.87), and parental attitude toward smoking (OR 2.66, 95% CI 1.04-6.79). This model correctly classified 80.2% of the participants (C-statistic = 0.79, C-index = 0.79, C-statistic = 26.83, Nagelkerke R2 = 0.267, p = 0.001). Parental smoking status and home smoking restrictions did not significantly contribute to the model. No interactions were found between gender and ethnicity in relation to adolescent smoking status. This study highlights several potential protective factors to smoking among a multi-ethnic sample of adolescents, including parental disapproval of smoking, regular church attendance, and better academic performance. Efforts to reduce the frequency of adolescent smoking may be enhanced by attention to these factors.

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POS1-12  RECENT CIGARETTE SMOKING PATTERNS AMONG ADULTS IN 2004 NATIONAL DATA

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There are no generally accepted definitions of light or intermittent smoking. The latent class model is an approach to identify subgroups in a population. Thus it may be an ideal method to identify common patterns of light and intermittent smoking. Recent smoking (number of days smoked in past 30 and average number of cigaretes smoked per day) and smoking history (ever smoked every day for a month and smoked 100+) data from the non-Hispanic White adult subsample of the 2004 National Survey of Drug Use and Health are presented. As an example of the results, among men and women between 18 and 25, five classes of recent cigarette smokkers were identified. The latent class model produces response profiles characterizing the classes and the proportion of people in each class. Besides experimenter and daily smokers classes, there are three classes corresponding to light and/or intermittent smokers. One class smoked 2 to 5 cigarettes daily or nearly so over the month. Members of this class were also highly likely to have endorsed the smoked every day for a month and smoked 100+ cigarettes items. This class comprised 25% of the women and 8% of the men. Another class was most likely to have smoked 2 to 5 cigarettes per day between 10 and 19 days of the past 30. Members of this class were highly likely to indicate smoking 100+ cigarettes, but less likely to endorse ever smoking daily for a month. The prevalent responses to the last two items indicate that these smokers were unlikely to have ever been daily smokers, but they are not just experimenters. This class comprised 6% of the women and 14% of the men in the sample. The third class are very light smokers, typically smoking 1 cigarette or less per day between 1 to 9 days in the past 30. Members of this class were most likely to indicate ever smoking daily for a month and 100+ cigarettes, 13% women and 5% men. Members of this class had smoked daily at some point, but now reported smoking very seldom, perhaps social smokers? Predictors and outcomes associated with class membership will also be presented. This analysis highlights smoking pattern variability in contemporary data.

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POS1-13  PREDICTORS OF ADOLESCENT AND FAMILY PARTICIPATION IN INTENSIVE MEASUREMENT STUDIES OF CIGARETTE SMOKING

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Recruiting teens for smoking research is challenging, particularly for studies with demanding study protocols and those using intensive measurements. A subset of adolescents enrolled in a longitudinal study of smoking behavior were randomly assigned to participate in three intensive assessments with: 1) adolescents carrying out and reporting smoking in a university lab (SE study); 2) adolescent and parents participating in video-taped discussions about family life and cigarette smoking (FT study); and 3) adolescents participating in a psychophysiological assessments of smoking in a university lab (Study). Active parental consent was required for participation in all three studies. This paper reports on the predictors of participation in these three studies. Of the 501 participants assigned to participate in the EMA study, 461 completed the baseline assessment for a participation rate of 92%. There were no differences on demographic or smoking variables between the adolescents who agreed to participate in the EMA study and those who declined. Of the 508 families assigned to participate in the FT study, 348 completed the home visit for a participation rate of 68.5%. The adolescents whose families completed the visit in the FT study reported smoking significantly fewer cigarettes in their lifetimes than the adolescents whose families did not participate in the FT study. School variables were also a factor in participation in the FT study. However other demographic and smoking variables were not related to participation. Of the 302 participants assigned to the SC study, 217 completed the baseline assessment for a participation rate of 71.8%. The adolescents’ school and both the number of adult and the number of parent smokers in the household were related to participation in the SE study, with participation rates decreasing as the number of smokers in the household increased. Challenges and solutions for increasing participation of teens and families into tobacco studies using intensive measures will be discussed.

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POS1-14  ARE THERE DIFFERENT TYPES OF PARENT INVOLVEMENT ASSOCIATED WITH SMOKING INTENTIONS IN NEVER AND EVER SMOKING FIFTH GRADERS?

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Parent involvement is a key predictor of smoking, especially among younger children. However, much more needs to be known about how parents can most effectively intervene with their children to prevent smoking. For example, different types of parental involvement may be needed, depending on whether children have experimented with smoking. The research question this study addresses is: Are parental involvement variables significantly associated with future smoking intentions in never smokers versus ever smokers? Cross sectional data from the baseline survey of the Healthy Passages Study were analyzed to address this question. Survey responses from over 5,000 5TH grade students from public schools in three geographic areas (Los Angeles, CA; Houston, TX; Birmingham, AL) were analyzed. A total of 6% (n=313) of the sample were ever smokers and 94% (n=4,778) were never smokers. Weighted least squares regression analyses were used to predict cross sectionally future smoking intentions from 1) four general parenting variables (i.e., parents know their child's friends and best friends; parents know what their child does in his/her spare time; parents provide their child with emotional support) and 2) two smoking-specific parenting variables (i.e., level of parental upset if their child smoked; and parents communications specifically about not smoking). Results revealed that different sets of parental involvement variables were associated with smoking intentions, depending on past level of experience with smoking. Never smoking children whose parents knew more about what their child did in his or her spare time, provided more emotional support to their child, and would be more upset about their child's smoking had higher future smoking intentions (p<0.01). In contrast, only higher levels of specific communications about not smoking were associated with weaker smoking intentions for ever smokers (p<0.001). These results are important both conceptually and practically for assisting parents to help their young children resist smoking.

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POS1-15  PREDICTORS OF SMOKING AMONG HIGH SCHOOL STUDENTS IN SOUTH CAROLINA

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Early smoking initiation has been shown to be linked to a lifetime struggle with tobacco addiction. Over 95% of the initiation of regular tobacco use occurs prior to age 25, and the highest rates of initiation occur between the ages of 15 and 17 years. The younger a person starts smoking, the greater the lifelong risk of developing smoking-related diseases. To determine the most important predictors of smoking, we examined data from the South Carolina Youth Tobacco Survey (SCYTS), a comprehensive, paper and pencil, statewide survey, which collects information on behaviors and attitudes toward smoking. Respondents were classified as current, never, and former smokers. We studied the role of age, gender, parental education (as a proxy for SES), school performance, peer pressure, smoking among family members, smoking policy at home and receptivity to tobacco marketing on smoking behaviors. A cursory examination of the 2007 SC YTS illustrates the following comparisons among the current smokers (18.7%) with the control group of never smoker (46.2%) high school students: 1) All risk factors aforementioned were found significant (P-value <0.05) when studied independently, except gender; 2) The receptivity to tobacco marketing increased six fold the chance of smoking; 3) A full multiple logistic regression model revealed that the most important factors were receptivity to tobacco marketing and peer pressure; 4) When multivariable models were run separately for black and white students, smoking policy at home appeared to be significant for black but not for white teens, while school performance and parental education were significant only for white teens.

Implications: A typical message is more effective among smokers influenced by peer smokers, to be older, have lower school performance, and live with a smoker who is less educated. Black teen smokers are also influenced by peer smokers, live in households without smoking policies, but own academic achievement and parental education count less. There is a significant association between receptivity to tobacco marketing and teen smoking.

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POS1-16

OBESITY AND SMOKING: COMPARING TREATMENT SEEKERS WITH THE GENERAL POPULATION

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Obesity and smoking represent the leading preventable causes of morbidity and mortality in the United States. The prevalence of obesity among cigarette smokers seeking smoking cessation treatment compared to a general population of smokers and non-smokers has not been reported. We compared the prevalence of obesity in a sample of smokers seeking treatment (N=1,439) with a representative US sample population using data from the National Health and Nutrition Examination Survey (NHANES) 2003-04 by forming three groups of smokers: never smokers (N=2,236), former smokers (N=1,206), and current smokers (> 10 cigarettes/day; N=638). Obesity was defined using body mass index (BMI; kg/m2), where <25 was defined as optimal, 25-30 was defined as overweight, and ≥30 was defined as obese. Results showed that smokers seeking treatment had the highest rates of obesity (36.6%) compared to never (34.4%), former (33.0%), and current (27.4%, p < 0.001) smokers. Smokers seeking treatment, compared to current smokers, were more likely to be female (59% vs. 41%, p<0.001) and have lower mean (± SE) HDL cholesterol concentrations (30.3±0.3 mg/dL vs. 50.3±0.4 mg/dL, p<0.001), but were similar in age (mean ± SE; 44.7±0.4 yrs vs. 45.2±0.4 yrs). We further examined differences in obesity by ethnicity, education, number of cigarettes smoked per day, age of smoking initiation, time to first cigarette, and other lifestyle behaviors, including diet and physical activity. Results suggest that smokers seeking treatment are significantly more obese than smokers in the general population and may have a different health profile than current smokers in the general population. Health care providers should be aware of underlying health issues, specifically obesity, in patients who are seeking smoking cessation treatment.

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POS1-17

OVERWEIGHT IN RELATION TO SMOKING AND SMOKELESS TOBACCO USE IN A LONGITUDINAL STUDY OF SWEDISH ADOLESCENTS


There are indications that adolescents may take up smoking as a mean to control weight, but this hypothesis has seldom been explored with the use of smokeless tobacco in longitudinal studies. To clarify whether adolescents use cigarettes and smokeless tobacco as a mean to control weight we used data from a population-based prospective cohort study running between January 1, 1998 and March 30, 2005 in the Stockholm region of Sweden (The BROMS cohort study). Schoolchildren (2922) aged 11.6 years never regular users of tobacco were followed up through six surveys during the following seven years. Height and weight, measured by school nurses during four surveys and self-reported by participants thereafter, were used to calculate the Body Mass Index. At the age of 15 years, the participants were also asked whether they believed to be overweight, normal- or underweight. We used Cox proportional hazard models to calculate the hazard ratios (HR) and the 95% confidence interval (CI) of becoming regular smoker or snus user. Neither being overweight nor the perception to be overweight was associated to subsequent uptake of tobacco among males. Among females, overweight at baseline increased the hazard of uptake of smoking (adjusted HR=1.33; CI=1.09-1.63). Overweight at baseline predicted the uptake of snus only among girls to parents with the lowest education. Likewise, being overweight during any of the follow-up occasions was associated with subsequent smoking but not with subsequent snus use. Among 15-years old females never tobacco users the perception to be overweight was associated to subsequent uptake of smoking even after adjustment for actual overweight (HR=1.71, CI=1.20-2.46).

Conclusions: Being and/or perceiving oneself as overweight are associated with the uptake of smoking among Swedish female adolescents. Smokeless tobacco (snus) may become appealing as weight control strategy among girls from disadvantaged social groups.

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POS1-18

SMOKING EXPECTANCIES, WEIGHT CONCERNS, AND DIETARY BEHAVIORS IN ADOLESCENCE

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Cigarette smoking and weight concerns are associated in adolescents. Adolescents may begin smoking or have difficulty quitting due to their expectancies of the effects of smoking on body weight. A preliminary study in a small sample of daily smokers indicated that adolescent girls are more likely to believe that smoking controls their weight and have more concerns about gaining weight upon quitting, with smoking intensity moderating weight concerns in girls and not boys (Cavallo et al., 2002). The current study used data from a cross-sectional survey in Connecticut high school adolescents to assess the influence of gender, smoking intensity and dietary restrictive behavior on smoking related weight concerns. Smoking related weight concerns were assessed using the Appetite and Weight Control Factors of the Smoking Consequences Questionnaire (SCQ; Brandon & Baker, 1991). Engagement in dietary restrictive behaviors was determined using the five dietary behavior questions from the Youth Risk Behavior Survey (CDC, 2005). Of the 4523 students completing the survey, 613 reported smoking in the past month and were included in these analyses. We hypothesized that those adolescent smokers who had high weight-related smoking expectancies would be more likely to be female, heavier smokers, and endorse more dietary restrictive behaviors. A General Linear Model with these three variables entered as fixed factors and SCQ as the dependent variable indicated that females (M = 3.24, SD = 1.4) had higher scores than males (M = 2.65, SD = .15) on the SCQ, (p = .004) heavier smokers (M = 3.72, SD = .20) had higher scores than light smokers (M = 2.4, SD = .14) and moderate smokers (M = 2.71, SD = .19), (p < .001), and those categorized as dietary restraints (M = 3.52, SD = .15) had higher scores than those considered non-dietary restrained (M = 2.37, SD = .15), (p < .001). These results indicate that among adolescent smokers, all three of these factors play a significant role in determining smoking specific weight related expectancies. These findings have clinical implications for smoking cessation interventions in adolescents.

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POS1-19

THE EFFECT OF EXERCISE ON SMOKING-RELATED OUTCOME EXPECTANCIES IN COLLEGE FRESHMAN


Introduction: Tobacco use among college students is a serious, ongoing public health concern. Nearly 25% of adults between the ages of 18-24 smoke on a regular basis, which makes this age group the leader in smoking prevalence. Of concern is the fact that for this population is not only the negative health consequences directly related to cigarettes, but also the findings that show smoking to be a detriment to physical fitness. However, research has shown that college students can engage in exercise behaviors, which still using low-dose instances of abuse (beer, alcohol & cigarettes). One explanation for this overlap could be that those who exercise more are concerned about weight issues and may continue to smoke cigarettes for weight control. The purpose of the current study was to examine trends in smoking-related outcome expectancies among college-aged smokers who did and did not report regular exercise.

Method: Participants were college freshman who completed a series of on-line questionnaires during their first semester of college. Smoking expectancies and nicotine dependence were assessed in students who reported both smoking and exercising at least four times per week (n=17) and among students who only reported smoking (n=18). RESULTS: A repeated measures analysis of variance (ANOVA) yielded a significant group X appetite-weight control smoking expectancy interaction [F (1, 33) = 4.94, p<.05], along with a significant group X negative reinforcement smoking expectancy interaction [F (1, 33) = 4.22, p<.05]. These findings indicate that those who reported exercising regularly showed a greater increase in smoking outcome expectancies regarding appetite and weight related concerns. Additionally, those who did not report exercising endorsed significantly higher expectations of negative reinforcement from smoking. Efforts to understand these differences can provide insight in developing more comprehensive smoking interventions that target more individual differences.

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POS1-20 RECREATIONAL AND CEREMONIAL TOBACCO USE AMONG AMERICAN INDIAN TRIBAL COLLEGE STUDENTS
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Among American Indian people, rates of cigarette smoking are disproportionately high. Many American Indian tribes use tobacco for ceremonial or traditional purposes, leading some theorists to suggest that there is a link between ceremonial use within American Indian cultures and their high prevalence of recreational (e.g., non-ceremonial) tobacco use. However, qualitative research has found that American Indian adolescents and college students view recreational tobacco use as distinct from ceremonial use. The purpose of the research reported here is to investigate the relationship between recreational and ceremonial tobacco use with quantitative methods. American Indian tribal college students (n = 105) completed a classroom-based survey about tobacco use. Fifty-two percent of the sample had smoked one or more cigarettes recreationally in the last 30 days. Ninety-two percent of participants reported that they reported their tribe used tobacco ceremonially, 57% stated that their families used tobacco ceremonially, and 49% reported that they used tobacco ceremonially. Individual ceremonial use and recreational use were not significantly correlated. Logistic regression found no relationship between 30-day smoker status and questions assessing for tribal, family, and individual use of ceremonial tobacco. Furthermore, there was no relationship between smoker status and frequency of ceremonial tobacco use. Our results support qualitative research findings that, at an individual level, recreational cigarette smoking appears distinct from ceremonial tobacco use among American Indians.

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POS1-21 PERCEPTION OF PUBERTAL TIMING, RATHER THAN TIMING OF PUBERTAL STAGE, INCREASES LIKELIHOOD OF TOBACCO USE IN ADOLESCENTS
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Subjective perception of development as on-time or asynchronous with peers may be highly salient to risk behaviors as it captures both biological and internal psychological processes associated with puberty (Dubas et al, 1991). Both the earlier attainment of a particular pubertal stage (based on physical characteristics) and an adolescent’s subjective perception of off-time development have been linked to increased tobacco use (Graber et al., 1999; Stratton et al., 2002). However, few studies have compared characteristic based assessments with perceptions of timing in relation to risk behaviors. We examined the relative influence of timing of pubertal stage and perception of timing on tobacco use in a sample of 9-12th graders (N=629). A continuous measure of current timing of pubertal stage was created from the standardized residuals from regressing pubertal stage (Pubertal Development Scale (PDS): Petersen et al, 1988) on age and gender (Dorn et al, 2003). Teens’ perceptions of timing of puberty were provided in response to the question: “Do you think your development is/was any earlier or later than most other boys/girls your age?” Three categories resulted: ahead, on-time, and behind. Logistic regression equations separately regressed lifetime tobacco use (never/ever) on gender, and either timing of stage or perception of timing (adjusted for age) and the interaction between timing and gender in the whole sample. As the interaction between perception of timing and gender was significant (p<.001) the models were repeated separately for boys and girls. PDS timing of pubertal stage was not related to tobacco use. Compared with those who perceived their development as asynchronous with peers, those who perceived themselves as ahead of peers were more likely to use tobacco (boys OR=1.7, 95% CI: 1.2-2.3 and girls OR=1.38, 95% CI: 1.1-1.7). Boys who perceived themselves as behind their peers also were more likely to use tobacco (OR=1.5, 95% CI: 1.0-2.0). Perceptions of developmental synchrony with peers rather than actual timing of stage may be an important factor mediating tobacco use, and may present a target for intervention and prevention efforts.

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POS1-22 SECON DHAND SMOKE EXPOSURE AS A LONGITUDINAL PREDICTOR OF ADOLESCENT SMOKING ONSET
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Context: A recent review suggest that nicotine exposure from secondhand smoke (SHS) can engender plasma nicotine concentrations that are equivalent to levels associated with nicotine-induced changes in behavior.

Objective: To determine the influence of SHS on smoking initiation among a population of South African adolescents.

Design and Setting: Data were obtained from a representative sample of 8th-grade adolescents (12-19-year-olds) from 11 randomly selected high schools in the Limpopo province in South Africa (N=1,010). Questionnaires were administered at baseline during 2005 and at a one-year follow-up. The questionnaire inquired about the usual smoking habit of a household member (HHM) if any smokers, namely; smokers usually outdoors or usually indoors (SHS). The questionnaire also included questions related to participants’ socio-demographic characteristics, alcohol use, peer influence, depressive symptoms, sense of coherence levels and oral health behavior. Data analysis was restricted to those who did not report past-month smoking at baseline and could be reached at follow-up (Follow-up rate was 82.4%). Taking into account the cluster sampling used, data was analyzed using chi-square statistics and multiple logistic regression.

Main Outcome Measure: Smoking onset defined as self-reporting past-month smoking at follow-up.

Results: At baseline, 27.7% of the respondents reported that a HHM smokes, but usually smokes outdoors; and 10.5% reported that a HHM smokes and usually smokes indoors. Of those who did not report past-month smoking at baseline (n=718), 9.5% had initiated smoking. Compared to others, those who reported at baseline that HHM mainly smoked indoors were more likely to have initiated smoking (16.4% vs. 8.6%; p=.05). Even after adjusting for potential confounders, compared to those who reported that no HHM smokes, living in a home where a HHM usually smoked indoors was significantly associated with smoking onset (OR=2.19; 95% CI=1.06 - 4.52), but reporting that HHM smoked mainly outdoors was not (1.20; 0.67 - 2.16). Conclusions: This study findings suggest that exposure to SHS may be an important risk factor for smoking onset among adolescents.

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POS1-23 HOW ARE RACIAL/ETHNIC DIFFERENCES IN FAMILY BONDING ASSOCIATED WITH SMOKING INITIATION IN EARLY AND LATE ADOLESCENCE?
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Background: It is unclear in what way race/ethnicity, age, and levels of family bonding influences the initiation of smoking. Objective: The objective of this study was to determine the association between family bonding and initiation of smoking in a sample of adolescent nonsmokers.

Methods: A secondary data analysis of Wave 1 and Wave 2 data from the National Longitudinal Study of Adolescent Health (Add Health) was conducted. The primary outcome measure was adolescent initiation of smoking at Wave 2. Multiple logistic regression analyses were used to examine the protective association between family bonding and smoking initiation by race/ethnicity and age group of adolescents at Wave 2.

Results: There were 4061 non-smoking adolescents between 11 and 17 years of age at Wave 1, of which 52% were female, and 70% were Caucasian. Overall, 18% of the sample initiated smoking during the 12 months between Wave 1 and Wave 2 surveys. For both younger African American and Hispanic youth, maternal satisfaction with the relationship with their adolescent was significantly protective and for older Hispanics, high parental presence and high parent-family connectedness were protective against smoking initiation. Lack of parental awareness about the adolescent’s whereabouts was a risk factor for smoking initiation in younger Caucasians, and in older Hispanics and Caucasians.

Conclusions: The results of this study underscore the importance of family bonding throughout adolescence in protecting against smoking initiation in a large sample of youth. It is important to continue to emphasize to parents the importance of maintaining high levels of bonding with their adolescent throughout early and late adolescence in order to decrease tobacco initiation.

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While several studies have explored the relationship between smokeless tobacco (ST) use and initiation of cigarette smoking, results have been inconclusive and there is a lack of longitudinal data to track initiation over time. Adolescents and young adults are a particularly important group to study given that both smokeless tobacco use and smoking initiation are highest among this age group. The current study addresses this gap by utilizing data from the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative study following adolescents through three survey waves ranging from 7th grade into young adulthood. Approximately 15% of the study population reported using ST during the last thirty days, 47% reported using cigarettes regularly, and 8% reported using both ST and cigarettes during at least one of the three waves. Experimentation with cigarettes was common, as 82% reported trying a cigarette during at least one wave. Results showed that approximately 35% of ST users not using cigarettes at baseline went on to use cigarettes, while 33% of those who had not used ST first went on to use cigarettes. In a logistic regression analysis using a model including demographic variables and ST use, peer smoking (p<.0001) at Wave 1 of the survey was the strongest predictor of transitioning to cigarette use, such that a person with more smoking peers was more likely to transition. In contrast, only 5% of cigarette smokers who were not using ST at baseline went on to use ST later. In a logistic regression analysis controlling for demographic factors and peer smoking, the number of days an individual smoked during the previous month at Wave 1 significantly predicted later ST use (p<.05). The Add Health dataset has some substantial limitations in its assessment of ST use that limited our ability to explore the relationship between ST use and cigarette smoking more fully. However, these results suggest that transitioning from ST use to smoking and vice versa is moderated by key environmental and behavioral factors, particularly peer influence and frequency of smoking.

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POS1-25 MULTIPLE TRAJECTORIES OF CIGARETTE SMOKING AND THE INTERGENERATIONAL TRANSMISSION OF SMOKING: A MULTI-GENERATIONAL LONGITUDINAL STUDY

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Longitudinal studies have shown heterogeneity in the course of smoking including variation in age of onset, speed of escalation, peak consumption, and persistence. These multiple trajectories may reflect “developmental phenotypes” that differ in their underlying etiologies or consequences. The current study tested whether these trajectories vary in the risk they carry for the intergenerational transmission of smoking. That is, we tested whether the parent’s smoking trajectory group predicted their adolescent’s smoking initiation above and beyond both parents’ current smoking. We also tested whether parents’ educational attainment and adolescent’s personality (NEO personality dimensions, John et al, 1994 and temperamentral resistance to control, Bates, 1994) mediated these effects. Adult participants were from the Indiana University Smoking Survey (Chassin et al., 2000). Between 1980-1983, all consenting 6th-12th graders in a Midwestern county school system completed annual surveys in school (total N=8,847) with four later mail follow-ups (total age span=10-42). Their smoking trajectory group was obtained from a latent class growth analysis. For those with adolescent children (average age=13, N=1,338), the adolescent’s self-reported “ever smoking” (dichotomized) was taken from a multigenerational study. Personality data were reported by the parent (averaged across the two parent reports). Results showed that parent’s smoking trajectory group significantly predicted adolescent smoking even when both parents’ current smoking status and parents’ educational attainment were controlled. Children’s personality attributes were partial mediators but could not account for the effects of parent’s smoking trajectories. Thus, variability in life course smoking trajectories (and not just current smoking status) affects intergenerational transmission, and these trajectories may have implications for theories of tobacco use etiology.

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POS1-26 ADOLESCENT PHYSICAL ACTIVITY AND SMOKING: A MODERATED-MEDIATION ANALYSIS OF GENDER DIFFERENCES VIA SPORT COMPETENCE BELIEFS AND DEPRESSIVE SYMPTOMS

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Research supports an inverse relationship between physical activity (PA) and smoking in adolescents. It is unclear though, why PA affects adolescent smoking, and whether there are gender differences in the effects. We sought to answer these questions in a two wave study with a two group structural equation model (SEM) proposing the effects of PA on smoking via sports participation (being on an official high school team roster) on adolescent smoking is indirect via the effect of PA and team sport on sport competence beliefs (SCB), SCB on depression symptoms (DS), and DS on smoking. We also proposed the effect would be stronger for males than females. Participants were 384 adolescents (55% male, 96% Caucasian) aged 15-18 at baseline, from a suburban South Eastern Pennsylvania high school taking part in a two-year cohort study (n=406) of the relationship between health habits and smoking. The analysis in this study included data from both waves. The two group SEM fit the data well, Chi square = 28.53, p=.38, CFI=1.00, RMSEA=.02, WRMR=.76. There were no significant direct effects for PA or team sport on smoking. However, results supported a significant indirect effect; team roster membership had a significant negative indirect effects on smoking via sport competence beliefs and DS, but only for boys (Beta indirect=-.05, z=2.12, p=.03, 95%CI=-.104, -.004). Consistent with previous research, the findings of this study suggest that team sport participation may provide the greatest protection against adolescent smoking. The effects on smoking may depend upon gender, being most beneficial for males. Also consistent with past research, these results suggest the importance of the subjective interpretation of team sport participation, and DS in the relationship between adolescent activity involvement and smoking. They also suggest the need for research on what features of the team sport environment protect against smoking in adolescence.

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POS1-27 SMOKING INITIATION AND PROGRESSION FROM ADOLESCENCE TO YOUNG ADULTHOOD

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Of adults ever smoking regularly, most initiated smoking during adolescence and progressed to a regular habit by 18. Research suggests race differences in smoking, with rates highest for Caucasians (CN) followed by Hispanic (HC), and lowest for African American (AA) youth. These differences, though, tend to diminish in adulthood. We assessed race differences in smoking initiation and progression. We proposed that compared to CN, AA and HC adolescents would be less likely to initiate early, and progress early, but that differences would disappear thereafter. We were also interested in factors fostering, and protecting against smoking initiation and progression generally. Participants were 998 Northern Virginia adolescents (age 14 at baseline) completing seven waves of a longitudinal study of bio-behavioral smoking predictors. We analyzed data in a two-part semi-continuous growth model with separate developmental trends for high school (HS) and young adulthood, assessing in one model the effects of predictors on initiation (binary) and progression (continuous). Compared to CN youth, neither AA nor HC adolescents were more likely to initiate at baseline or during HS. However, AA youth were 47% less likely than CN youth to initiate during young adulthood. Further, being HC and AA was associated with less smoking at baseline. There were no other race differences. As expected, peer and household smoking, and alcohol and marijuana use predicted smoking initiation and smoking at higher levels. Depression symptoms were associated with HS smoking progression. GPA, though, was associated with a 72% reduction in the odds of baseline initiation and 25% reduction during HS. Club participation was also associated with decreased progression during HS. The race findings were somewhat consistent with past studies, with AA and HC youth less likely to smoke at higher levels during HS. However, we also found that AA youth were less likely to initiate in young adulthood. Further, although several covariates predictably increased the risk of smoking initiation and progression, the one consistent protective factor was GPA.

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Although smoking rates have declined significantly over the last several decades, approximately 20% of adults continue to smoke. It has been suggested that some of these remaining smokers represent a distinct “hardcore” group, meaning that they are committed smokers unlikely to ever quit. The little research that exists on this group has examined demographic and smoking variables that distinguish hardcore smokers from other types of smokers. However, no studies have considered the possibility that hardcore smokers might consist of distinct subgroups. This possibility was addressed in the present study by incorporating motivational and self-efficacy measurements in an assessment of hardcore smokers. Participants were 379 daily smokers ages 27-39 from the Indiana University Smoking Survey. The study successfully distinguished two subgroups of hardcore smokers: those who were unmotivated to quit and those who had low self-efficacy concerning their ability to quit. Both groups had no quit attempts in the past year and no plans to quit soon. Their designation as “hardcore” was validated by their lack of smoking cessation (compared to other participants) at a five-year follow-up. Analyses of variance revealed significant differences between the two subgroups in nicotine dependence, beliefs and attitudes about smoking, and amount smoking in their social environments. Those with low self-efficacy reported more nicotine dependence, less positive attitudes toward smoking, and stronger addiction motives for smoking compared to the unmotivated group. In contrast, the unmotivated group perceived relatively greater benefits of smoking and reported more smoking in their social environments. Differences were also found between the two hardcore groups and a comparison group of smokers actively trying to quit. These findings suggest that “hardcore” smokers are a heterogeneous group, whose distinct cognitive and motivational characteristics are likely to be barriers to traditional cessation programs. Understanding the diversity that characterizes this group may help researchers promote more effective cessation strategies for helping hardcore smokers quit.

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POS1-29 COMPARING POLYTABACCO USERS TO CIGARETTE-ONLY USERS IN A SAMPLE OF CANADIAN YOUNG ADULTS: ARE THEY MORE LIKELY TO USE DRUGS AND ALCOHOL?

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Background: The concurrent use of cigarettes and other tobacco products, or polytobacco use among adolescents and young adults, has received limited attention. Polytobacco users may be at greater risk for use of illicit drugs and alcohol and for later nicotine addiction and adverse health outcomes.

Methods: We used 2002 survey data on a sample of Canadian young adults (n=1167), collected as a part of a cohort study that began in 1993. The purpose of the cohort study was to explore the interrelationships of smoking behaviors with different factors (e.g. demographics, psychosocial factors, alcohol and drug use). Using the most recently collected data, we determined estimates of current cigarette use and polypolaco use, defined as current cigarette smoking and an ever user of cigars, chewing tobacco, pipes, and/or bidis. Among polytobacco users, we identified which specific tobacco products were used. Multivariate analyses were used to determine differences in drug use and other substance use characteristics (gender, race/ethnicity, school year, drug use, alcohol use) that were associated with polytobacco use compared with cigarette-only use.

Results: The overall prevalence was 32.7% for current cigarette use: 9.1% for cigarettes-only and 23.6% for polytobacco use. Among polytobacco users, cigarettes with cigars had the highest prevalence of use (67.2%), followed by cigarettes with bidis (30.3%) and cigarettes with chew tobacco or pipes (2.5%). Polytobacco users were more likely to be male, to indicate ever use of illicit drugs (marijuana, ecstasy, and/or mushrooms), and currently binge drink than cigarette-only users.

Conclusions: Among this group of young-adult Canadians, most cigarette smokers had used other tobacco products. Polytobacco users were more likely to be male, binge drink, and indicate ever use of illicit drugs. Interventions that focus on individual substance use among young adults (tobacco, alcohol, illicit drugs) may need to be expanded in order to address combinations of substance use.

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POS1-30 INCREASES IN WATERPIPE TOBACCO SMOKING PREVALENCE ON A U.S. COLLEGE CAMPUS

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Tobacco smoking using a waterpipe (a.k.a. hookah, narghile, shisha) is spreading worldwide, and may be particularly common on U.S. college campuses. Despite concerns regarding waterpipe tobacco smoking and public health, there is little information regarding its prevalence among the U.S. college-age population. In 2006, a survey of 744 Introduction to Psychology students at Virginia Commonwealth University (VCU; 71.9% < age 20, 64.9% women, 43.8% non-white, 92.9% U.S. citizen) revealed 48.4% lifetime, 43.4% past year, and 20.4% past 30-day waterpipe tobacco smoking. Within the respondents that reported past 30-day waterpipe use, 70% reported that waterpipe is less harmful than a regular cigarette. In 2007, the identical survey was administered to a new group of Introduction to Psychology students at VCU (n=339: 62.8% < age 20, 62.8% women, 37.8% non-white, 95.6% U.S. citizen). In this sample, surveyed exactly one year later, respondents reported 60.8% lifetime, 53.7% past year, and 25.0% past 30-day use. In addition, of those respondents who reported using a waterpipe to smoke tobacco in the past 30 days, 25.3% believed waterpipe to be less harmful than cigarettes, and a large proportion believed that there was a low or no likelihood of addiction using the waterpipe socially (50.5%). These data suggest that waterpipe tobacco smoking prevalence may be increasing among U.S. college students. Controlling waterpipe tobacco smoking in the future likely requires better understanding of users’ motivations and attitudes, as well as the acute and long-term health effects of this form of tobacco use.

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POS1-31 EARLY VS. LATE SMOKING INITIATION IN COLLEGE STUDENTS

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Previous research indicates that initiation of cigarette smoking during adolescence is associated with a greater likelihood of continued smoking compared to initiation during adulthood. Emerging evidence indicates that a substantial proportion of previously never-smoking undergraduates initiate during college. At this time little is known regarding potential differences between early and later smoking initiation among college students. The present study was designed to test the hypothesis that students who initiated smoking during the first two years of college would be at greater risk for progressing to established smoking than those who initiated later in college. Additionally, we predicted that early initiators would be more likely than late initiators to possess risk factors associated with smoking progression. Participants were drawn from a longitudinal study of tobacco use during college, and were assessed annually for four years. Included in the present study were participants who initiated smoking during the college years (N = 67; 54% male). Early initiators (50%) were more likely to report 100 or more lifetime cigarettes at the next year’s assessment [c(2) = 7.39, p = .007] than later initiators (16%). Early and late initiators did not differ significantly in terms of peer smoking, baseline alcohol consumption, or alcohol consumption at the interview preceding initiation. However, early initiators reported higher levels of behavioral undercontrol [F (1, 65) = 6.28, p = .015] and greater current exposure to smoking [F (1, 65) = 5.49, p = .022]. Additionally, early initiators endorsed greater alcohol consumption [F (1, 65) = 5.58, p = .022] and more alcohol-related problems [F (1, 56) = 5.83, p = .019] during the assessment interval in which initiation occurred. These data suggest that students who initiate cigarette smoking early in college are disproportionately vulnerable to progressing to established smoking. In addition, early initiation was associated with a number of risk factors associated with adolescent smoking progression.

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Background: Studies have reported diminished quality of life (QOL) among smokers, but there are limited data about the impact of quitting on long-term changes in QOL. Purpose: To describe the relationship between smoking characteristics and QOL and the impact of quitting smoking on 4- and 8-year changes in QOL among women in the Nurses’ Health Study cohorts, followed from 1976 (NHS) and 1989 (NHSII) with biennial questionnaires.

Methods: The sample included 158,734 women who were 29 to 71 years of age in 1992 (NHS) and 1993 (NHSII) who reported smoking status and intensity and responded to a QOL survey (Short-form 36, which includes 8 subscales and component scores for mental health [MCS] and physical health [PCS]). Smoking characteristics and QOL were measured in baseline surveys in 1992 and 1993. At 4 and 8 years, smokers were classified as continuous smokers, former smokers, current smokers who had quit smoking, and non-smokers.

Results: At baseline, current smokers had the lowest MCS in all age groups and the lowest PCS until age 55 when scores in former smokers became lower. Current smoking (compared with never) and cigarettes/day were associated with significantly lower PCS and MCS, and cigarette smoking was associated with lower MCS but not PCS. Mean changes in QOL overtime were small. Those who quit had higher improvement in MCS compared with continuous smokers (1.9 vs. 1.5 at 4-yrs, 3.3 vs. 2.7 at 8-yrs) but a somewhat greater decline in PCS (-2.1 vs. 1.6 at 4-yrs, -3.8 vs. -3.6 at 8-yrs). Eight years after quitting, former smokers had the greatest improvement in mental health (4.4, compared with 1.9 for those who continued to smoke) and physical health (4.1, compared with 1.5 for those who continued to smoke) compared with continuous smokers. Among those who had never smoked, the greatest improvement in QOL was seen in those who continued to smoke (estimative improvement -7.8).

Conclusions: Current smokers had lower overall QOL as compared to former and never smokers. Quitting smoking had a slight impact on improving mental health, whereas it had the greatest decline in physical functioning (-7.8). Eight years after quitting, former smokers had the greatest improvement in all subscales except for Stereotypy. No funding.
SRNT ◆ Poster Session 1

POS1-36  WOMEN AND TOBACCO HARM REDUCTION IN APPALACHIA, OHIO
Amy K. Ferketich, Ph.D.1, Phyllis Pirie, Ph.D., Mary Ellen Wewers, Ph.D., M.P.H., Dalisa Barquero, R.N., M.P.H., Sheetal Hardikar, M.B.B.S., M.P.H., The Ohio State University College of Public Health

Background: The literature on potential reduced exposure products (PREPs) suggest that these products do not eliminate the harm associated with tobacco and that while smokers who have tried PREPs do not like them as much as regular cigarettes, many would be interested in doing so sometime in the future. The purpose of this study was to further extend research regarding the perceptions smokers have of the advantages and disadvantages of using PREPs.

Methods: Five focus groups with female current smokers were conducted in the Appalachian region of Ohio, a poor and medically underserved area. The semi-structured discussion guide was developed to capture information on reasons why women smoke, why and how they quit smoking, and reasons why women would switch to PREPs. All sessions were transcribed, reviewed, and coded. The textual data were analyzed to identify recurrent patterns and themes related to the research questions.

Results: The size of each focus group ranged from 4 to 7 women (total n = 27) and the length from 45 to 80 minutes. The results suggest that these smokers did not express enthusiasm for using PREPs as an aid to smoking cessation or as a harm reduction product. In general, the concept of harm reduction in the sense of reduction product. In general, the concept of harm reduction in the sense of reducing these problems (e.g., PREPs would allow one to engage in the smoking behavior, give you something to do with your hands, and let smokers continue to socialize with nonsmokers).

Conclusions: In conclusion, while use of PREPs is not prevalent in the United States, the tobacco control community should maintain its close monitoring of these products. The results from this qualitative study with female smokers suggest that PREPs may be attractive to some smokers because they offer benefits that other products lack.

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POS1-37  MODELING OF ENVIRONMENTAL INFLUENCES ON SMOKING HABIT IN ARIZONA’S YOUTH
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Despite school-based prevention programs and anti-tobacco campaigns, youth tobacco abuse remains a problem. There is much research on this trend, but few models that attempt to piece it all together. This study attempts a basic framework of many environmental variables affecting youth smoking. In 2006, 60,401 middle and high school students in Arizona were surveyed on their substance abuse. 52% were female, 48% male, 46% White, and 37% Hispanic. The dependent variable Smoking Habit consisted of three standardized questions which asked the respondent how many days in the past 30 they smoked cigarettes, how many cigarettes on average they smoked per day, and whether or not they feel they will smoke cigarettes as an adult. The eight environmental variables were measured by statistically reliable constructed scales based in empirical research. Random sampling reduced the sample size into more realistic samples of 500 participants. An EFA showed the environmental variables grouped into two factors. The first, labeled Protective, consisted of Parents Responsiveness, Parents’ Demandings, and Positive School Environment. The second factor, labeled Detrimental, consisted of Parents’ Permissiveness, Substance Abuse of Respondent’s Friends, Substance Abuse of Non-Parental Adults, Substance Abuse of Siblings, and Malign Community Influences. A CFA showed the best fit model was a direct causal influence of Detrimental on Smoking Habit with Protective weakening the influence of Detrimental. Fit indices were high (CFI: 0.90, NFI: 0.88, NNFI: 0.87) and the model predicted 25% of the variance in Smoking Habit. The model provides a general framework with many variables affecting youth smoking and shows the complexity of the problem. A big limitation is several environmental variables were neglected due to question limitation.

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POS1-38  QUITTING, RELAPSE, AND MENTHOL CIGARETTE USE AMONG BLACK WOMEN
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Although cigarette smoking has a major impact on the health of Black women, information concerning factors that influence their smoking behavior is limited. We used data from the Black Women’s Health Study, a nationwide cohort of women age 21-69 at baseline (1995), to identify factors that affect quitting, relapse, and menthol cigarette use. The study was to further extend research regarding the perceptions smokers have of the advantages and disadvantages of using PREPs. Follow-up data on biennial questionnaires. Overall, 36% of these smokers made an initial quit (not smoking on at least one follow-up questionnaire) over the 8-year period, of whom 27% later relapsed. A total of 26% of smokers made a sustained quit (not smoking on two follow-up questionnaires and no subsequent relapse). We used Cox models to evaluate factors associated with these outcomes. We first assessed the contributions of sets of variables grouped into domains: demographics, smoking-related measures, medical conditions, health behaviors, family-level measures (i.e., household size and structure, caregiving, and presence of other smokers), health care access, and racial discrimination. The family domain had the largest impact on each of the outcomes; the next most important domains were smoking-related factors for initial and sustained quit, and medical conditions for relapse. Within domains, specific measures strongly related to quitting included higher income, fewer cigarettes/day, recent cancer or cardiovascular disease (CVD) diagnosis, current pregnancy, lower alcohol intake, and no other smoking in household. Factors most strongly related to relapse were younger age, having quit due to cancer/CVD diagnosis or pregnancy, higher alcohol intake, being unmarried, and smoking by others in household. We also explored correlates of menthol cigarette use, as ascertained in the 2003 follow-up questionnaire. 77.5% of smokers used menthol cigarettes. Menthol cigarette use was less common among women living in the western US and with the highest levels of education, and more common among younger women. Use was also associated with childhood and current residence in primarily Black neighborhoods, and increased frequency of interpersonal experiences of racism.

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POS1-39  EFFECT OF ACCULTURATION ON TOBACCO USE IN HISPANIC ADULTS VISITING AN URBAN EMERGENCY DEPARTMENT
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Background: Female Hispanics are more likely to smoke with increasing acculturation to US society; male smokers are less likely to smoke. Less is known about the effect of acculturation on other tobacco use behaviors and beliefs, or its effect in Hispanics seeking emergent medical care. Objective: To study the impact of acculturation on tobacco use behaviors on a cohort of adult Hispanic patients at a hospital emergency department (ED).

Methods: A survey of a consecutive sample of self-identified Hispanic patients older than 20 years was recruited from an urban hospital ED that treats 90,000 adults annually. Consenting subjects were interviewed by bilingual, bicultural research assistants. Acculturation was assessed with the abbreviated 4-item Short Acculturation Scale (range 4-20, with higher scores indicating greater levels of acculturation). Data were analyzed with SPSS 13.0. Parametric and nonparametric statistics were used as appropriate.

Results: Of 1540 enrolled patients, 68.7% were female, and mean age was 44.8 years (SD 15.6). One-third were born in the mainland US, 30.2% in Puerto Rico, 25.5% in the Dominican Republic, and 10.4% in other Central or South American countries. 20.3% self-identified as every- or some-day smokers, with mean daily cigarette consumption 10.1 (SD 8.0). Subjects had a median acculturative score of 11.0 (IQR 5-15), indicating moderate levels of acculturation. Both female and male smokers displayed higher mean levels of acculturation than nonsmokers, (12.8 vs. 10.3, and 12.1 vs. 9.8, P < 0.001 and 0.03, respectively). There was no association between acculturation and motivation to quit (measured by the 9-point Ladder of Change), Fagerstrom Test for Nicotine Dependence, assessments of the importance of quitting, or readiness and confidence to quit.

Conclusion: Acculturation influences the probability of smoking in a largely Puerto Rican and Dominican cohort, but does not appear to affect tobacco behaviors or smoking affect interest in quitting. We did not find the gender discord noted in prior studies. The implications of these findings for cultural tailoring of smoking cessation programs require further study.

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POS1-40  HARD CORE SMOKING AMONG ITALIAN MALE AND FEMALE ADULTS

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Objectives: There has been some discussion of hardcore smoking in the literature and hardcore smokers have been described as heavy smokers who have not previously attempted to quit and have no future intentions to quit. The objectives of this study were twofold: first, to update the estimates of smoking prevalence in Italy using data from 2007 and, second, to characterize hardcore and non-hardcore smokers.

Methods: The data for this analysis were collected from 3,057 Italians (1,465 males and 1,592 females) in March and April 2007. Individuals who were age 15 or older were randomly selected to be representative of the population in terms of sex, age, and geographic area. Hardcore smoking, defined as consuming 15 or more cigarettes per day with no previous quit attempts and no future intention to quit smoking, was examined in individuals who were age 26 and older. Hardcore smokers were compared to their non-hardcore counterparts with respect to sociodemographic and smoking characteristics, perceived stress, and attitudes and beliefs about smoking using logistic regression models.

Results: The smoking prevalence overall was 23.5% (27.9% among males and 19.3% among females), the lowest prevalence observed over the last 50 years. An estimated 7.8% of individuals were hardcore smokers (9.7% among males and 6.0% among females), which translates to 33.1% of all smokers in Italy (34.6% among male and 31.3% among female smokers). Age at smoking initiation, occupation (among males), home smoking rules and perceived stress (among females) distinguished hardcore from non-hardcore smokers.

Conclusions: This is the highest prevalence of hardcore smoking that has been reported in the literature to date. This reflects the general attitude towards smoking cessation in Italy. While the indoor smoking ban has helped to reduce the rate of smoking it is clearly not enough. Stronger tobacco control measures are warranted.

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POS1-41  A CONSUMPTION SURVEY OF SNUS USERS IN SWEDEN

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To investigate snus consumption behaviour in Sweden, a telephone survey of around 3000 snus users — 2555 males and 359 females — was conducted between March and April of 2007. The survey addressed various topics, from average consumption per day and residence time in mouth to dependence and use of snus as a cessation aid. The male population was relatively evenly divided between use of loose snus (41.9%) and portion snus (54.0%), while the female population predominately used portion snus (92.7%). With regard to portion snus consumption, on average male consumption was 11.8 grams per day while the female group consumed on average 8.5 grams per day. Male portion snus users consumed on average 12 pouches a day while female portion snus users consumed an average of 10 pouches. Almost 70 % of the portion snus users answered they keep the pouch in mouth for more than 35 min. Subsequently reassessment of this question showed the median residence time in the mouth is 60 min. Twenty percent of male snus users took their first snus within 5 minutes of waking, and 67 % of males took their first snus within 30 minutes of waking. The data was similar for females. The survey also found that around 47 % of males and females had used snus as a way to stop cigarette smoking.

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POS1-42  KOREAN CHILDREN’S EXPOSURE TO ENVIRONMENTAL TOBACCO SMOKE AT HOME


Objective: There is limited information about environmental tobacco smoke (ETS) exposure among Korean children at home, despite having one of the highest adult male smoking rates worldwide. This paper estimates ETS exposure at home among children in Seoul, Korea. It also examines how demographic, social and behavioral factors influence children’s ETS exposure at home.

Methods: Randomization-based telephone survey stratified by gender was conducted in 2002 with 500 adults in Seoul. Bivariate analyses of cross-sectional data for 209 adults with children under 18 years of age living in the household.

Results: Thirty-one percent of respondents reported that a child was exposed at home. The mean weekly dose was 5 cigarettes among children who were exposed. This is despite the fact that almost all respondents indicated that inhaling ETS was harmful to one’s health. Children’s ETS exposure was significantly more likely if the respondent or their spouse smoked, or if the respondent’s parents were smokers. ETS exposure was less common among children living in homes that banned smoking (82%), than those living in homes that allowed smoking (36%). Children’s ETS exposure was also less likely if friends or relatives discouraged smoking and if respondents reported higher levels of self-efficacy regarding protecting children from ETS.

Conclusions: Although there is no safe level of exposure to ETS, nearly one-third of children were exposed to ETS in their own home, and often by their own parent or grandparents. Since children spend most of their time at home, greater measures are needed to protect them from ETS in their home, such as discouraging parental smoking and encouraging home smoking bans.

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POS1-43  PATTERNS OF SMOKING AND NICOTINE DEPENDENCE — IN THE INDIAN CONTEXT

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Background & Objectives: The tobacco use and measurement of Nicotine dependence is not given much importance, therefore little is known about the Tobacco consumption patterns and it's dependency in our country. The objective of this study was to concentrate on this issue.

Methods: The present communication is based on the large general population random stratified telephone survey conducted in the district of Thrissur (Kerala) during 2002 to estimate the prevalence of different drug abuse. Multistage stratified random sampling technique was applied to select the desire sample. The information was obtained by interviewing 12,730 individuals. DSM-III-R instrument was used to assess the dependent use.

Results: There were 4,370 males, of which 36.3% were tobacco users. Among tobacco users, 53.6% were diagnosed as dependent users by DSM-III-R scale. Most of the tobacco users were Hindu (64.4%), married (92.4%), educated (86%) and living in a nuclear family (60.5%). A high percentage of tobacco users were smokers (82.1%), while 13.4% were oral users of tobacco and 4.5% of users were smoking as well as consuming oral tobacco. Nicotine dependents were higher among oral tobacco users (59.2%) as compared to the smokers (52.9%). The mean consumption of cigarette was 11-20 cig/day while oral tobacco was consumed mostly for 6-10 times/day. A linear relation was observed between the consumption of smoking and Nicotine dependence while it was difficult to predict the relation between frequency of use and dependence.

Conclusion: Differences in dependence rates among two types of tobacco users are accounted for mostly by quantity of cigarettes smoked. Heavy tobacco use patterns reflect a need to gain more understanding in planning intervention programs for the benefit of tobacco users in this region.

WHO (India office).

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POS1-44 THE FAGERSTROM TEST FOR NICOTINE DEPENDENCE SCORES ACROSS COUNTRIES, SEXES AND IN CURRENT AND EX-SMOKERS

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For some time smokers have been pressured to stop smoking and it has been suggested that remaining smokers might be more dependent since the less dependent ones can stop easier. This is currently being debated particularly in United States, where the smoking prevalence has dropped significantly over the last decades but now almost come to a stall. In this paper the available data on degree of dependence across countries, by sex and by smoking status was reviewed. Both published and un-published data sets were accepted from colleagues, the U.S. National Library of Medicine, the SRNT Listserv, and Psych Info; fifteen studies were included. The instrument used for assessing dependence was limited to the Fagerstrom Test for Nicotine Dependence (FTND). Across countries the FTND scores ranged from 2.8 to 4.6. An inverse correlation was found towards higher FTND scores in countries with lower smoking prevalence, r=-.89, p=0.005. Males had higher FTND scores than females in every country, and ex-smokers had lower FTND scores than current smokers. Our findings suggest that in countries with low smoking prevalence the dependence was higher, and the hypothesis that remaining smokers have a higher dependence than those who have quit is supported.

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POS1-45 ETHNIC GROUP DIFFERENCES IN SMOKING SUSCEPTIBILITY AND ANTI-SMOKING PARENTING STRATEGIES AMONG URBAN PREADOLESCENTS

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This study describes patterns of cigarette smoking initiation and susceptibility among urban preadolescents and examines how anti-smoking parenting strategies differ across ethnic groups. Surveys were completed by 474 7th graders in RI (modal age 13 years; 54% female). Studies identified themselves as belonging to over 40 ethnic groups (20% Cape Verdean, 13% Puerto Rican, 14% European decent, 7% Colombian, 10% African decent, 4% Dominican, 6% Portuguese, 9% Other, 17% Multi-ethnic; 24% born outside the US). Measures included smoking initiation (ever smoked), smoking susceptibility (4-items of which have been shown to significantly predict smoking initiation two years later), and child self-report of male and female caregiver smoking status and antismoking parenting strategies. Analysis of variance was used to examine how smoking initiation/susceptibility and its hypothesized covariates differed across ethnic groups. Ever smoking (F (8,451) = 2.32, p<.05) and susceptibility (F (8,452) = 2.23, p<.05) showed significant differences across groups. Cape Verdeans reported lower levels of smoking initiation compared to multi-ethnic students. Caregiver smoking was significantly associated with child ever smoking (p<.05) and susceptibility (p<.05). Parents who smoke were more likely to be from European, Portuguese, and Puerto Rican decent compared to Cape Verdean and Columbia decent. Anti-smoking strategies (discussion or punishment if parent found out child smoked) were not predictive of susceptibility; however punishment was associated with lower levels of ever-smoking (p<.05). Male caregivers from African decent were more likely to use punishment as an anti-smoking strategy than those from Cape Verdean decent (p<.05). Note, Cape Verdeans were the largest group in this sample to report being born outside of the US. Immigrant status and acculturation may play a role in both susceptibility and effectiveness of anti-smoking parenting. Results emphasize the importance of better understanding protective influences in different cultural practices and how they can be cultivated to deter smoking uptake across increasingly multiethnic generations of urban youth.

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POS1-46 RACE DIFFERENCES IN EARLY EXPERIENCES WITH SMOKING

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To investigate race differences in retrospectively-reported early smoking experiences, we studied African-American (n=48) and Caucasian (n=155) current smokers who participated in a study designed to identify phenotypic and genotypic factors associated with smoking. African-American smokers were significantly older than Caucasian smokers when they first experimented (mean: 17.4 ±1.08 vs. 14.7 ±0.32; p<.05) and when they began smoking regularly (19.7 ±0.86 vs. 17.4 ±0.37; p<.05). Caucasian smokers endorsed the following reasons significantly more strongly than African-American smokers: weight control, social reasons, and “it perked me up.” African-American smokers reported a higher likelihood of pleasant sensations and “buzz” and a lower likelihood of unpleasant sensations, nausea, and difficulty inhaling in response to early experimentation with smoking. These findings may be due to genetic differences based on race. An alternative explanation is that the greater age at which African-Americans began experimenting and smoking regularly is due more to socio-cultural and socio-economic factors than to innate differences in nicotine sensitivity. The greater neurological, psychological, and/or physiological immaturity of the Caucasian smokers suggests that, while legal deviates may play some role in their susceptibility; overall race differences are at least as likely as genetic factors to explain apparent differences in responses to early exposure to nicotine. Additional research will be needed to disentangle these two possible explanations. Funded by DA017640 to the last author.

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POS1-47 CORRELATES OF CURRENT SMOKING: REPRIMAND AND FINES AMONG CALIFORNIA ADULTS OF KOREAN DESCENT

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Objective: This study assesses the effects of social and legal reprimand on current smoking prevalence among Californians of Korean Descent. Methods: Using a large population-based randomized telephone survey conducted by closely supervised bilingual professional interviewers conducted in 2005 and 2006, responses concerning smoking behaviors among 2,084 adults (18 years and older) of Korean descent who had the most recent birthday in Korean households were analyzed. About 85% of eligible respondents completed lengthy interviews, and data approximated recent census data for Korean adults in California. Tests were conducted using logistic regression.

Results: Reports of social reprimand (expected criticism by strangers and others) were strongly associated negatively with the CDC measure of current smoking [on a scale of 0-100, total mean among CDC current smokers:46.6 and among non-smokers:56.1, t(1993)=7.83, P<0.001], while reports of legal penalties (ticketing by police officers) were not significantly associated with current smoking [on a scale of 0-100, total mean among CDC current smokers:6.9 and among non-smokers:6.6, t(1811)=0.02, P=.984]. The results were robust (P<0.001) after multivariate logistic controls for the presence of models of smoking, primary group social support for smoking, acculturation, gender, acculturation by gender (male) interaction, age, and education. Covariates were also related to current smoking in the predicted direction (P<.01). Conclusions: Findings suggest that, while legal constraints may have an assumed larger effect on environments where people congregate, individuals of Korean descent are influenced to a greater extent by expectations of immediate social sanction. Expectations of social sanction are much greater than of legal sanction. It may be efficacious to target interventions encouraging individual protests of smoking in public among persons of Korean descent. National Institute of Health (NCI).

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POS1-48  HIGH RISK STRATEGY IS FEASIBLE ON A POPULATION-BASED LEVEL. THE INTER99 STUDY

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Introduction: One strategy to achieving a high impact on public health has been large community-based smoking interventions, but several of these have shown disappointing results.

Methods: All 2,408 daily smokers included in a multi-factorial randomized population-based intervention study, INTER99, Copenhagen, Denmark, were repeatedly offered individual face-to-face lifestyle consultation. All smokers were strongly encouraged to quit. Furthermore, smokers in the high intensity group were offered participation in smoking cessation groups. We measured self-reported and validated point abstinence at one, three and five-year follow-up and compared rates with a control group, using intention-to-treat analyses. Logistic regression analyses were used to identify predictors of validated point abstinence at five-year follow-up.

Results: Compared to the control group it was twice as likely to be self-reported abstinent at five-year follow-up in the high intensity intervention group (OR: 2.19; 95%CI: 1.7-2.8; p<0.001) and seventy percent more likely in the low intensity intervention group (OR: 1.71; 95%CI: 1.1-2.6; p=0.016). The effect of the intervention was significant even when comparing validated abstinence in the intervention groups with the control group (OR: 1.38; 95%CI: 1.1-1.8; p=0.014).

Conclusion: This large unselected population-based study showed a significant effect on smoking cessation in the long term. The face-to-face setting, the repeated offer of assistance to quit and the multi-factorial approach may explain the success of the smoking cessation intervention.

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POS1-49  THE ASSOCIATION BETWEEN CIGARETTE USE AND PROBABLE POST-TRAUMATIC STRESS DISORDER (PTSD) AMONG RESCUE AND RECOVERY WORKERS: FINDINGS FROM THE WORLD TRADE CENTER HEALTH REGISTRY (WTCHR)

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Background: In addition to respiratory symptoms and medical conditions (including asthma), other studies have documented increases in cigarette smoking and mental health effects among World Trade Center (WTC) rescue, recovery and clean-up workers after September 11, 2001. The purpose of this analysis was to determine demographic, as well as mental health factors associated with smoking among workers to aid in targeted smoking cessation efforts.

Methods: The WTC Health Registry (WTCHR) is designed to document health effects related to 9/11 through periodic monitoring of health conditions over the next 15 years. Baseline data was collected by self-report through phone surveys from individuals exposed to the WTC disaster or its aftermath 2-3 years after the event (n=71,437). We evaluated the association between current smoking status and PTSD among persons who worked at the WTC site (n=29,626). Probable PTSD was assessed with the PCL-17 checklist.

Results: Workers were predominantly male (78%), White (71%), and under 45 years old (66%). Self-reported current smoking prevalence was 17%, while former smoking was 27%. In multivariate analysis, after adjusting for demographic characteristics, variables significantly associated with an increased likelihood of being a current smoker were: probable PTSD [OR (95%CI):1.6 (1.50-1.77)], witnessing a traumatic event (e.g., airplanes and/or building collapse) on 9/11 [1.2 (1.10-1.25)], and being a construction, utilities or abatement worker [1.6 (1.48-1.74)]. Among workers with probable PTSD, characteristics significantly associated with current smoking were being under 45 years old [1.4 (1.19-1.61)], being White [1.5 (1.25-1.78)], having no college education [1.5 (1.29-1.73)], and being a construction [1.6 (1.27-1.94)], sanitation [1.4 (1.08-1.71)], or volunteer worker [1.7 (1.39-2.05)].

Conclusions: Among rescue and recovery workers, cigarette use is higher among construction workers, those with probable PTSD, and those who witnessed a traumatic event. Smoking cessation, in conjunction with mental health services, is a critical public health priority, particularly for construction, sanitation, and volunteer workers.

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REASONS FOR SMOKING AMONG INDIVIDUALS WITH SCHIZOPHRENIA

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While individuals with schizophrenia are more likely to smoke than those in the general population, there are no studies examining differences in reasons for smoking between these groups. This study sought to examine motives for smoking in eighty individuals with schizophrenia (SCZ) or schizoaffective disorder (SA) as compared to 463 control smokers (CON) without current mental illness. All participants completed the 68-item Wisconsin Inventory of Smoking Dependence Motives Scale (WISDM-68), a self-report measure of reasons for smoking. The WISDM-68 uses a 7-point scoring system anchored by 1=not true of me at all and 7=extremely true of me. There was a positive correlation between total WISDM-68 score and other measures of dependence (the Fagerstrom Test of Nicotine Dependence and cigarettes smoked per day) for both SCZ/SA and CON (p<0.01), indicating higher scores for more dependent smokers. Smokers with SCZ/SA scored higher on the total WISDM-68 (63 vs. 53; p<0.08) than the CON group. Multivariate analyses of variance (MANOVAs) adjusting for age, race/ethnicity, gender, education, cpd and FTND total score revealed that smokers with SCZ/SA scored significantly higher on (4 of 13) WISDM-68 subscales. Participants with SCZ/SA scored particularly high on Positive Reinforcement, Behavioral Choice Melloration, Affiliative Attachment, Negative Reinforcement subscales. Automatically was the only scale that was endorsed significantly more strongly (CON (4.88 vs. 4.43; p<0.03) as compared to SCZ/SA participants. These data indicate that like smokers in the general population, smokers with SCZ/SA report multidimensional drives for smoking although they may be more sensitive to positive effects, have a greater emotional attachment to cigarettes and smoke despite consequences, which can have implications for treatment development.

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DIFFERENCES IN SECONDHAND SMOKE EXPOSURE AMONG RESTAURANT AND BAR WORKERS: A PRELIMINARY ASSESSMENT OF THE GEORGIA SMOKEFREE AIR ACT OF 2005

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The purpose of this study was to examine secondhand tobacco smoke exposure of hospitality employees after implementation of the Georgia Smokefree Air Act of 2005, which took effect on July 1, 2005. Most public places need to comply with the new regulations, but restaurants and bars that only admit patrons aged 18 years and older may declare themselves a smoking establishment by posting signs and will be exempt from the law. Smoking is also allowed in separately ventilated enclosed rooms. Approximately 100 nonsmoking hospitality workers were recruited from the Atlanta metropolitan area via flyers and advertisements in a local newspaper. After screening, each employee was mailed a saliva collection kit and asked to return it to the laboratory using overnight mail. Saliva was contributed following a work shift. Respondents then completed a telephone interview asking about their establishment’s smoking policy, attitudes and beliefs about secondhand smoke exposure, exposure to secondhand smoke in other non-work venues, and use of smokeless tobacco and NRT. Respondents were also asked about respiratory symptoms and about eye and throat irritation. Respondents reported working in establishments with non-smoking and smoking policies. Cotinine levels were higher in employees who worked in establishments that allowed smoking. The average level of cotinine in this study was higher than has been reported in other studies following the implementation of a smoking ban, suggesting that hospitality workers in Georgia are still at increased risk of heart attack and premature death from coronary heart disease and lung cancer.

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MOVING TO SMOKE-FREE LONG TERM CARE HOMES: CHALLENGES AND SOLUTIONS

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Following the introduction of the Smoke-Free Ontario Act in 2006, many long-term care homes in the province faced significant challenges in establishing smoke-free environments at their facilities. To assist, the Ontario Ministry of Health Promotion funded a program of educational support and resources. One educational component was a half-day workshop. The workshop included a presentation on secondhand smoke, smoking and the elderly, the benefits of quitting at any age, and the quit process, including the use of nicotine replacement therapy (NRT). It also included participant exercises for managing organizational change through policy development, determining educational needs of residents, staff, and family, and devising plans for communicating new policy. Workshop participants completed a written questionnaire as they arrived, prior to the start of the session. Five months later, they were asked to complete the same survey, this time on-line. There was a significant increase at 5 months post-workshop in providing cessation counseling to their residents (from 42% to 88%) and making NRT available (from 35% to 75%). Prior to the workshop, 42% of attendees said they fully understood how the new Smoke-Free Ontario Act related to LTC Home; this increased to 81% when surveyed 5 months later. Participants also reported a slight post-workshop increase in the provision of cessation support to staff and volunteers (from 24% to 31%). All LTC homes received the on-line survey, so we were able to compare responses from those who attended the workshop and those who did not. Attendees were also more likely to plan an evaluation of smoke-free policy implementation at their homes (44% vs. 21%). These results suggest that educational workshops, combining didactic and experiential learning, can be effective in assisting facilities undergoing a cultural shift from protecting smokers “rights” to providing a healthier environment for staff and residents.

Ontario Ministry of Health Promotion.

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POS1-54  SECONDHAND SMOKE EXPOSURE AMONG MULTIUNIT HOUSING RESIDENTS IN NEW YORK STATE

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Objective: To assess (1) the prevalence of secondhand smoke transfer in multiunit buildings throughout New York State, (2) the extent to which this exposure bothers non-smoking tenants within these buildings, and (3) support for comprehensive smokefree multiunit housing policies among both smoking and non-smoking tenants.

Methods: Data from the New York State Adult Tobacco Survey (ATS) was used to examine the previously described research objectives. The ATS is a random digit dial telephone survey of non-institutionalized New York State residents 18 years of age and older. The data included in the current analysis was obtained from 716 ATS participants surveyed between May and July 2007 who resided in a duplex, multi-family home, apartment building, condominium, or townhouse.

Results: Sixty percent of tenants who did not allow smoking in their unit reported that SHS entered their living space from elsewhere in or around their building within the past 12 months. Of these, 83% reported being bothered by secondhand smoke, with 16% reporting that it bothered them to the point that they considered moving. Only 2% of multiunit housing tenants reported having a comprehensive building policy banning smoking in all areas, including personal living spaces, balconies, and patios. Of those tenants without a smokefree policy, 17% of current smokers and 74% of non-smokers would support the institution of a comprehensive policy. Following adjustment for smoking status, age, gender, ethnicity, income, and education, non-smokers [OR:10.0, 95% CI (5.3-18.8)] and those who self-identify as either Hispanic [OR:5.8, 95% CI (2.6-13.0)] or non-Hispanic Black [OR:1.7, 95% CI (1.0-2.9)] were more likely to support the institution of a comprehensive policy.

Conclusions: These findings suggest that SHS remains a potential health risk for many non-smokers residing in multiunit housing throughout New York State, that most of these individuals are not protected by comprehensive smokefree building policies, and that a majority of multiunit housing residents favor the institution of such policies.

New York State Department of Health.

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POS1-55  TOBACCO POLICIES IN AMERICAN PRISONS, 2007

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At any given time more than 2.2 million people are being held in American jails and prisons. Though mass incarceration may be a source of social problems, it also presents an underutilized public health opportunity. The poor and people of color are over-represented in incarcerated populations. Prisoners tend to be sicker and less healthy than the general population. The toll on their health status can increase risks of infectious diseases, and infectious diseases are also high. Smoking is one of the negative health behaviors contributing to these health disparities. Smoking rates among prisoners have traditionally been much higher than those among the general population. As recently as the mid 1980s many prisons distributed tobacco free of charge to inmates. Climbing costs of incarceration, legal challenges, and public health concerns have led many prison systems to implement increasingly strict tobacco policies. A telephone survey was conducted during the first half of 2007 to examine tobacco policies in the 52 U.S. prison systems. Complete responses were obtained from 51 of the systems (98%), while one provided partial information. The majority of correctional systems (n = 31, 60%) reported total tobacco bans on prison grounds, with most remaining facilities (n = 14, 27%) having an indoor ban on tobacco use. Only two departments reported having no statewide policy in place. None of the prison systems currently distributes free tobacco to prisoners. No serious problems were reported relating to the implementation of stricter tobacco policies, however many respondents noted that tobacco became a major contraband item following the implementation of a total tobacco ban. A small percentage of respondents reported that tobacco policies have the dual purpose of maintaining or improving the health of those they serve and of providing a residence. Although healthcare facilities generally maintain smoke-free environments, nursing homes are often an exception due to their efforts to create settings that respect individuals’ rights to self-determination in their permanent residence (Omnibus Budget Reconciliation Act of 1987). Because of close living proximity and exposure to environmental tobacco smoke (ETS), restricted mobility of many residents, needs for assisted smoking, and other safety concerns that present risks for smoking and non-smoking residents and staff, an examination of the facilities’ policies addressing resident smoking in nursing home facilities is necessary. This study will present findings of a nation-wide project that examined nursing homes tobacco policies for residents. Rubrics were developed to objectively describe and compare the facilities’ policies across four types of facilities: 1) facilities that allow smoking indoors and outdoors, 2) facilities that do not allow residents to smoke indoors, 3) facilities that do not allow residents to smoke indoors or out of doors, and 4) facilities in transition. Each of these facilities had common categories for examining the policies: administrative/authority issues, notification, resident smoking, safety, cessation assistance/encouragement, and smoking areas. Items within each category varied to reflect the smoking regulations of each type of facility (e.g., policies that respect residents’ rights to self-determination in their permanent residence). This research supported in part by funding from the National Cancer Institute Grant 1 R03 CA097742-01.

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POS1-56  THE IMPACT OF LOCAL SMOKING RESTRICTIONS ON RELAPSE AMONG SMOKERS TRYING TO QUIT IN MINNESOTA

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Workplace smoking restrictions reduce cigarette consumption and increase quits. It is possible that city, county and municipal regulations that restrict smoking in restaurants and/or bars may have a similar effect. Literature suggests that smokers already motivated to quit are most sensitive to impacts of local restrictions but the impact of such restrictions on quit rates may be difficult to detect in part because quitting can be a lengthy process that involves multiple relapses. Therefore, assessing the impact of bans on relapse using longitudinal methods contributes to understanding the full impact of smoking restrictions. Participants in QUITPLAN(R) cessation programs were assessed at enrollment from December 2003 to April 2005, and followed-up via telephone at 1, 2, and 6 month follow-up. Local restrictions were instituted after the 6-month follow-up. The treatment group included communities with restrictions. Comparison group communities had no restrictions. Sampling was exhaustive. At 18 month follow-up 643 surveys were completed for a response rate of 53.5%. A logistic regression assessed the impact of exposure to local smoking restrictions on 7-day abstinence at 6 months. Variables were included in blocks accounting for demographic and clinical characteristics at intake: abstinence, program utilization, medication use and program satisfaction at 6 months; other services used, program type, and motivation to quit at 18 months; and exposure to restrictions. At 18 months, the 7-day point prevalence (ITX) rate was 20.2% and statistically similar to the rate at 6 month follow-up. Of those 7-day abstinence at 6 months, a total of 40 participants (26.3%) relapsed and were not 7-day abstinent at 18 months. Exposure to smoking restrictions was marginally associated with relapse (p=0.061). Those exposed to the ban were about two times less likely to relapse (-1.957 relative risk). No effect was found on 7-day abstinence. Focus groups and phenomenological interviews explain that smoking restrictions prevent relapse because they diminish the temptation to smoke.

A contract for evaluation services from ClearWay Minnesota, provider of QUITPLAN(R) services, to Professional Data Analysts, Inc. 2005-2006.

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POS1-57  AN EXAMINATION OF SMOKING POLICIES AMONG RESIDENT SMOKING IN NURSING HOMES

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Skilled nursing facilities have the dual purpose of maintaining or improving the health of those they serve and of providing a residence. Although healthcare facilities generally maintain smoke-free environments, nursing homes are often an exception due to their efforts to create settings that respect individuals’ rights to self-determination in their permanent residence (Omnibus Budget Reconciliation Act of 1987). Because of close living proximity and exposure to environmental tobacco smoke (ETS), restricted mobility of many residents, needs for assisted smoking, and other safety concerns that present risks for smoking and non-smoking residents and staff, an examination of the facilities’ policies addressing resident smoking in nursing home facilities is necessary. This study will present findings of a nation-wide project that examined nursing homes tobacco policies for residents. Rubrics were developed to objectively describe and compare the facilities’ policies across four types of facilities: 1) facilities that allow smoking indoors and outdoors, 2) facilities that do not allow residents to smoke indoors, 3) facilities that do not allow residents to smoke indoors or out of doors, and 4) facilities in transition. Each of the four rubrics had common categories for examining the policies: administrative/authority issues, notification, resident smoking, safety, cessation assistance/encouragement, and smoking areas. Items within each category varied to reflect the smoking regulations of each type of facility (e.g., policies that respect residents’ rights to self-determination in their permanent residence). Using the rubrics, facilities’ policies from (N = 48) geographically diverse facilities are described. Analyses and discussion focus on the prevalence of numerous factors within the policies. Although nursing homes may in fact have practices that are more extensive than their policies portray, examining the policies that guide practice can assist long-term care facilities in creating policies that align with their goals and desired practices.

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POS1-58 THE IMPACT OF SMOKE-FREE LEGISLATION IN ONTARIO ON LEVELS OF SECOND HAND SMOKE IN ENCLOSED PUBLIC PLACES

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Objective: To evaluate the impact of the Smoke-Free Ontario Act (SFOA) by comparing levels of second hand smoke (SHS) in separately ventilated designated smoking rooms (DSRs) of bars and coffee shops before and after the implementation of the Act, which prohibited smoking in all enclosed workplaces and public places in Ontario.

Methods: A sample of 46 bars and coffee shops was drawn. Air particulate matter (PM), and carcinogenic particulate polycyclic aromatic hydrocarbons (PPAH) were measured inside and outside DSRs in Toronto, Ontario venues, which allowed smoking only in DSRs, and in venues in a control community, Windsor, Ontario where smoking was allowed in shared spaces before the ban. Measurements were repeated two months post-ban on the same day of the week and at approximately the same time of day as before the ban. Mixed model analysis was used to compare levels of markers for SHS before and after the ban.

Results: Before the ban, the median PM and PPAH levels were 438 mm²/m³ and 162 ng/m³ in Toronto, Ontario venues, which allowed smoking only in DSRs, and in venues in a control community, Windsor, Ontario where smoking was allowed in shared spaces before the ban. Measurements were repeated two months post-ban on the same day of the week and at approximately the same time of day as before the ban. Mixed model analysis was used to compare levels of markers for SHS before and after the ban.

Conclusions: DSRs did not provide adequate protection from SHS for nonsmoking workers and patrons. The total ban on smoking implemented as part of the SFOA, produced a significant and substantial reduction in both particulates and carcinogens produced a significant and substantial reduction in both particulates and carcinogens in bars and coffee shops with DSRs and in those with no separately enclosed areas. Ontario Ministry of Health and Long-Term Care.

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POS1-59 EFFECTS OF TOBACCO CONTROL POLICIES AND MASS MEDIA CAMPAIGNS ON MONTHLY AUSTRALIAN SMOKING PREVALENCE, 1995-2006

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This study aimed to assess the relative influence of tobacco control policies and televised anti-smoking advertising in explaining change in Australian adult smoking prevalence. We used time series analysis to assess the relationship between tobacco control measures and monthly smoking prevalence, using data from a unique serial cross-sectional survey of Australians aged 18 years which collected information on smoking prevalence using standard questions each and every month from June 1995 to December 2006 in the five largest media markets in Australia (average n=2,700 adults/month). Tobacco control policies included: costliness of cigarettes expressed as a price (square millimeters per cubic meter) and 162 ng/m³ outside DSRs in Toronto venues, and 349 ng/m³ and 77 ng/m³ in Windsor venues, respectively. Post-ban, the median PM and PPAH levels were reduced by 88% (to 53 mm²/m³) and 93% (to 11 ng/m³) inside DSRs and by 47% (to 53 mm²/m³) and 60% (to 7 ng/m³) outside DSRs in Toronto, and by 87% (to 46 mm²/m³) and 87% (to 10 ng/m³) in Windsor venues, respectively. All reductions were statistically significant (p<0.001).

Conclusions: DSRs did not provide adequate protection from SHS for nonsmoking workers and patrons. The total ban on smoking implemented as part of the SFOA, produced a significant and substantial reduction in both particulates and carcinogens in bars and coffee shops with DSRs and in those with no separately enclosed areas. Ontario Ministry of Health and Long-Term Care.

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POS1-60 WHERE ARE WE GOING WITH INDIGENOUS TOBACCO CONTROL APPROACHES IN AOTEAROA (NEW ZEALAND): MORE OF THE SAME OR A NEED FOR A RADICAL SHIFT?

Heather Gilford, Ph.D. and Shane Kavena Bradduk

Aim: To discuss three major population-level tobacco control policies/interventions being developed or utilized in Aoteaora (New Zealand) by Maori (indigenous) tobacco control advocates to reduce smoking in Maori.

Results: While this country compares favorably with most other OECD countries in terms of tobacco control policies/interventions, some key policy leaders, especially in the Ministry of Health, and key tobacco control advocates have recently called for a more significant role of tobacco control interventions within Aoteaora. This is evident in a number of initiatives which vary in scale at a range of levels. For example, by a change to the key legislation to focus on harm reduction (e.g., auahí kore (smokefree) to smokefree for all tobacco free). In addition Maorí focused mass media campaigns are designed to target the tobacco industry and are designed to denormalize tobacco as part of cultural identity; for example websites calling for support for innovation to tobacco (e.g., resist.co.nz), and campaigns such as the Maori Murder Social Marketing campaign.

Conclusions: Maori are providing strong leadership models in a range of policy and advocacy areas to reduce and eventually eliminate tobacco consumption in Aoteaora. While overall smoking prevalence rates in Maori are slowly trending down, we have yet to see the full implementation and impact of the current "end game" policy approaches. However what we do identify is a potential regulatory and policy pathway forward over the next ten years to realize the goals of auahí kore and then tupeka kore for Maori.

This study was conducted while the author was on a postdoctoral fellowship from the Health Research Council of New Zealand.

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POS1-61 SMOKELESS TOBACCO IN TOBACCO HARM REDUCTION: ISSUES AND OPPORTUNITIES

Jack E. Henningfield*, Martin Jarvis and Erik Dybing, Tobacco Regulation Study Group, World Health Organization; Gemma Vestal and Douglas Betcher, Tobacco Free Initiative, World Health Organization — Draft Authors

The World Health Organization Framework Convention on Tobacco Control (WHO FCTC) supports the right of all people to the highest standard of health through the regulation of the contents of tobacco products, their disclosures, and packaging and labeling. The WHO Study Group on Tobacco Product Regulation (TobReg) supports WHO’s efforts to implement the treaty by providing scientific guidance. TobReg’s predecessor, the Scientific Advisory Committee on Tobacco Product Regulation issued a recommendation document on Smokeless Tobacco in 2004, which addressed the harms posed by smokeless tobacco product use. Although smokeless tobacco products (which vary greatly in composition and hazard) continue to be recognized as harmful and their use discouraged in non-tobacco users, TobReg recognizes that there is wide variation in the hazard potential of tobacco products, with the overall disease risk of smokeless tobacco users generally lower than that of cigarette smokers, considerably so in the case of users of low-nitrosamine moist snuff. However, communications intended to support the use of smokeless tobacco products among cigarette smokers who are unable to completely give up tobacco have raised concerns over potential unintended consequences, which could undermine efforts to prevent tobacco initiation and promote cessation. Guidance is additionally complicated by gaps in regulatory capacity to set and enforce standards for levels of toxicants in marketed products. Communicating relative risk without implying that smokeless tobacco products are “safe” or “safer” than what is currently available can add to confusion and uncertainty.

This poster presents the conclusions, recommendations, and research needs addressing the potential place of smokeless tobacco products in tobacco harm reduction.

No funding.

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**POS1-62**

**TO WHAT EXTENT ARE PRIMARY HEALTH CARE (PHC) PROVIDERS PREPARED TO LEAD AND IMPLEMENT ANTI-SMOKING PROGRAMS IN PHC, IN ALEPPO, SYRIA?**

Taghrid Asfar, M.D.*, Kenneth D. Ward, Ph.D., Radwan Al Ai, M.D., Mark W. Vander Weg, Ph.D., Thomas Eisenberg, Ph.D., and Wasim Maziak, M.D., Ph.D.

Introduction: In many developing countries, including Syria, evidence-based smoking cessation programs have not yet been integrated into primary health care (PHC) delivery, and little is known about provider factors that may affect implementation, including smoking prevalence, current tobacco intervention practices, and attitudes related to anti-smoking policies. To guide the development of system-wide smoking cessation services for Syria's PHC system, we examined these factors among PHC providers in Aleppo.

Methods: Anonymous questionnaires were distributed to all PHC providers in seven (of 17) randomly selected PHCs. Participation rate was 100% and included 85 physicians (62% men, mean age + SD 39.6 ± 7.0 years), and 96 nurses (28.1% men, mean age + SD 35.4 ± 7.3 years). Results: Current tobacco use was reported by 22.4% of physicians compared to 26% of nurses. Use was lower among women than men for both physicians (8.8% vs. 31.4%; p = 0.01) and nurses (17.3% vs. 48.1%, p = 0.004). Compared to non-smokers, smokers were less likely to support banning smoking in enclosed public places (P = 0.01) and in PHCs (P = 0.006). Only half of physicians routinely asked patients about their smoking status, among whom 81.9% advised patients to quit. 45.8% assessed patients’ motivation to quit, 40.3% assisted patients in quitting, and 15.3% arranged follow-up visits. In a multivariate analysis, smoker physicians were less likely to assess patients’ motivation to quit (OR = 0.24; 95% CI) and assist them in quitting (OR = 0.13; 95% CI).

Conclusions: Given the important role of PHC providers in reducing smoking among the general population and advancing tobacco control policies, these data support the need to increase tobacco education among PHC providers in Syria.

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**POS1-63**

**HOUSEHOLD EXPENDITURES AND TOBACCO USE IN THE PHILIPPINES**

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Objectives: 1) Determine the income share of tobacco expenditure for the different income groups; 2) Compare the monthly household expenditures on tobacco products of the poor and poorest households with their expenditures on basic needs; 3) Determine the change in calorie intake taken from rice and other major food items of Filipino households especially the poor and poorest households if tobacco expenditures were reallocated.

Materials and Methods: A cross-sectional study design utilizing the 2000 and 2003 Family Income and Expenditure Survey which used stratified three-stage sampling design. A total of 39,615 and 42,094 households were included in the 2000 and 2003 respectively.

Results: Greater percentages of Filipinos do not earn enough to satisfy their family’s basic needs. The ratio of tobacco expenditure to total income is highest among the lowest income level. Since their income is meager, their tobacco expenditure, though low in absolute terms, has a great impact. The poor and poorest households spend more on tobacco than clothing, education and even on their health. Their average monthly tobacco expenditure when reallocated to food can add around 750 calories, not to mention protein, vitamins and minerals.

Conclusion: The expenditure on tobacco is a misuse of essential income especially among the poor and poorest Filipinos. When utilized properly, it can help alleviate malnutrition especially in children.

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**POS1-64**

**CIGARETTE PURCHASING BEHAVIOR IN THAILAND AND MALAYSIA: COMPARATIVE ANALYSIS OF A MONOPOLISTIC AND A FREE MARKET STRUCTURE**

Hana Ross*, ACS; Pete Driezen, University of Waterloo, Waterloo; Buphpa Sirirassamee, Mahidol University, Thailand; Foong Kin, Universiti Sains Malaysia, Penang, Malaysia

The study uses data from the ITC Southeast Asia cross sectional survey collected among a representative sample of smokers in Thailand and Malaysia in 2005 to analyze the impact of socio-economic factors on price paid per cigarette, attempts to obtain cheaper cigarettes, and on regrets for spending money on cigarettes. It speculates on pricing strategy of tobacco industry in two different market structures (monopolistic versus free-market competition) and draws implications for tobacco tax policy. The results show that smokers in Thailand consume primarily domestic cigarette brands, have fewer cigarette brand and price choices, but pay lower prices for their cigarettes compared to smokers in Malaysia. They also purchase cigarettes from more concentrated distribution channels and exercise less effort to buy cigarettes cheaper. The Malaysian cigarette market is dominated by foreign brands with wider brand and price selection. Age, income and education are the major determinants of purchasing price/brand choice in both countries. However, age is a much stronger predictor of brand choice in Thailand, and income is the main driver for brand preferences in Malaysia. The price responsiveness in Thailand is mostly expressed via brand choice, but in Malaysia, it is via both brand choice and a search for a cheaper cigarette source. The study concludes that the monopolistic features of the cigarette market in Thailand result in less competition and more control over cigarette prices. This has implications for the impact of a tax increase on a smoker’s behavior. Smokers can avoid the full impact of a tax increase more easily in Malaysia compared to Thailand. On the other hand, the Thai Tobacco Monopoly keeps cigarette prices lower than they would be in a fully competitive market. The pricing strategy in Thailand might be driven by the availability of a relatively close substitution (roll-your-own cigarettes) and/or by an attempt to secure future customers by making cigarettes more affordable.

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DIFFERENCES IN QUIT ATTEMPTS OF PACK V. CARTON BUYERS IN SMOKERS ACROSS FOUR COUNTRIES: FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL (ITC) FOUR COUNTRY SURVEY (ITC-4)

Sara C. Hitchman, B.A.*, Nigar Nargis, Ph.D., and Geoffrey T. Fong, Ph.D., University of Waterloo

Previous studies show that smokers who obtain their cigarettes from a discount source are less likely to quit smoking. Since smokers tend to buy cigarettes in larger quantities (e.g., cartons vs. packs) when buying from discount sources, we sought to examine if smokers who purchase their cigarettes by the carton are less likely than smokers who purchase by the pack to attempt to quit smoking. We identified carton and pack buyers in a sample of 1,522 adult daily smokers from the waves 1, 2, and 3 of the International Tobacco Control (ITC) Four Country Survey (ITC-4), a longitudinal cohort survey of adult smokers in Canada, United States, United Kingdom, and Australia, to test whether carton vs. pack purchasing at waves 1 and 2 was related to attempts to quit smoking between waves 2 and 3. Demographic and socio-economic variables, including, age, sex, ethnicity, country, income, education, and variables found to be related to quit attempts in the sample from a previous study, including: heaviness of smoking, intentions to quit, quit history, beliefs about quitting, and motivational variables were controlled for. We additionally controlled for the source of purchase, which was identified as discount or full-price, the extent to which smokers indicated that the price of cigarettes has led them to think about quitting, and whether smokers agreed they spend too much money on cigarettes. Smokers who purchased their cigarettes by the pack were found to be 1.398 times more likely to attempt to quit smoking than smokers who purchased their cigarettes by the carton, p<0.037, 95% C.I. = (1.021 - 1.914), or stated differently, 45% of pack buyers attempted to quit vs. only 31% of carton buyers. These results demonstrate that higher-quality purchasing is an additional predictor of diminished quitting, likely because of the lower per-unit price of some carton sales. Quit campaigns could target carton buyers, and encourage them to switch to pack buying in a step towards quitting. Specific warning labels could also be designed for cigarette cartons to target smokers buying large quantities of cigarettes.

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THE BURDEN OF SMOKING-RELATED DISEASES AND HEALTH CARE COSTS OF TOBACCO USE IN THE PHILIPPINES

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Objectives: Determine the health impact and economic impact attributable to smoking-related diseases.


Results: CVD and CAD caused majority of the deaths. The SAM-MEC method yield 35,845 deaths, 8% of mortality from all causes. Majority of deaths were from COPD and CVD. Using the Peto-Lopez methodology, SAM is 23,250 or 6% of all deaths. CCFRs ranged from 67% for Lung CA to 10% for CAD and COPD. By SAM-MEC, an estimated 302,104 new cases of Lung CA, CVD, CAD and COPD combined. By Peto-Lopez, 21,910 new cases of Lung CA, CVD, CAD and COPD combined were estimated. By SAM-MEC, smoking-attributable mortality was estimated at US$ 611 M and COPD at US$ 565.6 M. By Peto-Lopez smoking-attributable mortality was US$ 550 M, CAD at US$ 577 M, COPD at US$ 530 M, Lung CA at US$ 377 M.

Conclusion: Smoking-attributable mortality was higher by the SAM-MEC method. This is expected since SAM-MEC incorporated current smokers and former smokers in the equation thus the higher SAF values. Peto-Lopez had conservative SAF estimates. PAVL and CVD contribute the most DALYs. Health care costs estimate by Phil Health data for lung CA and also raising tax revenues which are critical given the tight fiscal constraints. Smoking-attributable health care costs estimates by experts’ interviews were larger than combining expert opinion with Phil Health records. Overall, the use of Phil Health records in the health care costs gave more conservative estimates. Annual productivity losses from premature deaths ranged from US$65.4 M to US$ 1.08B using Peto-Lopez estimates and US$ 2.93 B with the SAM-MEC estimates. Overall productivity losses were estimated at US$ 2.23B (Peto-Lopez) to US$55.00B (SAM-MEC). Productivity losses from work days lost at US$120 M to US$185 M. Total costs of illness at US$6.05B (SAM-MEC) 2.86B (Peto-Lopez).

Conclusion: Costs were over GNP in 2003 (Q3) at Php1.44 B (USD 52.00) and GDP of same period Php1.332.4B, and total health expenditures at Php 165.2B. Over half of the major smoking-related diseases investigated were attributable to tobacco use, thus prevention and control of tobacco use should be a topmost priority.

World Health Organization-Tobacco Free Initiative.

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ANALYSIS OF DEMAND OF TOBACCO USE IN THE PHILIPPINES

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Objectives: To measure the impact of price on the demand for cigarettes using time series data.

Materials and Methods: Time series analysis and simulations on the impact of a tax increase on price and total tax revenues have also been undertaken using price elasticities derived from the regression analysis and elasticity values that are in line with other countries.

Results: The study finds the price elasticity of demand for cigarettes range from -0.15 to -0.20, which are generally lower than the estimates found for other countries. The simulations indicate that although a tax increase, which translates into a price increase, leads to a fall in the consumption of cigarettes, the effect on total tax revenues would be positive - there are projected increases in tax revenues of 17-85% with tax increases of 20-100% and a price elasticity of -0.20. Assuming higher elasticity values, at -0.40 and -0.80, an increase in tax revenues is also likely to occur but at a slower rate. The impact on the poor in terms of reduction of consumption of cigarettes is also substantial, to as much as 35 packs or 700 sticks less than their annual initial consumption levels. Thus, raising taxes not only has the potential of reducing consumption of cigarettes, but also raising tax revenues which which are critical given the tight fiscal constraints. More importantly, by reducing consumption, raising tax revenues may help lower exposure of millions of individuals to the risks and hazards of smoking.

Conclusion: It is important for the government to continue raising taxes to lower consumption of cigarettes to protect the health of individuals. Since the poor would be better off if their income were spent on food, clothing, health care, and other essentials, then measures should be undertaken to assist them to quit smoking. Free assistance on smoking cessation may be provided, financing of which may be achieved by the tax increases in the tobacco excise tax.
POS1-68 USING PUBLIC OPINION RESEARCH TO FACILITATE THE ADOPTION OF EVIDENCE-BASED TOBACCO CONTROL POLICIES IN DEVELOPING COUNTRIES: A CASE STUDY ON KENYA

Over one billion men and 250 million women worldwide smoke. If current trends continue, the number of deaths from tobacco use will increase nearly threefold from 5.0 million to 15 million deaths each year by 2030. Developing countries will bear much of the burden with over 70% of all tobacco related deaths, half of which will occur among individuals in their middle and most productive years of life, occurring in developing countries. Action in the form of implementation of effective and recommended tobacco control policy is crucial to reduce and reverse the damage caused by tobacco consumption. Using Kenya as an example, this presentation will describe how public opinion research can facilitate the adoption of evidence-based tobacco control policies in countries around the world. A public opinion poll of 2,021 respondents, representing 53 districts across 8 provinces, was conducted between March 14 and March 22, 2007. Results of the poll revealed that a majority of Kenyans consider themselves “very concerned” about tobacco use (66%). An even greater majority (80%) characterize themselves as “very concerned” about tobacco use among young people. A significant majority of respondents (ranging from 56% to 78%) indicated strong support for regulatory measures proven to be effective within comprehensive tobacco control policy. Further, they were equally supportive of the Kenyan Parliament passing the Tobacco Control Bill establishing nationwide smoke free places, requiring health warning labels on tobacco products, and banning tobacco advertising in all media among other recommended tobacco control policy measures. Following this presentation, participants will be able to describe the history of advocacy for a national tobacco control law in Kenya, explain how the implementation of evidence-based tobacco control policy in developing countries can help to mitigate rising rates of tobacco consumption, and use public opinion research in policy-making contexts, particularly within the developing country context. Bloomberg Global Initiative.

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POS1-70 KNOWLEDGE AND ATTITUDES TOWARDS SECONDHAND SMOKE IN SEVEN CITIES IN CHINA
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Objectives: To examine knowledge and attitudes towards secondhand smoke and support for smoke-free policies in China.

Methods: Data used in this study came from representative sample of 5,610 smokers and 1,463 non-smokers who aged 18 years or older, who resided in Beijing, Shanghai, Shenyang, Zhengzhou, Yinchuan, Changsha, or Guangzhou, and who completed the Wave 1 survey of the International Tobacco Control China Study. Descriptive statistics were used to describe the knowledge level of SHS and the level of support for smoke-free policies in public places. Multivariate logistic regression models were used to identify factors associated with knowledge and attitudes towards SHS.

Results: Overall, 73% of the smokers and 85% of the non-smokers agreed that SHS causes lung cancer, compared to 80% of the smokers and 93% of the non-smokers who agreed that active smoking causes lung cancer. Only 22% of the smokers and 41% of the non-smokers support complete smoking ban in restaurants and bars. Support for complete smoking ban in restaurants and bars tends to be higher in respondents who know SHS causes lung cancer (OR=1.48, 95% C.I.=1.25, 1.75).

Conclusion: Support for smoke free policy in restaurants and bars was associated with the knowledge level of the adverse health effects of SHS. To increase the support for smoke free policies in China, measures need to be taken to increase the knowledge level of SHS.

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POS1-71 SMOKE FREE POLICIES AND SOCIAL NORMS AGAINST SMOKING IN MEXICO AND URUGUAY
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Objective: We examined self-reported prevalence of smoke-free policies at home, work, and restaurants among adult smokers in Uruguay, which has comprehensive smoke-free legislation, and compared it with Mexico, which has ratified the FCTC but has weak legislation. We aimed to determine whether smoke-free policies were independently associated with the perceived social acceptability of smoking.

Design: Data came from a 2006 representative sample of adult smokers from Montevideo, Uruguay (n=770), and major cities in Mexico (Mexico City, Guadalajara, Tijuana, and Juarez) (n=1079).

Results: Reported perceptions of 100% smoke-free policies were more prevalent in Uruguay than Mexico with respect to restaurants (83% vs. 23%) and enclosed workplaces (80% vs. 57%). However, Mexicans were more likely than Uruguayans to report smoke-free policies at home (35% vs. 17%). Mexican smokers were also more likely to report smoke-free policies across all places if they lived in towns bordering the US. Uruguayans reported a stronger perceived social norms against smoking, both when focusing on familial norms (3.90 vs. 3.71, p<0.001) and norms that applied more broadly to society (3.34 vs. 3.00, p<0.001). Multivariate models combined data from Mexico and Uruguay, adjusting for demographics and smoker characteristics. The results indicated that household prohibitions against smoking (B=0.14, p<0.001) and being Uruguayan (B=0.19, p<0.001) were independently associated with familial acceptability of smoking. Being Uruguayan (B=0.26, p<0.001) and exposure to anti-smoking policies in restaurants (B=0.06, p<0.01) were independently associated with a lower level of perceived acceptability of smoking in society.

Conclusion: Awareness of existing smoke-free legislation appears relatively high in Uruguay. Smokers in Mexican towns that border smoke-free US towns are more likely to report smoke-free policies than smokers in central Mexico. In both countries, reported awareness of smoke-free policies was independently associated with decreased social acceptability of smoking, which has promoted cessation and support for smoke-free policies in other countries.

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POS1-72 A 32-COUNTRY STUDY OF TOBACCO SMOKEDERIVED PARTICLE AIR POLLUTION IN PUBLIC PLACES
Mark J. Travers*, Andrew Hyland, Cheryl Higbee, and K. Michael Cummings, Roswell Park Cancer Institute

The Framwork Convention on Tobacco Control (FCTC) calls for all ratifying nations to implement stronger tobacco smoke pollution (TSP) protection policies (among many other provisions). Studies that use quantitative means for assessing levels of TSP exposure have generally been conducted in selected cities, primarily in wealthier nations. Little data exists in non-Western nations regarding levels of exposure. Such localized information can be more salient to policymakers. This study provided novel scientific equipment and methods to researchers around the world to determine TSP exposures in a wide range of geographically and economically disparate countries. The TSI Sidepak AM510 Aerosol Monitor was calibrated for TSP and used to measure the concentration of particles less than 2.5 microns (PM2.5) in hospitality venues, such as bars and restaurants, transportation venues, and other public places. The amount of smoking, number of people, and dimensions of each place sampled were determined. In all, 2,531 places were sampled with over 1,700 sites from across the United States. This study is from all regions of the world including the Americas, Europe, Eastern Mediterranean, South-East Asia and Western Pacific, and Africa. Overall, places with no observed smoking had a geometric mean PM2.5 level of 23 (micrograms per cubic meter), while PM2.5 in places with observed smoking was 8.3 (95% CI 7.1-9.1) times higher at 182. The active smoking density (average number of burning cigarettes per volume) was significantly and positively correlated with PM2.5 (r=0.69, p<0.001). The large increase in PM2.5 when smoking was observed was consistent across countries, although the difference between smoking and smoke-free places was smaller in countries with higher background PM2.5 levels. Levels of indoor fine particle air pollution in places with observed smoking is typically greater than what is measured in the World Health Organization and US Environmental Protection Agency have concluded is harmful to human health. This is true in countries all over the world. Comprehensive smoke-free policies are the most effective strategy to reduce tobacco smoke pollution exposure.

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POS1-73

THE IMPACT OF SMOKEFREE LEGISLATION IN SCOTLAND: RESULTS FROM THE SCOTTISH INTERNATIONAL TOBACCO POLICY EVALUATION PROJECT

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Objective: To evaluate how Scotland’s nationwide smokefree law, which came into effect on March 26, 2006, impacted secondhand smoke (SHS) exposure in the home, hospitality venues, and the workplace, support for the law, changes in pub and restaurant patronage, and smoking cessation indicators, and whether any observed changes were differential by socioeconomic status.

Design: A quasi-experimental longitudinal telephone survey of nationally representative samples of smokers and non-smokers interviewed before the Scottish law (February to March 2006) and 1 year later, after the law (March 2007) in Scotland (n=808 pre-law and n=530 post-law) and the rest of the UK (n=807 pre-law and n=511 post-law)

Results: Dramatic declines in the observance of smoking in pubs, restaurants, and workplaces were observed in Scotland relative to the rest of the UK by both smokers and nonsmokers. The rate of change in the percent of smokers reporting a smokefree home and the fraction of daily cigarette consumption in the home was comparable in Scotland and the rest of the UK. Support for smokefree policies was also a greater extent in Scotland than in the rest of the UK. Self-reported frequency of going to pubs and restaurants was generally comparable between Scotland and the rest of the UK; however, nonsmokers in Scotland were more likely to frequent pubs more often. No differences in smoking cessation indicators were observed between countries.

Conclusion: The Scottish smokefree law has been successful thus far, and these findings are useful for informing smokefree policy debates in other countries, in the wake of the Framework Convention on Tobacco Control, which calls for effective smoke-free legislation.

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POS1-74

SMOKE LOAD AND MORTALITY PARADOXES, DISPARITIES, AND BURDEN OF MORTALITY TO GLOBALLY

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Background: Due to secondhand, brief, irregular, and denied smoking in “never smokers,” and rapid quitting in studied smokers, smoking status is a poor proxy for cumulative tobacco smoke damage (smoke load), just as “gay” or “New Yorker status is a poor proxy for HIV load. Since a poor smoke load proxy like smoking explains many deaths, I assessed if better proxies like lung cancer rates may explain more deaths, disparities, and death excesses in the wealthy (“paradoxes”).

Methods: Published age-adjusted death rates were used, lung, all cancer, and related rates used as smoke load proxies, and linear regressions run. Smoking-attributable fractions (SAFs) = 1 - unexposed/observed rates.

Results: The paradoxical age-adjusted mortality excesses of: non-lung cancer in developed versus undeveloped nations; Japan females from wealthier municipalities in the 1990s; and immigrants or less educated Hispanics versus most Americans; correlate with their smoke load excesses (each p<0.05). Tight smoke load/mortality rate associations exist across wealth strata in 1990s males and 2000s males and females in England and America, 1990s Canadians, and 1990s male Poles in middle-age, each p<0.10. Tight associations exist between 2002 lung cancer and a) Globocan other cancer and b) OECD male all other except HIV and injury deaths rates in populous nations (each p=0.000 and r>0.90). That suggests that most OECD male and 90% of Hungary male chronic disease premature mortality is linkable to smoke load. Tight lung/other non-breast (NLB) cancers death rate associations exist across US gender-education-race-strata in 2001 (p=0.0000) and in forward and backward stepwise regressions leave only weak cancer death rate associations with White race and smoking prevalence with no residual association of NLB cancer death rates with education level, obesity or uninsurance prevalence, or gender.

Discussion: Improved smoke load proxies like lung cancer death rates can explain premature deaths, disparities, and paradoxes left unexplained by smoking status, in nations with high quality cause of death certification. Smoke exposure may be much more dangerous than previously thought.

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POS1-75

SCOTLAND SMOKE LOADS AND MORTALITY DISPARITIES ACROSS WEALTH, PLACE, AND TIME STRATA, 1950-2005

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Background: Scotland was known in recent years as the “sick man of Europe,” given its unexplained high mortality rates and disparities. However, in 1950 Scotland had negligible male socioeconomic cancer and total mortality disparities. And in 2006 Scotland led the UK in declaring public places smokefree and noted a 17% decrease in myocardial infarctions. So we assessed smoke load/mortality associations across recent social disadvantage and place, and past social class strata in Scotland.

Methods: Published age-adjusted lung or all sites cancer death rates or relative indices of inequality (RII) were used as smoke load proxies and smoke load/other mortality linear regressions run. Smoking-attributable fractions (SAFs) = 1 - unexposed/observed rates.

Results: The smoke load/mortality association slopes were 3.6 (95% confidence interval (CI) 2.7-4.6, correlation coefficient (r)=0.95) for cancer/all other mortality across Scottish Index of Multiple Deprivation (SIMD) deciles in 2001 for ages 0-74, 0.5 (CI 0.4-0.7, r=0.89) and 0.8 (CI 0.43-1.1, r=0.8) across male lung/all other cancer mortality 1991-5 disadvantage and 2001-2005 NHS Board strata, and 0.9 (CI 0.1-2.1, r=0.94) for cancer/all causes mortality social RII across decade strata from 1950-1980 as social mortality disparities rose from negligible to large. The associations suggest 2001 all cause mortality SAFs as high as 61 and 68% in the most disadvantaged population deciles.

Discussion: Tight smoke load/mortality associations are observed in Scotland across deprivation, place, and decade strata. Those associations suggest that lung and other cancer, and cancer and non-cancer, mortality disparities may share a very dominant cause like tobacco smoke. Tobacco control progress may yield large reductions in mortality disparities and burdens.

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LONGITUDINAL EVALUATION OF SMOKE-FREE SCOTLAND ON PUB AND HOME DRINKING BEHAVIOR: FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL POLICY EVALUATION PROJECT

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On March 26, 2006 Scotland implemented a smoke-free policy banning smoking in indoor public venues, including bars and pubs. As drinking and smoking are highly comorbid behaviors with concurrent use increasing episodic levels of both alcohol and cigarette use, we evaluated whether the ban would decrease drinking behavior in public venues among smokers. Further we evaluated whether this effect would be more pronounced in heavier drinkers, and whether decreases in drinking behavior in pubs would be offset by increased drinking in the home. Participants were adult smokers (n=614) and non-smokers (n=445), from Scotland (n=525) and the rest of the United Kingdom (n=534), which did not have a smoke-free policy during the study period. Data was collected by random digit-dialed telephone survey from February to March 2006, just prior to the policy implementation in Scotland. Follow-up surveys were collected in March 2007. Using baseline data, participants were categorized into abstainers (n=222), moderate drinkers (n=573), and heavy drinkers (n=254) following NIAAA criteria. Regression models demonstrated that there were no main or interactive effects of drinking status, smoking status, or country on changes in drinking in either pubs or the home. However, planned comparisons examining mean changes in drinks consumed in pubs or bars following the ban demonstrated significant reductions among moderate and heavy drinking smokers in Scotland, versus the rest of the UK. Correspondingly, moderate and heavy drinking Scottish smokers also reduced their pub attendance following the implementation of the ban. Overall, results demonstrated that drinking behavior did not significantly change between Scotland and the rest of the UK, following the implementation of the smoke-free policy in Scotland. There were some limited effects of the ban on reducing drinking behavior in pubs and bars among moderate to heavy drinking smokers in Scotland, which suggests that there may be additional public health benefits to smoke-free policies.

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EXPERIMENTAL EVALUATION OF ANTI-TOBACCO PSAS: EFFECTS OF MESSAGE CONTENT AND FORMAT ON COGNITIVE, PHYSIOLOGICAL AND BEHAVIORAL OUTCOMES

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The effect of anti-smoking message campaigns on smoking cessation has been mixed, and therefore theory-based communication research on message effectiveness and mechanisms of effect is warranted. The aim of this study was to test the effects of specific message features in anti-tobacco PSAs utilizing theory-based cognitive, physiological, and behavioral outcome measures. We used a 2 x 2 [Message Sensation Value (MSV) and Argument Strength (AS)] factorial design to evaluate the main and interacting effects of 4 different PSA conditions within an experimental laboratory investigation. MSV has previously been associated with level of attention, physiological arousal and recall; AS assesses the persuasive strength of a PSA. 200 participants (55% male) were current smokers (mean 21.8 daily cigarettes) who completed demographic and smoking history items, viewed 4 PSAs while having physiologically responses assessed, then completed beliefs, attitudes, processing, intention and recall questions. Physiologically, there was a marginal effect of AS (p = .053) on heart rate and skin conductance; each increased more among participants who viewed high AS PSAs. There was also a significant positive effect of MSV on corru- gator responses (p = .012) and a negative association with cognitive processing (p = .013). There were no significant main or interacting effects of MSV or AS for attitudes, beliefs or on quitting intentions. The implications of these results for PSA message design will be discussed.

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EVALUATION OF NOVEL TOBACCO PRODUCT ADVERTISEMENTS USING EYE-TRACKING TECHNOLOGY

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Cigarette companies are introducing new products that may claim to have reduced health risks. The purpose of this study is to examine how smokers perceive advertisements for these products, particularly in terms of what they look at and remember from the ads. Data from this study describe results from a pilot study examining patterns of eye movements comparing advertisements for two potentially reduced exposure products (Marlboro UltraSmooth and Eclipse) to advertisements for matched traditional cigarette products (Marlboro Red and Camel). A total of 25 smokers viewed the 4 ads for 15 seconds each, with order of presentation counterbalanced. Participants then completed a questionnaire regarding expectancies, beliefs about the products, and recall of information contained in the ads viewed. A key outcome in eye tracking is dwell time (i.e., amount of time spent in defined space on each image). Analysis of data from this study revealed significant differences in the amount of time spent viewing different parts of the advertisements, with greater time spent noticing the product warning for the products which implied lower health risk (i.e., Eclipse vs. Camel). Average dwell time on the Surgeon General’s warning in the Marlboro Red ad was 0.36 sec (SD = 0.18) compared to 0.49 sec (SD = 0.37) for the Marlboro UltraSmooth ad, with a correlation between dwell times of -0.32. Interestingly, nearly half of the participants did not look at the tar and nicotine yield information in the UltraSmooth ad at all, while nearly all participants look at this information in the Marlboro Red ad. Results from this research can be used to better understand the components and presentation of anti-tobacco messages that are more effective in communicating educational information to smokers.

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BREAKING DOWN THE MESSAGE: A LABORATORY-BASED APPROACH TO UNDERSTANDING THE KEY EFFECTIVE INGREDIENTS OF ANTI-SMOKING PUBLIC SERVICE ANNOUNCEMENTS

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Anti-smoking public service announcements (PSAs) reduce adolescent smoking. However, there is no consensus on what features of anti-smoking PSAs are the most effective and little information about moderators of adolescents’ responses to PSAs. These gaps limit what can be done to improve the next generation of anti-smoking PSAs. This presentation introduces a project that undertook an intensive, “bottom-up” approach to understanding what features of anti-smoking PSAs work most effectively with different groups of adolescents. One central anti-smoking message was extracted from each of 41 PSAs (e.g., did the PSA emphasize health consequences of smoking or tobacco industry manipulation?) and the sources communicating the anti-smoking message in each PSA were digitally extracted as photographs so that anti-smoking messages were divorced from the sources delivering those messages. A sample of 117 adolescents (58% female, 41% Caucasian; 55% African-American) then rated the message and sources independent of one another. In Session 1 they rated only the persuasive strength of the anti-smoking message (and completed a variety of different individual variables); in Session 2 they rated only the sources (e.g., on attractiveness, likeability). Additional information was also collected from the PSAs (e.g., emotional tone, age of sources). In Session 3, participants viewed each of the 41 PSAs and their smoking intentions after viewing each PSA. This incredibly rich data set permits a diverse set of questions to be asked about which features of anti-smoking PSAs are most effective and for whom. For example, does direct or indirect delivery of certain anti-smoking messages (i.e., health effects versus tobacco industry manipulation?) have an impact on future smoking intentions (answer: it depends)? Is the attractiveness of the message delivery source associated with the efficacy of the PSA (answer: sometimes, depending on the anti-smoking message being delivered and the age of the audience)? The long-term implication of these results is that more effective anti-smoking advertisements could be developed for maximal benefit of specific populations of adolescents.

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COLORING ON CIGARETTE PACKS: IS IT PART OF DECEPTIVE TOBACCO MARKETING?

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Aim: To describe cigarette pack coloring in the New Zealand market and determine whether pack color is related to cigarette brand variant (regular, light, extra light and menthol brands).

Methods: Packs of popular cigarette brands and brand variants covering the spectrum of light/mild/regular and menthol that were sold in a common supermarket chain were obtained (n=29 packs). Color descriptions of pieces from the packs were provided by 10 respondents who were blinded as to the origin of the color segments and the study purpose.

Results: ‘Light’ variant packs were twice as likely to be colored in one of the ‘cool’ color grouping (blue/silver or white) and over twice as likely to be colored gold compared to ‘regular’ variants. ‘Extra light’ variants were significantly associated with the ‘cool’ colors (blue/silver or white) compared to ‘regular’ brand variants (p=0.034). Menthol packs were 25 times more likely to have a main pack color of green (p<0.001). When the color associated with the descriptor on the pack was analyzed, it was found that the use of the blue was six times more likely for ‘light’ variants (p=0.008) and also for ‘extra light’ variants (p=0.002) compared to ‘regular’ variants. The use of the color red as the associated descriptor color was inversely associated with all ‘light’ variants compared with regular cigarette packs (p=0.001). Menthol packs were also more likely to have green coloring (p<0.001).

Conclusions: These results indicate that commonly available cigarette packs in New Zealand are color coded by brand variant. Pack color and design therefore needs to be taken into account by policymakers when making decisions regarding the banning of misleading cigarette descriptors such as ‘light’ and ‘mild.’ The ideal policy solution from a public health perspective is probably plain packaging for all tobacco products (combined with graphic warnings).

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NEW YORK TOBACCO RETAILERS’ ATTITUDES TOWARDS LOWER TAXED AND UNTAXED CIGARETTES

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Objective: To assess New York State tobacco product retailers’ knowledge of, and attitudes towards, the sale of lower taxed and untaxed cigarette sales by Internet, on Indian reservations, and in neighboring states.

Methods: A random cross-sectional telephone survey was administered to licensed cigarette retailers within New York State who originally participated in a retail advertising assessment study in 2004. These retailers (n=674) completed a phone survey (37% response rate) between September 2005 and January 2006 where they were asked about their attitudes and beliefs concerning the sale of lower taxed and untaxed cigarettes.

Results: The majority of surveyed retailers reported being aware of the availability of lower taxed and untaxed cigarettes by Internet (86%), on Indian reservations (91%), and in neighboring states (86%). Sixty-nine percent and 51% of retailers reported that their establishment loses revenue due to the sale of cigarettes over the internet and in other states, respectively. Likewise, 77% of retailers reported that their establishment loses cigarette sales to retailers on reservations, with the proportion of retailers with this belief being significantly higher among those within a ten-mile radius of a reservation. In addition, a statistically significant proportion of retailers were found to be in favor of a statewide policy to collect taxes on cigarette sales through the internet (71%) and from non-Indian consumers on Indian reservations (83%).

Conclusions: Most cigarette retailers report that the availability of lower taxed and untaxed cigarettes is harming their business and support efforts to obtain these unpaid taxes.

New York State Department of Health.

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HOW DO INSTITUTIONAL REVIEW BOARD (IRB) DECISIONS REGARDING WAIVING PARENTAL CONSENT IMPACT ADOLESCENT SMOKING CESSATION RESEARCH? A CASE STUDY OF ADOLESCENT SMOKING RESEARCH IN PENNSYLVANIA

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The Pennsylvania (PA) Network for Adolescent Smoking Cessation Research is conducting a multi-center randomized controlled trial (RCT) comparing two counseling interventions for smoking cessation in adolescents, 14 to 18 years. The Code of Federal Regulations (CFR) defines minors as persons who have not attained legal age for consent to treatment or procedures involved in research under the applicable law of the jurisdiction in which the research will be conducted. In PA, minors can give consent for clinical testing and treatment of certain reportable diseases and conditions. Minors age 14 and up can also consent to clinical outpatient mental health assessment and treatment and receive counseling related to diagnosing and treating substance abuse. This suggests that in PA, a waiver of parental consent should be allowed for minors over age 14 years to participate in tobacco research if the study is minimal risk.

Methods: Case study.

Results: We found key differences in how IRBs interpret and apply relevant laws, regulations, and recommendations regarding waiving parental consent for minors participating in tobacco research. Three IRBs provided different decisions regarding waiving parental consent. One site waived parental consent, agreeing that requiring parental consent could bias results and generalizability of findings. The second site denied a waiver based on a strict reading of the 4 criteria in the CFR. The third IRB denied waiver because they felt the CFR did not allow minor consent and were concerned about community standards of high parental involvement in minors’ lives.

Conclusions: IRBs vary in decisions to allow waivers of parental consent for minors to participate in tobacco research. The effect of requiring parental consent on participation rates, costs, and sample bias will be assessed as this RCT progresses. Generalizability of findings may also be affected by requiring parental consent. By describing the current legal and ethical milieu in PA, we hope to promote dialogue between researchers and IRBs based on legal and scientific data to enhance access of potentially beneficial minimal risk research to all adolescents who use tobacco.

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EFFECTS OF A POLICY ON TREATMENT OF TOBACCO USERS IN PRIMARY CARE

Erin J. Sinisgalli, M.P.H.*, Jeri S. Bosman, R.N.*, Tavia Rauch, C.R.T., B.S., Center for Smoking Cessation at Seton Health

Primary care offices are ideal settings for addressing tobacco use with patients. Due to issues such as time constraints, statistics have shown that addressing tobacco use is not a priority with many healthcare providers. We have worked extensively over the past three and a half years with healthcare providers to train them how to implement the Public Health Service Guideline for Treating Tobacco Dependence. Chart reviews conducted by these offices have shown a moderate improvement in implementation of the 5 A’s after our initial training. In an effort to raise these results, we have worked with 16 primary care sites to develop and implement a written standard of care/policy to require that all providers address the 5 A’s with every patient at every visit. This presentation describes the process of executing the policy and the results of the implementation based on pre- and post-policy chart reviews. Data from chart review compilations will be provided. We will discuss various methods of implementing policies within both a healthcare system and individual provider offices and the differentiation in the results between these unique settings. Ongoing implementation data collected over a period of six months will enable further examination of the benefits and shortcomings of a mandatory policy to address the 5 A’s.

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CONSEQUENCES OF DRAMATIC REDUCTIONS IN STATE TOBACCO CONTROL FUNDS: FLORIDA, 1998-2000

Jeff Niederdeppe, Ph.D.*, University of Wisconsin School of Medicine and Public Health; Matthew C. Farrelly, Ph.D., James C. Hersey, Ph.D., and Kevin C. Davis, M.S., RTI International

Several states have witnessed dramatic reductions in tobacco control funding. The effects of these budget cuts are not well understood. It is instructive to examine consequences of tobacco control budget cuts on intermediate outcomes like program exposure and program-targeted cognitions because program effects on smoking behavior often take time to manifest. This study assessed whether dramatic funding reductions to the Florida Tobacco Control Program (FTCP) influenced trends in recall of the Florida “truth” anti-smoking media campaign, anti-industry attitudes, and non-smoking intentions among Florida teens between 1998 and 2000. We used spline regression to test for differences in the rates of change in “truth” recall, anti-industry beliefs, and non-smoking intentions before and after the FTCP budget cuts using the Florida Anti-tobacco Media Evaluation survey, a repeated cross-sectional telephone survey of Florida teens. Confirmed recall of the Florida “truth” campaign (from 0% to 84%), anti-industry attitudes (scale value from 16.0 to 16.8, range 4 to 24), and non-smoking intentions (83% to 91%) increased dramatically between April 1998 and May 1999 (all p<0.001 using chi-square and t-tests). Florida “truth” recall declined after dramatic reductions in funding for the FTCP in June 1999 (from 85% in May 1999 to 68% in May 2000; p<0.01). Anti-industry beliefs (scale value from 16.8 to 17.0) and non-smoking intentions (from 91% to 91.5%) plateaued or began to decline between May 1999 and May 2000, following of the budget cuts. Spline regression models confirmed that upward trends in each of these outcomes were reversed after the budget cuts (all p<0.05). The launch of the national “truth” campaign in February 2000 helped to offset otherwise deleterious effects of the budget cuts on anti-industry beliefs, but not non-smoking intentions. Reductions in tobacco control funding have immediate effects on program exposure and cognitive precursors to smoking initiation. There is a critical need to maintain and enhance funding for state tobacco control programs to continue nationwide progress in preventing youth from initiating cigarette smoking.

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TRENDS AND PREDICTORS OF PUBLIC SUPPORT FOR RESTRICTING SALES OF CIGARETTES IN CANADA: CROSS-SECTIONAL DATA FROM 1998 TO 2006

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Despite tobacco-control efforts, tobacco product availability remains ubiquitous in North America. While limiting tobacco outlet locations can be key to a comprehensive tobacco-control plan, little research on levels of public support for such restrictions is known. Levels of public support for restricting cigarette sales (“sold in government-owned stores” or “not sold at all”) were assessed in 1998, 2000-2006 using cross-sectional data from the CAMH Monitor (a RDD survey of Ontario residents aged 18+ with a region-stratified 2-stage (household, respondent) probability sample design; unweighted n=8,930; mean response rate=62%). Using logistic regression controlling for sociodemographic factors and survey recency, predictors of expressed support were identified. Support for restricting cigarette sales increased from 47.6% [95% CI: 44.4%-50.8%] in 1998 to 57.6% [95% CI: 53.9%-61.3%] in 2006 (p<0.01). Support for banning cigarette sales increased 2.5 times from 11.6% [95% CI: 9.6%-13.9%] in 1998 to 29.8% [95% CI: 26.5%-33.4%] in 2006 (p<0.01). In 2006, expressed support for restricting cigarette sales ranged from 39.8% for current smokers [95% CI: 27.6%-44.0%] to 52.4% for former smokers [95% CI: 45.8%-59.3%] to 68.6% for never smokers [95% CI: 63.8%-73.4%]. Expressed support among current smokers increased marginally over the period (23.6% [95% CI: 18.3%-29.0%]; 0.05<p<0.10). Compared to current smokers, former smokers and never smokers were much more likely to support restrictions on sales ([OFR=2.48 [95% CI: 2.15-2.86], p<0.01 and OR=4.17 [95% CI: 3.65-4.76], p<0.01, respectively). Supporters were more likely to be included in recent surveys, female, aged 18-34, urban residents, speaking a non-official language at home, pro workplace smoking ban, more pro anti-smoking at home and in cars. Those who completed high school only, were previously married or living with a partner, were less likely to support restrictions. Current smokers intending to quit in 30 days/6 months, or having 1+ serious past-year quit attempt, were also more likely to express support. Legislation on the sale of tobacco products needs to reflect increasing support for restrictions on sales.

Ontario Ministry of Health Promotion.

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COPIING WITH CIGARETTE TAX INCREASES – THE FULL PICTURE FROM SELF-REPORT AND TAX DATA

Frederic Malter, M.S.*

In December 2006, a tax hike increased the retail price per cigarette pack in Arizona by 17%. Previous research demonstrated that smokers try to cope with price increases in different ways. This paper aims at reporting a complete picture of smokers’ adaptations. Coping strategies include: attempting to quit; cutting back; switching to cheaper brands, lower quantities; different products (roll-your-own or smokeless tobacco); buying from low-price outlets (Indian Sovereign Nations, internet or neighboring states). 796 Arizona residents provided data through a web-based survey within a study on perception of smoking policies. Survey items were phrased to assess the perceived causal impact of the tax increase. The Arizona tobacco tax tracking system allowed cross-validating self-reported buys from reservations with sales figures from cigarette tax stamps, one indicator of cigarette consumption. Results show that 86% of all smokers on the panel had contemplated quitting in response to the tax increase, 38% rated the increase as a six or seven on a seven-step scale and 28% of all smokers reported having quit a day or more. There were no differences by income levels. 27% of all smokers reported having bought more at Indian reservation outlets and 13% reported purchasing more over the internet. Tax stamp figures from Indian reservation outlets showed steep yet short-lived increases of sales to non-Indians. Whereas these sales accounted for about 10% of all sold tax stamps before the tax increase, the rate spiked to highs around 30% shortly after the tax hike, stabilizing at about 15%. Tax revenue from other tobacco products doubled after the tax increase. Higher income smokers had a stronger propensity to buy at low-priced outlets, especially Indian reservations, than low-income smokers. Level of addiction showed strong inverse relationships to quit attempts and cutting back, which in turn were highly correlated.

Conclusion: Tax hikes provide motivation to change behavior for certain types of smokers. Highly addicted smokers may need alternative or additional incentives to change. Further implications & remaining issues (e.g., smuggling) will be discussed.

Arizona Department of Health Services–Tobacco Education and Prevention Program (TEPP).

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POS1-87 REVISITING RECOMMENDATIONS FROM THE REPORT OF THE TOBACCO POLICY RESEARCH STUDY GROUP ON TOBACCO PRICING AND TAXATION IN THE UNITED STATES
Rosanna Morales, M.Sc.*, and Joanna Cohen, Ph.D., University of Toronto

In 1992, Tobacco Control published a series of reports outlining strategic directions for policy research. This presentation revisits recommendations regarding tobacco pricing and taxation, and synthesizes available literature to assess how knowledge in this area has evolved over the past 15 years. Relevant research since 1990 was identified by searching Medline, PubMed, EconLit, and EMBASE. Reference sections of identified studies were searched to find additional studies. Identified English studies were categorized according to the core area(s) addressed and evidence in each area was synthesized. Knowledge has evolved considerably in the past 15 years. However, research efforts have focused on a few key areas, including estimates of the price elasticity of demand for cigarettes, the impact of tax and price on youth and young adults, and successful advocacy campaigns to raise tobacco taxes. Areas that remain misunderstood include why taxation policy has been so greatly underutilized despite knowledge that it is one of the most effective tobacco control policies available and the impact of tobacco tax and price on subpopulations other than youth and young adults (e.g., aboriginal people). Despite the progress made by the research community in the past 15 years, many questions related to tobacco taxes and prices remain and have emerged as a result of new knowledge. This work highlights research priorities in this important area of tobacco control policy.

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POS1-88 MANDATING LOWER YIELDS OF TOXICANTS IN CIGARETTE SMOKE
David Burns, UCSD; Erik Dybing, Tob Reg Chair; Gemma Vestal and Douglas Betcher, WHO

The WHO FCTC recognizes the need for tobacco product regulation. Existing product regulatory strategies based on the machine measured tar, nicotine and carbon monoxide yields per cigarette are causing harm. This abstract describes a strategy for regulation proposed by WHO based on product performance measures with the goal of reducing toxicant levels in mainstream cigarette smoke. It recommends establishing levels for selected smoke toxicants per mg nicotine and prohibiting the sale or import of cigarette brands that have yields above these levels. Normalizing toxicant levels per mg nicotine is used to shift the interpretation of the measurement away from the quantity of the smoke generated and toward product characterization. The toxicants selected were based on consideration of: animal and human toxicity data, hazard indices, variability of the toxicants across brands, the potential for the toxicant to be lowered, inclusion of constituents from both particulate and gas phases of smoke and from different chemical classes in cigarette smoke. Consideration was also given to selecting compounds implicated in cardiovascular and pulmonary toxicity as well as carcinogenicity. Available data on the variation in the toxicant levels for cigarette brands are used to identify levels of reduction that have already been achieved by some products on the existing market. The recommended regulatory strategy should be implemented in phases beginning with a period of required annual reporting of follow by the promulgation of the regulatory levels for toxicants above which brands cannot be marketed and enforcement of those levels. Mandated lowering of levels of toxicants per mg nicotine in cigarette smoke will make regulation of cigarettes consistent with other regulatory approaches which mandate reduction of known toxicants in products used by humans. Use of the results of the testing, or of relative ranking of brands by testing levels, should be prohibited as are statements that the brand has met governmental regulatory standards.

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POS1-89 EXPOSURE TO SECONDHAND SMOKE AT HOME AND IN PUBLIC PLACES IN SYRIA: A DEVELOPING COUNTRY’S PERSPECTIVE

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Objectives: This study employs sensitive methods to address the issue of exposure to secondhand smoke among children and women in an understudied developing country setting (Syria). Methods: This study combines data collected by the Syrian Center for Tobacco Studies as part of two international studies conducted in 2006; the Secondhand Smoke Exposure among Women and Children study (Johns Hopkins) and the Global Air Monitoring Study (Roswell Park Cancer Institute). We employed objective measures (hair nicotine, and ambient household nicotine assessed by passive monitors) to assess children and mothers exposure to secondhand smoke at home, and used the TSI SidePak Personal Aerosol Monitor to sample respirable suspended particles less than 2.5 µm diameter (PM2.5) in the air in public places (40 restaurants/cafes in Aleppo). Results: In homes, mean ambient nicotine level (± standard deviation, SD) was 2.24±2.77 µg/m3. Mean level of hair nicotine was 11.8 ng/mg among children (n=54), and was higher if the mother was a smoker (19.4±23.6 ng/mg) than non-smoker (5.2±6.9 ng/mg) (p=0.05). Mean hair nicotine among non-smoking mothers (n=23) was 1.17±1.56 ng/mg. Children’s hair nicotine level was strongly correlated with ambient household nicotine and number of cigarettes smoked daily in the house (r=0.56 and r=0.64, respectively, p<0.001), as well as was related to having a father who smoked in the children’s presence. In public places, average PM2.5 in the monitored 40 hospitality venues was 464 µg/m3 and correlated, albeit not significantly, with smoker density measured as cigarettes-waterpipes/100 m3 (r=0.26, p=0.11).

Conclusions: Children in Syria are exposed to high levels of SHS at home, of which mother’s smoking plays a major role. Also, levels of respirable hazardous particles are high in public hospital venues putting customers and workers at serious health risks. Efforts to limit exposure of children and women at home and to adopt clean air policies should be top priority in Syria and the Arab region.

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Poster Session 1
POS2-1

A NOVEL CYP2A6 GENETIC VARIANT 6458A>T (Asp438Tyr) IS ASSOCIATED WITH LOWER CYP2A6 ACTIVITY

Nael Al Koudsi*, Jill C. Mwenifumbo, Ewa Hoffmann, M.Sc., Edward M. Sellers, M.D., Rachel F. Tyndale, Ph.D., Centre for Addiction and Mental Health, University of Toronto, Department of Pharmacology

In humans, the majority of nicotine (~80%) is inactivated to cotinine (COT) by the hepatic enzyme CYP2A6. In addition, CYP2A6 exclusively (~100%) metabolizes cotinine to trans-3-hydroxycotinine (3HC), making the 3HC/COT ratio a reliable indicator of CYP2A6 activity. Our aim was to investigate the functional impact of a novel uncharacterized variant (6458A>T) on in vivo CYP2A6 activity. The variant occurs predominantly among African Americans and results in an amino acid substitution (Asp438Tyr). Samples collected from 270 African Canadians (54% females and 50% smokers) were used to assess the 3HC/COT ratio, the frequency of the 6458A>T variant and other known CYP2A6 variants. A genotyping assay was developed and the presence of the variant confirmed by sequencing. An allele frequency of 2.8% was found and the genotypes were in Hardy-Weinberg equilibrium. The 3HC/COT ratio (mean ± SD) was significantly lower among heterozygous (6458A>T) individuals (n=10) compared to individuals with no other detected CYP2A6 variants (n=156) (0.17 ± 0.12 vs. 0.29 ± 0.18, p<0.05). Our analyses also revealed an effect of gender and smoking status on the 3HC/COT ratio therefore we performed multiple regression analyses to control for these factors. The 3HC/COT remained significant-ly lower among individuals heterozygous for 6458A>T (p<0.05) indicating that the variant is associated with lower CYP2A6 activity in vivo. This variant alters CYP2A6 activity, which may impact on smoking behaviors and cancer risk, particularly among those of black African decent.

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POS2-2

HO-1 AND P21 PLAY A CRITICAL ROLE IN NNK-INDUCED LUNG CARCINOMA GENESIS IN ERK AND NF-KAPPA-B DEPENDENT PATHWAYS

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4-(N-Methyl-N-nitrosamino)-1-(3-pyridyl)-1-butanone (NNK), the tobacco-specific nitrosamine, induces lung cancer in all animal species tested and contributes significantly to the development of smoking-related lung cancer. In present work, we evaluated HO-1 (heme oxygenase 1) and p21 levels in 30 lung cancer tumor samples and 10 matched non-tumor tissues. The levels of HO-1 and p21 were significantly increased in lung tumor tissues and the increased p21 was mainly localized in the nucleus. NNK stimulated the proliferation of lung cancer cells (NCI-H23) and elevated the levels of HO-1, p21, c-IAP2 and Bcl-2 in a time-dependent manner. p21 induced by NNK was found to be in the nucleus. NNK down-regulated the expression of Bad, ZnTP II a HO-1 specific inhibitor not only significantly inhibited NNK-induced HO-1 expression, but also down-regulated p21 and c-IAP2 expression and blocked the nuclear p21 induced by NNK, indicating that HO-1 is required for NNK-induced p21 and c-IAP2. Further studies showed that NNK enhanced the activity of NF-kappaB by translocating p65 into the nucleus and inducing the NF-kappaB DNA binding activity. NNK also promoted ERK activation. The effect of NNK on the NF-kappaB activity could be blocked by not only SN50, a specific inhibitor of NF-kappaB but also by U0126, a specific inhibitor of ERK. Unlike U0126, NNK-mediated increased ERK activation could be suppressed by U0126 but not by SN50. Thus, ERK activation appeared to be upstream of NF-kappaB in NCI-H23 cells treated by NNK. Inhibition of ERK and NF-kappaB activation led to the suppression of NNK-mediated HO-1, p21, c-IAP2 and Bcl-2 expression, indicating that NNK may regulate cell proliferation through an ERK- and NF-kappaB-dependent pathway. In conclusion, compared with non-tumor tissues, lung cancer tissue are associated with increased HO-1 and p21. NNK enhances the level of HO-1 and p21, inhibits ERK and NF-kappaB, and subsequently it promotes the nuclear p21, up-regulates c-IAP2 and Bcl-2 and down-regulates Bad. Therefore, this study reveals a novel pathway showing how NNK promotes the development of lung cancer.

The study was supported by a grant from the Research Grants Council of the Hong Kong Special Administrative Region (Project No. CUHK4390/03M).

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Tobacco smoke contains many carcinogens that induce lung cancer. Among these, 4-(N-Methyl-N-nitrosamino)-1-(3-pyridyl)-1-butanone (NNK) is a tobacco-specific nitrosamine that exhibits strong carcinogenic activity in all species tested, including humans. In present work, we evaluated HO-1 (heme oxygenase 1) and p21 levels in 30 lung cancer tumor samples and 10 matched non-tumor tissues. The levels of HO-1 and p21 were significantly increased in lung tumor tissues and the increased p21 was mainly localized in the nucleus. NNK stimulated the proliferation of lung cancer cells (NCI-H23) and elevated the levels of HO-1, p21, c-IAP2 and Bcl-2 in a time-dependent manner. p21 induced by NNK was found to be in the nucleus. NNK down-regulated the expression of Bad, ZnTP II a HO-1 specific inhibitor not only significantly inhibited NNK-induced HO-1 expression, but also down-regulated p21 and c-IAP2 expression and blocked the nuclear p21 induced by NNK, indicating that HO-1 is required for NNK-induced p21 and c-IAP2. Further studies showed that NNK enhanced the activity of NF-kappaB by translocating p65 into the nucleus and inducing the NF-kappaB DNA binding activity. NNK also promoted ERK activation. The effect of NNK on the NF-kappaB activity could be blocked by not only SN50, a specific inhibitor of NF-kappaB but also by U0126, a specific inhibitor of ERK. Unlike U0126, NNK-mediated increased ERK activation could be suppressed by U0126 but not by SN50. Thus, ERK activation appeared to be upstream of NF-kappaB in NCI-H23 cells treated by NNK. Inhibition of ERK and NF-kappaB activation led to the suppression of NNK-mediated HO-1, p21, c-IAP2 and Bcl-2 expression, indicating that NNK may regulate cell proliferation through an ERK- and NF-kappaB-dependent pathway. In conclusion, compared with non-tumor tissues, lung cancer tissue are associated with increased HO-1 and p21. NNK enhances the level of HO-1 and p21, inhibits ERK and NF-kappaB, and subsequently it promotes the nuclear p21, up-regulates c-IAP2 and Bcl-2 and down-regulates Bad. Therefore, this study reveals a novel pathway showing how NNK promotes the development of lung cancer.

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POS2-3

SELEGILINE (L-DEPRENYL) INHIBITS NICOTINE METABOLISM IN MICE AND HUMANS AND IS A MECHANISM-BASED INHIBITOR OF CYP2A6

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The MAO-B inhibitor selegiline (L-deprenyl) is under investigation as a potential smoking cessation drug. Based on its structure and metabolism we investigated the inhibitory effects of selegiline and its metabolites on nicotine metabolism. In vitro, mice selegiline significantly inhibited nicotine metabolism in liver microsomes and by the cDNA-expressed nicotine metabolizing enzyme CYP2A5. Selegiline metabolites, desmethylselegiline, L-methamphetamine and L-amphetamine, also inhibited nicotine metabolism. Pretreatment with selegiline and desmethylselegiline increased inhibition (IC50) in microsomes by 3.3- and 6.1-fold, respectively, but not in CYP2A5, suggesting an inhibitory metabolite is made by other liver enzymes. In vivo in mice, selegiline increased both nicotine elimination half-life (6.6±1.4 vs. 12.5±6.3 min, p<0.05) and AUC (57.4±3.5 vs. 90.7±6.8ng/h/mL, p<0.05). In vivo in humans, selegiline inhibited nicotine metabolism in hepatic microsomes and by the cDNA-expressed nicotine metabolizing enzyme CYP2A6. Selegiline metabolites, desmethylselegiline and L-amphetamine also inhibited nicotine metabolism. Pre-incubation with selegiline increased the inhibition of nicotine metabolism in microsomes (3.7-fold) and CYP2A6 (14.8-fold) and the Ki for competitive inhibition is 4.2uM. More importantly, selegiline dose- and time-dependently inhibited CYP2A6-mediated nicotine metabolism (kin-h=0.30±0.07min-1) and the inhibition was irreversible upon metabolic activation of selegiline. These data suggest that selegiline is a mechanism-based inhibitor of CYP2A6, reducing nicotine metabolism by decreasing the amount of functioning CYP2A6. Thus, in mice selegiline inhibited nicotine metabolism competitively in vivo and significantly increased plasma nicotine levels in vivo. In humans where selegiline is both a competitive and mechanism-based inhibitor, it is likely to have even greater inhibition on human in vivo nicotine metabolism. As slower nicotine metabolism is associated with reduced smoking and increased cessation, our findings suggest that an additional aspect of selegiline’s efficacy in smoking cessation is through its inhibition of nicotine metabolism.

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POS2-4  A PRELIMINARY EXAMINATION OF THE POTENTIATION OF NICOTINE’S REWARD EFFECTS THROUGH PAVLOVIAN CONDITIONING

Jamie L. Wilkinson* and Rick A. Bevins, University of Nebraska–Lincoln

Objectives: From a Pavlovian conditioning perspective nicotine is typically conceptualized as the unconditioned stimulus (US) that enters into an association with other stimuli (bar, smoke odor). More recently, research from our lab has demonstrated that nicotine also functions as a conditional stimulus (CS) in an appetitive conditioning task.

Methods: Animals were randomly assigned to two groups: a Control group and a Nicotine trained as a CS group. The nicotine trained as a CS group received nicotine (0.01 mg/kg IV) infused before each trial for 10 trials. The Control group received saline before each trial for 10 trials. Subjects were tested in a Pavlovian conditioning apparatus where they were exposed to nicotine or saline and received either a reward or no reward. The rewards were either food pellets, water, or a combination of both foods and water. The results revealed that nicotine trained as a CS enhanced the rewarding effects of nicotine in male rats relative to saline trained rats.

Conclusions: These results suggest that nicotine training can enhance the rewarding effects of nicotine in a Pavlovian manner.

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POS2-5  EARLY EXPOSURE TO NICOTINE CAUSES LONG-LASTING BEHAVIORAL CHANGES IN BOTH NICOTINE REWARD AND WITHDRAWAL MODELS

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Over 4,500 adolescents start smoking every day in the United States (Gilpin et al., 1999). In addition, adolescent smokers have been shown to have a more difficult time quitting than smokers who began in adulthood (Chen and Millar, 1998; Colby et al. 2000). This suggests that adolescence is a critical period for the initiation and maintenance of tobacco use. Literature from rodent studies has shown that early adolescence (PND 21-30) is a unique phase of high neuronal plasticity. In particular, alterations of the mesocorticolimbic reward system have been cited (Picciotto et al. 1998) which may play a significant role in nicotine dependence. Recent data from our lab shows that exposure to nicotine during early adolescence has long-lasting behavioral effects in both a nicotine reward model, conditioned place preference, as well as in a nicotine withdrawal model in ICR male mice. Specifically, early adolescent nicotine exposure enhanced the rewarding effects of nicotine in adulthood. Moreover, nicotine withdrawal symptoms were attenuated in adolescents as compared to adults. This reduction in nicotine withdrawal persists even once mice have fully matured into adults. The underlying pharmacological and molecular mechanisms for this neuronal plasticity are not yet fully understood. However, using rubidium efflux and dopamine release assays, we have investigated possible molecular mechanisms that may correlate to these long-lasting behavioral changes. Our data suggests that differences in receptor and post-receptor mechanisms may be involved in the nicotine-induced plasticity, which enhances the level of overall nicotine dependence in adolescents. It will be essential to further investigate both behavioral and molecular changes that are induced in the adolescent through early exposure to nicotine in order to gain a better understanding of why this age group has difficulty with smoking cessation.

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POS2-6  THE REWARDING EFFECTS OF NICOTINE ARE ENHANCED DURING ADOLESCENCE IN BOTH MALE AND FEMALE RATS

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Clinical studies suggest that there is a heightened vulnerability to nicotine dependence during the adolescent period of development. Recent work in our laboratory demonstrates that the aversive effects of nicotine withdrawal are lower in adolescent versus adult male rats. The present study expands previous work by examining developmental differences to the rewarding effects of nicotine in adolescent and adult female and male rats. Also, this study examined whether adolescent nicotine exposure enhances the rewarding effects of nicotine later in adult development in male rats. Male and female adolescent (PND 28) and adult (PND 60) Wistar rats were tested for their initial preference for either of two distinct compartments of our conditioning apparatus. Four days later, conditioning was conducted over eight days and consisted of four two-day trials. On one day, separate groups of rats received a dose of nicotine (0.0, 0.2, 0.4, 0.6, 0.8 or 1.2 mg/kg; base, sc) and were confined to their initially non-preferred side for 30 min. On alternate days, rats received saline and were confined to their initially preferred side for 30 min. Following conditioning, the rats were then re-tested for their preference. Adult female rats received vaginal lavage procedures to determine the phase of the estrous cycle they were in during the final preference test. The results revealed that nicotine produces an inverted U-shaped dose-response curve in both male and female rats in both age groups. The magnitude of preference produced by nicotine was similar in male and female rats, and this effect did not appear to differ across the various phases of the estrous cycle in adult female rats. However, the rewarding effects of nicotine were enhanced in adolescent versus adult rats of both sexes. Furthermore, nicotine exposure during adolescence enhanced the rewarding effects of nicotine in adult male rats relative to naive adult males. Taken together, our results support the hypothesis that adolescence is a period of enhanced vulnerability to the rewarding effects of nicotine.

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POS2-7  STIMULATION OF KAPPA-OPIOID RECEPTORS INDUCES THE BEHAVIORAL EFFECTS OF NICOTINE WITHDRAWAL IN NICOTINE-DEPENDENT ADULT BUT NOT ADOLESCENT RATS

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The kappa-opioid receptor (KOR) system plays a role in mediating the rewarding effects of drugs of abuse. However, little is known about the role of the KOR system in mediating withdrawal from drugs of abuse, including nicotine. Further, it is unclear whether the role of the KOR system in withdrawal is age dependent. Thus, this study compared the ability of U50,488H, a KOR agonist, to induce the affective properties of nicotine withdrawal in adolescent (PND 28-45) and adult (PND 60-77) male rats using the conditioned place aversion (CPA) and elevated plus maze (EPM) paradigms. In the CPA study, preference for either of 2 distinct and adjacent compartments was assessed. The next day, rats were prepared with subcutaneous pumps that delivered a dose of nicotine that produces equivalent nicotine plasma levels in these age groups (4.7 for adolescents and 3.2 mg/kg/day for adults; base). Control rats received a sham surgery. Six days later, all rats received U50,488H (5 mg/kg, sc) and were confined to their initially preferred side for 30 min. On alternate days, they received saline and were placed in their non-preferred side for 30 min. This 2-day procedure was repeated 4 times over 8 consecutive days. After conditioning, rats were re-tested for preference. The results revealed that U50,488H produced CPA in adult, but not adolescent rats even when the dose of U50,488H was increased to 7.5 mg/kg in adolescents. In controls, U50,488H alone did not produce CPA in either age group. In the EPM study, rats were prepared with pumps that delivered the same nicotine doses as the CPA study. Six days later, rats received 3 injections of U50,488H (5 mg/kg, sc) every other day to mimic the CPA study. Rats were then tested for the amount of time spent in the closed versus open arms of the EPM 20 min after U50,488H administration (5 mg/kg, sc). U50,488H increased anxiety-like behavior in nicotine-dependent adult rats, and this effect was absent in adolescents. These data suggest that stimulation of the KOR system elicits nicotine withdrawal in an age-dependent manner such that activation of this system may not induce nicotine withdrawal during the adolescent period of development.

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Varenicline, a partial agonist for c4b2 nACHRs, has been approved for the treatment of smoking cessation. While clinical efficacy in smoking cessation has been demonstrated, support for varenicline in the treatment of nicotine withdrawal associated cognitive deficits has not yet been reported. Contextual fear conditioning is a learning paradigm altered by both acute nicotine and nicotine withdrawal. Nicotinic effects on contextual fear conditioning suggest an opponent process model of nicotinic effects on learning, with acute administration enhancing conditioning, chronic administration showing tolerance to nicotine’s effects, and withdrawal producing a deficit. As cognitive deficits are part of the array of symptoms reported to accompany smoking cessation, contextual fear conditioning seems an appropriate model in which to test smoking cessation aids. To determine the efficacy of varenicline in treating withdrawal associated cognitive deficits we administered a range of nicotine doses (0.01, 0.1, 1.0 mg/kg) to C57BL6 mice 24 hours following withdrawal of chronic nicotine administration (6.3 mg/kg/day). Varenicline, at 0.1 mg/kg, prevented withdrawal-associated deficits in contextual fear conditioning. This suggests that varenicline may be effective at treating nicotine withdrawal associated cognitive deficits.

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**POS2-9**

**NICOTINE DEPENDENT AND WITHDRAWN MICE DEMONSTRATE CONDITIONED PLACE AVERSIONS THAT ARE ABOLISHED BY THE DopAMINE ANTAGONIST ALPHA-FLUPENTHIXOL**

Taryn Grieder*, Laurie Sellings, Ryan Ting-A-Kee, and Derek van der Kooy

Although nicotine is one of the most widely used addictive drugs, the motivational properties that make it so addictive are largely unknown and the current practice for characterizing the nicotine abstinence syndrome and its motivational effects in the mouse is unreliable. We implanted mice with osmotic minipumps containing a high dose of nicotine (35 mg/kg/day) for 2 weeks and observed them for somatic and motivational withdrawal upon pump removal. These mice demonstrated a nicotine somatic-abstinence syndrome that was strongest 8 hours after pump removal. Furthermore, nicotine dependent mice showed an aversion to the withdrawal-paired side in a conditioned place preference paradigm when conditioned 8 hours after pump removal. These results were also obtained using rats as the experimental subjects. Historically, the mesolimbic dopamine (DA) system is believed to play an important role in the rewarding and aversive aspects of many addictive drugs, including nicotine. Therefore we investigated the role of DA in dependent nicotine aversion. Interestingly, when our nicotine dependent and withdrawn mice were pre-treated with the broad-spectrum DA receptor antagonist alpha-flupenthixol (0.8 mg/kg, i.p.) under conditions where alpha-flupenthixol produces no motivational effects on its own, their conditioned place aversions were abolished. However, naive mice that were administered a single dose of nicotine (1.75 mg/kg, i.p.) and conditioned 8 hours later showed a significant conditioned place preference for the acute withdrawal paired side that was not blocked by alpha-flupenthixol. These results suggest that dopamine receptor activation mediates the aversive motivational effects of nicotine withdrawal when animals are in a drug dependent and withdrawn state.

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**POS2-10**

**INVOLVEMENT OF JUN N-TERMINAL KINASE IN THE ENHANCEMENT OF LEARNING AND MEMORY BY NICOTINE**

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Nicotine is known to enhance learning and memory in rodents in a variety of hippocampus dependent tasks such as the water maze, novel object recognition and contextual fear conditioning. While recent studies clearly implicate the hippocampus and nicotinic acetylcholine receptors therein in the effect of nicotine in contextual fear conditioning, the critical second messenger molecules that mediate the enhancement remain unknown. Using a cDNA microarray we have previously explored changes in gene transcription in the hippocampus thirty minutes following training in contextual fear conditioning in the presence of systemic nicotine in C57BL6 mice compared to mice that were trained but received systemic saline. The microarray data suggested that mRNAs for two members of the mitogen activated protein kinase (MAPK) family (JNK1 (Jun N-terminal Kinase) (MAPK8) and JNK3 (MAPK10)) were upregulated 30 minutes post-training in the presence of nicotine. The present study consisted of a follow-up to the microarray in which we confirmed the upregulation of JNK1 mRNA using qRT-PCR and demonstrate that the effect is specific to the hippocampus and JNK1. Furthermore, infusion of the JNK inhibitor, SP600125, into the dorsal hippocampus 60 minutes post-training to mice that were trained in contextual fear conditioning and administered systemic nicotine blocked the enhancement of contextual fear conditioning by nicotine. Together these data suggest that JNK1, a protein that has not been previously implicated in nicotine addiction, may mediate the effects of nicotine on learning and memory and thereby play an important role in addiction.

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**POS2-11**

**TEMPORAL DYNAMICS OF NICOTINIC ACETYLCHOLINE RECEPTOR ANTAGONISM OF THE CONDITIONED STIMULUS EFFECTS OF NICOTINE**

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 Previous research has established that nicotine functions as a conditioned stimulus (CS) in a Pavlovian discrimination task. The present research sought to further elucidate the neuropharmacological mechanisms by which nicotine functions as a CS. Initially, rats received either nicotine (0.4 mg base/kg, SC) or saline before place conditioning in a conditioning chamber for 20 min. On nicotine sessions, rats had intermittent access to sucrose; no sucrose was available on saline sessions. The main dependent measure was rate of dipper entries, and the nicotine-evoked conditioned response (CR) was sensitive to nicotine dose. After establishing an antagonist dose effect curve at a 25 min injection-to-placement interval (IPI), the temporal dynamics of antagonism were assessed using mecamylamine (MEC), a noncompetitive nicotinic receptor antagonist, or dihydro-beta-erythroidine (DHBE), an antagonist for the alpha4beta2* receptor subtype; iPs were 5, 10, 25, 50, 100, or 200 min before testing with nicotine administered 5 min before testing. For MEC there was partial blockade of the CR at 0.5 mg/kg and full blockade at 1 and 2 mg/kg. When varying the IPI, 1 mg/kg fully blocked the CR at all IPIs except at 5 min; 2 mg/kg fully blocked at all IPIs except at 200 min. For DHBE there was partial blockade of the CR at 1 and 3 mg/kg and full blockade at 10 mg/kg. When varying the IPI, 3 mg/kg DHBE fully blocked the CR at 25 and 50 min, and 10 mg/kg fully blocked the CR at 25 to 100 min. Additional tests indicated that the antagonist alone did not substitute for the nicotine CS or alter activity. Methyleneacetonine, an antagonist for the alpha7* receptor subtype, did not block the CS effects of nicotine at any dose. These data suggest that the alpha4beta2* receptor subtype contributes to nicotine’s ability to function as a CS, as well as its locomotor stimulant effects. MEC and DHBE are effective as early as 5 min before testing and still impact behavior 200 min later.

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POS2-12 COMBINATION IMMUNOTHERAPY WITH A NICOTINE VACCINE AND A NICOTINE SPECIFIC MONOCLONAL ANTIBODY BLOCKS NICOTINE-INDUCED LOCOMOTOR SENSITIZATION IN RATS
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Vaccination against nicotine reduces the behavioral effects of nicotine in rats, and preliminary reports suggest efficacy in clinical trials. Efficacy is limited by the need for high serum nicotine-specific antibody (NicAb) levels, but there is large variability in the NicAb levels generated by vaccines. Passive immunization with a nicotine-specific monoclonal antibody (Nic311) has also shown efficacy in rats. We hypothesized that supplementing vaccinated rats with Nic311 would result in higher total serum NicAb levels, reduced brain nicotine concentrations, and a greater attenuation of nicotine-induced locomotor sensitization (LMS) compared to vaccination alone. Five groups of rats were treated with either active or control vaccine and Nic311 or control antibody to provide groups receiving each treatment alone, both, or neither. Rats were then administered 10 daily injections of nicotine 0.3 mg/kg s.c., each immediately followed by 30 minutes of locomotor activity assessment. Nicotine control rats exhibited significant LMS. Treatment with Nic311 or Vaccine alone resulted in similar serum NicAb concentrations and brain nicotine levels, and a similar attenuation of LMS compared to nicotine control rats. Combination immunotherapy resulted in significantly higher total serum NicAb levels, lower brain nicotine concentrations, and a greater attenuation of LMS compared to vaccination alone. Higher serum nicotine concentrations were strongly correlated with lower brain nicotine levels and reduced locomotor activity on session days 7 - 10. These data indicate that the efficacy of vaccination can be substantially improved by supplementing vaccinated animals with passively administered antibodies, and provide a basis for further clinical exploration of combination immunotherapy to treat tobacco dependence.

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POS2-13 MAGNITUDE OF CONDITIONED REINFORCEMENT DURING NICOTINE SELF-ADMINISTRATION IS DEPENDENT ON DOSE
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Response-contingent pairings of environmental stimuli with nicotine have been shown to establish those stimuli as conditioned reinforcers. The purpose of the present study was to determine whether the magnitude of conditioned reinforcement depended on the dose of nicotine during training. During a 29-day training phase, rats were either trained to self-administer nicotine (0.03 mg/kg/infusion) or given access to a 15-s onset-of-the-stimulus light (CS), passively-received explicitly unpunished nicotine (0.03 mg/kg/infusion) and CS presentations (yoked to the paired group), or nose poked for CS presentations. The conditioned reinforcing strength of the CS was then tested using the acquisition of a novel response paradigm. During this phase, animals were no longer able to nose poke, but were presented with two levers, one active and one inactive. While the inactive lever had no consequence, pressing the active lever resulted in delivery of the CS and a saline injection. Animals in the paired group exhibited higher responding during both the training and test phase, indicating the transfer of nicotine's reinforcing properties to the CS. Rats self-administering 0.03 mg/kg nicotine tended to respond at a greater rate than rats at 0.09 during the training phase, but at a somewhat reduced rate during the testing phase. PR sessions revealed that the CS was a more robust reinforcer in rats with a history of the CS being paired with nicotine and that the strength of conditioned reinforcement was greater with the larger dose of nicotine. The results of the current study further illustrate the ability of nicotine-based associative learning to support behavior even in the absence of nicotine. Additionally, they suggest that factors that alter the reinforcing value of nicotine, such as dose in the present case, nicotine yield in cigarettes or individual variability in the response to nicotine, may also determine the strength of conditioned reinforcement from nicotine-associated stimuli. Establishing a better understanding of the role of conditioned reinforcement and the determinants of this effect may facilitate the development of more effective smoking cessation treatments.

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POS2-14 COMPENSATORY NICOTINE SELF-ADMINISTRATION IN RATS FOLLOWING A DECREASE IN NICOTINE UNIT DOSE: AN ANIMAL MODEL OF SMOKE REDUCTION
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The ability of smoking reduction to produce significant reductions in toxin exposure is limited by compensatory increases in smoking behavior. Characterizing factors contributing to the marked individual variability in compensation may be useful for understanding this phenomenon. We have previously reported that rats exhibit compensatory increases in nicotine self-administration (NSA) when duration of daily access to nicotine is reduced. The goal of the current study was to develop an additional model in which the NSA unit dose is decreased, and to begin to examine potential behavioral and pharmacokinetic contributors to compensation in this model. Rats were trained for NSA during 23-hr/day sessions using a unit dose of 0.06 mg/kg infusion until responding was stable. The unit dose was then reduced to 0.03 mg/kg infusion for at least 10 sessions. Following reacquisition of NSA at the 0.06 mg/kg infusion, the unit dose was set at 0.02 mg/kg infusion. Pharmacokinetic parameters were determined. Mean daily nicotine intake decreased when the unit dose was reduced. Decreases in intake were not proportional to the decrease in unit dose, indicative of compensation. The magnitude of compensation differed considerably among rats (range ~10-90%). Rats exhibiting the highest baseline infusion rates exhibited the lowest levels of compensation. Nicotine pharmacokinetic parameters were not significantly correlated with compensation. In contrast to our access reduction model, NSA rates were not transiently increased after baseline conditions were restored. These findings indicate that rats exhibit substantial individual variability in compensation following a reduction in nicotine unit dose, and that some behavioral effects of reduction (e.g., reacquisition) depend upon the model used. The current model may be useful for characterizing mechanisms and potential consequences of compensatory smoking.

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POS2-15 YOHIMBINE INCREASED NICOTINE SELF-ADMINISTRATION IN RATS WITH INITIALLY LOWER BUT NOT HIGHER NICOTINE INTAKE
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Clinical literature indicates that stress may substantially contribute to high rates of cigarette smoking and that smokers use cigarette smoking to reduce their stress levels. However, the issue of whether stress exposure influences nicotine self-administration in animals has received little experimental attention. Yohimbine, a a2-adrenergic antagonist, increases central noradrenergic neurotransmission and thereby produces stress- and anxiety-like states in both humans and animals. Furthermore yohimbine, presumably acting as a pharmacological stressor, has been found to reinstate drug-seeking behavior in rats after extinction of self-administration. This study examined the effect of yohimbine pretreatment on nicotine self-administration in rats that differed in their pretreatment levels of nicotine intake. Male Sprague-Dawley rats were trained in daily 1-h sessions to self-administer nicotine (0.03 mg/kg/infusion, i.v., free base). Responses on an FRS schedule resulted in delivery of nicotine and its associated stimulus, which signaled a 20 s. timeout period. In both lower (< 6 infusions/session) and higher (> 6 infusions/session) drug intake rats, yohimbine (0.0, 0.5, 1, 2 mg/kg) was intraperitoneally administered 30 min before testing sessions by using a within-subject and Latin Square design. Pretreatment with yohimbine dose-dependently increased active lever responding for nicotine in rats with initially lower but not higher nicotine intake. These data suggest that stressful life events may be effective in prompting cigarette smoking in a subpopulation that otherwise would remain light smokers and thereby significantly contribute to an increase in the prevalence of smoking and nicotine dependence.

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**POS2-16**

**DOPAMINE D2, BUT NOT D1, RECEPTORS CONTRIBUTE TO DIFFERENCES IN OUR NEW MODEL OF NICOTINE SELF-ADMINISTRATION IN RATS**

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Animal models of nicotine intake typically utilize rapid (1-3 sec) intravenous infusions of nicotine, reflecting the belief that nicotine rapidly reaches the brain as a highly concentrated "bolus" following each cigarette puff in humans. Intravenous self-administration studies in animals also tend to use high unit doses of nicotine (e.g., 15-30 µg/kg), equivalent to 1-2 cigarettes worth of nicotine per infusion. We have previously shown that rats will readily self-administer intravenous infusions of nicotine over 30 sec in duration and prefer these to fast infusions when given a simultaneous choice. Here we examine the contribution of dopamine D1 and D2 receptors to the self-administration of nicotine in the traditional "fast/high" model (30 mg/kg/inf over 3 sec) and our new "slow/low" model (3 mg/kg/inf over 30 sec). In Experiment 1, rats were trained to self-administer nicotine in the "fast/high" or "slow/low" model on a fixed ratio 1 (FR1) schedule of reinforcement before being transferred to a progressive ratio (PR) schedule. All rats were then tested with each of five doses of the D1 antagonist SCH 23390 (0, 3, 12.5, 62.5, 125, 25 mg/kg, sc) on every third day. In Experiment 2, rats were trained in the same manner, but tested with each of four doses of the D2 antagonists spiroperone (0, 3, 10, 30 mg/kg, sc) and sulpiride (0.5, 10, 20 mg/kg, ip). In Experiment 1, SCH 23390 reduced intake of cocaine and nicotine regardless of the dose and speed. In Experiment 2, both spiroperone and sulpiride increased the intake of cocaine and "fast/high" nicotine on the PR schedule. In contrast, both of the D2 antagonists decreased the intake of "slow/low" nicotine. These results suggest that, noradrenaline and dopamine involvement in the traditional "fast/high" and adapted "slow/low" models of nicotine self-administration, but this difference may be due to activity specifically at dopamine D2 receptors. More generally, our new model, by more closely modeling the kinetics of nicotine delivery in smokers, may ultimately provide a better understanding of neurobiological mechanisms that drive human smoking behavior.

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**POS2-17**

**AN INVERTEBRATE MODEL FOR NICOTINE MOTIVATION**

Laurie H. L. Sellings*, Crystal Pegg, Derek van der Kooi

Nicotine motivated behaviors have been modeled in nicotine naive and dependent rodents. It is, however, costly and time consuming to perform genetic analyses in rodents to try to identify new potential drug targets for smoking cessation therapies. The nematode Caenorhabditis elegans is an ideal genetic model. The nervous system is well characterized, and their short gestation period allows for high throughput behavioral screens. They are also amenable to genetic manipulations such as RNAi, and several well characterized mutants of nicotinic receptors are available. Since C. elegans exhibits nicotine-induced locomotor behavior resembling that seen in higher organisms, such as locomotor sensitization, we investigated whether C. elegans is also a good model for nicotine motivated behavior. To examine whether worms exhibited unconditioned approach behavior, a chemoattract assay was conducted using standard 100 mm Petri dish containing 6 ml of agar. A spot of nicotine was placed at one side of the Petri dish and allowed to diffuse for 3-16 hours. Then, 100-400 wild-type individuals (N2 strain) were placed in the centre. Worms were cold shocked to prevent further movement 15-120 min after placement on the Petri dish, and their position on the plate relative to the spot was recorded. From this, a chemotaxis index (CI) was calculated. A positive CI indicates an attraction to nicotine, whereas a negative CI indicates avoidance. Worms approached the nicotine spot in a concentration and time-dependent manner. Preliminary data suggests that this is an age-dependent effect; young worms appear to approach nicotine more readily than do older worms. Further experiments will determine whether worms can associate a conditioned stimulus with nicotine, and what effects mutations of nicotinic receptors exert on nicotine motivated behavior. This new model of nicotine motivated behavior could translate into an efficient screen for the identification of genes implicated in the development and maintenance of nicotine dependence.

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**POS2-18**

**ANIMAL MODELS OF GESTATIONAL CIGARETTE SMOKE EXPOSURE-INDUCED INFANT LOW BIRTH WEIGHT**

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Maternal/fetal genetic constitution and environmental factors are vital to delivery of a healthy baby. In the United States, a low birth weight (LBW) baby is born every minute and a half. LBW affects nearly 1 in 10 infants born in the US with resultant costs for the nation of more than 15 billion dollars annually. Various risk factors for LBW have been identified, yet over 1 million babies are exposed prenatally to cigarette smoke. In utero, cigarette smoke exposure results in a variety of adverse developmental outcomes with intrauterine growth restriction and infant LBW being the most documented. However, the mechanisms underlying these causes remain poorly understood. The purpose of this study was: 1) to establish an animal model of prenatal cigarette smoke-induced LBW using conditions which simulate “active” and “passive” tobacco smoke exposures, and 2) to identify a window of vulnerability for smoking induced LBW. Pregnant C57BL/6J mice were exposed to cigarette smoke during three periods of gestation: pre/pre-implantation (gestational day [gd] 1-5), post-implantation (gd 6-18), and throughout gestation (gd 1-17). Reproductive and fetal outcome measures were assessed on gd 18.5. Exposure of dams to mainstream/sidestream tobacco smoke, simulating “active” maternal smoking, resulted in decreases in fetal weight and crown-rump length when exposed throughout gestation (gd 1-17). Similar results were seen when animals were only exposed during the first five days of gestation (gd 1-5). Exposures from post-implantation through gestation (gd 6-18) did not result in reduced fetal weight, although reduced fetal weight in crown-rump length remained evident. Interestingly, maternal sidestream smoke exposures, simulating environmental tobacco smoke (ETS), during the pre/pre-implantation period of development also produced significant decreases in weight and crown-rump length. Collectively, these data confirm an association between exposure to either “active” smoke or “passive” ETS and diminished fetal growth. The data also identify a temporal window of vulnerability for cigarette smoke-induced LBW during the pre/pre-implantation period of embryonic development.

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**POS2-19**

**EXPOSURE TO CIGARETTE ADVERTISING AND ADOLESCENTS’ INTENTIONS TO SMOKE: THE ROLE OF THE DEVELOPING SELF-CONCEPT**

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A robust literature has strongly suggested that an increase in exposure to cigarette advertising and marketing is associated with an increase in smoking initiation among adolescents. However, the psychological mechanisms that mediate and moderate this relationship are largely unknown. This laboratory-based study evaluated both the role of adolescents’ developing self-concept and the perceived self-relevance of cigarette advertising as moderators of the advertising exposure-smoking intentions relationship in a sample of never smoking adolescents. Eighty-seven adolescents (ages 11-17; 54% female; 81% Caucasian; 10% African-American; 9% other race/ethnicity) completed measures self-concept development and were exposed to 30 cigarette print magazine advertisements for a variety of brands popular with adolescents (e.g., Camel, Newport, Marlboro, Kool). After exposure to each advertisement, participants rated their intentions to smoke. Results revealed a significant three-way interaction of adolescent age, self-concept development, and ad self-relevance (p = .005). These significant interaction effects held after controlling for a number of critical covariates (e.g., gender, smoking attitudes, mood, prior exposure to cigarette advertising and tobacco marketing). Further analysis of the three way interaction suggested that early adolescents (ages 11-13) with less mature self-concepts who also said that cigarette advertising was relevant to them had the strongest smoking intentions after exposure to cigarette advertising compared to all other groups of adolescents. Thus, early adolescents who are having the most difficulty figuring out “who they are” and time-dependent manner. Preliminary data suggests that this is an age- dependent effect; young worms appear to approach nicotine more readily than do older worms. Further experiments will determine whether worms can associate a conditioned stimulus with nicotine, and what effects mutations of nicotinic receptors exert on nicotine motivated behavior. This new model of nicotine motivated behavior could translate into an efficient screen for the identification of genes implicated in the development and maintenance of nicotine dependence.

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A HUMAN LABORATORY MODEL OF RELAPSE: PRIMING EFFECTS AND USING MEASURES OF IMPULSIVITY TO PREDICT OUTCOMES

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Pre-clinical research suggests a critical role of drug cue exposure in precipitating relapse to drug use. Human laboratory research suggests that behavioral measures of impulsivity are predictive of treatment outcomes. This study extends previous research by examining the pharmacological priming effects of nicotine and by comparing multiple measures of impulsivity in the ability to predict abstinence duration. Study completers (N=80; 51% female, 51% Caucasian) were 41 years old (SD = 7 years), smoked 17 (SD = 7) cigarettes per day, and were not seeking treatment. At study intake, a subset of study participants (N=50) completed 3 behavioral (Mirror Drawing, Iowa Gambling, and Delay Discounting), and one self-report (BIS-11) measure of impulsivity. After 4 days of verified abstinence, participants were randomly assigned to receive either 5 doses of placebo nasal spray, 5 doses (1mg each) of nicotine nasal spray, or to smoke five cigarettes of their usual brand in the laboratory. An abstinence test was then conducted for 6 days. Repeated measures ANOVAs (group x time) indicated participants who smoked cigarettes reported greater reductions in tobacco withdrawal and felt more buzzed, dizzy, and nauseous compared with those exposed to either nasal spray condition. Those exposed to nicotine spray felt much buzzed and reported greater reductions in withdrawal compared with placebo. Relapse rates were at least 20% greater in the nicotine spray exposed group compared with the placebo group on Days 2-6 of the abstinence test. There were no differences in abstinence rates between those exposed to nicotine via nasal spray or smoked cigarettes. Interestingly, only the self-report measure of impulsivity (Cognitive and Total scores) was predictive of abstinence survival measured independent of exposure group assignment. These findings provide initial evidence of a purely pharmacological priming effect of nicotine in humans that has not previously been observed, and suggests that self-report, but not behavioral measures of impulsivity are predictive of abstinence survival beyond priming effects.

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THE LATENCY TO THE ONSET OF NICOTINE WITHDRAWAL: A TEST OF THE SENSITIZATION-HOMEOSTASIS THEORY

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The latency to withdrawal (LTW) is the expired time between the last cigarette and when the smoker feels the need to smoke again. The sensitization-homeostasis theory predicts that the LTW is inversely related to the frequency and duration of smoking such that more frequent cigarette consumption and a longer history of tobacco use will be associated with a shorter LTW. An anonymous cross-sectional survey of 1,055 10th and 11th grade students of mixed ethnicity was conducted in two schools using self-completed questionnaires. Participants were asked “After you have smoked a cigarette, how long can you go before you feel you need to smoke again?” Of 162 current smokers, 73.5% reported a regular need to smoke and a LTW. Reported values for the LTW ranged from .05 hours to “3 weeks or more.” Monthly cigarette consumption ranged from 1 to 1176. The LTW correlated inversely with monthly cigarette consumption (Kendall’s tau b = -.54, P < .001) and the duration of smoking (Kendall’s tau b = -.27, P <.001) as predicted by the sensitization-homeostasis theory.

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EFFECTS OF TWO TYPES OF EXERCISE ON CRAVINGS TO SMOKE

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Becoming more physically active is associated with increased confidence to maintain smoking abstinence as well as success at stopping smoking. The purpose of the current study was to assess the effects of two different types of exercise (cardiovascular and Hatha yoga) on general and cue-elicited craving for a cigarette. Participants were 76 smokers age 18-45 (mean=29) who smoked at least 10 cpd (mean=29) for at least one year. Participants were randomly assigned to engage in 30 minutes of cardiovascular activity (walking on a treadmill), yoga, or to view a video about exercise (control). Participants completed a self-report measure of craving (Questionnaire of Smoking Urges-Brief [QSU-brief]; Cox, Tiffany, & Christien, 2001) and a brief mood form, as well as a picture-based cue reactivity assessment before and approximately five minutes after the activity. Results demonstrated that participants in both exercise groups reported a significant decrease in anticipation of pleasure from smoking following exercise as compared to the control group, as measured by Factor 1 of the QSU-brief (p < .05). There was also a trend toward a significant group x time interaction effect for the QSU-brief Global scale (p = .053). These effects were partially mediated by both an increase in positive mood and a decrease in negative mood following exercise (p’s < .05). Following activity, the cardiovascular group had a significant decrease in craving towards smoking pictures and an increase in craving towards neutral pictures, the yoga group demonstrated a significant decrease towards both smoking and neutral cues, and the control group had an increase in craving over time for both types of cues (p’s < .05). Overall, these findings suggest that both cardiovascular activity and yoga may reduce urges to smoke following exercise, but that cardio exercise may be specifically associated with reduced cue-elicited craving. Future studies should examine the relationship between acute and long-term effects of exercise on cravings and smoking behavior. This can inform the potential application of exercise regimens within smoking cessation programs.

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ASSOCIATION OF RETROSPECTIVE EARLY SMOKING EXPERIENCES WITH PROSPECTIVE SENSITIVITY TO NICOTINE VIA NASAL SPRAY IN NONSMOKERS

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Greater sensitivity to early exposure to tobacco smoking may predict higher risk of becoming nicotine dependent. The most common measure of this sensitivity is the retrospective self-report Early Smoking Experiences (ESE) questionnaire. To evaluate the validity of the ESE, we examined the relationship between responses to the ESE and prospectively assessed sensitivity to young adult nonsmokers (N=54) with modest lifetime smoking experience (>0 but <10 lifetime cigarettes). Acute effects of nasal spray nicotine (10 microg/kg — less than 1/2 cigarette) on mood, other self-report, cardiovascular, and reinforcing effects were assessed. Nicotine spray was used due to ethical and practical concerns with administering tobacco smoke to nonsmokers. Responses to the ESE items of pleasant, unpleasant, relaxed, dizzy, and buzzed obtained during screening were related to subsequent acute nicotine effects on: 1) visual-analog scale (VAS) items assessing the same responses included in the ESE (pleasant, unpleasant, nausea, etc.), 2) VAS items on nicotine reward and perception, such as ‘liking’, ‘want more’, and ‘feel the effects’, 3) cardiovascular activity, and 4) nicotine reinforcement via a choice procedure. Results showed that ESE dizzy was associated with greater VAS buzzed and buzzed responses to nasal spray nicotine, as well as ‘want more’ and ‘feel the effects’. ESE buzzed was associated with greater VAS buzzed and nausea. No other ESE item was related to the same VAS item in response to nicotine spray, but ESE pleasant was related to VAS dizzy and buzzed, and ESE nausea was related to greater ‘liking’. ESE items were largely unrelated to cardiovascular and reinforcing effects of nicotine. These findings suggest some association between two ESE items, dizzy and buzzed, and the same prospectively assessed responses to nicotine spray in young adult nonsmokers. However, most ESE items were not related to the effects of nicotine spray, perhaps because of the very different methods of nicotine administration, biases inherent in retrospective assessment, and instability of some responses to early tobacco or nicotine exposures.

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POS2-24 IMMEDIATE SATISFACTION WITH SMOKING IN THE NATURAL ENVIRONMENT

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Despite the notion that smoking is reinforcing, there has been little study of subjective satisfaction derived from smoking outside the laboratory. We analyze smokers' ratings of satisfaction with cigarettes smoked in the natural environment. Using electronic diaries for Ecological Momentary Assessment, 390 smokers recorded each cigarette over 10 days of ad lib smoking. At random intervals after smoking, the diary collected ratings of satisfaction (0-10 scales) with the most recent cigarette (n=14,882 cigarettes). Smokers generally found smoking satisfying, with average ratings of 7.1 (SD=2.0); 26.8% of cigarettes were highly satisfying (>8), and only 2.2% were unsatisfying (<2). There was wide variability both among smokers and among cigarettes within smokers. Women (M=7.4; SD=2.0) found cigarettes more satisfying than did men (M=6.7; SD=2.1), and African-Americans (M=7.8; SD=1.9) found them more satisfying than did others (M=7.0; D=1.8). Within subjects, satisfaction declined very slightly over successive cigarettes during the course of the day (B=-0.007 per cigarette, p<0.001); in the context of this trend, the first cigarette of the day did not stand out as uniquely satisfying. Cigarettes smoked under positive affect (z-score) were later rated as more satisfying (B=0.15, p<0.001). The biggest situational influence on satisfaction was craving: cigarettes preceded by higher craving (0-10 scale) were subsequently rated as more satisfying (B=0.22, p<0.001). This held even after controlling for mood, etc, at time of smoking and at the time the satisfaction rating was made. Craving may act as a final common pathway for conditions that render smoking satisfying, and relief of craving itself may be an important source of smoking reinforcement. The immediate hedonic effect of smoking deserves further study. Interests: SS is a partner in ivivoda inc. (electronic diaries for research). NIDA grant DA08084.

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POS2-25 DEVELOPMENT OF PARALLEL SETS OF SMOKING AND ALCOHOL CUES

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Cue reactivity paradigms are often used to examine motivation to smoke, to elucidate cognitive and neural substrates of nicotine dependence, and for predicting and tracking treatment outcome. One cue modality that has been used increasingly in recent years involves the presentation of picture cues. The purpose of the present study was to develop four parallel sets of smoking, alcohol, and neutral picture cues that could be utilized within repeated measures study designs. Each set consisted of 40 pictures, with 8 from each of five categories: smoking, beer, liquor, wine, neutral. Pictures were selected from existing sets used in the investigators and other labs, supplemented from Internet and other sources. In each category, approximately half of the pictures displayed the substance-cue (e.g., cigarette pack, glass of beer) or neutral comparison cue alone, and half included one or more people using the substance (or people only, for neutral). To date, thirty-nine smokers (mean cigs/day = 15.7, range = 2 to 40) have rated the pictures, with one set viewed per session (average inter-session interval of one week). The picture sets were distributed in a random order across four sessions, and pictures were presented in a quasi-random order within each session. Each participant viewed alcohol pictures from their preferred beverage category. Ratings included craving to smoke, craving to drink, valence, arousal, and interest. Analyses indicate that cravings to smoke and drink were highest for the relevant substance categories, with substantial cross-reactivity between smoking and alcohol cues. There were no significant differences in craving across the four picture sets, and no temporal effects. There was a trend for participants to report decreasing interest in alcohol and neutral cues, yet interest in smoking cues was maintained across the sessions. Thus, these pictures appear to have utility for lab or treatment studies in which multiple cue assessments are desirable, with minimal habituation across sessions. Given the statistical power often gained from within-subject designs, the availability of validated parallel picture sets could provide a valuable research tool.

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POS2-26 EFFECTS OF THE NICOTINIC ALLOSTERIC MODULATOR GALANTAMINE ON NEUROCOGNITIVE DYSFUNCTION IN SCHIZOPHRENIA

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Schizophrenia is characterized by multiply domains of cognitive dysfunction. Thus, the development of medications to treat cognitive dysfunction associated with the disorder is an important endeavor. There is increasing evidence that nicotinic acetylcholine receptor (nAChR) deficits may be linked to neurocognitive deficits in schizophrenia, and that nAChR agents (including nicotine) may improve these cognitive deficits. Accordingly, we studied the effects of acute doses of the nAChR allosteric modulator galantamine (GAL; 0, 4 and 8 mg) on cognitive outcomes in patients with schizophrenia (N=21) using a double-blind, randomized, counterbalanced, within-subjects design. Subjects with schizophrenia were non-smokers (N=9) or smokers who were studied under satiated (N=6) or deprived from cigarettes overnight (N=6). A battery of neurocognitive assessments was performed after administration of each of the three testing sessions, and included tests of working memory (Dot test, DS-backward), sustained attention and impulsivity (CPT, Stroop), executive function (TMT), verbal memory (HVLT-R), psychomotor speed (Grooved Pegboard), and psychomotor performance and prepulse inhibition (PPI). Patients were required to have a one standard deviation (versus normative controls) deficit in spatial working memory performance (Dot test) for inclusion. Overall, we found no evidence that GAL altered any of the neurocognitive outcomes studied as a function of drug dose, smoking status or their interactions. Galantamine was well tolerated at these doses. Accordingly, we conclude that nAChR allosteric modulation using acute doses of GAL up to 8 mg does not improve neurocognitive deficits associated with schizophrenia.

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POS2-27 EFFECTS OF SENSORMOTOR REPLACEMENT IN SMOKERS WITH SCHIZOPHRENIA

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Smoking rates among people with schizophrenia remain markedly high. We recently found that smokers with schizophrenia (SWS) were less sensitive than non-psychiatric controls (CON) to the effects of nicotine replacement, suggesting that complementary strategies are needed to reduce smoking in SWS. In this laboratory study, we are investigating the effects of 5-hr exposure to sensorimotor replacement for smoking (denicotinized cigarettes or no cigarettes), alone and combined with transdermal nicotine replacement (42 mg or placebo patch), compared to effects of participants’ usual cigarettes, on smoking urges and withdrawal symptoms in SWS and CON. The groups are matched on age (mean = 48), gender distribution (70% male), number of cigarettes smoked per day (mean = 28), and Fagerstrom Test of Nicotine Dependence scores (mean = 7.8). Preliminary results from this study indicate that SWS and CON indicate that sensorimotor replacement significantly decreased Questionnaire on Smoking Urges scores (No cigs: 5.1 ± 0.4; Denic cigs: 3.5 ± 0.6; Usual brand: 3.4 ± 0.5, p < .01) and Minnesota Nicotine Withdrawal Scale scores (No cigs: 40.1 ± 6.1; Denic cigs: 21.4 ± 6.0; Usual brand: 21.7 ± 7.3, p < .01) to levels comparable to those from participants’ usual brands. However, participants rated their usual brands as being more satisfying than denicotinized cigarettes (p = .08). There is no indication from these preliminary data that SWS are more or less sensitive to the effects of sensorimotor replacement than CON. Preliminary findings from this study indicate that, like non-psychiatric smokers, smokers with schizophrenia experience reductions in smoking urges and nicotine withdrawal symptoms when smoking denicotinized cigarettes, suggesting that treatment approaches that include sensorimotor replacement may improve quit rates in this population.

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POS2-28  HIGHER SERUM CAFFEINE IN SMOKERS WITH SCHIZOPHRENIA COMPARED TO CONTROLS
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Previous studies showing increased dietary caffeine intake in individuals with schizophrenia have not demonstrated biological evidence of higher serum levels or controlled for the effects of smoking which is a 1A2 enzyme inducer. Measuring caffeine levels in subsets of smokers allows for control of smoking variables that impact laboratory studies of cue reactivity. We theorized that smokers with schizophrenia (SCZ) would have higher serum levels of caffeine compared to control smokers (CON) with and without nicotine substitution. This study examined serum caffeine levels in 167 smokers (104 with schizophrenia/schizoaffective disorder and 63 controls). Blood draws were standardized to occur at midday on a usual smoking day. Assays for caffeine were conducted at the Clinical Pharmacology Laboratory at the University of California, San Francisco by a highly specific gas liquid chromatography technique. The mean serum caffeine level was significantly higher for SCZ compared to CON (2722 ng/mL vs. 2122 ng/mL; p<0.05) and more than 20 cdp (2934 ng/mL vs. 2589 ng/mL; p<0.05) and more than 30 cdp (2934 ng/mL vs. 1248 ng/mL; p<0.001). Linear backwards stepwise regression analyses including demographic and smoking variables revealed that having a diagnosis of schizophrenia or schizoaffective disorder (compared to being a non-maternal ill control smoker) significantly predicted higher serum caffeine levels. Indeed, even when the effect of caffeine intake was controlled, a significant amount of variance in caffeine level remained. A limitation of this study was that dietary intake of caffeine was not assessed through questionnaires. We also did not assess caffeine metabolites to determine if individuals with schizophrenia were slow 1A2 metabolizers although this is unlikely based on other studies. Cigarette smokers with schizophrenia have more double than the serum caffeine levels compared to control smokers with similar smoking behavior.

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POS2-29  SUBJECTIVE AND PHYSIOLOGICAL RESPONSES TO PERSONALIZED SMOKING ENVIRONMENTS IN SMOKERS WITH SCHIZOPHRENIA AND CONTROLS
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Cigarette smoking remains highly prevalent in persons with schizophrenia, despite declining rates in the general population. Laboratory studies of reactivity to smoking-related cues are useful for studying mechanisms that underlie the high rates of smoking in this population. Novel approaches in cue reactivity have examined effects of participant-specific drug cues such as images of personal smoking environments. In this study, 9 smokers with schizophrenia (SS) and 5 equally-heavy smokers without psychiatric conditions (CS) completed a pictorial cue reactivity paradigm using participant-captured digital images of their own smoking and nonsmoking environments. Participants completed pre-and post-cue measures of urge to smoke (0-100 visual analogue scale; Questionnaire on Smoking Urges - Brief Form) and nicotine withdrawal symptoms (Minnesota Nicotine Withdrawal Scale). Physiological assessments included heart rate and mean arterial pressure. Change from baseline in urge to smoke was significantly greater following exposure to smoking environment cues (M = 14.3) than nonsmoking environment cues (M = -5.0; t13 = 6.0, p < .001). SS demonstrated greater increase in urge to smoke (M = 22.0) following smoking environment cues than SS (M = 10.0), although this was not significant in this small sample. Likewise, CS had a greater reduction in mean arterial pressure during exposure to smoking environment cues than SS (M = -9.6; S = 0.33). Exposure to nonsmoking environmental cues reduced urges to a similar extent in SS (M = -4.0) and CS (M = -5.6). SS (M = 80.0) reported paying significantly less attention to nonsmoking environment cues than CS (M = 98.0; t = 2.02, p < .05) and tended to pay less attention to smoking environment pictorial cues as well (SS: M = 76.7; CS: M = 92.0; NS: 0.5). These preliminary findings suggest that while CS smokers may be more subjectively and physiologically responsive to environmental cues than SS, attentional deficits in schizophrenia may interfere with cue-processing. This work was supported in part by the National Institute on Drug Abuse (NIDA) grant (R21 DA020773, NIH NIDA Intramural Research Program). Background: Attempts at smoking cessation in habitual smokers commonly end in relapse, with up to 90% of quitting smokers eventually failing. Although relapse risk is highest immediately after quitting, recent preclinical studies indicate that drug-seeking responses to conditioned stimuli increase over periods of up to six months of abstinence. If this phenomenon, known as “incubation”, also occurs in humans, it may contribute to an explanation of relapse occurring after the acute withdrawal period. This translational study investigated “incubation” in relation to smoking-related cue reactivity in currently abstinent human smokers. Based on preclinical findings, it was hypothesized that cue reactivity would intensify with increasing lengths of abstinence.

Methods: Non-treatment seeking daily smokers (>10 cigarettes/day) were randomly allocated to a 7-day, a 14-day or a 35-day abstinence condition, with self-reported abstinence verified daily with CO and cotinine assays. At completion of the abstinence period, subjects underwent a cue session, in which they viewed smoking-related and neutral cue material, in counterbalanced order. Heart rate, blood pressure, mood and acute smoking cravings were assessed before and after cue presentation. Results: Preliminary analyses indicate that cardiovascular reactivity in response to smoking-related, as opposed to neutral cues, increased as a function of time of abstinence. Heightened subjective craving ratings after presentation of smoking-related stimuli occurred to a greater extent for those who abstained for a longer length of abstinence, with longer abstinence periods associated with relatively higher cravings post smoking cue presentation. Conclusions: These data suggest that the phenomenon of “incubation”, which in responses to drug-related stimuli increase with longer periods of abstinence, may occur in relation to human nicotine consumption. Further investigation of the impact of “incubation” of smoking-related cue reactivity on relapsing behavior in human smokers appears warranted.
POS2-32  NICOTINE DEPRIVATION AND TRAIT IMPULSIVITY AFFECT SMOKERS’ PERFORMANCE ON COGNITIVE TASKS OF INHIBITION AND ATTENTION

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Trait impulsivity has been identified as a risk factor for relapse to smoking. While nicotine deprivation is known to produce decrements in cognitive performance, it is unknown how nicotine deprivation and trait impulsivity affect cognitive performance. Our objective was to investigate the relationship between trait impulsivity and nicotine deprivation on measures of attention and inhibitory control in daily smokers (n=30, 50% female). Using a within-subject design with three nicotine deprivation conditions (non-deprived, 6-hour, 18-hour), volunteers completed the Connor’s Continuous Performance Task-II (CCPT-II) and the Cued Go/No-Go Task (CGNG). These tasks were designed to measure attention, response activation, and response inhibition. Trait impulsivity was measured at intake using the Barratt Impulsiveness Scale. Nicotine deprivation effects were observed on both tasks after controlling for trait impulsivity. On the CCPT-II, nicotine deprivation increased omissions, hit rate reaction time, hit rate reaction time standard error, and hit rate reaction time standard error variability. On the CGNG, nicotine deprivation increased mean reaction time to both the go and no-go cues. To understand the nature of the effect of trait impulsivity and nicotine deprivation on cognitive performance, we also calculated change scores for each cognitive measure (18-hour minus non-deprived condition). Change scores and trait impulsivity were then correlated, with results demonstrating that impulsiveness was negatively correlated with nicotine deprivation-associated decrements of task performance. In smokers with poor behavioral control, nicotine deprivation did not produce further impairment of attention and inhibitory control, possibly due to floor effects. By contrast, less impulsive smokers were more affected by nicotine deprivation and demonstrated greater impairment. Further research is needed to understand the mechanisms by which trait impulsivity confers greater risk for relapse. Our results suggest that nicotine deprivation may not increase relapse risk among impulsive smokers by further impairing inhibitory control.

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POS2-33  SELF-REPORTED IMPULSIVITY IS RELATED TO BEHAVIORAL INHIBITION: IMPLICATIONS FOR CIGARETTE SMOKING

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Cigarette smokers are known to be more impulsive than non-smokers. The literature shows that impulsivity, traditionally assessed by self-report measures, may be related to initiation and maintenance of smoking. Impulsivity has been defined diversely as an inability to wait, a tendency to act without forethought, insensitivity to consequences, and an inability to inhibit inappropriate behavior. One facet of impulsivity which is well studied in psychopathology is behavioral inhibition (BI); the ability to inhibit a pre-potent motor response). BI is improved by acute nicotine in non-smokers with Attention-Deficit/Hyperactivity Disorder (ADHD). BI has been understudied in the smoking literature. People with ADHD have an increased vulnerability to smoke. It may be that effects of nicotine on BI contribute to smoking behavior in this population. Understanding the relationship between impulsivity measured as BI and impulsivity measured using traditional self-report measures may help us to understand if these are measuring the same construct, and may have implications for smoking and psychopathology interventions. The aim of this study was to examine the relationship between behavioral inhibition and measures of impulsivity commonly used in substance abuse research. This was a cross-sectional study of 84 young adults age 18-25. Subjects completed paper and pencil as well as laboratory measures of impulsivity. Results found a significant relationship between scores on the Barratt Impulsiveness Scale (BIS-11) and the Stop Signal Reaction Time (SSRT) measure of the Stop Signal Task. The finding that SSRT is related to BIS-11 scores suggests that BI may be a useful construct in smoking research. One advantage of using BI in research is its sensitivity to acute drug manipulations and the ability to use function- al brain imaging (fMRI) to investigate the neurobiology of impulsivity. The results of our study are in contrast to a recent study that reported no relationship between self-report and laboratory measures of impulsivity in a similar sample. Further research on the vulnerability to smoking associated with different types of impulsivity is needed.

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POS2-34  ACUTE NICOTINE DOES NOT AFFECT MEASURES OF IMPULSIVE BEHAVIOR IN ADULT NEVER SMOKERS

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Prior studies have indicated that smokers are more impulsive than never smokers on a variety of behavioral measures of impulsivity. However the source of this difference is unclear. One possibility is that the direct action of nicotine on neural structures is responsible. The current study examined this idea by assessing the impact of nicotine (versus placebo) on impulsive decision-making in self-reported never smokers. On one 10-hour session, subjects were exposed to nicotine via a skin patch (7 mg), and on another 10-hour session all subjects received a placebo skin patch. The brand of nicotine patch selected delivered nicotine such that peak levels were attained after 8 hours of exposure. Every 3 hours after the patch had been applied, we measured subjective effects and impulsive decision-making using both questionnaires and several computer tasks (the balloon analogue risk task, the stop task, and a delay discounting task). Although subjects reported several prototypical subjective effects of nicotine, there was no impact on any measure of impulsivity. These findings suggest that differences in impulsivity between smokers and never smokers are either exist prior to smoking initiation or are due to neuroadaptations associated with chronic nicotine use.

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POS2-35  DELAY DISCOUNTING DIFFERENCES BETWEEN SMOKERS AND NEVER SMOKERS ARE SIGNIFICANTLY REDUCED WHEN BOTH REWARDS ARE DELAYED

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When offered a choice between a small monetary reward available immediately (SmallNow) versus a larger reward available after a delay (LargeLater), smokers select the SmallNow alternative more than non-smokers. That is, smokers discounting of the value of the LargeLater reward more than non-smokers. We hypothesized that smokers respond more positively to rewards available immediately compared with non-smokers, and that this overweighting of immediate rewards was responsible for the behavioral difference. To examine this hypothesis we examined whether this group difference held true when both alternatives were delayed to some degree, i.e., when choosing between a SmallSoon reward and a LargeLater reward. Thus, 20 smokers and 20 never smokers completed a task including SmallNow versus LargeLater choices and SmallSoon versus LargeLater choices. Data replicate previous findings showing that smokers discount the LargeLater reward more than non-smokers when the smaller reward is available immediately. However, this difference was also seen for the SmallSoon versus Large Later choices. This result indicates that the smoker–never smoker difference is not confined to situations involving immediate rewards. However, a significant interaction between time to the smaller reward and smoking status indicated that, for smokers only, the time to the small reward was a key determinant of the degree of discounting, and the longer this period the less smokers and never smokers differed. These findings underscore the complexity of the smoking - delay discounting relationship.

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POS2-36  DELAY DISCOUNTING AND SMOKING: ASSOCIATION WITH NICOTINE DEPENDENCE BUT NOT CIGARETTES SMOKED PER DAY

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Delay discounting has been shown to be related to smoking status and — less consistently — frequency of cigarette use, but its independent relationship with dependence has not been examined. In the current study, we evaluated the relationship between smoking and delay discounting as a function of both quantity of use and level of dependence controlling for use. A community sample of 712 adults completed a delay discounting task using hypothetical monetary rewards, and participants were classified according to smoking status. Current smokers were further characterized based on number of cigarettes smoked per day (CPD) as light (<6 CPD, n=24), moderate (6 to 20 CPD, n=81), or heavy (>20 CPD, n=16) smokers. Dependence was assessed using the FTND, with the CPD item removed. Current smokers were found to discount delayed rewards more than never (p<.001), occasional (p<.001), or ex-smokers (p<.001), while the latter three groups did not differ. Delay discounting was not related to CPD, analyzed continuously or categorically. FTND scores were correlated with both CPD (r=.545, p<.001) and delay discounting (r=.210, p<.05). Dividing moderate smokers into high dependence (n=33) and low dependence (n=28) groups based on a median split of FTND scores yielded two groups that differed in level of dependence, but not in CPD, years smoking, or any demographic variable. High dependence smokers discounted delayed rewards more steeply than low dependence smokers (p<.01), while low dependence smokers and never smokers did not differ (p>.10). These results suggest that delay discounting among smokers is not simply the result of nicotine exposure, but may be an important marker for dependence.

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POS2-37  A LABORATORY MODEL OF SMOKING RELAPSE: EFFECTS OF INCENTIVES FOR NOT SMOKING AND RELATIONSHIP TO DELAY DISCOUNTING

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Relapse often occurs shortly after stopping. Factors that support longer periods of initial abstinence may be worthwhile to identify. In the current experiment, we employed a laboratory model of relapse that provided monetary incentives to 9 heavy smokers for brief time periods (2 hours) of not smoking. We systematically varied procedures for delivery of monetary incentives; using schedules of delivery that were constant, increased, or decreased. Participants were classified according to smoking status. Current smokers were further characterized based on number of cigarettes smoked daily for at least the past year. To simulate a cessation attempt, all participants abstained from smoking for 48 consecutive hours. Positive and negative affect and urge, possible mediators of smoking initiation, cessation, and relapse, and that different measures of impulsivity contribute unique variance.

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POS2-38  RELATIONSHIPS AMONG IMPULSIVITY SCALES AND SMOKING-RELATED VARIABLES

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Impulsivity encompasses a range of traits associated with impaired self-regulation, such as risk-taking, inability to inhibit behavior, and preference for immediate over delayed rewards. Many studies have reported that smokers are more impulsive than non-smokers. Within smokers, it has been demonstrated that scores on various impulsivity scales are associated with number of cigarettes smoked daily, positive and negative reinforcement expectancies among college smokers, and time to relapse. The current study sought to examine relationships among impulsivity measures and smoking-related variables in a community sample of 175 adult smokers. Participants completed three measures related to impulsivity: Barratt Impulsiveness Scale (BIS-11), BIS/BAS scales based on Gray’s theory of behavioral activation and inhibition, and a delay discounting task (DDT) that measures preference for immediate versus delayed monetary rewards. They also completed measures of smoking quantity, nicotine dependence (FTND), positive and negative affect, urge, and smoking-related expectancies. Intercorrelations among the impulsivity measures were absent or weak. Nevertheless, all impulsivity measures were significantly associated with dependence, affect, and urge. Additionally, the BIS-11 and two of the BAS scales were associated with negative affect relief expectancies, and the BAS fun-seeking scale was associated with positive reinforcement expectancies. Only the BIS-11 was associated with number of cigarettes smoked daily. To determine whether impulsivity contributed to urge independently of dependence, affect, and expectancies, we conducted a regression analysis with urge as the dependent variable and impulsivity, dependence, affect, and expectancies as predictors. This analysis revealed that the BIS-11 and the DDT both accounted for significant variance. In summary, results extend earlier research on the role of impulsivity in smoking, indicating that this construct is strongly related to negative affect and urge, possible mediators of smoking initiation, cessation, and relapse, and that different measures of impulsivity contribute unique variance.

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POS2-39  IMPULSIVITY AND THE ROLE OF SMOKING-RELATED OUTCOME EXPECTANCIES AMONG DEPENDENT CIGARETTE SMOKERS

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Introduction: Despite the known risks and long-term consequences associated with cigarette smoking, nearly 20.9% of adults regularly smoke cigarettes. Reasons for the continuation of this unhealthy behavior include the nicotine withdrawal syndrome craving, and smoking outcome expectancies. Recent studies have also focused on the role of personality traits, such as impulsivity and how it may increase the probability of relapse during smoking abstinence. The goal of the present study was to examine the relationship between trait-impulsivity and smoking-related outcome expectancies during a 48-hour smoking abstinence period.

Methods: Participants were college students who reported smoking 16 or more cigarettes per day for at least the past year. To stimulate a cessation attempt, all participants abstained from smoking for 48 consecutive hours. Positive and negative smoking reinforcement expectancies were assessed in eligible participants (N=50) categorized as either high trait-impulsivity (n=27) or low trait-impulsivity (n=23) based on scores from the Barratt Impulsiveness Scale, version 11.

Results: A repeated measures analysis of variance (ANOVA) yielded a significant group X positive reinforcement interaction [F (2,96) = 3.265, p<0.05] indicating that higher levels of impulsivity were related to greater positive reinforcement smoking expectancies over a 48-hour abstinence period. Level of impulsivity, however, was not related to changes in negative reinforcement expectancies. Results indicate that during an abstinence period, those higher in trait-impulsivity may be more prone to relapse in response to satisfy an immediate desire for a more rewarding and pleasurable stimuli. In addition, these findings support the importance of understanding personality factors when developing intervention and cessation tools for cigarette smokers.

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POS2-40  EFFECT OF CHEWING GUM ON URGE TO SMOKE AMONG BINGE DRINKING AND NON-BINGE DRINKING SMOKERS DURING 24 AND 48 HOURS OF NICOTINE ABSTINENCE

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The consequences and health risks associated with nicotine use are well known yet dependent smokers are frequently unable to quit even with strong incentives to do so. Given the high rates of relapse among dependent smokers attempting to abstain from cigarettes, a better understanding of smoking urges during abstinence is needed so that long-term abstinence can be obtained. Uprise to smoke (also referred to as craving) has been defined as a motivational state involving the subjective desire to use nicotine. It is known from previous literature that urges to smoke can be attributed to withdrawal based negative affect or an appetitive process involving positive affect that is related to the mesolimbic dopamine center of the brain. The current study examined differences in urge to smoke during abstinence in a gum and no gum condition to examine whether differences were present between binge and non-binging smokers.

Methods: Participants (N=49) were nicotine dependent, college-aged students who reported smoking at least 16 cigarettes per day over the past year. Each participant was placed in both a gum and no gum condition during two 48-hour abstinence periods. Eligible participants were identified as either binge drinkers (N=21), or not, (N=28) based on results from the AUDIT. In each participant completed measures assessing their urge to smoke at 24 and 48 hours of nicotine abstinence.

Results: A repeated measures analysis of variance (ANOVA) revealed that binge drinkers experienced lower urge severity after 48 hours of abstinence compared to their non-binge drinking peers when they had access to gum [F(2, 94) = 3.846, p < .05]. This finding suggests that binge drinkers may experience more of a reinforcing effect from chewing gum that assists in alleviating their craving symptoms when compared to their non-binging peers.

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POS2-42  THE EFFECT OF FOOD DEPRIVATION ON CIGARETTE SMOKING IN FEMALES

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Studies have shown that food deprivation is associated with increases in the self-administration of nicotine and other substances in laboratory animals. However, little is known about the effects of food deprivation on substance use in humans. The purpose of the present study was to compare smoking rates, expired carbon monoxide levels, and smoking topography in 15 female participants during a state of acute food deprivation and in a non-deprived state. A within-subjects design was utilized to test the primary hypotheses that smoking rate and expired carbon monoxide levels would be greater among the participants in the food-deprived condition than in the non-deprived condition. Analyses indicated that expired carbon monoxide levels were significantly greater in the food-deprived condition and in the non-deprived condition (p = .03), although no differences were found in the total number of cigarettes smoked during the laboratory session. Analysis of smoking topography indicated that the time to first puff was significantly greater in the non-deprived condition (p = .03), while the sum of the interpuff intervals (p = .02) and the time to removal from the last puff were greater in the food-deprived condition (p = .03). The total time total smoking was marginally greater in the food-deprived condition (p = .10). Findings suggest that females may alter the manner in which they smoke during acute food deprivation.

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POS2-43  RESPONSES TO STRESS IN LIGHT SOCIAL SMOKERS

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There is evidence that regular cigarette smokers exhibit dampened responses to acute stress relative to nonsmokers. The purpose of this study is to determine whether response to acute stress is also related to habitual smoking among college-aged light social smokers, who may be on a trajectory to regular smoking. Responses to stress may serve as a risk factor for future escalation of smoking and future nicotine dependence. In this study healthy young light smokers (less than 20 cigarettes per week) underwent the Trier Social Stress Test (TSST) session and a no-stress session, administered in random order. The outcome measures included salivary cortisol, heart rate, blood pressure, as well as subjective ratings of mood. Number of cigarettes smoked and measures of dependence (FTND and NDSS) were evaluated at intake, before the stress sessions. Preliminary analyses indicate that there is a modest correlation between increases in cortisol after stress and number of cigarettes smoked. This is part of a larger, long-term study in which we are examining responses to stress and smoking progression over a 1-year period.

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**POS2-44 EFFECTS OF ATOMOXETINE ON COGNITIVE FUNCTION AND SMOKING BEHAVIOR IN SCHIZOPHRENIA**

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Schizophrenia is characterized by a broad range of neurocognitive deficits and high rates of tobacco use. These may be due, in part, to prefrontal dopaminergic hypofunction. Atomoxetine (ATM) is a selective norepinephrine (NE) reuptake inhibitor, which has been approved for the treatment of attention deficit disorder. Since the primary means of dopamine (DA) reuptake in the prefrontal cortex (PFC) is via NE transporters, ATM treatment may ameliorate DA deficits in the PFC. Therefore, we conducted a preliminary double-blind, between groups, placebo-controlled 15-day trial of ATM (0, 40 and 80 mg/day) in N=12 cigarette smoking outpatients with schizophrenia. A total of N=5 randomized to placebo, N=4 to 40 mg/day and N=3 to 80 mg/day. After a practice session, the neurocognitive battery was administered at baseline (Day 1), and at Days 8 and 15, and included tasks of attention and concentration (CPT), working memory (Dot Test, Digit Span), executive function (Trail Making Tests), verbal fluency (Controlled Oral Word Association Test; COWAT), verbal memory (HVLT-R) and psychomotor performance. Patients were required to have a one standard deviation (versus normative controls) deficit in spatial working memory performance (Dot test) for inclusion. Our preliminary results suggest that ATM at the 80 mg/day dose selectively reduced deficits in visuospatial working memory (30 and 60 sec delays) and verbal fluency (total words produced on COWAT). Smoking consumption and craving were not affected by ATM. ATM was well-tolerated in this population of smokers with schizophrenia. Results of this trial while limited by small sample size suggest that ATM may reduce certain prefrontal cortical and executive function deficits in patients with schizophrenia.

**POS2-46 NOVEL AND ESTABLISHED CYP2A6 ALLELES REDUCE IN VIVO NICOTINE METABOLISM IN A POPULATION OF BLACK AFRICAN DESCENT**

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Background: Cytochrome P450 2A6 (CYP2A6) is a human enzyme best known for metabolizing tobacco-related compounds such as nicotine, cotinine, and nitrosamine procarcinogens. CYP2A6 genetic variants that impair enzyme activity are associated with lower smoking rates, lower cigarette consumption, and lower risk of tobacco-related cancers. Investigating CYP2A6 genetic variants is of interest in populations of black African descent given that this ethnoracial group has slower metabolic clearance of nicotine to cotinine compared to Caucasians and significantly higher rates of most smoking-related diseases.

Objective: To functionally characterize novel and established CYP2A6 alleles with respect to their frequency and impact on CYP2A6 activity. Methods: Nicotine was administered orally to a community-based sample of 281 volunteers of black African descent. Plasma samples were collected for both kinetic phenotyping and CYP2A6 genotyping. The variant enzymes CYP2A6.24, CYP2A6.25, CYP2A6.26, CYP2A6.27, and CYP2A6.28 were expressed in a heterologous system to determine their impact on nicotine metabolism in vitro.

Results: We identified 25 new DNA sequence variations and characterized 8 novel alleles in this population, namely CYP2A6*1B17, *24A&B, *25, *26 and *28A&B. The majority of the novel and established variant alleles resulted in significantly lower in vitro and in vivo CYP2A6 activity. Additionally, we confirmed that oral nicotine metabolism was significantly different between normal, intermediate, and slow metabolism groups, as clustered by CYP2A6 genotype. The normal group (CYP2A6*1/*1) had the greatest capacity for nicotine metabolism relative to the intermediate and slow genotype groups.

Significance: We discovered that 7% of this population had at least one of the eight novel alleles and 29% had at least one established allele (not including CYP2A6*1B6). Furthermore, groupings of metabolism capacity, based on genotype, were validated. These characterizations and validations are particularly important as many studies examine the association between CYP2A6 genotype and behavioral, disease or pharmacological phenotypes.

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**POS2-45 EFFECTS OF ATOMOXETINE ON NICOTINE ABSTINENCE SYMPTOMS**

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Nicotine dependence has been linked to Attention Deficit Hyperactivity Disorder (ADHD) symptoms in both clinical and general populations. This behavioral pharmacology study used a within-subject double-blind crossover design to test the effects of atomoxetine, a novel treatment for ADHD, on nicotine abstinence symptoms. Fifty non-treatment seeking smokers (>15 cigs/day) completed a baseline session when they were smoking as usual, and then two laboratory testing sessions after overnight abstinence and treatment with either 7 days of atomoxetine or placebo. During each lab session, participants completed subjective measures of abstinence symptoms and neurocognitive tasks. In mixed effects models of the two subscales of craving (QSU factor 1 and QSU factor 2), there were statistically significant interaction effects between treatment phase and baseline scores on a “smoking for stimulation” scale (p = 0.001). Specifically, atomoxetine led to significant reductions in self-reported cravings amongst smokers who scored higher for stimulation smoking. There was a reduction of transformed subjective withdrawal symptoms during the atomoxetine vs. placebo phase (p =0.01), and no effect of treatment on measures of mood disturbance was observed. There were no effects of atomoxetine on performance on any of the neurocognitive tasks employed in the study. These preliminary results suggest that atomoxetine may reduce cravings to smoke among a subgroup of smokers who use nicotine to increase arousal.

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ASSOCIATIONS BETWEEN GENES CODING FOR THE ALPHA-4, ALPHA-5, BETA-2 AND BETA-3 SUBUNITS OF NICOTINIC RECEPTORS AND SMOKING, DEPRESSION, ANXIETY, AND NOVELTY SEEKING

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Aim: To assess whether smoking behavior was associated with eight polymorphisms of the genes coding for the nicotinic receptor subunits alpha-4 (rs1044396, rs1044397 and rs2273505), alpha-5 (rs16969968), beta-2 (rs2072658 and intron 5 a10160c) and beta-3 (rs4953 and rs6474413), and whether these associations were modulated by depression, neuroticism and novelty seeking.

Methods: An internet survey and collection of saliva by mail for DNA and cotinine analyses, in Switzerland in 2003. Bonferroni adjustments were used to adjust for multiple testing.

Results: We conducted DNA analyses for 277 participants and cotinine analysis for 141 daily smokers. Cotinine levels were higher in carriers of the CT or TT genotypes (275 ng/ml, p=0.014), a difference of 0.54 standard deviation units. However, this difference was not significant after Bonferroni adjustment (p=0.062). These 8 polymorphisms were not otherwise associated with smoking behavior, nicotine dependence and neuroticism. However, participants with the CHRNA4 CC genotype of rs1044397 had higher scores of depression-anxiety than participants with the CT genotype (mean=1.82 vs. 1.35, p=0.012 after Bonferroni adjustment), a difference of 0.50 standard deviation units. There were significant associations between the temperament trait novelty seeking and rs1044396, rs1044397, rs16969968, rs6474413 and a10160c.

Conclusion: This study indicates that significant nicotine content of a cigarette is result in DA release by examining responses to additional factors as being important in craving reduction.

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POS2-50  TRAUMA-BASED PRIMING AND ATTENTIONAL BIAS TO SMOKING CUES: A STROOP TASK STUDY

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Introduction: Past research has highlighted the importance of better understanding the high rate of smoking among individuals exposed to trauma. However, few studies have investigated the cognitive mechanisms that may contribute to the smoking-trauma relationship. The primary goal of the present study was to examine the associative relationship between smoking and trauma at a cognitive level, by examining the extent to which trauma-relevant pictures primed emotional biases to smoking-related words on a modified Stroop task. A secondary aim of the study was to evaluate the relationship between smoking-related variables and PTSD symptoms on a dimensional range.

Methods: Eighty daily smokers (mean age 27), who smoked at least 10 cigarettes per day (M = 20.6), and who were exposed to a DSM-IV Criterion A traumatic event were included in the study. Participants were classified as having low, medium, or high levels of post trauma symptomatology. In an experimental session, they were instructed to ink-name smoking-related and neutral words after being primed with trauma-related, positive, or neutral picture cues.

Results: Although participants did not display an overall significant difference in reaction time (RT) between smoking words and neutral words, we found a significant prime x word type interaction, with slower RT to smoking words after being primed by trauma-related pictures. In addition, we found a significant 3-way interaction between symptom severity level, prime category, and target type. Further analyses revealed that the prime x word type interaction was significant only among individuals with the lowest and highest levels of PTSD symptomatology. Correlational analyses indicated that participants who were more severely impaired at the time of the study were more likely to report strong cravings to smoke.

Conclusion: Overall, findings suggest that smokers who have experienced trauma exhibit an attentional bias to smoking words when primed with trauma-related pictures, and post-trauma symptoms are related to smoking motivation. Further research is needed to clarify the relationship between post-trauma symptomatology and attentional bias to smoking cues.

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POS2-51  NICOTINE’S EFFECTS ON AFFECTIVE PRIMING OF LATERALIZED EMOTIONAL WORD IDENTIFICATION

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Based on evidence suggesting greater left than right hemisphere-dominant cholinergic and dopaminergic asymmetric neurotransmitter densities, the lateralized neural network (LNN) hypothesis of the Situation Á— Target Adaptive Response (STAR) model suggests that nicotine primes (enhances) left hemisphere-dominant positive affect-related information processing and reduces right hemisphere-dominant negative affect-related information processing. To test this hypothesis, we assessed the effects of nicotine patch on emotional priming of lateralized emotional word identification in 59 habitual smokers. Consistent with the LNN hypothesis, relative to placebo patch, nicotine patch enhance right visual field (left hemisphere) emotional word detection while decreasing performance of emotional word detection in the left visual field (right hemisphere).

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POS2-52  SPATIAL WORKING MEMORY: WHO BENEFITS FROM NICOTINE REPLACEMENT THERAPY?

Joshua M. Carlson*, David G. Gilbert, Hege Rise, Jamie Huber, Norka E. Rabinovich, Brett Froeliger, and Chihiro Sugai, Southern Illinois University

It has been suggested that individuals may use nicotine to self-medicate for person-specific cognitive or affective deficits. For example, George et al. (2001) found nicotine to alleviate the spatial processing deficits that typically occur in schizophrenic smokers. Research indicates that highly depressed individuals also have impairments in spatial processing and nicotine appears to normalize certain aspects of depressive affect, such as frontal EEG asymmetries. While nicotine enhances spatial working memory (SWM) in schizophrenic populations, the extent to which nicotine enhances performance in other individuals who have poor baseline levels of SWM is unknown. Thus, the aims of the current study were to assess the effects of nicotine patch on SWM in relation to participants: 1) SWM performance during nicotine abstinence and 2) level of trait depression as measured by the MMPI. In the current study, 64 habitual smokers completed the dot recall test of SWM (George et al., 2001) during two testing sessions. At the beginning of each trial a dot appeared at a pseudorandom location on a computer screen. The dot then disappeared and was followed by a distractor tic-tack-toe task. After which participants were instructed to recall the location of the dot. Each participant completed one nicotine and one placebo, double-blind and counterbalanced, testing session. Prior to each session participants were 24 hr nicotine deprived. The results indicate that nicotine replacement enhances performance of SWM in individuals who perform poorly during nicotine abstinence. Additionally, trait depression was negatively correlated with overall task performance and nicotine attenuated this negative association. That is, there was a positive correlation between depression and the beneficial effects of nicotine on SWM. Consistent with previous research (Newhouse, Potter, & Singh, 2004), the results suggest that nicotine enhances SWM in participants who have low baseline levels of SWM, including individuals with high levels of trait depression.

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POS2-53  BASAL HIGH BLOOD PRESSURE INFLUENCES STRESS-INDUCED REACTIVITY AMONG SMOKERS

Krista Highland, B.S.*, Silvina Salvi, B.A., and Dennis E. McChargue, Ph.D., University of Nebraska-Lincoln

Cigarette smokers with high blood pressure (HBP) have a greater risk of coronary heart disease compared with smoker with normal blood pressure (NBP) and non-smokers with high blood pressure. Most research shows that nicotine exposure via cigarette smoking among those with HBP increases fatty deposits and weakens the vessel walls. Less is known about psychological stress parameters that may contribute to HBP smokers’ disease risk. The overall study aim (n=91) tested whether HBP smokers (systolic=140-159 and diastolic=90-99) were more reactive to a stress induction than smokers with normal blood pressure (NBP: average blood pressure =120/80 or below) and HBP non-smokers. Group (HBP smoker vs. HBP smoker vs. HBP smoker vs. NBP smoker) by condition (stress vs. neutral induction) by time (post-exposure; 30-min post-exposure; 60-min post-exposure) repeated measures analyses were employed to test for affective and physiological differences, after covarying for age, gender, caffeine/alcohol intake, smoking confounds and baseline responses. The primary results showed a group X condition X time interaction in dysphoria (p= .001), anxiety (p=.007), anger (p=.262) and systolic blood pressure responses (p=.047). During the stressor, HBP smokers showed greater than normal increases in dysphoria that maintained across time compared with NBP smokers and HBP non-smokers. This effect appeared to be carried by anxiety and anger responses. HBP smokers also showed stress-induced delayed delayed systolic reactivity compared with other groups. Although systolic responses were relatively similar post-exposure and 30-min post-exposure for HBP smokers when compared with NBP smokers and HBP non-smokers, 60-min post-exposure reactivity was substantially greater for HBP smokers compared with the other groups. Implications are discussed.

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**POS2-54** SMOOKING MOTIVATION IN RESPONSE TO A NEGATIVE MOOD INDUCTION: THE ROLES OF ATTENTIONAL BIAS, DEPRESSION, & GENDER

Lisa M. Fuerto, M.A.*, and Laura M. Juliano, Ph.D.

Smoking rates are elevated among individuals prone to depression and smokers hold powerful beliefs that smoking alleviates negative moods such as depression. Nevertheless, a causal relationship between depressed mood and smoking has not been established. It has been proposed that the relationship between smoking behavior and negative mood may be explained via cognitive factors (e.g., Baker et al., 2004). Similarly, there is some evidence that negative mood may have a greater influence on certain subtypes of smokers (Borsini et al., 1999). However, to date the experimental research on both of these factors has been limited. This study investigated the independent and combined effects of cognitive induced mood, cognitive control processes (i.e., attentional bias), and individual difference variables (i.e., depression status at baseline and gender) on smoking behavior. Smokers (N = 121) were randomly assigned to receive either a depressive or neutral mood induction via standardized video clips. Attentional bias was assessed using the Affective Go/No Go Task and modified Stroop Task. Mood, smoking urge, and smoking behavior (e.g., latency to smoke, smoking duration, and number of cigarette puffs) were also measured. As anticipated, smokers exposed to the depressive mood induction reported a greater increase in negative mood and greater decrease in positive mood compared to smokers exposed to the neutral mood induction. Moreover, smokers in the depressive condition exhibited greater attentional bias, smoked longer, and took more cigarette puffs than smokers in the neutral condition. These effects were more pronounced among participants who endorsed symptoms of depression at baseline. There were no gender differences in response to the mood induction procedure. The results suggest that smoking motivation among depressed smokers may be related to greater reactivity to affective and smoking-related cues. Such findings have implications for smoking prevention and intervention and could ultimately lead to better cognitive-behavioral strategies.

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**POS2-55** MOOD STATE AS A MODERATOR OF SMOKING CUE EFFECTS ON URGES FOR LIGHT AND IMMERTENT SMOKERS (LITS)

Josie Tracy, M.A.*, Thomas Lombardo, Ph.D., John Bentley, Ph.D., Patrick Riordan, M.A., Carol Gohm, Ph.D., University of Mississippi

Although prior laboratory research examines mood effects on smoking urge in regular smokers, no study has manipulated mood in light/intermittent (LITS) smokers to determine the effect on urge. Our laboratory study examined the potential moderating effect of mood on the relationship between smoking cues and urge to smoke in a sample of 16 LITS (fewer than 6 cpd or 7 days per week) and 16 regular (more than 12 cpd) undergraduate smokers. Subjects were exposed to six experimental conditions that paired each of 3 sets (2 positive, 2 negative, 2 neutral) of imaginal mood scripts (Maude-Griffin & Tiffany, 1996) with a smoking and a neutral cue in a counterbalanced within-subjects design. For regular smokers, we predicted our study would replicate findings from similar laboratory studies with positive and negative mood phases in smoking cue conditions producing the strongest urges. For LITS, we predicted the strongest urges would occur during the positive mood phase of the smoking cue condition. Results showed mood induction was successful and revealed significant main effects for smoker type, mood phase, and cue condition on two different measures of smoking urge. Uge to smoke was stronger for regular smokers, for negative mood phases, and for smoking cue exposure. Interactions were nonsignificant. However, based on our predicted study outcome, the interaction between smoker type and mood phase in only the smoking cue conditions was examined in a follow-up analysis. Results revealed a significant interaction using the QSU-Brief urge measure, and an interaction trend using a single item global urge score. Subsequent t-tests failed to support our hypotheses. Specifically, urge scores for LITS were weakest during the positive mood phase and strongest during the negative mood phase, while urge scores for regular smokers were not significantly different across mood phases. This finding is contrary to prior indirect research that suggested LITS may be more prone to smoke in response to positive as opposed to negative affect. This result may help guide the strategies of clinicians treating the growing population of LITS.

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**POS2-56** TRAUMA EXPOSURE INFLUENCES CUE ERECTED AFFECTIVE RESPONSES AMONG SMOKERS WITH AND WITHOUT A HISTORY OF DEPRESSION

Alicia K. Klanecky, B.A.*, Kate Walsh, M.A., David DiLillo, Ph.D., and Dennis McChargue, Ph.D.; University of Mississippi – Lincoln

Research has established a robust relationship between trauma exposure and depressive symptomatology (Lubit, Rovine, Defrancisci, & Eth, 2003; Zlotnick, Mattia, & Zimmerman, 2001). Moreover, comorbid trauma exposure and depression have been associated with higher rates of substance use disorders, particularly cigarette smoking (Norman, Tate, Anderson, & Brown, 2007). The interactive effect of trauma exposure and depression on cue-elicited affective reactivity among cigarette smokers remains unclear. The current study tested the affective reactivity of smokers (N=70) with and without histories of trauma exposure (TE) and major depression (MDD Hx). It was hypothesized that smokers with dual vulnerabilities (i.e., TE+MDD Hx) would show greater affective reactivity from a laboratory stressor compared with other less vulnerable groups (TE only; MDD Hx only; no history). We further explored whether the presence of smoking paraphernalia provided an additive effect on smokers’ affective reactivity. Four counterbalanced conditions nested negative or neutral mood inductions with in vivo versus control smoking paraphernalia cues (Neutral-Control; Neutral-Cigarette; Neg-Control; Neg-Cigarette). Analysis of covariance tested differences in depressive symptoms pre- to post-exposure across four groups (TE+MDD Hx; TE only; MDD Hx only; no history). Results showed a significant TE x MDD Hx x Condition interaction (F(3,183) = 4.205, p = .007, Mse = 74.656, r = .254) that produced two notable effects. First, dual history participants reported the most depressive symptoms during the Neg+Cigarette condition compared with Neg+Control condition. Second, TE only individuals endorsed the greatest increase in depressive symptoms across both negative mood conditions (regardless of smoking paraphernalia) compared with other groups. Findings suggest that: a) trauma plays a strong role in smokers' affective responses to stress and b) dually vulnerable smokers may have more stress-related smoking particularly when environmental cues are coupled with emotional cues.

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**POS2-57** CUE-INDUCED CRAVING IN A VIRTUAL REALITY ENVIRONMENT: AN fMRI STUDY

Brenda K. Wiederhold, Ph.D., M.B.A., BCIA, Virtual Reality Medical Center; Sun Kim, Ph.D., Hanyang University

In comparison to smoking craving responses to neutral cues, smokers illustrate cardiovascular reactivity when exposed to smoking-related cues. In relation to an increase in cue reactivity, a decrease in probability of triumphant cessation can be predicted. A difference in gray matter volumes and densities between smokers and non-smokers in four brain regions may be suggested from several brain imaging studies. In these studies, however, smoking-related objects were the only stimuli presented to smokers. The pilot study conducted employs a virtual reality (VR) technique, where the virtual environments (VEs) were more conducive to immersion and more effectively elicited smoking craving when juxtaposed with traditional methods. The purpose of this study was to examine if virtual smoking cravings could be induced by cue-exposure within a virtual environment by utilizing the VR system. Our preliminary task was a paradigm of VR cue-eliciting craving scenario and was comprised of both 2D visual (2D VE) and 3D virtual reality (3D VE) settings. In the 2D condition, an increase in activity drawn from the participants’ group mean occurred in the following areas: left supplementary motor area, left uncus, right inferior temporal gyrus, right lingual gyrus, left anterior cingulate gyrus (ACC). Differential activation in the 3D condition, also drawn from the participants’ group mean occurred in the following areas: left posterior cingulate, left precuneus, left insula, left superior temporal gyrus, and the right superior temporal gyrus. The results of this study mirror those of previous nicotine craving studies, illustrating activation in the PFC and ACC. Conversely, activation surfaced in areas such as the superior frontal gyrus, inferior occipital gyrus, cerebellum, the superior temporal gyrus, and the PFC in the 2D condition. Hence, in the 3D condition, heightened attention, coordinating movement, and visual balance seemed to occur in participants versus those in the 2D condition. This funding was conducted while the second author was at Hanyang University. Supported by Korea Research Foundation Grant funded by the Korea Government (MOEHRD) (KRF-2009-332-H00021).

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POS2-58

VIRTUAL REALITY CUE REACTIVITY FOR NICOTINE DEPENDENCE AND TREATMENT

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Cue reactivity has been a model for assessing craving and physiological reactions to smoking related stimuli. Traditionally, cue reactivity assessment methods have involved bringing persons into the laboratory environment and using photos, videos, or actual stimuli that are strongly related to an individual’s smoking habit. To enhance cue reactivity methods and to provide realistic contexts for cue exposure, a virtual reality cue reactivity (VRCR) system was developed. The VRCR integrates 3D computer graphics, tracking devices, head mounted displays (HMD), vibrotactile stimulus, surround sound audio, and scent to create an immersive virtual experience. Importantly, the VRCR system provides an opportunity to examine craving associated with simple and complex cues in congruent environmental contexts. Feasibility tests in two urban laboratory trials in dependent smokers, demonstrate that VRCR is a viable method for assessing reactivity to both simple and complex cues presented in congruent contexts. Specifically, smokers experienced increased craving and attention to stimuli in VR smoking environments compared to VR neutral environments. These results and VR studies in alcohol and marijuana users provide a beginning foundation to further this VR based cue assessment tool. In addition, the incorporation of VR systems for teaching coping skills in smoking cessation treatment will also be discussed.

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POS2-59

SMOKING CUES IN A VIRTUAL WORLD PROVOKE SELF-REPORTED CRAVING IN CIGARETTE SMOKERS

Stephen B. Baumann, Ph.D.*, Psychology Software Tools, and Michael A. Sayette, Ph.D., University of Pittsburgh

An interactive virtual world of multiple environments within an urban area was designed for subjects to freely navigate. A variety of smoking stimuli, such as brand-specific advertisements, packs of cigarettes, and numerous smokers, could be placed within the environments. Twenty smoking-deprived cigarette smokers participated in a study to test the ability of the smoking cues to provoke self-reported craving-to-smoke. Participants were exposed to two virtual reality simulations displayed on a 21" computer monitor: first a control environment containing any intentional smoking stimuli and then a cue-exposure environment containing smoking stimuli. At various points participants were asked to rate their urge-to-smoke on a scale of 0-100. Results indicated that urge-to-smoke ratings were equivalent in both conditions (~50), but the maximum increase in urge ratings was significantly higher in the cue-exposure environment than in the control environment; the run with the embedded smoking stimuli increased urge to smoke by 15.1 points (SD = 22.1) more than did the control run without smoking stimuli. While there was a significant increase in smoking propensity, participants were aware of the context and environment; they did not report any differences in functional emotional valence between the conditions. This suggests that VRCR is a viable method for assessing craving associated with simple and complex smoking cues in congruent environmental contexts.

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POS2-60

DOES SELF-REPORTED TASK PERSISTENCE PREDICT PERFORMANCE ON BEHAVIORAL MEASURES OF TASK PERSISTENCE AND DISTRESS TOLERANCE?

Joseph W. Ditre* and Thomas H. Brandon, University of South Florida and the H. Lee Moffitt Cancer Center and Research Institute

Background: The term task persistence (TP) stems from learned industriousness theory, which states that individuals display differing degrees of persistence depending on their history of reinforcement for effortful behavior. Individuals low in the related construct of distress tolerance (DT) are said to have limited capacity to tolerate physical and/or psychological distress. Collectively, behavioral measures of TP/DT have differentiated smokers from nonsmokers and predicted sustained abstinence from smoking. However, shorter and more portable measures of TP/DT would likely have broader clinical applicability. The purpose of this study was to examine the predictive utility of a recently developed two-item, internally consistent, self-report measure of TP in relation to several behavioral measures of TP/DT (i.e., a mirror-tracing task, a breath-holding endurance test, and a cold-pressor task).

Method: Participants (N=132) were required to smoke at least 20 cpd. Participants completed the self-report measure of TP prior to completing the behavioral tasks. Only half of the sample underwent the cold-pressor task. Pearson product-moment correlations and simple linear regressions were conducted with self-reported TP as the predictor variable and behavioral measures of TP/DT as the dependent variables.

Results: Self-reported TP was correlated with mirror-tracing TP at a trend level (r(130)=.17, p<.06). Self-reported TP was not correlated with duration of breath-holding (r(130)=.08, p=.35), cold-pressor threshold (r(64)=.02, p=.90), or cold-pressor tolerance (r(64)=.04, p=.76). Endurance on the mirror-tracing task was significantly correlated with cold-pressor threshold (r(64)=.33, p<.01) and tolerance (r(64)=.36, p<.01). Significant correlations were also observed between breath-holding endurance and cold-pressor threshold (r(64)=.35, p<.01) and tolerance (r(64)=.30, p<.02).

Conclusions: Results suggest that a brief, self-report measure of TP may be predictive of performance on at least one behavioral measure of TP/DT. The potential utility of self-report measures of TP/DT and suggestions for future research are discussed.

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POS2-61

EFFECTS OF NICOTINE PATCH ON DISTRACTION BY EMOTIONAL AND SMOKING-RELATED STIMULI DURING A FLANKER-TASK

Herman A. Diggs*, David G. Gilbert, Hege Risë, Amber Dillon, Jamie Huber, Norka E. Rabinovich, Brett Froeliger, and Chihiro Sugai, Southern Illinois University at Carbondale

Prior evidence suggests that nicotine administration may alter the processing of emotional stimuli. To test this hypothesis, we assessed the effects of nicotine (14 mg patch versus placebo patch) on distraction by emotional stimuli in 48 habitual smokers using an emotional flanker task. Each participant completed two sessions, one after 5 hours on a nicotine patch and one when on a placebo patch. The task consisted of 96 target words flanked immediately above and below by distractor words of different valences (emotionally positive, negative, or neutral, or smoking-related). Participants were asked to discriminate between target words that named a plant/animal and those that did not by pressing one of two buttons. Reaction time (RT) and accuracy of responses were analyzed via ANOVAs with the factors Nicotine, flanker Valence, and Gender. For RT, a Nicotine — Valence — Gender interaction was found, such that females receiving nicotine had significantly faster RTs in trials with the smoking and positive flankers than females receiving a placebo. This suggests that smoking and positive flankers were less distracting in the nicotine condition than in the placebo condition for females. In the nicotine condition also had significantly faster RTs in trials with the smoking flanker than in trials with negative or neutral flankers. For accuracy, a significant overall effect of Nicotine was found, such that, relative to placebo, nicotine improved overall accuracy of target-word discrimination. A Valence by Gender interaction showed that during trials with positive or negative emotional flankers, females receiving nicotine were more accurate than females receiving a placebo. These results suggest that nicotine has an effect on emotional processing, but these results are moderated by gender and are dependent on the emotional valence of stimuli.

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Together with our earlier study, these results identify differences in the influence of nicotine dose and dose expectancy on acute responses to nicotine delivery as a function of the formulation involved.

As in our prior smoking study, both actual and expected nicotine dose influenced nasal spray liking and dose perception. However, unlike our prior study, actual and expected dose also influenced acute craving response to spray, but spray use itself had no influence on affect. Together with our earlier study, these results identify differences in the influence of nicotine dose and dose expectancy on acute responses to nicotine delivery as a function of the formulation involved.

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POS2-64

NEGATIVE AFFECT OVER MULTIPLE SMOKING LAPSES: AN EMA INVESTIGATION

Hilary Tindle, Saul Shiftman, Qianyu Dang

Background: When smokers quit, negative affect (NA) may undermine resistance to smoking and is associated with lapsing; NA rises sharply several hours before a first lapse. We hypothesized that NA would be highly elevated in early lapse situations and would converge toward background NA levels over time. We describe trends in NA over successive lapses in smokers who have quit.

Methods: We analyzed prospective data from 131 adult smokers who quit and who then recorded lapses via Ecological Momentary Assessment (EMA) using an electronic diary. Lapses were defined as any smoking. Participants reported NA in each lapse. ‘Background’ NA was also assessed at random outside of lapse situations. We used linear generalized estimating equations to characterize NA over the first 20 successive lapses.

Results: NA in initial lapses was substantially higher than background NA. However, over successive lapses, NA declined significantly, converging on background levels of NA over the course of up to 20 lapses (p < .001). Lapse NA seemed to move through three distinct phases: an initial high plateau (lapses 1-6) followed by a downward slope (lapses 7-12) followed by a relative plateau (lapses 13-20). Background NA did not show linear trends over this period.

Conclusion: The intensity of NA and its role in lapse episodes declines as smokers experience successive episodes of smoking and progress towards relapse. This suggests that progression to regular smoking is a gradual, continuous process in which resistance to smoking may be progressively degraded. Future research focusing on the interaction between NA and resisting smoking during relapse crises will help guide optimal timing of mood management techniques in clinical smoking cessation programs.

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POS2-65

RUMINATION INTERACTS WITH IMPULSIVITY TO INFLUENCE STRESS-INDUCED AFFECTIVE RESPONSES OF DEPRESSION-PRONE SMOKERS

Maria Jose Herrera, B.A.*, and Dennis E. McChargue, Ph.D., University of Nebraska-Lincoln

Cigarette smoking among individuals with a history of major depression has been shown to a) be reinforced via self-medicating/affect regulatory processes (Lerman et al., 1996) and b) unduly increase one susceptibility to smoking- and nonsmoking-related illnesses compared with non-depressed smokers and depressed nonsmokers (Links & Comstock, 1990). Despite research efforts over the past two decades to understand this comorbidity, less is known about cognitive and behavioral factors that may help explain why depression-prone smokers smoke to alleviate presumed problematic negative affectivity. The present study tested whether, among depression-prone smokers, cognitive vulnerabilities associated with major depression (i.e., ruminative tendencies) interacted with behavioral control issues (i.e., impulsivity) to dramatically influence negative affective expressions following a laboratory stressor.

We further explored whether smoking paraphernalia produced additive effects on such affect responses. Participants (n=35) were exposed to four counterbalanced conditions that varied by mood induction (neutral vs. negative) +/- environmental cues (in vivo cigarette vs. control) and were grouped using median splits of rumination (hi vs. low) and impulsivity (hi vs. low). Affective reactivity was measured by changes in Profile of Mood States subscales (depression; anger; anxiety). After entering potential confounds, analyses of covariance produced a ruminant by impulsivity by condition interaction for anger scores (F(3.78) = 2.930, p = .039), but not depression or anxiety. Simple effects showed that the magnitude of change in anger responses was significantly greater for depression-prone smokers both high in rumination and high in impulsivity compared with other groups. This effect was dramatically greater following the negative mood induction + in vivo cigarette; suggesting that environmental smoking cues produce additive effects on negative mood states. Implications are discussed.

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POS2-66

CONFECTIONARY CHEWING GUM ATTENUATES NEGATIVE AFFECT DURING THE FIRST 24 HOURS OF SMOKING CESSION

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Introduction: Research has reliably demonstrated that negative affect (NA) is an important predictor of smoking maintenance and relapse and is closely related to nicotine withdrawal. Recent laboratory research has demonstrated that confectionary chewing gum appears to decrease self-reported nicotine withdrawal. Specifically, participants in these studies reported lessened nicotine withdrawal during periods of brief cessation when they were allowed to chew confectionary gum. The purpose of the present study was to investigate if reduction of NA is the possible mechanism by which withdrawal is attenuated. It was hypothesized that the amount of confectionary gum chewed during a 24-hour cessation period would predict reductions in NA.

Methods: Fifty college students, who reported smoking 16 or more cigarettes per day, were recruited for this study. Participants were instructed to abstain from smoking for 2, 24-hour periods. During the gum condition participants were encouraged to chew as much confectionary gum (supplied by the study) as they wished. During the no gum condition participants were instructed to abstain from chewing gum. During each cessation trial, participants completed measures at baseline (hour 0) and 24 hour follow up. Measures included amount of gum chewed and current NA (as measured by the Profile of Mood States [POMS]).

Results: Data were analyzed via regression analysis, whereby the difference between gum and no gum condition NA scores were regressed on the number of pieces of gum chewed at 24-hour follow-up. Results indicated that the number of pieces of gum chewed significantly predicted greater decreases in POMS anxiety, depression, and dysphoria \( r = -.32, t(49) = -2.4, p < .05; r = -.42, t(49) = -3.2, p < .01; \) and \( r = -.39, t(49) = -2.9, p < .01, \) respectively.

Discussion: Results suggest that NA attenuation is a possible mechanism by which confectionary chewing gum reduces self-reported nicotine withdrawal. These findings are promising given that previous research has highlighted the importance of NA in predicting smoking relapse. This study adds to the growing literature suggesting that confectionary gum chewing may be a viable smoking cessation aid.

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POS2-67

A COMPARISON OF SUSTAINED AND TRANSIENT NEURAL RESPONSES TO VISUAL SMOKING CUES: RESULTS OF A MIXED EVENT-RELATED/BLOCK FMRI EXPERIMENT

F. Joseph McClernon, Ph.D.*, Rachel V. Kozink, B.S., Avery M. Lutz, B.A., and Jed E. Rose, Ph.D., Duke University Medical Center

Exposure to conditioned drug cues engages both relatively transient (e.g., associative, evaluative) and sustained (e.g., craving, motivation) processes. However, previous neuroimaging studies have examined either transient brain responses to discretely presented cues (event-related design) or sustained brain responses to blocks of cues (block design). Therefore, the common and unique anatomical substrates of event-related and sustained brain responses to cues have not been directly evaluated. In this study we presented visual smoking cues (e.g., people smoking, confectionary cigarettes) and control cues (e.g., people engaged in everyday activities) to dependent smokers \( n = 7 \); mean cigarettes/day = 18.0, SD = 3.85) during fMRI-BOLD scanning. In a mixed event-related/block design, cues were presented for 3 to 9 s (mean duration = 6 s) in 60 s blocks. Four smoking and four control blocks were presented. Statistical analyses of BOLD signal modeled both transient (event-related) and sustained (block-related) brain activity during smoking cue viewing after controlling for activity associated with neutral cue viewing. Unique transient activity was observed in left precuneus (BA 7) and right insula whereas unique sustained activity was observed in right inferior parietal cortex (BA 40) and right superior frontal gyrus (BA 6). Overlap in transient and sustained activity was observed in only ventral left post-central gyrus (BA 43) — region involved in gustatory sensory processing. The present findings indicate that transient and sustained brain activity in response to smoking cues have distinct yet overlapping neural substrates and this information may aide in the interpretation of previous studies that examined only transient or sustained activation. Moreover, transient and sustained brain reactivity to cues may represent different endophenotypes with distinct genetic and environmental bases.

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POS2-68

SMOKING ABSTINENCE DECREASES OCCIPITAL/PARIETAL AND INCREASES FRONTAL BRAIN ACTIVITY DURING RESPONSE INHIBITION

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Successful abstinence from smoking requires inhibiting a highly over-learned, prepotent behavior. At the same time, abstinence from smoking has been shown to result in decrements in performance on laboratory measures of response inhibition. We sought to evaluate the neurobiological basis of abstinence-induced decrements in response inhibition performance by fMRI scanning smokers following 24 hrs of smoking abstinence and after smoking as usual. During scanning, participants (mean cigarettes per day=17.25, SD=2.63; mean age=28.5, SD=7.60) completed a version of the XY Go/No-Go task in which alternating X’s and Y’s were presented in the center of a screen at a rate of 1/s. Participants were required to make a response following each letter presentation except when two of the same letter were presented in succession (e.g., X, X or Y, Y). Behavioral data and fMRI data were analyzed. In fMRI analyses, we examined event-related brain activity associated with correctly identified no-go trials. Analysis of performance data indicated significantly greater (p<.05) response inhibition errors early and late in the task in the abstinence condition. Compared to the satiated condition, abstinence resulted in large areas of decreased activity in parietal and occipital regions including bilateral cuneus (BA 19). At the same time, greater abstinence-induced activity was observed in two distinct clusters within the right middle frontal gyrus (BA 8 and BA 46). The present findings potentially suggest that decrements in response inhibition performance following smoking abstinence are the net effect of 1) deficits in parietal/occipital attentional and sensory functioning and 2) concomitant increases in frontal lobe activity relevant to executive functioning. Implications for understanding the effects of smoking abstinence on cognition and behavior will be discussed.

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POS2-69

NICOTINE-INDUCED PREFRONTAL SYSTEM BRAIN CIRCUITRY ASSOCIATED WITH AFFECT DYSREGULATION

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Affect dysregulation, subserved in part by prefrontal system dysfunctions, may increase susceptibility to nicotine and, thus, may be a risk factor for smoking initiation and nicotine addiction. The purpose of the study was to determine whether brain metabolic changes in the prefrontal system in response to nicotine are associated with depressive, aggressive, or anxious dispositions and mood states. This study identified brain regions within the prefrontal system that showed the strongest response to a low-dose nicotine patch and were strongly associated with dispositional and state affect dysregulation in nonsmokers. Twenty adult nonsmokers (9 women, 11 men) participated in two laboratory sessions to assess brain metabolism with fluorodeoxyglucose Positron Emission Topography (FDG-PET) in response to nicotine and placebo patches during an anger provocation task. Individual differences in affect regulation were assessed in three ways: trait measures of depression, aggression, and anxiety; field monitoring of daily mood states via electronic diaries for 4 days; and anger task performance. Stepwise linear regression models were used to identify nicotine-induced changes in prefrontal system metabolism associated with trait and state affect. Results indicated that trait measures of depression, aggression, and anxiety were associated with nicotine-induced changes in brain metabolism in the limbic-orbital prefrontal cortical circuitry. In contrast, daily ratings of negative mood states and anger task performance were associated with nicotine-induced changes in the amygdaloïd-thalamic-orbital circuitry. These findings reveal the underlying brain circuitry for nicotine susceptibility in individuals with affect dysregulation.

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POS2-71  THE ACUTE EFFECTS OF NICOTINE ON WORKING MEMORY PERFORMANCE IN NON-ABSTINENT SMOKERS


Smokers often attribute the reinforcing nature of smoking to its alleged ability to facilitate cognitive processing and aid in tasks requiring concentration. Research has shown that smoking subsequent to extended abstinence can reverse the withdrawal-related deficits typically observed in focused and selective attention, as well as recognition memory. Several studies have also examined the effects of smoking and smoking abstinence on working memory (WM) performance but, taken together, have yielded inconclusive findings. Of the few studies that have assessed the acute effects of nicotine on WM performance in smokers not deprived of nicotine (non-abstinent), none have found an effect of nicotine on WM performance. It is possible that these nonsignificant results are due both to the fact that different tasks have been used to assess WM performance and to the sensitivity (or lack thereof) of the tasks themselves. As such, the current study investigated the acute effects of nicotine on WM performance in non-abstinent smokers using a reliable, well-validated, and sensitive measure of WM performance such that excessive levels of dopamine may cause WM impairments.

Methodology: The current study examined the effects of experimental smoking and non-smoking periods on WM performance in non-abstinent smokers using a reliable, well-validated, and sensitive measure of WM performance.

Results: Consistent with previous studies, the current findings suggest that acute nicotine exposure has significant effects on WM performance in non-abstinent smokers, with nicotine impairing WM performance in smokers deprived of nicotine as well as research suggesting that there may be an "inverted-U" relationship between brain dopamine levels and WM performance such that excessive levels of dopamine may cause WM impairments.

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POS2-72  A COMPARISON OF THE PLOWSHARE CRESSMICRO SMOKE TOGTOPHACY ANALYSER WITH A PROPRIETY SMOKE ANALYSE

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Introduction: Inter- and intra-smoker variations in smoking behavior influence the amounts of smoke constituents generated. Devices for measurement of puffing behavior rely on measuring differential pressures across an orifice in a cigarette hold-er. Historically, this required a laboratory setting with consequent impact on "normal" smoking behavior generally resulting in increased puffing frequency. Recently, measurements away from the laboratory have been enabled by the Plowsahare CReSSmicro smoking topography analyser, a portable cigarette pack size device. Objectives: To compare the CReSSmicro smoking topography analyser with the Smoking Analyser Mk7 (SA7) developed in-house by BAT, using human and machine smoking. To compare CReSSmicro data recorded at home, work or leisure with a central non-laboratory location. Methods: 50 established smokers of the same Smg ISO product were recruited and gave their informed consent to participate in the study. They smoked their usual cigarettes using both devices (order randomized/ balanced) at the central location on 3 separate occasions. The subjects also smoked in their normal environment with and without the CReSSmicro. In a laboratory lit and unit cigarettes were puffed to a range of parameters on a smoking machine with both devices in series. Filter tip sections from human and machine-smoked cigarettes were collected to estimate the yields of "tar" and nicotine generated. Results and Conclusions: Puffing parameters measured by the CReSSmicro and SA7 from human and machine smoking were not significantly different (p=0.34 to 0.92) except average flow (derived differently). Using the CReSSmicro, in-use yields of tar and nicotine and all puffing parameters except puff duration were higher at the central location than in the smoker’s normal environment (p<0.05). Further, the in-use yields in the normal environment were 25% higher using the device than without (p<0.05). Further assessment of calibration, reliability and data processing are being carried out with Plowsahare.

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POS2-73 IN VITRO TEETH WHITENING STUDY WITH NICOTINELL MEDICATED GUM

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This in vitro study compared the ability to remove extrinsic stains and whiten teeth of three chewing gums (Group A-Nicotinell Mint, Group B- Nicotinell Thrive Mint, Group C- Nicotinell Creme) plus a reference product. The in-mouth ability of the teeth from bovine incisors was performed with a device enabling alternate air drying and immersion into a staining broth, replaced once a day. This cycle lasted for ten days. A device simulated human mastication (1, 2) and amount of stain on teeth was measured using a colorimeter (3). Measurements were obtained for each specimen (average of three absorbances) using the L*a*b* scale: whiteness (L*), red-green (a) and yellow-blue (b) (4). DE represents the overall change in the color of the stained teeth. After 60 minutes of treatment, chewing gum A and B resulted in DE scores of 10.80 ± 1.96 and 10.08 ± 1.69 respectively. Both removed significantly more stain than chewing gum C (DE=5.00 ± 2.27) and saliva (DE=1.03 ± 0.48). After 120 minutes of treatment, chewing gums A and B removed significantly more stain (DE=14.91 ± 2.12 and 13.15 ± 1.57) than chewing gum C (DE=6.55 ± 2.24) and saliva (DE=0.65 ± 0.29). The total available stain was evaluated at the end of the experiment by pumicing teeth to remove remaining stain. Chewing gum A removed 34.6% and 47.6% of the stain after 60 and 120 minutes and chewing gum B removed 34.6% and 45.2% of the stain after 60 and 120 minutes, respectively. Both were significantly more effective than chewing gum C (16.5% and 21.4%) or saliva (3.3% and 2.1%). Chewing gums A and B rendered the teeth visually whiter, while chewing gum C had a milder effect. Nicotinell chewing gums have proven in this study to relieve extrinsic teeth stain, significantly more than gum base or saliva. This visible tooth whitening action could strengthen the quiter's motivation and as such is a very relevant property.

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POS2-74  SMOKERS IN AN AFFECTIVELY NEUTRAL STATE UNDERESTIMATE THE MOTIVATIONAL IMPACT OF THEIR OWN FUTURE CRAVINGS

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Many decisions related to cigarette smoking require when in an affectively neutral or “cold” state a prediction of how one will feel or behave when in a craving or “hot” state. Research in other domains reveals that in a cold state often underestimate the impact of being in a hot state on their own future behavior. Ninety-eight smokers were asked to indicate their willingness to accept monetary compensation in exchange for enduring cigarette craving (delaying smoking) 1 week later. Participants were randomly assigned to one of three groups: hot group (during a high-craving session 1 they made predictions about a session 2 high-craving state; cold group (during a low-craving session 1 they made predictions about a session 2 high-craving state; comparison group (experienced a single high-craving session only). As predicted, a repeated measures ANOVA revealed a significant interaction between group and time. F (1, 72) = 7.83, p = .007. In contrast to smokers in the Hot group, smokers in the Cold group under-predicted the value of session 2 smoking. Results support a cold-to-hot-empathy-gap explanation (see, Loewenstein, 1999), and they are discussed with respect to implications for understanding tobacco addiction.

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POS2-75  CIGARETTE SMOKING: ATTENTIONAL MEDIATION OF ANXIETY AS A PREDICTOR OF NICOTINE WITHDRAWAL SEVERITY

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Although the majority of cigarette smokers report that they smoke to relieve anxiety, studies examining the anxiolytic properties of smoking have yielded equivocal results. Kassel and colleagues proposed and found empirical evidence to suggest that the anxiolytic effects of nicotine are mediated by the presence or absence of distracting stimuli. More specifically, smoking “constrains smokers’ attention to the most immediate and salient stimuli in their environment”—when such stimuli are available,” As a result, smokers are more likely to focus on immediate and distracting stimuli than more distal anxiogenic stimuli, thus reducing anxious mood and perhaps making it more difficult for them to quit smoking. The current study was designed to assess the degree to which attentional mediation influences the experience of self-reported nicotine withdrawal severity in a sample of 21 adult heavy smokers. It was hypothesized that smokers who related more heavily on attentional mediation to relieve anxiety would experience more severe nicotine withdrawal. Participants completed the attentional mediation paradigm, developed by Kassel and Shiffman, and then abstained from smoking for 24 hours. As expected, results indicated that anxiety and withdrawal symptoms increased during abstinence from smoking, F(1,19) = 7.3, p < .05 and t(20) = -5.1, p < .001. However, even with a high level of statistical power (95%), the primary hypothesis was not supported: smokers who displayed greater reductions in anxiety in the presence of a distracting stimuli did not experience more severe nicotine withdrawal after 24 hours of abstinence from smoking, p > .7. These findings have valuable implications for how the relationship between anxiety and nicotine withdrawal can be understood. They also suggest important ways to refine research methodology and theory development, with regard to how we measure anxiety and nicotine withdrawal, define stress in the real world and bring it into the laboratory. Also, specified participants, higher BMI was associated with lower levels of mood disturbance, perceived stress, depression and negative affect. Similar analyses in male participants were non-significant.

Conclusions: The results of the current study confirm previous reports regarding the relationship of BMI and various indices of mood in a sample of male and female cigarette smokers undergoing cessation. Methods: Total mood disturbance, perceived stress, depression, anxiety, positive and negative affect and salivary cortisol concentrations were assessed during the early phases of smoking cessation. Results: Among smoking participants, higher BMI was associated with lower levels of mood disturbance, perceived stress, depression and negative affect. Similar analyses in male participants were non-significant.

This research was conducted while the first author was at Texas Tech University and at the University of California, San Diego. Portions of this study were supported by a Summer Dissertation Award from Texas Tech University and NIH grant # R01AA011227.

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POS2-77  DIFFERENCES BETWEEN CURRENT SMOKERS AND SUCCESSFUL QUITTERS WITH CO-OCCURRING SOCIAL ANXIETY DISORDER

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Although burgeoning attention has been lent to investigating tobacco use among anxiety disorders (Morissette et al., 2007; Feldner et al., 2007), not much is known about successful quitters with anxiety disorders. Specifically, little is known about the influence of active tobacco use (versus past tobacco use) on anxiety symptoms and coping strategies. The current study examined differences in anxiety symptoms and coping strategies between current smokers (n=16) and successful quitters (n=18) with co-occurring social anxiety disorder (SAD). As part of a larger study investigating the psychosocial stress responses of psychiatric ever-smokers, participants completed self-report measures assessing anxiety symptoms (Anxiety Sensitivity Index; Beck Anxiety Inventory) and coping strategies (Brief-COPE). We hypothesized that successful quitters would report less anxiety and anxiety sensitivity than current smokers. Results suggested that current smokers would report greater use of maladaptive emotion-focused coping strategies, such as denial and behavioral disengagement. We further hypothesized that successful quitters would report greater use of adaptive emotion-focused coping strategies such as seeking emotional social support, turning to religion, and acceptance. Contrary to predictions, no differences were found between current smokers and successful quitters on anxiety symptoms and sensitivity. Significant differences were initially found on select coping subscales, including denial, humor and substance use. However, after a modified Bonferroni correction was applied to control for error related to multiple comparisons, only humor remained significant. These preliminary findings suggest that successful quitters and current smokers with SAD have similar levels of anxiety symptoms and use similar methods of coping. These data are inconsistent with findings related to other anxiety disorders (e.g., panic disorder), but document greater symptomatology among current smokers, but are consistent with limited published data in the area of smoking and SAD (Morissette et al., 2006).

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POS2-78  SEX-SPECIFIC ASSOCIATIONS OF BODY MASS INDEX WITH MOOD DISTURBANCE DURING SMOKING ABSTINENCE

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Objective: Previous reports have suggested an inverse relationship between body mass index (BMI) and negative mood in women. However, little is known about the potential association of these variables under stressful conditions, such as those experienced during smoking cessation. The current investigation examined the relationship of BMI and various indices of mood in a sample of male and female cigarette smokers undergoing cessation. Methods: Total mood disturbance, perceived stress, depression, anxiety, positive and negative affect and salivary cortisol concentrations were assessed during the early phases of smoking cessation. Results: Among smoking participants, higher BMI was associated with lower levels of mood disturbance, perceived stress, depression and negative affect. Similar analyses in male participants were non-significant. Conclusions: The results of the current study confirm previous reports regarding the relationship of BMI and mood in women and extend these findings to the early stages of smoking cessation.

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POS2-79 EXPERIMENTAL SMOKING IN COLLEGE STUDENTS: A PROFILE

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We and others have shown that many college students who smoke on a nondaily basis do not think of themselves as “smokers.” To examine the extent to which these students exhibit at-risk patterns, we compared 91 students who reported smoking “occasionally but not regularly” and who had smoked within the past 30 days but less than one cigarette/day with 35 current daily smokers and 363 never-smokers. Students were recruited from psychology classes at a large Midwestern university; women and students of color were over-recruited. Groups did not differ significantly in age or race. Experimental Smokers (ES) and Daily Smokers (DS) were about twice as likely as Never-Smokers (NS) to be male (18.7% vs. 20.0%; p<.05). Alcohol problems were reported by 83.5% of ES and 74.3% of DS, compared with 56.5% of NS (p<.001). ES and DS scored significantly higher than NS on both the Center for Epidemiological Studies-Depression (ES: 15.6 ±1.1; DS: 15.6 ±1.6; NS: 13.1 ±.7; p<.05) and the Dieting and Bingeing Severity Scale (ES: 3.5 ±.1; DS: 3.7±2; NS: 3.1 ±.1; p<.01), controlling for gender. We conclude that experimenters more closely resemble daily smokers than they do never-smokers on a number of key variables known to be elevated in smokers. Because these students may not identify themselves as smokers, stop-smoking messages targeted at smokers may fail to reach a group potentially at risk of progressing to daily smoking.

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POS2-80 EFFECTS OF ACUTE ABSTINENCE AND NICOTINE ADMINISTRATION ON TASTE

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Smoking cessation is associated with marked increase in body weight, corresponding to an increase in body mass index of 1.6 kg/m², and this contributes to relapse. Also, some of the health benefits of stopping smoking are offset by the detrimental effects on health of the resulting weight gain. Better understanding of the mechanisms involved in this process may identify novel treatment targets for post-cessation weight gain. We investigated the effects of acute abstinence from smoking and nicotine administration on taste, since modulation of taste is a likely mechanism by which eating behaviors may be altered in abstinent smokers. Cigarette smokers (n = 27) who reported smoking within 1 hr of waking were recruited from the general population and randomized to abstain for 12 hrs or smoke as normal prior to testing, and to receive a nicotinised or de-nicotinised cigarette. Taste measures for salt and sucrose were collected pre- and post-cigarette. A series of 2 x 2 x 2 ANOVAs, with absti- nence (ABS, NON-ABS) and nicotine (NIC, DE-NIC) as between-subjects factors, and taste (SAL, SUC) and time (PRE-CIG, POST-CIG) as within-subjects factors, were conducted on taste threshold, intensity rating and hedonic ratings data. For intensity ratings, there was a significant time x taste x abstinence x cigarette interaction (F [1, 23] = 5.35, p = 0.030). For taste thresholds and hedonic ratings there were no significant main effects or interactions involving the experimental manipulations. Post-hoc tests to clarify the significant four-way interaction indicated a significant increase in intensity rating for salt from PRE-CIG to POST-CIG in the NIC condition but not the DE-NIC condition, with no effects for sucrose. These results are discussed in the context of mechanisms of weight gain following cessation.

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POS2-81 COMPARISON OF SELF-REPORT OF TOBACCO USE AND URINARY COTININE LEVELS AMONG DRUG DEPENDENTS: A PILOT STUDY

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Background: The treatment for tobacco use has been given low priority in the de-addiction centers. The validity of self-reports of tobacco use is often questioned. It is necessary to establish its validity by an objective method. Objective: The aim of the study was to examine the agreement between self-reported tobacco use and urinary cotinine concentrations among drug dependents.

Methodology: Seventy consecutive male drug addicts attending the OPD at National drug treatment centre were interviewed by the clinician. Their tobacco as well as drug use history was recorded, and thereafter their urine sample was analyzed for drug testing.

Result: Mean age of the subjects was found to be 33 years (SD: 10). Urinalysis showed high concentration of cotinine (mean: 586.40; SD: 222.15ng/ml) in 95% of the subjects. High concordance was observed between self-report of tobacco use and urinary cotinine. The cotinine to creatinine (CCR) was found to be greater than 100ng/mg (mean: 596; SD: 352 ng/mg) suggestive of current smokers. The quantity of tobacco consumption was also correlated with the urinary cotinine levels.

Conclusion: Tobacco is highly prevalent among the drug abusers. Moreover, the effectiveness of the treatment program may be increased by using the combination of urine analysis along with self-report.

Support: By National Drug Dependence Treatment Centre, Department of Psychiatry, All India Institute of Medical Sciences, New Delhi-110029, India.

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POS2-82 RESPIRATORY SINUS ARRHYTHMIA (RSA) DURING CIGARETTE SMOKING

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Heart rate variability or respiratory sinus arrhythmia (RSA) refers to the normal beat-to-beat variation associated with breathing patterns’ cardio acceleration during inspiration, cardio deceleration during expiration. RSA is largely mediated by changes in parasympathetic efferent stimulation of the sinus node and has been interpreted to be a measure of vagal tone. Some studies have shown that acute stress (e.g., public speaking tasks) decreases RSA; other shown that RSA is associated with drug craving. In the present study we measured RSA changes during and after cigarette smoking in a laboratory setting. RSA was determined in ten subjects before, during and after smoking their usual brand of cigarette. Data was recorded on two occasions from each subject by means of chest electrode embedded in LifeShirt, a vest that records respiratory induced changes in chest volume. We found that heart rate increased during smoking and the increase was sustained for up to 6 min after the cigarette was extinguished. RSA decreased during smoking in some (7 of 10) subjects and did not change in the other 3 subjects. At the second visit RSA decreased in 5 of the 10 smokers. Generally RSA changes were most evident in subjects that had greatest heart rate change during smoking. Solanasol analyses to determine whether mouth level exposure to nicotine and other smoke delivered toxins are correlated to these cardiovascular measures. These results suggest that RSA measures during laboratory smoking may be related to subjective and other physiologic response to cigarette smoking.

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A RISK ASSESSMENT BASED APPROACH TO IDENTIFYING PRIORITY TOXICANTS IN CIGARETTE SMOKE

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Tobacco smoke contains many different toxicants. From the perspective of both regulatory controls and product modifications aimed at harm reduction, it would be of great advantage if it was possible to identify which toxicants were most important to the various diseases caused by cigarette smoking. Fowles and Dybing (1) have taken a toxicological hazard assessment approach to calculating the relative risk of tobacco smoke toxicants, focusing on combining risk indices from databases such as that developed by the Californian EPA with knowledge of concentration levels in cigarette smoke. This paper seeks to develop this model further by additionally considering the biological mechanisms related to various diseases. In particular, we explore whether the concept of margins of exposure, used by the European Food Safety Authority to consider carcinogens in food, could be applied to cigarette smoke toxicants. We also consider applying the approach of Physiologically based Pharmacokinetic (PBPK) modeling to the issue. We propose that further dialogue is required on the best approach to determine a relative ranking of priority toxicants, and illustrate our suggestions with an evaluation of two classes of tobacco smoke toxicant.


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**POS3-1**

**THE EFFECT OF ST JOHN'S WORT (SJW), CHROMIUM (3+) OR PLACEBO ON THE MEASUREMENT OF EARLY MORNING SALIVARY CORTISOL IN QUITTING SMOKERS**

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Objectives: Studies show that morning waking salivary cortisol is a good measure of stress. Stopping smoking is difficult and causes stress. Our pilot study demonstrated that the early morning rise of salivary cortisol is a good measure of stress following temporary smoking abstinence. Reduction of stress may make it easier to quit. Can SJW or chromium reduce stress and make quitting easier? Both acutely and sub-chronically chromium and SJW increase plasma and salivary cortisol but SJW decreases cortisol and corticosterone in the rat brain.

Methods: We monitored morning salivary cortisol prior to and during treatment in four groups of quitting smokers. This is a double-blind placebo controlled trial. Subjects (n=144) aged 18+ were randomised to receive SJW + chromium, SJW + placebo chromium, chromium + placebo SJW or placebo chromium + placebo SJW respectively. Treatment was administered 10 days prior to quitting and for up to 12 weeks after. Saliva cortisol was monitored at -10, 0 (quit day), 1, 3, 7, 14 and 28 days.

Results: Preliminary results (n=15-21/group) show that chromium and SJW alone and in combination significantly reduce morning salivary cortisol as measured by the AUC of the time v cortisol curve (p=0.0001-0.03 for chromium, p=0.0001-0.02 for SJW) and p=0.02-0.11 for SJW/chromium respectively for days 0, 1, 3, 7, 14 and 28 versus day 0 (unpaired t-test). Whilst double placebo showed no effect (p=0.1-0.37).

Conclusions: From initial observations we conclude that both SJW and chromium alone and their combination reduce morning salivary cortisol and possibly stress levels too. Initial results suggest that SJW and chromium may show treatment efficacy for smoking cessation possibly through their known antidepressant effects. A reduction in the degree of stress, particularly during the early post-quit period may be an important factor.

Study was supported by CR-UK and SJW extract and placebo was supplied by Cassella-med GmbH and Co, KG (Berlin).

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**POS3-2**

**RELAPSE PREVENTION TREATMENT: OLDER SMOKERS**

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The specific aims of this randomized clinical trial were to test a series of hypotheses about four treatments for cigarette smoking in a sample of N=403 smokers aged 50 and older. Treatment conditions were: (1) Brief Treatment (12 weeks bupropion + NRT + group counseling); (2) Extended NRT (Brief Treatment + 40 weeks of NRT availability); (3) Relapse Prevention (Brief Treatment + 11 sessions of cognitive behavioral relapse prevention counseling over a 40 weeks period); (4) Relapse Prevention+NRT (Relapse Prevention + 40 weeks of NRT availability). Thus, in the three conditions with extended treatment, intervention continued for one year after study start. The Relapse Prevention intervention addressed five areas suggested by the Practice Guidelines as important in preventing return to cigarette smoking. These areas were: poor mood, weight gain, lack of social support, fluctuating motivation, and withdrawal symptoms. Techniques used were primarily cognitive behavioral. Participants were assessed at baseline before study start, and at 12, 24, 52, 64 and 104 weeks after treatment initiation. The primary outcome variable was CO verified 7-day point prevalence abstinence rates. Three hundred fifty-six subjects have reached the 104 assessment week. For this partial sample, abstinence rates at 52 weeks (end of extended treatment) are: Brief Treatment, 37%; Extended NRT, 42%; Relapse Prevention, 54%; Relapse Prevention + NRT, 52%. At 104 weeks, abstinence rates are: Brief Treatment, 40%; Extended NRT, 39%; Relapse Prevention, 53%; Relapse Prevention + NRT, 47%. These preliminary and partial data suggest that behavioral relapse prevention interventions can produce high abstinence rates, and these rates are maintained one year after the end of extended treatment.

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**POS3-3**

**THE EFFECTS OF THREE NOVEL NICOTINE REPLACEMENT THERAPIES ON THE RELIEF OF TOBACCO WITHDRAWAL SYMPTOMS**

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Background: The primary mechanism of action of nicotine replacement therapy (NRT) is to reduce the severity of tobacco withdrawal symptoms. Speed of nicotine delivery may be the key to the ability of NRT to reduce withdrawal and increase chances of quitting.

Objectives: To compare the effects of three novel NRTs (Zonnic pouch 4 mg, mouth spray 1 mg/dose and lozenge 2.5 mg) on withdrawal discomfort and craving after overnight abstinence from smoking with 4mg NRT gum and placebo.

Method: A total of 77 smokers participated in this cross-over study which was undertaken in two parts. Part 1 (n=30) examined the effect of pouch, gum and placebo on withdrawal discomfort and craving. Part 2 (n=47) examined lozenge, mouth spray, gum and placebo on withdrawal discomfort and craving. Participants reported to the study site at 0730 on each study day, provided overnight abstinence from smoking with 4mg NRT gum and placebo.

Results: Part 1: The pouch produced significantly greater reduction in craving than placebo (mean difference=14 units, 95% CI: -24 to -5; p=0.002). There was no significant difference between gum and pouch and placebo and gum. Part 2: Compared to placebo active NRTs had significantly greater craving relief: lozenge -16 units (95% CI: -24 to -8; p<0.0001); mouth spray -20 units (95% CI: -28 to -12; p<0.0001); gum -19 units (95% CI: -27 to -11; p<0.0001). There was no statistically significant difference between active products. Analysis of onset of craving reduction over the first 30 minutes showed the pouch was already significantly more effective than placebo at 5 minutes. The mouth spray was significantly better than placebo from 5 minutes, and the gum and lozenge better than placebo from 10 minutes. The mouth spray was significantly better than gum at 5, 10, 15 and 20 minutes. Conclusions: This study suggests that the Zonnic pouch, lozenge and mouth spray are likely to be at least as effective as 4mg gum, with spray in particular holding a promise of improvement in craving relief.

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POS3-4  EFFECTS OF A GRADUAL CESSATION INTERVENTION

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Many studies report that gradual smoking cessation produces quit rates as good or even better than abrupt cessation. Possible effects of gradual cessation include decreasing dependence and stimulus control, while increasing self-efficacy and confidence in quitting. We tested the effects of gradual vs. abrupt cessation in a randomized controlled trial where 748 participants have been randomized to an abrupt cessation condition based on the USPHS clinical practice guidelines or a gradual cessation condition based on reduction before a quit date aided by NRT. At baseline and at the week prior to the quit date, participants completed the Fagerstrom Test of Nicotine Dependence (FTND), the Cigarette Dependence Scale (CDS-5), DiClementes self-efficacy scale, the stereotype subscale of the Nicotine Dependence Syndrome Scale (i.e., amount of variability in smoking), and a single-item question on confidence in quitting. We removed items on number of cigarettes per day (CPD) and time to first cigarette on the CDS-5 and FTND to obtain dependence measures independent of reduction. Preliminary analyses examined the pre-quit outcomes in the first 508 participants who entered the study. For the 145 participants who did not complete the pre-quit date assessments, we assumed the baseline values did not change. As expected, participants in the gradual cessation condition significantly reduced their CPD from baseline to pre-quit date (23 vs. 15) and those in the abrupt group showed only a slight reduction (23 vs. 21). Two-way repeated-measures ANOVAs indicated significant time-by-group interaction effects such that smokers in the gradual group reported greater decreases in nicotine dependence (mean CDS score decreased from 12.3 to 11.3; mean FTND from 2.1 to 2.0) and in stereotype (6.8 to 6.0) and greater increases in self-efficacy (ratings of tempting situations decreased from 35.4 to 32.3) than the abrupt group. Confidence in quitting increased similarly in the two groups. Pre-quit day decreases in nicotine dependence and stereotype and increases in self-efficacy would be expected to increase quitting in the gradual group. A future report will describe abstinence outcomes.

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POS3-6  RANDOMIZED TRIAL OF COMBINATION PHARMACOTHERAPY VERSUS MONOTHERAPY FOR MEDICALLY-ILL SMOKERS

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Smokers with medical illnesses are most susceptible to the harm of continued tobacco use. Yet, these smokers are under-treated with medication for fear of medical complications and are often excluded from clinical trials. This study assessed the benefit and adverse effects of a 3-medication cessation combination for smokers with medical illness. 127 smokers received either nicotine patch alone for a 10-week, tapering course (n=64) or the combination of nicotine patch, inhaler, and bupropion (n=63). Only minimal behavioral intervention was provided to simulate typical medical treatment. Both groups were similar with regards to demographics, tobacco history, dependence, and level of medical illness. Mean age was 49 (range: 22-86), 65% were female: 61% White, 32% Black, and 6% Hispanic. 65% smoked 20 or more cigarettes per day and 79% smoked within 30 minutes of waking. Mean FTND score was 5.2 and mean expired CO was 20 ppm. 27% had heart/vascular disease, 24% COPD, 13% cancer, 16% diabetes, 39% hypertension, 36% depression, and 32% substance abuse history. Outcomes were analyzed on an intent-to-treat basis. Exhaled CO-confirmed, 7-day point abstinence rates at 4 weeks (combination vs. patch alone) were 62% v 47% (p=0.089) and at 6 months were 27% v 17% (p=0.13). At 6 months, men (33% v 17%; p=0.04) and subjects not living with a smoker (30% v 13%; p=0.03) had higher abstinence rates. Adverse event rates did not differ significantly between the patch alone and combination groups. Overall, the most common adverse events reported were skin rash (11%), insomnia (7%), and nausea (3%). Findings of this study suggest that under circumstances simulating general medical practice, the combination of nicotine patch, inhaler, and bupropion appears safe and results in good abstinence rates (27% at 6 months) which were non-significantly higher than patch alone in this hard-to-treat group. Larger trials are needed to confirm the trend supporting the use of combination therapy in this population.

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POS3-5  SMOKING CESSATION IN HIV+ CLINICAL CARE SETTINGS: PARTICIPANT CHARACTERISTICS

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HIV-positive (HIV+) populations have higher rates of smoking than the general population and smoking puts HIV+ individuals at higher risk for HIV-related health problems. Relatively little information is available on HIV+ cigarette smokers. Our group is conducting a clinical trial to determine the efficacy of smoking treatment provided in HIV clinical care settings. The present study examines the baseline psychosocial characteristics of the first 120 HIV+ cigarette smokers enrolled. We hypothesized that this group of smokers faces significant psychological and interpersonal issues that may influence smoking, motivation to quit, and success in quitting. Findings: The sample is 80% male with 53% identifying as Caucasian. The mean age is 44.6 years. 73% of the sample identified as gay/lesbian/bisexual. Marital status was predominantly single (80%). 99% of the sample had a high school education or less. 66% were unemployed and 41% were in temporary living situations or homeless. Mean daily cigarettes = 19.8 and mean number of previous quit attempts = 4.6. Mean FTND score = 5.0. The vast majority reported a strong or extremely strong desire to quit, however, only 48% endorsed a goal of complete abstinence. This proportion is significantly lower than our group has found in general community samples. 57% were in the preparation stage and 43% in the contemplation stage for smoking cessation. 48% of the sample reported current illicit drug use and 70% reported a history of drug or alcohol treatment. Diagnostic interviewing indicated that 41% of the sample has a history of major depressive disorder, 21% met criteria for a bipolar disorder, 48% has a history of alcohol dependence and 71% met the criteria for nicotine dependence. Conclusions: Findings related to most tobacco use variables are similar to other populations studied. However, psychosocial variables known to negatively impact smoking treatment success occur at high levels in this sample. Prior to the conference, these analyses will be repeated with a larger sample size.

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POS3-7  CYP2A6 ACTIVITY AND ITS ASSOCIATION WITH BASELINE SMOKING BEHAVIORS AND TREATMENT OUTCOMES IN A CLINICAL TRIAL OF AFRICAN-AMERICAN LIGHT SMOKERS

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Variation in human CYP2A6, the gene for the main enzyme that metabolizes nicotine, is associated with individual differences in smoking behaviors. The role of variation in CYP2A6 activity in smoking has not been well established in African-Americans, a unique population of predominantly light smokers. A recent study, Kick it at Swope-II (KIS-II), evaluated the efficacy of nicotine replacement therapy (2 mg gum vs. placebo) in African-Americans smoking 10 or fewer cigarettes per day (CPD). We examined whether CYP2A6 activity affected baseline smoking behaviors and treatment outcomes in African-American light smokers enrolled in KIS-II (n = 755; 33% males, 67% females). Subjects were genotyped for CYP2A6 alleles (CYP2A6*2, *4, *9, *12, *17, *20, *23) (n = 517) and grouped by predicted rates of CYP2A6 activity (normal - NM, intermediate - IM, slow - SM). The trans-3-hydroxy-cotinine to cotinine ratio (3HC/COT), an indicator of CYP2A6 activity, was also determined from plasma levels at baseline (n = 646). CYP2A6 genotype was significantly associated with the 3HC/COT ratio, being highest in NMs (0.41 ± 0.27), followed by IMs (0.32 ± 0.28) and SMs (0.21 ± 0.14) (p < 0.001). The expired carbon monoxide (CO) levels at baseline trended towards lower values in IMs and SMs (p = 0.10), suggesting reduced smoking rates. SMs, as determined by genotype and 3HC/COT quartiles, had significantly higher baseline NIC/CPD (p < 0.05) and NIC/CO (p < 0.001) compared to NMs, implying slower rates of nicotine metabolism after adjustment for cigarette consumption. SMs reported later ages of smoking initiation compared to NMs, reaching significance in females (p < 0.05). Preliminary analyses also suggest those with the lowest 3HC/COT quartile had the highest abstinence rates, which was particularly evident in the placebo arm (27% vs. 15% for the lowest vs. highest quartile) and in females. These results are in agreement with previous studies demonstrating CYP2A6 slow metabolism reduces smoking behaviors and increases success at cessation.

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POS3-8  DESIGN OF A RCT TESTING A PHARMACIST-DELIVERED SMOKING CESSATION PROGRAM

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As one of most accessible health care professionals, pharmacists are in an ideal position to provide tobacco-cessation and prevention services. Only 15 studies identified in the literature assessed the effectiveness of tobacco-cessation services delivered by pharmacists. These studies suggest that pharmacists can deliver tobacco-cessation interventions and may be effective in helping smokers quit. However, it is difficult to compare and make conclusions from these studies because of numerous limitations in the study methodologies, such as the use of uncontrolled designs, failure to account for attrition, and lack of biochemical verification. A randomized controlled trial was designed and implemented to test the effectiveness of a pharmacist-delivered program versus standard medical care on 7-day point prevalence quit rates at 6 months among veterans at a Veterans Administration outpatient clinic. Study participants were individually randomized and assigned to treatment (6 hour group program delivered in 3 sessions over 5 weeks) or control (3-5 minute standard care delivered over the telephone). Both groups were offered choice of medication (nicotine patch or bupropion). Of 309 patients referred to the study, 33% (101/309) met eligibility criteria, were recruited, completed a baseline survey, and assigned to treatment (n=50) or control (n=51). Both groups were similar with respect to sex, race, marital status, education, level of smoking, and health status. At baseline, participants were moderately motivated to quit smoking (average of 7 on a scale of 1 to 10, where 1 is no motivation) and slightly lower in their confidence to quit (average of 6). Participation in the treatment sessions was moderately high, with 75% (76/50) completing at least 2 of the 3 group sessions. At 6 months from the quit date, urinary cotinine testing will be used to confirm self-reported abstinence. This is the first controlled trial of a pharmacist-delivered smoking intervention conducted in the US. Successful recruitment and high retention are prerequisites for conducting a rigorous evaluation of the effectiveness of this pharmacist delivered tobacco cessation program.

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POS3-10
LONG-TERM DISEASE MANAGEMENT FOCUSED ON PHARMACOTHERAPY UTILIZATION AMONG RURAL SMOKERS
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Introduction: Smoking cessation interventions typically last about 12 weeks with outcome evaluations conducted 6 to 12 months after enrollment. KanQuit is the first study of a long-term disease management approach to nicotine dependence treatment; it addresses the full spectrum of smokers regardless of their willingness to quit smoking. This study describes interest in pharmacotherapy among rural smokers regardless of interest in quitting; assesses interest in pharmacotherapy over time and identifies factors associated with increased interest in using smoking cessation pharmacotherapy.

Methods: We analyzed data from a population-based disease management intervention study for smokers attending clinics. The 3-arm randomized trial evaluated a) usual care, b) minimal counseling plus feedback to physicians, c) intensive counseling plus feedback to physicians. Participants could request bupropion or nicotine patches at cost of six intervals over 24 months.

Results: Of 750 adults (mean age = 47 SD=13.12); 59% were female, 33% were unemployed, 77% smoked 20 or more cigarettes per day and 61% were contemptuously quitting smoking. More participants had previously used nicotine patches (53%) compared to bupropion (33%). Pharmacotherapy was requested by 60%, 48%, 31%, and 31% of participants who identify themselves as continuing smokers at the beginning of 1st, 2nd, 3rd and 4th cycles of treatment, respectively. We identified greater preference for nicotine patches overtime. During the course of the study <31% used at least one course of pharmacotherapy and 47% requested two or more courses of pharmacotherapy treatment over 24 months. Older age, greater number cigarettes per day, higher motivation and previous use of pharmacotherapy were significantly related to greater requests of smoking cessation pharmacotherapy overtime.

Conclusion: A large proportion of smokers are interested in pharmacotherapy for smoking cessation. Many of these smokers are willing to make multiple pharmacological quit attempts over time. In addition to brief intervention, long-term treatment of tobacco dependence should be made available to people who continue to smoke.

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POS3-11
TOBACCO USE IN DRUG DEPENDENT PATIENTS—FINDINGS FROM A TOBACCO CESSATION CLINIC
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Most individuals with alcohol and drug use disorders are also dependent on nicotine. These patients are at high risk of morbidity and mortality from tobacco-related illnesses. Tobacco use profile of 86 consecutive patients attending the Tobacco Cessation clinic of a National level Deaddiction Centre were analyzed. All the patients were males, with most (31.4%) being in the 31-40 yrs age group. Most were Hindus (67%) and were married (79%). 20.41% were presently unemployed and 28.57% were illiterate. Their drug use profile revealed that the primary drug of abuse was heroin in 61 patients (70.9%), alcohol in 31 patients (36.0%) and cannabis in 23.3%. Nicotine was commonly the secondary drug of abuse. Their tobacco use profiles revealed that 44 patients (51.2%) used tobacco in smokable form (bidi, cigarettes), 11(12.8%) in smokeless form and 31 patients (36%) used both together. Mean age of onset of tobacco in smokable form was 17±6yrs. A majority of the patients were in contemplation stage (58.3%) to give up tobacco use as measured by Readiness to change questionnaire (RCQ). Severity of dependence was assessed using Fagerstrom’s test for nicotine dependence (FTND). Nearly 88% of patients had FTND scores ranging from high (6-7) to very high (8-10). Further FTND scores were significantly correlated with age of onset of use of tobacco and average number of bids used per day. Psychiatric co morbidity was found in 5 patients (5.8%). Treatment approaches for tobacco cessation were pharmacotherapy in the form of Nicotine gum and behavioral counseling.18 patients (20.9%) were retained at 6 months follow up out of which 5 patients had completely stopped tobacco use. These findings have treatment implications, as most drug users are highly nicotine-dependent with very low long-term quit rates of tobacco. Drug dependent patients may require more intensive, multimodal treatments of their tobacco use, to be effective in this difficult to treat population.

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POS3-12
RECONSIDER REACHMENT: SECONDARY CESSATION FINDINGS FROM THE FOREVER FREE TRIAL
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Self-help smoking cessation interventions have the potential for high public health impact by reaching large numbers of smokers. Prior research conducted by Brandon and colleagues has demonstrated the efficacy of a series of self-help booklets designed to reduce smoking relapse in two clinical trials. These “Forever Free” booklets significantly reduced relapse through two years of follow-up and were extremely cost-effective. The second clinical trial also tested the degree to which the efficacy was due to the content of the booklets, or to the repeated contact over time. Results revealed that the effect was entirely due to the booklet content rather than the repeated contact. Although recruitment for the second clinical trial offered relapse prevention information to ex-smokers, current smokers who called and reported that they planned to quit within the next 6 months were also randomized across the 4 conditions. This yielded 271 current smokers who did not meet baseline abstinence criteria for the relapse-prevention study and were not included in the primary, published analysis. The current study is an analysis of these participants, offering new insights on any demographic or smoking variables. Secondary analyses with current smokers revealed that participants who received the 8 booklet series over 12 months had a greater rate of abstinence (49%) at the 12-month follow-up as compared to control participants who received only 1 booklet (27%); p = .052. With an intent-to-treat analysis, the corresponding abstinence rates were 54% vs. 36%; p < .005. Interestingly, in direct contrast to the findings with ex-smokers, the amount of contact, but not content, was a significant predictor of abstinence at 1-year follow-up for current smokers (hi-contact 28% vs. low-contact 15%, p < .01). These differential abstinence rates are much higher than are typically found with self-help interventions, and they suggest that an extended, repeated form of self-help might be more effective than the usual single-point distribution.

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POS3-13
LONG-TERM OUTCOMES OF A BRIEF PRIMARY CARE-BASED SMOKING CESSATION INTERVENTION
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Brief smoking cessation interventions delivered by primary care physicians increased future quit rates and have the potential for significant public health impact. Research over the past decade has focused on methods to increase the rate of delivery and effectiveness of brief provider-delivered cessation interventions. The current study evaluated 12-month cessation outcomes of a brief, computer-tailored primary care physician (PCP)-delivered intervention. The 6-month cessation outcomes from this study have been previously presented. In this analysis, we compared the 12-month outcomes with the 6-month results. The intervention included brief physician cessation counseling training and receipt of a 1-page report that summarized patients’ smoking habits and provided tailored recommendations to aid in quitting. The report was distributed to the patients and their physician during a routine office visit. Four hundred twenty six patients provided 12-month follow-up data via telephone. Cessation outcomes included: 7-day point-prevalence abstinence, number of days quit, number of quit attempts, and stage-based motivation to quit. The overall 12-month quit rate was 12.7%, however, the difference between the intervention and control patients was not significant (11.2% versus 14.2%, respectively, p = .21). In contrast to the treatment group differences observed 6 months post intervention, no group differences remained significant at the 12-month assessment. Although the use of a brief primary care smoking cessation intervention increased 6-month outcomes, these effects were not sustained 12 months post intervention. Potential reasons for the lack of long-term effects of the intervention and implications for treatment will be discussed.

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**POS3-14**

**AN OPEN CASE SERIES OF VARENICLINE TREATMENT FOR NICOTINE DEPENDENCE IN OUTPATIENTS WITH SCHIZOPHRENIA**

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Schizophrenia is associated with increased prevalence of smoking, heavy smoking, and smoking-related morbidity and mortality. Standard nicotine dependence treatments have been associated with modest efficacy in patients with schizophrenia and high rates of relapse to smoking upon their discontinuation. Fifteen patients with schizophrenia who had relapsed to smoking following previous treatment elected to try the newly available medication, varenicline, for smoking cessation with good results. Five patients with schizophrenia on stable antipsychotic medication regimens who had relapsed to smoking within 2 weeks of discontinuation of bupropion or NRT requested treatment with varenicline for smoking cessation. They received varenicline 0.5 mg/day for 3 days, 0.5 mg bid for 4 days, then 1 mg bid in addition to brief individual counseling weekly for 2 weeks then monthly. All fifteen patients reported reduced craving to smoke on varenicline. Twelve patients tolerated the medication, quit smoking within 10 days of starting varenicline, maintained biochemically validated abstinence for > 6 months and elected to continue to take varenicline beyond the standard 24 week regimen to prevent relapse to smoking, currently 6-10 months after quitting smoking. Three patients could not tolerate varenicline due to nausea. There has been no evidence of psychotic relapse or significant worsening of psychiatric symptoms or side effects of antipsychotic medications. Varenicline is a partial a4b2 and full a7 nicotinic acetylcholine receptor (nACHr) agonist. Decreased activity at a4b2 and a7 nACHrs in schizophrenia may underlie high rates of both nicotine dependence and relapse to smoking after discontinuation of nicotine dependence treatment observed in this population. Because nACHr activity is reduced at baseline, is increased by smoking and is not expected to return to a normal baseline after smoking cessation in schizophrenia, as in the general population, it may be reasonable to propose that longer duration, perhaps chronic agonist or partial agonist therapy may reduce relapse to smoking in schizophrenia. Studies are needed to test this hypothesis.

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**POS3-16**

**SMOKING PREVALENCE IN THE BONN COHORT OF HIV-INFECTED INDIVIDUALS**

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Life expectancy in HIV-infected individuals receiving highly-active antiretroviral therapies is determined by cardiovascular disease due to dyslipidemia and insulin resistance, pneumonia and lung cancer. Smoking cessation is a high priority. This study examined the Bonn cohort in order to determine risk groups in need of a specialized smoking cessation program. We analyzed all patients currently being treated at Bonn University Medical Center. Parameters included: gender, age, cigarettes per day, AIDS, non-AIDS, risk groups: sexual orientation (LGBT-lesbian, gay, bisexual, transgender), and illicit smoking. We did not find in our sample some common correlations (like male gender and illicit drug use), usually found in non-psychiatrically ill populations and found in STEP 2000, were not found in our sample. This may suggest that there are unique features of being a veteran that alter what demographic or illness features correlate with smoking.

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**POS3-15**

**THE EFFECT OF USING NICOTINE REPLACEMENT THERAPY DURING A HOSPITALIZATION ON SMOKING CESSATION AFTER DISCHARGE**

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Background: Hospitalized smokers face a period of sudden tobacco abstinence. Increasingly, they are offered nicotine replacement therapy (NRT) to relieve withdrawal symptoms. Whether NRT use in hospital promotes NRT use and smoking cessation after discharge (d/c) is uncertain.

Methods: Fifteen outpatients with schizophrenia on stable antipsychotic medication regimens who had relapsed to smoking within 2 weeks of discontinuation of bupropion or NRT requested treatment with varenicline for smoking cessation. They received varenicline 0.5 mg/day for 3 days, 0.5 mg bid for 4 days, then 1 mg bid in addition to brief individual counseling weekly for 2 weeks then monthly. All fifteen patients reported reduced craving to smoke on varenicline. Twelve patients tolerated the medication, quit smoking within 10 days of starting varenicline, maintained biochemically validated abstinence for > 6 months and elected to continue to take varenicline beyond the standard 24 week regimen to prevent relapse to smoking, currently 6-10 months after quitting smoking. Three patients could not tolerate varenicline due to nausea. There has been no evidence of psychotic relapse or significant worsening of psychiatric symptoms or side effects of antipsychotic medications. Varenicline is a partial a4b2 and full a7 nicotinic acetylcholine receptor (nACHr) agonist. Decreased activity at a4b2 and a7 nACHrs in schizophrenia may underlie high rates of both nicotine dependence and relapse to smoking after discontinuation of nicotine dependence treatment observed in this population. Because nACHr activity is reduced at baseline, is increased by smoking and is not expected to return to a normal baseline after smoking cessation in schizophrenia, as in the general population, it may be reasonable to propose that longer duration, perhaps chronic agonist or partial agonist therapy may reduce relapse to smoking in schizophrenia. Studies are needed to test this hypothesis.

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**POS3-17**

**SMOKING CHARACTERISTICS OF UNITED STATES VETERANS ENROLLED IN A LARGE MULTICENTER STUDY OF BIPOLAR DISORDER**

Annette M. Matthews, M.D.*, Suzanne H. Mitchell, Ph.D., Peter Hauser, M.D.

Objective: Bipolar disorder is the mental illness second-most associated with smoking, after schizophrenia, although there is very little literature on smoking and bipolar disorder. Understanding smoking in US veterans is particularly important as they smoke at a much higher rate than the general population. We compared smoking data from the first 2000 participants in the Systematic Treatment Enhancement Program for Bipolar Disorder (STEP 2000) to the data from the only VA site for this multi-site clinical trial. We predicted that veterans would smoke at a higher rate than the STEP 2000 sample and that they would have different variables correlate with smoking than those in the STEP 2000 database. Method: We compared our subset to the STEP 2000 dataset on risk factors including: gender, education, socioeconomic status, bipolar subtype, age of illness onset, and concurrent substance use. Results: In the 121 veterans enrolled at our site, mean age was 49 years old and 82.6% were male. N=51/121 (42.1%) reported that they were current smokers; N=42/121 (34.7%) were former smokers and N=28/121 (23.1%) were never smokers. Lifetime prevalence of smoking was N=93/121 (76.9%). Of the 51 current smokers, N=43/51 (82.7%) reported smoking one pack or less a day and N=9/51 (17.6%) reported smoking more than one pack per day. Both current alcohol use (P=0.020) and current caffeine use (P=0.005) were associated with current smoking, but not current illicit drug use (P=0.084). There was no significant difference in several of the variables that were significantly associated with smoking status in the STEP 2000 sample including gender (P=0.577) and age of illness onset (P=0.104). Conclusions: 42.1% of the veterans enrolled in the study at our site reported they were current smokers as compared to 31.2% of those enrolled in the STEP 2000 sample. We did not find in our sample some common correlations (like male gender and illicit drug use), usually found in non-psychiatrically ill populations and found in STEP 2000, were not found in our sample. This may suggest that there are unique features of being a veteran that alter what demographic or illness features correlate with smoking.

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**POS3-18**

**EFFECTS OF TOPIRAMATE ON SMOKING IN PATIENTS WITH SCHIZOAFFECTIVE DISORDER, BIPOLAR TYPE**

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Topiramate (Topamax®) may have utility for treating various addictions and dependencies although previous research regarding its effects on nicotine dependence has been mixed. This study was based on secondary analysis of a placebo-controlled trial of topiramate on psychiatric symptoms in patients with schizoaffective disorder, bipolar type. No significant difference between topiramate and placebo on the reduction of psychotic symptoms were noted in the parent study. The purpose of the current study was to examine the effects of topiramate on smoking levels. Smoking was assessed through expired breath carbon monoxide (CO) levels at baseline, week 4, and week 8 (end of study) for twenty-four patients (50% male) with a diagnosis of schizoaffective disorder, bipolar type, who reported being current smokers and had a CO level of at least 10 ppm (topiramate n=13; placebo n=11). Participants did not receive any specific behavioral or pharmacological treatment for nicotine dependence. There were no baseline differences between the demographics or smoking level of the treatment groups. No differences were found in CO levels at week 4 (p=0.44) or week 8 (p=0.62) between treatment groups and no significant change in CO levels occurred from baseline to week 4 or baseline to week 8 (p=0.56). Overall, CO levels remained generally unchanged for participants on topiramate and placebo during the course of the trial. Limitations of this study include small sample size and assessment of smoking by CO level only. Although topiramate has shown some promise for smoking cessation in non-psychiatric and alcohol-dependent smokers, these findings do not support the idea that this medication would help patients with schizoaffective disorder reduce their smoking spontaneously.

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**POS3-19**

**CHARACTERISTICS OF INDIVIDUALS ENROLLED IN A SMOKING CESSATION PROGRAM WHO ARE OR ARE NOT IN RECOVERY FROM CHEMICAL DEPENDENCY – TREATMENT IMPLICATIONS**

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A retrospective tobacco cessation research study was conducted using the records of 63 individuals who received treatment for tobacco dependence at the Indiana University Nicotine Dependence Program at Fairbanks (addiction) hospital, Indianapolis. The patients were treated between October 2004 and September 2006. Thirty-nine of the sixty-three study subjects (62%) reported prior treatment and recovery for chemical addiction. Detailed demographic data, health history, tobacco usage and cessation histories, as well as scores from assessments taken during smoking cessation counseling sessions, were studied. Investigators were interested in determining differences in cessation between individuals who were in recovery from alcohol and/or drug addiction and those who had never been chemically addicted. Findings largely supported results from other studies indicating that those smokers in chemical dependency recovery were (1) more physically addicted to nicotine; (2) somewhat more psychologically addicted than the group who had not been chemically dependent; and (3) had a higher prevalence of psychiatric disorders. However, the in-recovery participants still successfully stopped smoking in the program (56% vs. 67% never added). In fact, there were no statistical differences in quit rates between these two groups. The study investigators believed that cessation success of both groups could be due to the nature of the program (i.e., intensive, one-on-one cessation counseling). An unexpected finding of this study was that the individuals from the in-recovery group stayed quit for longer time periods in previous quit attempts than those who had never been chemically dependent. It could be that these subjects used similar strategies that they adopted when they successfully stopped their alcohol and/or drug abuse.

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**POS3-20**

**FACTORS ASSOCIATED WITH RETURN TO SMOKING FOLLOWING A SMOKE-FREE PSYCHIATRIC HOSPITALIZATION**

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Tobacco use is particularly prevalent among those with psychiatric disorders, who account for nearly half the cigarettes sold in the US. Negative affect has shown to be a significant component in smoking initiation, progression to dependence, and relapse. This study investigates the relationship between context (i.e., mood, location and smoking) and return to smoking among psychiatric patients discharged from an acute-stay hospital with a complete smoking ban. Participants were 100 smokers (39% female, 73% non-Hispanic Caucasian) recruited from a university-based adult inpatient psychiatry unit. Intake assessments were conducted on the unit within 48 hours of admission. Follow-up assessments were obtained at 1, 4, and 12 weeks after hospital discharge. The primary measure of interest was a self-report of smoking’ instrument designed for the current study, collecting information on the context surrounding the patient’s first cigarette following hospital discharge. Results showed that most participants (76%) smoked their first cigarette the same day as they were leaving the hospital, with a median time of five minutes. Identified mood states were coded as unpleasant, aroused mood (52.4%), pleasant, aroused mood (16.7%), pleasant, calm mood (21.4%), and unpleasant, calm mood (9.5%). Most patients smoked their first cigarette alone (47.7%), while the remaining patients were with a family member (17.4%), a significant other (8.1%), a friend (17.4%), neighbor (3.5%), healthcare professional (2.3%), or other (3.3%). Surprisingly, identified mood states were unrelated to the time to first cigarette, the location or social context of smoking, or patient diagnosis. Greater support is needed post-hospitalization to address patients’ nicotine dependence.

**Study supported by the State of California Tobacco-Related Disease Research Program (#16FT-0050 and #13KT-0152), the National Institute on Drug Abuse (#T32 DA007250, #K23 DA018891 and #P50 DA09263), and the UCSF Summer Research Training Program.**

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**POS3-21**

**INTEGRATING SMOKING CESSATION TREATMENT IN A RADIATION ONCOLOGY DEPARTMENT**

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Despite significant evidence showing decreased survival, increased toxicity, and lower quality of life in cancer patients who smoke, roughly one third continue to use tobacco after diagnosis. Cancer patients undergoing curative radiotherapy customarily receive daily treatment over the course of three to eight weeks. They are often accompanied by family members or companions, many of whom smoke. This represents a significant exposure to the health care system and a unique opportunity for intensive intervention in both cancer patients and their families/companions during their “daily routine” of radiotherapy. The purpose of this study was to assess the feasibility of an intensive combined modality smoking cessation program delivered to radiation oncology patients and their families/companions concurrent with planned radiotherapy. Eligible participants included smoking cancer patients scheduled to receive > 3 weeks of radiation therapy and their smoking family/friends. The treatment included 8 weeks of bupropion and 9 individualized behavioral interventions in the radiation oncology clinic, followed by 9-12 scheduled relapse prevention sessions delivered in person or by telephone. Over the 8-month trial, 20 cancer patients and 3 family members were enrolled. Based on our sampling, this represented greater than 40% of eligible smokers seen in clinic. Six cancer patients withdrew on or before the third behavioral intervention session. Thirteen participants completed all 9 behavioral interventions while 4 patients completed 7-8 sessions. At the completion of the behavioral intervention sessions, 13/16 participants had exhaled CO concentrations < 10 ppm and 12/17 participants self-reported tobacco abstinence. Of the 17 participants completing 7-9 behavioral interventions, the median number of relapse prevention sessions was 5 (range 1-9). Six-month self-reported 7-day point prevalence abstinence rate was 50%. Integrating an intensive tobacco cessation program in a radiation oncology setting was feasible and showed promise for increasing treatment of nicotine dependence in cancer patients and their families. This research was supported by funding from Walther Cancer Institute, Indianapolis, IN.

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POS3-22  SMOKING BEHAVIOR AFTER A DIAGNOSIS OF LUNG CANCER

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Lung cancer is the leading cause of cancer death in the United States. Despite the known benefits of quitting smoking after a diagnosis of lung cancer, 13-20% of lung cancer patients still do not quit. The variables and relationships that influence smoking behavior among lung cancer patients who continue to smoke after diagnosis are poorly understood. The purpose of this study was to examine sociodemographic and biobehavioral characteristics, patient perception of illness (illness representation), and quality of life after a recent diagnosis of lung cancer at baseline and 6 months to further describe smoking behavior. This prospective, one-group longitudinal study included patients who were age 18 years or older, were diagnosed with lung cancer within the past 60 days, and self-reported current smoking within the past 7 days. After obtaining informed consent, patients produced a 1mL saliva sample for cotinine analysis and completed a series of questionnaires at baseline and 6 months. Patients who self-reported abstinence from smoking at 6 months provided a saliva cotinine sample for biochemical verification. Descriptive statistics were calculated on sociodemographic, medical history, tobacco use, patient perception of illness, and quality of life data. Fifty-three patients enrolled and only 27 (50.9%) reached the 6-month study endpoint. At 6 months, five (18.5%) patients were biochemically confirmed to be abstinent by saliva cotinine. Importantly, most patients (78.1%) made at least one attempt to quit smoking in the previous 6 months. There were a high percentage of depressive symptoms reported by the sample at baseline (60.8%) and at 6 months (40.0%). An unexpected large percentage of patients were deceased before reaching the 6-month study endpoint. Future studies should examine the relationship between depression and smoking cessation among lung cancer patients. Examining the smoking status and length of survival among lung cancer patients in a population-based sample is warranted. The results of this study will be used to develop future smoking cessation interventions with lung cancer patients, and guide future research questions.

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POS3-23  CURRENT MEDICAL CHART DOCUMENTATION PRACTICES FOR TOBACCO USE IN RADIATION ONCOLOGY PATIENTS WITH LUNG OR HEAD AND NECK CANCERS

Larry Pan, M.D.*, McMaster University and Juravinski Cancer Centre; Joanna Cohen, Ph.D., University of Toronto and Ontario Tobacco Research Unit; Gordon Okawara, M.D., FRCP, McMaster University and Juravinski Cancer Centre; Parameswaran Nair, M.D., FRCPC, McMaster University and St. Joseph's Hospital.

Background: Smoking during radiation therapy increases the risk of treatment failure and disease recurrence. Despite these significant sequelae of tobacco use for this patient population, detailed screening for smoking status and addressing smoking cessation are sometimes neglected by oncologists.

Objectives: To retrospectively review medical chart documentation practices of radiation oncologists for tobacco use in patients with lung or head and neck cancer seen in consultation at a tertiary care cancer center.

Methods: 134 current radiation oncology patient charts were examined, consisting of 67 consecutive charts in each of the two tumor sites. Charts were reviewed to determine the content of information documented by physicians on patients’ smoking status and any cessation counseling offered.

Results: Overall, information pertaining to smoking status was documented in 104/134 (77.6%) of cases. Analysis by tumor type showed 79.1% for lung cancer and 76.1% for head and neck cancer. Of the cases where smoking status was documented, 86.5% of these charts were deemed to have met a threshold level of adequacy in information required for patient management. History regarding secondhand smoke exposure was recorded in only 2% of charts. Lack of smoking status documentation in the current radiation oncology consultation note occurred more frequently in patients who had been previously seen by medical or surgical oncology (30%) and in cases of treatment with palliative intent (30%). Documented smoking cessation counseling by the oncologist occurred in 1/134 cases. CONCLUSIONS AND DISCUSSION: An attempt to document smoking status appears to be undertaken by about three-quarters of radiation oncologists in a tertiary care cancer centre. However, adequate documentation occurred in only 87% of cases where documentation occurred. Thus, smoking status information meeting the threshold level of adequacy would be found in only 67% of the patient charts in this population, suggesting room for improvement. Adequate recording of tobacco use status is instrumental in furnishing the first step for any efforts in prompting cessation counseling in subsequent follow-up visits.

This study was conducted while the first author was at McMaster University and the Juravinski Cancer Centre. Supported by an Ashley Studentship for Research in Tobacco Control from the Ontario Tobacco Research Unit.

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POS3-24 SMOKING CESSATION IN RADIATION ONCOLOGY AS THE MISSING DRUG IN CLINICAL TRIALS—IDENTIFYING THE PATTERNS OF TOBACCO USE AND BARRIERS TO CESSION IN ONCOLOGY PATIENTS

Larry Pan, M.D.*, Gordon Okawara, M.D., FRCP, McMaster University and Juravinski Cancer Centre; Joanna Cohen, Ph.D., University of Toronto and Ontario Tobacco Research Unit; Parameswaran Nair, M.D., FRCP, McMaster University and St. Joseph's Hospital.

Background: Abstinence from tobacco use, especially during treatment, may significantly improve response rates to radiation therapy. The magnitude of this improvement may be greater than that seen with drugs, such as radiosensitizers or chemotherapy. Despite this, some patients continue to smoke during radiation therapy.

Objectives: To perform a qualitative study to examine the tobacco use behaviors and barriers to smoking cessation of patients diagnosed with lung or head and neck cancer.

Methods: Eighteen patients with a diagnosis of either lung or head and neck cancer who were on active radiation therapy at a tertiary care cancer centre were accrued. Detailed self-administered questionnaires and/or structured interviews were used to gather data regarding smoking behaviors, barriers to cessation, and attitudes towards tobacco use cessation. Input was also obtained from key healthcare providers. Content analysis was performed using the questionnaire/interview data and recurring themes were extracted.

Results: Smoking cessation represented a difficult achievement for most patients, requiring multiple attempts. Reasons for quitting cited by former smokers included the patient's cancer diagnosis, for better health, symptoms associated with smoking, cost of cigarettes, inconvenience of smoking (e.g., smoking outside), and pressure from others to quit. The most significant patient-perceived barriers to smoking cessation included the belief of being addicted to cigarettes, using cigarettes to “calm nerves”, cravings for a cigarette, and fear of losing the enjoyment/pleasure derived from smoking. Overall, patients’ perception that smoking is bad for one’s health increased after diagnosis of their malignancy. Self-reported overall quality of life improved or remained the same after quitting for most patients. Practitioner-based advice was also received, and barriers to tobacco use cessation counseling included primarily a lack of time in clinical consultation visits.

Conclusions and Discussion: Knowledge gained from this study is instrumental for ongoing program development and may contribute towards investing resources for tobacco use cessation efforts in the oncology population.

This study was conducted while the first author was at McMaster University and the Juravinski Cancer Centre. Supported by an Ashley Studentship for Research in Tobacco Control from the Ontario Tobacco Research Unit.

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POS3-25 EVALUATION OF AN INTERVENTION TO ASSIST CANCER PATIENTS TO STOP SMOKING


Background: Even in patients diagnosed with cancer, smoking cessation improves health outcomes. Despite this fact, provider-delivered cessation interventions are not systematically incorporated into clinical settings. This study evaluates an effort to alter smoking cessation practice patterns in a dental/surgical clinic for cancer patients.

Method: A quasi-experimental study design was used to compare practice patterns and smoking cessation outcomes associated with an enhanced smoking cessation treatment program (EC) compared to usual care. Adult smokers were accrued via a self-administered survey from May to July for the UC group and from July to Sept 2007 for the EC group. The EC group included systematic delivery of advice to quit, assistance (smoking cessation medication, education materials) and telephone support at 1 week. All providers attended a training program on smoking cessation as part of enhanced care. Interim results are reported from a follow-up telephone interview conducted with patients one month after their clinic visit for the UC group (n=56) and EC group (n=35).

Results: In the one month follow-up interview smokers who were exposed to the EC intervention were more likely to reporting being asked by someone in the clinic about their smoking status (94% vs. 70%, p=0.02), advised to quit (91% vs. 56%, p=0.01), and to report receiving a prescription for a stop smoking medication (38% vs. 4%, p<0.01) compared to those exposed to the UC condition. However, quit attempts (38% vs. 55%, p=0.04) and the self-reported quit rate between those in the EC group did not differ from those in the UC group (18% vs. 14%, p=0.63).

Conclusion: These preliminary results suggest that our intervention was successful in changing the delivery of smoking cessation support to smokers, but that this has not translated to a higher quit rate as anticipated. The presumed quitting advantage of more systematic delivery of cessation treatments to smokers may require a larger sample and longer period of follow-up to demonstrate.

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POS3-26 A COMPREHENSIVE TOBACCO-CESSATION TREATMENT FOR CANCER PATIENTS: PRELIMINARY OUTCOME FINDINGS

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Cancer prevention via smoking cessation has been touted as necessary for many years. However, the majority of cancer centers in this country and around the world do not provide smoking-cessation services to their current patients, cancer survivors or their surrounding communities. Consistent with the mission of its cancer prevention division, in 2006 The University of Texas M. D. Anderson Cancer Center launched a large-scale, multidisciplinary, and comprehensive treatment program that is free of charge to all active and surviving cancer patients. During the first 18 months of operation, the program delivered services to approximately 800 unique patients (7500 visits). These actively referred patients were almost an equal split between men (53%) and women (47%). Their average age was 56 years, ranging from 20 to 83 years. The majority were Caucasian (84%) then African Americans (10%), Hispanic (4%), and other (1%). The mean number of smoked cigarettes per day was around 20 and the mean of smoking years was around 35. These patients were highly nicotine dependent smokers with an average FTND score of approximately 8. Our preliminary overall abstinence rate was at 44% after 12 weeks of treatment. The abstinence rates were higher (60%) for patients that were motivated and willing to set a firm quit date upon entering the program. Among patients unmotivated to set a quit date, 30% were able to achieve total abstinence (30%) by the end of treatment (12 weeks follow-up). Those who were not able to quit still managed to reduce their number of smoked cigarettes each day from 23.32 (SD=12.41) at baseline to 11.24 (SD = 10.86) at 12-week follow-up. This represents a mean reduction of 12.08 cigarettes per day (48%) for this group, a significant change in behavior, t(118) = 11.64, p < .0001. Our abstinence rates were impacted negatively by the presence of multiple psychiatric comorbidities and they improved in those receiving more treatment exposure (including counseling and medication). The conceptualization, the roadblocks and possible future directions of the program will be discussed.

The program is funded by M. D. Anderson through proceeds from the State of Texas Tobacco Settlement Funds.

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POS3-27  CANCER TYPE IN TOBACCO-DEPENDENT PATIENTS INFLUENCES SMOKING REDUCTION, QUITTING READINESS, AND SELF-REPORTED PROVIDER ADVICE TO QUIT

Adam Rzetelny, Ph.D.*, Jack Burkhalter, Ph.D., Yuelin Li, Ph.D., Susan Holland, M.A., and Jamie Ostrow, Ph.D., Memorial Sloan-Kettering Cancer Center

Despite the universal risks of smoking for all presurgical cancer patients, some 13 to 35% of these patients continue to smoke after diagnosis. Data from across a number of studies suggests that cessation rates among recently diagnosed cancer patients may be higher for lung cancer, presumably because this is the cancer most associated with smoking. However, less is known about factors influencing receptivity to quitting, such as provider advice to quit, patient readiness to quit, and patient attendance at programs for patients with cancers other than lung that may not be linked as closely with smoking. We focused on newly diagnosed cancer patients scheduled for surgical treatment because the peri-diagnostic period represents a “teachable moment” during which patients may be uniquely receptive to smoking cessation, and because survival prospects of this population are appropriate for smoking cessation interventions. Patients (n = 101) were recruited at a large urban cancer center and were assessed on number of cigarettes smoked per day (cpd) before and after diagnosis, self-report of whether they received provider advice to quit, and stage of readiness to quit. For analyses, patients were dichotomized into Lung Cancer (LC; n = 39) or Other Cancer (OC; n = 62) groups. The OC group included patients with diverse types of cancers but comprised only those with newly diagnosed and/or primary cancer, and only patients with LC were excluded. The sample comprised equal numbers of men and women, mainly Caucasian (86%), and were an average of 54 years old. A univariate ANOVA conducted on cpd change scores revealed that the decrease in cpd after diagnosis of the OC group (mean = 4.18) was significantly less than that of the LC group (mean = 10.84; p < .05). Relative to LC, the OC group was also less likely to report receiving provider advice to quit (p < .001), and at a lower stage of readiness to quit (p < .05). These findings warrant enhanced efforts to increase the receptivity to smoking cessation among patients diagnosed with cancers other than lung, such as by increasing provider advice to quit and by capitalizing on patients’ health concerns to enhance readiness to quit.

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POS3-28  PREVALENCE OF PSYCHIATRIC DISORDERS IN CANCER PATIENTS RECEIVING TOBACCO-CESSATION TREATMENTS

Janice Blalock, Ph.D., Maher Karam-Hage, M.D., Michael Mallen, Ph.D.*, Paul Cinciripini, Ph.D., Mary Lou Heater, C.N.S., Department of Behavioral Science, University of Texas M.D. Anderson Cancer Center

Cigarette smoking has been correlated with high prevalence of co-occurring psychiatric disorders and a relationship to reduced medical outcomes. In a recent survey of 4153 cancer patients, 25% reported a major psychiatric disorder and 51% a history of any psychiatric disorder. Patients with psychiatric disorders have worse outcomes than those without, and many are noncompliant with their cancer treatments. The University of Texas M.D. Anderson Cancer Center has pioneered a large-scale, multidisciplinary, and comprehensive tobacco treatment program for cancer patients using the Systems Strategies from the Clinical Practice Guideline. During the first 18 months of operations, the program has delivered services to approximately 800 unique patients (total of 7500+ visits) with various types of cancer diagnoses. On admission to the program, all patients are screened for the presence of comorbid psychiatric disorders, their level of nicotine dependence and motivation to quit. Forty-three percent of the patients met criteria for at least one psychiatric diagnosis, which highlights the importance of screening and identifying comorbid psychiatric disorders to cancer patients before, during and after tobacco-cessation treatment. As expected, the most common psychiatric diagnoses were depressive (32%), anxiety (32%) and alcohol-use (10%) disorders. Abstinence rates were observed at the 12-week mark of treatment. The abstinence rate (47%) was observed for smokers with no psychiatric comorbidities. In contrast, smokers with one or more psychiatric diagnoses demonstrated a 39% abstinence rate. The presence of a psychiatric disorder seems to negatively impact smoking abstinence rate. However, these quit rates are surprisingly high, and may be attributed to treatment. However, these quit rates are surprisingly high, and may be attributed to treatment. However, these quit rates are surprisingly high, and may be attributed to treatment. However, these quit rates are surprisingly high, and may be attributed to treatment. However, these quit rates are surprisingly high, and may be attributed to treatment. However, these quit rates are surprisingly high, and may be attributed to treatment. However, these quit rates are surprisingly high, and may be attributed to treatment. However, these quit rates are surprisingly high, and may be attributed to treatment. Ø

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POS3-30  AWARENESS OF THE TOBACCO FREE NURSES INITIATIVE AND NURSES’ FREQUENCY OF THE 5 A’S

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Objective: To determine the awareness of the Tobacco Free Nurses (TFN) Initiative among nurses working in Magnet accredited facilities and the association between awareness, demographic, professional, and work-site factors on the frequency of delivery of tobacco dependence interventions to patients.

Methods: A cross-sectional web-based survey was used to assess frequency of smoking cessation interventions (ask, advise, assess, assist, arrange, including recommendations for cessation medications, referral to a telephone quitline and other resources) of 3482 nurses working with adult patients in 35 Magnet facilities. Logistic regression was used to evaluate the contribution of factors to frequency of interventions.

Results: The majority of nurses always/usually asked (73%), advised (62%) and assessed (62%) tobacco status; a minority assisted (37%), arranged (19%), recommended cessation medications (24%), referred to resources (22%), or recommended use of the telephone quitline (10%). Those familiar with TFN (15%) were significantly more likely to deliver smoking cessation interventions, including referral to the quitline (OR = 2.29, p<.01). Current smokers were less likely to arrange for follow-up (OR = 62, p<.05) as compared to never smokers. Compared to other respondents, nurses with advanced practice roles had a higher frequency of cessation interventions. Nurses working in emergency rooms, psychiatric units, obstetrical/gynecological units, and outpatient facilities, were less likely to engage in interventions as compared to nurses in medical-surgical units. Nurses working in states with higher tobacco prevalence were more likely to intervene, including 63% greater referral to the quitline (OR = 1.84, p<.01).

Conclusions: Awareness of the TFN initiative had a significant relationship with increased delivery of smoking cessation interventions by nurses working in Magnet hospitals. Further efforts are needed to increase cessation interventions among nurses. Resources such as the TFN may be able to assist in these efforts.

The Smoking Cessation Leadership Center, The Robert Wood Johnson Foundation.

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**POS3-31**  
ABC’S OF SMOKING CESSATION

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**Background:** Smoking cessation is a life-saving treatment for people who smoke. Assessment of smoking status, provision of brief advice to stop smoking, and the offer of smoking cessation treatment needs to be undertaken by all healthcare professionals if the burden of smoking related disease is to be reduced.

**Discussion:** Previously the 5A’s mnemonic (ask, advise, assess, assist and arrange) has been widely used as a memory aid for providers in helping people stop smoking. Recently there have been some shorter variations of the 5A’s approach, for example the American Dental Hygienists’ Association’s Ask, Advise, and Refer approach. The New Zealand Smoking Cessation Guidelines have recently been updated and in an effort to further simplify the 5A’s for healthcare professionals a new mnemonic was developed — ABC. ABC is a simple, memorable prompt for providers of stop smoking services: Ask about smoking status, give Brief advice to stop smoking to all smokers, and provide evidence-based Cessation support for those who wish to stop smoking. This presentation outlines and discusses the structure of the ABC approach for encouraging smoking cessation and will draw upon some of the new evidence identified by the Guidelines Revision.

**Conclusion:** Healthcare professionals are well-placed to help people who smoke to quit. The ABC (Ask, Brief Advice, Cessation treatment) approach is a model that is memorable and incorporates all aspects of evidence-based smoking cessation treatment.

This project was funded by the New Zealand Ministry of Health.

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**POS3-32**  
THE UNIVERSITY OF WISCONSIN'S TRANSDISCIPLINARY TOBACCO USE RESEARCH CENTER (TTURC-2): IMPLEMENTING A CESSATION TRIAL IN A REAL-WORLD CLINICAL SETTING

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The University of Wisconsin’s TTURC Cohort 2 was designed to test state-of-the-art smoking cessation interventions in real-world clinical settings. This study enrolled 1364 smokers who were identified during routine visits to their primary care providers. Enrollees came from 11 primary care practices in Eastern Wisconsin that are part of a large health care system. Existing office staff and providers were trained in the screening and initial enrollment procedures. Final enrollment and randomization was done by telephone by off site research staff. Smokers were randomly assigned to one of five medications regimens: bupropion (n = 256), nicotine lozenge (n = 260), nicotine patch + nicotine lozenge (n = 282), and nicotine lozenge (n = 279). Medication was provided free of charge and dispensed by the clinic pharmacy. All patients were referred to the Wisconsin Quitline for counseling. Of nearly 13,000 visits, 22% were by smokers and two thirds of those smoked 10 or more cigarettes and were eligible for enrollment in Cohort 2. Approximately 40% of the eligible smokers were referred by clinic staff for treatment and research staff enrolled 57% of them, resulting in an overall enrollment of 26% of eligible smokers. We believe that if, at every primary care visit, every smoker were enrolled 57% of them, resulting in an overall enrollment of 23% of eligible smokers. We also believe that large scale smoking cessation trials can be successfully completed in busy primary care practices using a collaborative approach between office and research staff.

This study was conducted at the University of Wisconsin and supported by NIH Grant # P50-DA0187-06.

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**POS3-34**  
TAKING STOCK: WHAT DOES THE BODY OF TOBACCO RESEARCH LOOK LIKE?

Joanna E. Cohen¹, Michael O. Chaiton, Lynn C. Planinic, Ontario Tobacco Research Unit, University of Toronto

Tobacco research is a mature area of study, with three academic journals now dedicated to this topic. But what does the body of tobacco research look like? Are some areas of the field receiving disproportionately more attention? This presentation is to take stock of the current body of human tobacco research in order to identify areas that may be ripe for further investigation. We used the epidemiologic triangle framework of host-environment-agent-vector to categorize published research articles from the past seven years. Relevant journal articles were identified using a two-step procedure. First, we identified journals that had an impact factor of at least 2.0 that would potentially publish tobacco research focused on humans. Second, based on titles, we identified original research articles focused on tobacco by reviewing the table of contents of each volume of these journals (including supplements) published between January 2000 and June 2007. Abstracts of all the identified articles were reviewed and classified into one or more of the following categories: host (e.g., psychosocial aspects of smoking, individual-based smoking cessation treatment), environment (e.g., population-based interventions including policy), and agent/vector (e.g., cigarette/tobacco industry). Funding source was documented, where available, based on each paper’s acknowledgements section. The review was limited to articles published in English. Thousands of tobacco-related articles have been published since 2000. Over half of the published articles focused on the host, and about one fourth of the articles focused on the environment. Less than one in five manuscripts focused on the agent or vector of disease. The influence of source of funding source on area of focus was not statistically significant. The majority of published articles focused on the host, with relatively little attention paid to the agent and vector responsible for tobacco-caused morbidity and mortality.

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**POS3-33**  
A PROPOSED FRAMEWORK FOR PREP ASSESSMENT

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British American Tobacco is committed to developing potentially reduced exposure products (PREPs) as part of its approach to harm reduction. Currently, there are only outline guidelines for the evaluation of PREPs, based on risk assessment criteria developed for other types of products; e.g. functional foods or pharmaceuticals. We propose a tobacco product specific, multi-step, stage-gated approach to PREP assessment. The stages cover technology assessment, product assessment, regulatory-based toxicology testing, clinical studies and long-term evaluation. Although a case-by-case approach to PREP assessment is required, there are common elements throughout. The early drivers of the assessment are smoke chemistry evaluation, for toxicant elimination or reduction, and biological evaluation using in vitro models reflecting physiological change and disease endpoints. Progress through this stage gate defines a reduced toxicant product (RTP). Regulatory-based toxicology analysis is performed prior to any clinical studies. In these studies, smoking behavior, smoke retention, and biomarkers of exposure and effect are analyzed. As part of a comprehensive analysis, physiological, genonomic, proteomic and metabolic data are also collected. RTPs that show statistically significant results in clinical studies, in the direction of those established in smoking cessation trials, advance to long-term consumer trials. In these long-term trials, additional biomarkers and potential epidemiological intermediate end-point studies are conducted. In parallel studies, RTPs may be tested against relevant, validated animal models of disease as they become available and recommended by the scientific community. Together, these data would allow a weight of evidence approach to the development and assessment of PREPs. A consensus on an assessment framework, the efficacy of PREPs as harm reduction products and consumer information on PREPs will require the active participation of independent health scientists and agencies. BAT will not make unilateral health claims.

**British American Tobacco.**

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POS3-35
WHO ENROLLS IN A SMOKING CESSATION TREATMENT PROGRAM AFTER ELIGIBILITY SCREENING? IMPLICATIONS FOR RECRUITMENT
Jamie Lyn Dahm, B.A.*, Lauretta Ovadje, B.A., Angela Pinto, M.B.A., Frank Leone, M.D., M.S., Aimee Read, B.A., Robert Schnoll, Ph.D., and Ch Anita Haltrust Halbert, Ph.D., University of Pennsylvania.

Only a fraction of smokers considered eligible for pharmacotherapy treatment programs for nicotine dependence will enroll. However, very little is known about the population of smokers who do not join a treatment program or about how these smokers differ from those who do enroll. We screened 2,257 individuals for a smoking cessation treatment program involving behavioral counseling and a novel medication; of those, only 33.4% of callers were eligible for enrollment (N = 753). Of those individuals who were eligible for the program, only 37.5% attended the subsequent session to enroll in the program (N = 283). We compared these 283 attendees to the 470 smokers who were eligible for the treatment program but did not attend subsequent sessions. While gender was not related to the likelihood of entering the treatment program (p > .05), African American smokers were less likely to enroll in the treatment program vs. smokers of European ancestry (65% vs. 56%; p < .05). Compared to program enrollees, those who did not return for the treatment program were younger (40.4 vs. 45.3) and consumed less alcohol (.32 vs. .57 drinks per day) (p < .05). Lastly, compared to program enrollees, those who did not return for the treatment program indicated, to a greater extent, that they were contacting the program to help researchers and/or for financial compensation (p < .05); program decliners were also significantly more concerned about potential treatment-related side effects and the amount of time required to complete the study, compared to enrollees (p < .05). These data may be useful for the targeting and the tailoring of recruitment messages to increase enrollment among eligible smokers to treatment programs.

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POS3-35A
A PLACEBO-CONTROLLED TRIAL OF MODAFINIL FOR TOBACCO DEPENDENCE
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Only a fraction of smokers treated with medications FDA-approved for tobacco dependence achieve long-term abstinence. Thus, there is a critical need to develop new pharmacotherapies for nicotine dependence. Nicotine deprivation symptoms predict relapse after cessation. Modafinil, a wakefulness medication with efficacy for treating cocaine addiction, has clinical effects that counter nicotine deprivation symptoms. In a double-blind clinical trial, 157 smokers received smoking cessation counseling and were randomized to: 1) 8 weeks of modafinil (200mg/day), or 2) 8 weeks of placebo. The primary outcome was biochemically verified 7-day point prevalence abstinence at the end of treatment (EOT). Secondary outcomes were smoking rate and nicotine deprivation symptoms (e.g., withdrawal). EOT quit rates did not differ between treatment arms (42% for placebo vs. 34% for modafinil; OR = 0.67 [0.34-1.31], p = .24). Further, non-abstainers on modafinil had higher smoking rates over time vs. non-abstainers on placebo (OR = 1.34 [1.06-1.70], p = .01). Modafinil subjects also reported greater increases in negative affect and withdrawal symptoms vs. placebo subjects (p < .05). These data do not support modafinil as a treatment for tobacco dependence. Further, medications that increase arousal may not be useful for treating nicotine dependence and cigarette smoking should be considered if modafinil is prescribed, particularly among those with psychiatric conditions that have high comorbidity with tobacco dependence.

Study Support: Pennsylvania DoH grant SAP #1400027297; NC/NIH Transdisciplinary Tobacco Use Research Center grant CA/DA P5084718; Cephalon, Inc.

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POS3-36
DISTRESS TOLERANCE AND PRE-SMOKING TREATMENT ATTENTION: EXAMINATION OF MODERATING RELATIONSHIPS
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Research targeting affective variables in smoking cessation has provided extensive information for improving treatment for early lapses. Less is known regarding individuals who drop out of research studies before treatment begins. This may be especially relevant for low-income smokers who evidence poorer cessation rates. Taking the perspective that these high-risk individuals may be most in need of research attention and corresponding tailored treatment efforts, the current study investigated the relationship between pre-smoking treatment attention and laboratory-based assessments of physical and psychological distress tolerance, as well as self-reported affective variables. The sample included 53 low-income adults who met entry criteria and completed a baseline assessment for a randomized control trial of a pilot behavioral activation cessation intervention for smokers with elevated depressive symptoms. Results indicated 56% (n=30) of the sample continued on to the intervention and that greater psychological distress tolerance was related to treatment entry (p=.002) with no significant differences across gender or ethnicity. In addition greater physical distress tolerance and lower anxiety sensitivity related to physical concerns also correlated to treatment engagement, but relationships were moderated by gender. Men who did not continue to treatment exhibited lower physical distress tolerance across two persistence tasks than men who entered treatment (p=.01). Anxiety sensitivity related to physical concerns was specific to those not entering treatment. Women who did not enter treatment exhibited higher ASI physical distress scores than men (p<.05). Given ethnic diversity in the sample, we also investigated ethnic identity as a possible moderator; results did not indicate moderation. Intervention assignment, smoking history, demographics, quit motivation, and depressive symptoms were unrelated to pre-treatment attrition. Results suggest continued focus on the need to not only identify smokers most at risk for cessation failure but also dimensions on which to better improve our ability to reach these individuals and engage them in potentially effective treatments.

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POS3-37
ADAPTATION OF A LAY HEALTH ADVISOR MODEL AS A RECRUITMENT AND RETENTION STRATEGY IN A CLINICAL TRIAL OF COLLEGE STUDENTS
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The current study describes and provides results from a process evaluation of a Lay Health Advisor (LHA) model to enhance participation and decrease attrition in a clinical trial of the effectiveness of Motivational Interviewing (MI) on smoking cessation in college freshmen and sorority members. According to MI models, LHAs have been used in clinical trials to directly deliver interventions. In the current study, the LHA model was adapted to employ fraternity and sorority members as liaisons between the research staff and participants. The implementation of the adapted model included two different phases: (a) the selection and training of LHAs and (b) LHAs’ fulfillment of two primary roles as recruitment and retention enhancement agents. Recruitment duties included advertising and endorsing the study to chapter members, and promoting interest and attendance at screening meetings. Retention duties included encouraging attendance at sessions, locating missing participants, and communicating to staff the perceptions of the trial among participants and campus community. Participant (N=119) and LHA (N=8) perceptions of the adapted LHA model were explored using computer administered questionnaires after the first year of the trial. The results indicated both trial participants and LHAs were generally satisfied with the adapted LHA model and felt that LHAs facilitated participation in the study. Specifically, participants identified LHAs as: helpful to participation (M = 7.33, SD = 2.89), enthusiastic (M = 8.33, SD = 2.29), and knowledgeable (M = 8.38, SD = 1.97). LHAs reported being satisfied with their own participation (M = 9.87, SD = .35), receiving adequate training (M = 9.75, SD = .71), and their role being helpful to the participation of the chapter (M = 9.87, SD = .35). Seventy-four percent (900/1216) of chapter members were successfully screened, with 76 percent (148/197) of those eligible enrolled in the study. Seventy-three percent (109/149) of participants received 3 out of the 4 MI sessions. These results indicate the LHA model not only met the needs of the research project, but was also well received by LHAs and participants alike.

This study is part of an ongoing study funded by grant number R01 CA107191-01 from NCI awarded to Dr. Kari Jo Harris.

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POS3-38  CAN COMMUNITY AGENCIES INTERVENE WITH SMOKERS LIVING IN POVERTY?

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Those living in poverty have a high smoking prevalence (40 - 45%). There are multiple barriers between them and effective treatment including misperceptions about treatment and poor access to health care. New channels are needed to reach this population of smokers. Those living in poverty have poor contact with community agencies that have as their mission service to those living in poverty. Such community agencies have not typically addressed the smoking of their constituents. It is not known whether smokers would perceive a smoking intervention by a community agency as appropriate. Nor is it known whether such an intervention would have any measurable effect. The present study sought to answer these two questions. The study took place at two Wisconsin Salvation Army community centers, one in Sheboygan, and the other in Appleton/Rhinasha. Within these two sites, 147 smokers seeking services from the Salvation Army were randomly assigned to receive a brief smoking intervention (about 30 seconds) while 148 randomly selected smokers did not. The intervention consisted of three steps. First, the intervention linked smoking to the Salvation Army’s primary mission of providing emergency services in order to establish legitimacy. Second, it offered a brief smoking intervention. Third, it provided information about seeking treatment. A survey measured outcomes immediately after the intervention. Results indicate that smokers consider it appropriate for a community agency to address their smoking. Further, this brief intervention did not interfere with the Salvation Army’s primary mission as measured by the smoker’s evaluation of service and willingness to return. While the intervention had no impact on the smoker’s intention to quit in the next six months nor perception of the difficulty of quitting, smokers that received the intervention indicated a greater likelihood of seeking help. Based on this study, it is acceptable to smokers from low-income communities to add a smoking intervention to their other missions. However, such interventions will likely have to be more intense than the one used in this study to be effective.

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POS3-39  GETTING PATIENTS TO SERVICES: USE OF A COMMUNITY HEALTH EDUCATOR REFERRAL LIAISON (CHERL) IN PRIMARY CARE MEDICAL PRACTICE

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Tobacco use, physical inactivity/poor diet, and alcohol use are the key preventable causes of death in the US. Primary care practitioners have a unique opportunity to identify patients with these health behavior risks and help them to improve. However, there are many practice barriers to either delivering health behavior change services within their practice or getting patients connected with community services. This study investigated the use of a Community Health Educator Referral Liaison (CHERL) as a way to connect primary care patients to community services and provide brief behavior change counseling via telephone. Methods: One CHERL per community in three communities was made available to 15 practices to accept referrals of patients needing improvement in tobacco, physical activity, diet, and/or alcohol use. Practices identified eligible patients and faxed a referral to the CHERL. The CHERL called patients to complete a baseline assessment and follow-up assessments (3 and 6 months), encourage use of community resources, and provide brief behavior change counseling (up to 3 additional calls). A specialized database tracked practice referrals to each CHERL and calls conducted with patients by the CHERL. Results: There were 707 referrals made (average 53/practice; range 0-177) to the CHERLS in 8 months with 446 resulting in follow-up calls. Of the 446, 137 were smokers (had a puff in past 7 days) at baseline and 63 of these completed all follow-ups. Among the 63, there was a significant decline in smoking-related deaths comprise approximately 70,000 annually. There are many different methods to quit smoking. Quit-Line is an effective method in health care programs. In this study we evaluated the efficacy of Quit-Line in smoking cessation. This study has been carried out for the first time in Iran.

Background and Aim: There are approximately 10 million smokers in Iran and smoking-related deaths comprise approximately 70,000 annually. There are many different methods to quit smoking. Quit-Line is an effective method in health care programs. In this study we evaluated the efficacy of Quit-Line in smoking cessation. This study has been carried out for the first time in Iran.

Methods: There have been considered, nicotine dependency by "Fagerstrom" test, reason of smoking by using proposed questionnaires of IUATLD and ACS, the number of previous attempts to quit, the number of smoking years and existence of any disease.

Results: In this study which was done during November 2004 to July 2006 in National Research Institute of Tuberculosis and Lung Disease, 221 persons participated — 78.3% of all participants were male. — 50.2% of all participants had FT over 7 (high nicotine dependency). — The mean of previous attempts to quit was 3.4 (+/- 1) times. — 31.7% of participants had no history of cessation. — 45.7% of participants had no specific disease. — 45 persons out of all participants at least had 4 times contact (20.4%) and at least one time after the quit-day made a contact, of which 40 persons (88.8%) had a successful cessation.

Conclusion: According to the results of this study and because of our method, was FIRST COME/FIRST SERVICE. Quit-Line consulting seems to be more effective and more economical in comparison with attending in cessation classes. Therefore, we can use it as a cure and also prevention.

This study conducted and supported by Massil Danshanviri Hospital, Tobacco Prevention and Control Research Center.

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POS3-40  RECRUITMENT AND RETENTION OF AFRICAN-AMERICAN SMOKERS IN A PHARMACOKINETICS STUDY

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Recruitment and retention of minority populations in pharmacokinetic studies have not been well documented. The current study describes the recruitment and retention of participants in a study that examined the effects of menthol on bupropion pharmacokinetics among African American smokers. Study participation consisted of four visits over six weeks at a General Clinical Research Center. Two of the sessions required repeated blood draws using an intravenous catheter over the course of 12 hours. Five hundred and fifteen African American smokers completed telephone screening; 187 were phone-eligible, and 92 met initial matching criteria and were scheduled for a first visit. Of the 81 who attended the first visit, 18 individuals were ineligible - abnormal lab results (2), use of drugs that may interfere with Bupropion (2), marijuana use (8), current participation in another drug study (1), cpd < 10 (1), and difficulties drawing blood (4). Of the 63 that were eligible for Visit 2, 15 subsequently became ineligible due to failure to attend visit 4, reaction to placebo (1), and non-adherence to medication protocol (10). Seven individuals were dropped at Visit 3 because of failure to attend the scheduled appointment (4) and difficulties drawing blood (3). A total of 40 individuals (23 menthol (57% female) and 17 non-menthol smokers (42%; female) completed the study. Participants smoked approximately 50 years of age (menthol=47.4, SD=7.67; non-menthol=53.3, SD=7.54) and smoked an average of 15 cigarettes per day (menthol 15.3, non-menthol 16). These data suggest that recruitment into a non-treatment, pharmacokinetic study poses challenges for researchers in the field. These results provide potentially valuable information for investigators embarking on non-treatment laboratory-based studies among minority populations.

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POS3-41  EVALUATION OF SUCCESSFUL AND EFFICACY RATE OF QUIT-LINE IN SMOKING CESSATION

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POS3-42  INTERNET-BASED REINFORCEMENT OF SMOKING ABSTINENCE  

Jesse Dallery*, Bethany Raff, Steven Meredith, Alana Rojewski  

We tested an internet-based method to deliver voucher reinforcers for smoking abstinence. The internet-based method circumvented obstacles associated with frequent monitoring of smoking status (e.g., making twice daily visits to a clinic). Twenty heavy smokers completed the study. We used a within-subject reversal research design (i.e., baseline, treatment, return-to-baseline). The system verified and reinforced smoking abstinence by breath carbon monoxide (CO) output. We found that patients were highly compliant with the treatment (over 97% of the 1,120 scheduled CO samples were collected). Voucher reinforcement produced significantly higher rates of abstinence compared to baseline (65% versus 5% of COs were negative, respectively). To offset the costs associated with treatment, we developed a deposit contract treatment delivery model. Participants deposited a small fee, which they earned back contingent on evidence of abstinence (n=8). Compared to a control, no-deposit group, these participants showed equivalent rates of abstinence and compliance with the treatment. The results suggest that the costs associated with treatment can be partly offset with a deposit contract, which could aid in the dissemination and sustainability of the intervention.  

NIH-NIDA.  

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POS3-43  PHONE AND WEB-BASED TOBACCO CESSATION TREATMENT: CORRELATES OF UTILIZATION AND OUTCOMES  

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Many commercial treatments are available for tobacco cessation, but few integrate the phone and web for delivery. This paper describes a comprehensive integrated phone/web tobacco cessation program, and user characteristics, correlates of utilization, and outcomes. Participants received up to five proactive phone counseling sessions, access to an interactive website, up to 20 tailored emails, printed booklets, and cessation medication information. We tracked web utilization and call completion rates, quit status, satisfaction, and demographics of 19,869 participants using the program between 5/1/2006 and 8/1/2007. Participants were cigarette smokers (98%) who were on average 43 years of age (18-81), female (55%), and ready to quit within 30 days (91%). Participants smoked 13 cigarettes per day, often within 5 minutes of waking (36%). Women utilized web and phone services significantly (p < .05) more than men (i.e., more logins, discussion forum visits, and counseling calls). Similarly, older (> 26 yrs) and moderate smokers (15-20 cigs/day) utilized services more (p < .01) than younger (< 26 yrs) and light or heavy smokers. Satisfaction with services was high (93-96%) and did not vary with web utilization. However, web utilization was significantly associated with increased call completion and 30-day tobacco abstinence rates at the 6-month follow-up evaluation. Participants who logged in 0, 1-4, or 5+ times completed 1.6, 1.9, 2.9 calls respectively and achieved 34%, 49%, 67% levels of abstinence (based on responder quit rates). This paper expands our understanding of a real-world treatment program combining two mediums, phone and web. Results indicate greater use of the web program is associated with increased call completion and quit rates. The differential use patterns based on gender, age, and smoking level present an opportunity for tailoring integrated treatments to promote greater use and adherence. This study has implications for reaching and treating tobacco users with an integrated phone/web program, and offers evidence regarding the effectiveness of integrated cessation programs. Other findings and implications are discussed.  

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POS3-44  DEVELOPMENT AND EVALUATION OF AN ONLINE TOBACCO CESSATION TRAINING PROGRAM (WEBBREATHE) FOR PEDIATRIC RESPIRATORY THERAPISTS  

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Introduction: According to the National Association of Children's Hospitals and Related Institutions, respiratory illnesses represent the majority of cases seen at children's hospitals. The hospital setting is ideal for encouraging parents of children hospitalized with a respiratory illness to quit smoking, since the focus is on the child's overall health and the etiology of the medical problem. Aims: The specific aims of the study were to design and evaluate an online tobacco cessation intervention program, called WebBREATHe (Web-Based Respiratory Education About Tobacco and Health), specifically adapted for pediatric respiratory therapists (RTs) and nurses (RNs). Methods: Thirty-three pediatric RTs and 17 RNs currently employed at Cincinnati Children's Hospital Medical Center participated in an evaluation of the program using a pre/post-design. Results: Knowledge, attitudes, and self-efficacy regarding cessation advice significantly increased, and perceived barriers significantly decreased, as a function of program participation. In addition, the majority of participants rated the consumer satisfaction items as a 4 or 5 with 5 as most positive on a 5-point scale. Discussion: The results of the study indicated that the program was very effective at changing knowledge, attitudes, perceived barriers, and self-efficacy in the anticipated direction. Overall, the results of the evaluation were extremely promising.  

This research study was funded by a grant from the National Heart Lung and Blood Institute (R41-HL083540).  

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POS3-45  SMOKING CESSATION COMPETENCIES FOR HEALTH CARE WORKERS IN NEW ZEALAND  

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Competencies are the skills and knowledge needed to conduct the tasks and functions in a particular role. They provide standards against which an individual practitioner can assess their own level of competency, can be converted into learning outcomes for training, and provide a basis for planning professional development. Competency standards also help to maintain public confidence and give workers a clearer understanding of their work and best practice. The competencies were developed from three sources: a literature review of competencies measurable and relevant to New Zealand; the evidence for effectiveness of different interventions from the 2007 New Zealand Smoking Cessation Guidelines; and consultation with an expert advisory group plus smoking cessation providers throughout New Zealand. The literature search identified only a handful of relevant documents on smoking cessation advice significantly increased, and perceived barriers significantly decreased, as a function of program participation. In addition, the majority of participants rated the consumer satisfaction items as a 4 or 5 with 5 as most positive on a 5-point scale. Discussion: The results of the study indicated that the program was very effective at changing knowledge, attitudes, perceived barriers, and self-efficacy in the anticipated direction. Overall, the results of the evaluation were extremely promising.  

This research study was funded by a grant from the National Heart Lung and Blood Institute (R41-HL083540).  

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POS3-46  CHANGING CLINICAL PRACTICE AND BUILDING CAPACITY IN TOBACCO CESSATION: THE TEACH PROJECT

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Given the complexity of current smokers and evidence of a dose response relationship between intensity and duration of smoking cessation counseling, there is need to offer intensive interventions as an adjunct to brief screening and advice. Enhancing clinical practice through dissemination and training in empirically based tools and approaches is of increasing concern to health care funders, managers, providers and consumers; however there is some question whether such standard knowledge delivery formats as 2-3 day training sessions actually change clinicians' behavior. This presentation summarizes evaluation results of the TEACH project, including practitioners' intentions re: practice change, their specific practice objectives post-training, and actual changes to practice 3 and 6 months post-training. The TEACH project (Training Enhancement in Applied Cessation Counseling and Health) is a University-accredited certificate program designed to increase treatment capacity in intensive cessation programs in Ontario. The 248 participants rated their readiness to adopt key practice applications, and the feasibility and importance of integrating these applications into their daily practice. Ratings were completed pre- and post-training. Results show statistically significant improvements in practitioners' confidence in performing intensive cessation counseling. 90.7% of participants set goals for practice change, and received a personalized feedback summary post-training. Formative and summative workshop evaluations showed mean ratings of 3.6/4.0 for workshop content and 4.5/5.0 for relevance. Changes in clinicians' behavior were seen at three and six-month follow up (done via a brief, online survey): 61.7% had implemented practice changes at 3 months post-training, and 70.4% reported practice change at 6 month follow-up. The project also has developed an ongoing Community of Practice to further sustain practice change. TEACH demonstrates how knowledge transfer of a comprehensive evidence-based curriculum can be achieved, with resulting enhanced cessation treatment capacity over a wide geographic area with an inter-disciplinary group of health practitioners. Ministry of Health Promotion of Ontario, Canada Centre for Addiction and Mental Health.

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POS3-47  TAILORED SMOKING CESSATION PROGRAMS FOR WORKSITES

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Employers are increasingly offering wellness programs to their employees. In so doing, they have healthier employees, have greater retention than competitors, and have a more productive workforce. Such programs often focus on eating well and increasing physical activity, but less often incorporate specific smoking cessation programs. A state-funded regional tobacco cessation center, along with a large local managed health care plan, partnered to meet with various local worksites in order to implement programs to assist employees with smoking cessation. An assessment was conducted at each worksite, including recent employee survey data (conducted by the employers) and a needs assessment meeting with worksite leadership. Unique programs were then tailored to accommodate each site’s specific needs and requests by offering the a “menu of services,” most of which were state-funded interventions such as trainings, materials, Fax-to-Quiet procedures, quit-smoking groups, and assistance with Tobacco Free Environments, but also included resources provided by the company’s managed health care plan. Data collected to date will be presented to show how widely varying worksite settings (including companies that are multi-national, municipal, hospital, industrial, and private) differentially identified their needs and agreed to partner for specific services. Recommendations for worksite research on such tailored approaches will be presented.

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POS3-48  EVOLUTION OF MINNESOTA’S WORKSITE CESSATION PROGRAM


Worksites provide a unique opportunity for providing tobacco cessation. The QUIT-PLAN® at Work program, funded by ClearWay Minnesota(SM), has served over 2000 tobacco users and 231 Minnesota companies from January 2004 to present. The program has a 5-session curriculum with a corresponding counselor-training manual to ensure consistency around program delivery. The manual includes information about skills and techniques important for group facilitation. Six-month follow-up surveys of participants in 2005 (n=343) found a 19.0% 7 day point prevalence rate (ITT), however 55.5% reported relapsing after a quit of 30 days duration or longer at any time from registration to follow-up. Subsequently, several program changes were implemented in 2006. Access to NRT was improved by establishing a dedicated telephone line for clients to order gum, patch or lozenge. Tools such as stress balls, stress bands and flavor strips were added at each session to aid clients in their quit attempts. A series of seven relapse prevention cards/emails was developed for companies to distribute weekly after the program conclusion. Follow-up surveys of participants in 2007 (n=358) revealed a 7 day point prevalence rate of 26.5% at 6 months, a significant improvement from 2005 (p<0.05). The percent of participants abstaining for the past 30 days at 6 months was 20.0%, unchanged from 15.5% (NS). The percent who had abstained for 30 days sometime during the past six months was 52.3%, increased from 34.5%(p<0.05), however the relapse rate was unchanged at 56.0%. There was no relationship between self-reported receipt of relapse prevention messages and achieving abstinence or preventing relapse, however 24% relapsed in the 6th month, or two months after the last prevention card or email. Although there was no change in the pharmacotherapy use rate (65%), there was an increase of 24 percentage points in clients obtaining NRT from the program in lieu of buying products OTC or by prescription. Evaluation has informed programmatic improvements with subsequent improvement in sustained abstinence. This translation into process improvements will continue as the program continues to evolve.

No funding.

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POS3-49  UNDERSTANDING RELAPSE IN A WORK SITE CESSATION PROGRAM


Background: Work site programs are effective in assisting smokers to quit. QUITPLAN® at Work has served over 2000 tobacco users in over 230 Minnesota companies since January 2004. Prior research on QUITPLAN at Work established a 19.0% 7 day point prevalence rate (intention-to-treat) at 6 month follow-up. 55.5% of respondents had “relapsed” or achieved a quit of 30 days’ duration or longer at any time from enrollment to follow-up but reported using tobacco during the 30 days prior to follow-up. Understanding quit patterns among relapser can inform improvements to worksite cessation programs. Methods: All eligible enrollees in QUITPLAN at Work from January 2005 to October 2006 were contacted for a telephone survey 7 months post-enrollment. 257 participants responded for a 71.8% response rate. Results: Among respondents, 159 achieved a quit of 30 days or more post-enrollment. Of this group, 56.0% (N=89) had relapsed at 7-month follow-up. On average, relapers’ longest quit begins 26 days post-enrollment. The average duration of longest quit is 98 days. Relapse occurs, on average, 134 days after enrollment. 15-18% relapsed in each of the second, third, and fourth months following enrollment. Nearly 24% did so in the sixth month. Non-quiters, or participants who did not achieve a quit of 30 days at any time since enrollment, have a different pattern of quitting than relapers. Their longest quit occurs later after enrollment (76 days on average vs. 25, p<.013) and is shorter (7 vs. 98 days, p<.001). At follow-up, statistically similar proportions of relapers and non-quiters intend to make another quit attempt and both groups report moderately strong desire to quit. However, those who experienced the success of quitting for 30 days or longer use less tobacco (p<.001), smoke less often (p<.005) and are more confident in their ability to quit again (p<.034). Work site participants who relapse are making significant quit attempts following enrollment and appear to be well positioned for future success. Additional program efforts, such as relapse prevention materials provided even later than 12 weeks post enrollment, may benefit relapers.

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POS3-50

PSYCHOSOCIAL CONSTRUCTS RELATED TO LIGHT SMOKING REDUCTION IN A PROMINENTLY HISPANIC SAMPLE

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Light smoking is a common and often overlooked pattern of smoking that is especially prevalent among young adults and ethnocultural minority groups. Understanding psychosocial influences on light smoking is critical to the development and refinement of tailored cessation interventions. This study examined potential psychosocial influences on smoking rates among a sample of predominately Hispanic light smokers participating in a brief cessation intervention. At baseline and a one month follow-up, light smokers (n=148) completed measures assessing tobacco use and Transtheoretical Model (TTM) constructs, including Decisional Balance and Processes of Change measures. Following completion of baseline questionnaires, student smokers participating in a brief 45-minute intervention consisting of carbon monoxide feedback, motivational enhancement, the promotion of accessing social support, brief health education via costs of smoking and benefits of quitting smoking handouts, and when feasible setting a quit date. One month follow-up reports of average number of cigarettes smoked per day were regressed on the residual variances (i.e., unexplained variance) that represent the change between baseline and the one-month follow-up. After adjusting for baseline levels of smoking, the residual variance from baseline to follow-up for environmental reevaluation (IRR=.81, p< .05) was of marginal effect on cigarettes smoked (IRR=.78, p< .05, -21.6%). Other processes of change and smoking pros and cons were not significantly related to number of cigarettes smoked at follow-up. Though attending to stimulus control residual variance had a significant impact on cigarettes smoked (IRR=.81, p= .07) was of marginal effect on cigarettes smoked (IRR=.78, p< .05, -21.6%). Other processes of change and smoking pros and cons were not significantly related to number of cigarettes smoked at follow-up. However, there were slight differences in Readiness to Change groups (2.57 ug/m3) and the non-smoking control group (0.35 ug/m3). No significant differences existed between groups. This study supports the evidence that stimuli control was a significant factor in smoking reduction at follow-up.

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POS3-51

ADDRESSING ENVIRONMENTAL TOBACCO SMOKE REDUCTION IN A CHILD HEALTH CARE SETTING

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Scope: The present study tested the impact of a brief intervention emphasizing a Smoke-Free home message compared to an intervention emphasizing a Smoking Cessation message with smoking caregivers on smoking behavior in the home after discharge from an intensive care nursery. Given the likely importance of motivational variables in the successful initiation and maintenance of smoking behavior change, this study also examined the utility of a brief intervention for increasing intentions for having a Smoke-Free home.

Method: Fifty-three smoking caregivers of infants admitted to a Neonatal Intensive Care Unit were randomly assigned to one of three groups. The Usual Care Group (UCG) received brief information about the hazards of ETS exposure along with advice from their physician. The Smoking Cessation Group (CESS) and the Smoke-Free Group (SFH) received a brief intervention following the Clinical Practice Guideline for Treating Nicotine Dependence. An additional 25 non-smoking caregivers were recruited as a comparison group. Initial measures of caregiver smoking were assessed using a carbon monoxide (CO) monitor and caregiver-report. Alternative measures of success (i.e., harm reduction) included progression along the stages of change model as measured by the Stages of Change Algorithm. Groups were compared on nicotine monitor levels in the home and parent report of smoking at three months post hospitalization. Additional analyses were run to determine the relationship of the Stage of Readiness to stop smoking on the rate of ETS exposure in the home.

Findings: The results indicated passive nicotine monitoring levels for smoking caregivers who did not receive any intervention had significantly higher passive nicotine monitor readings at follow-up (8.54 ug/m3) when compared to the intervention group (2.57 ug/m3) and the non-smoking control group (0.35 ug/m3). No significant differences were found between the smoking caregivers in the number of cigarettes smoked at follow-up. However, there were slight differences in Readiness to Change to have a Smoke-Free Home in the intervention groups compared when the UC group

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POS3-52

SMOKELESS TOBACCO INITIATION PRODUCTS

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Introduction: Initiation of smokeless tobacco use is influenced by several factors, including palatability of the products and their nicotine and pH content affecting nicotine absorption. Starter products have lower nicotine levels and pH, reducing nicotine absorption, and enticing flavors increasing their acceptability. This study examines the course of smokeless tobacco product use from initiation to regular use in a treatment seeking population.

Methods: Smokeless tobacco users (N=335) were recruited for three tobacco use reduction studies. Subjects attended a baseline visit where they completed a tobacco use history questionnaire, including information on the first smokeless tobacco brand ever tried, first brand used regularly, first brand daily and current brand. In addition, subjects reported cut of tobacco and flavor.

Results: Subjects were male moist snuff users with an average age of 33.5 (SD=7.4) who used mean of 4.3 tins per week (SD=2.1) and initiated daily use at the age of 19 (SD=5.7). Average age of first trying smokeless tobacco was 16.5 (SD=5.4). At entry into treatment, one third of the subjects used Copenhagen; Kool 39%; Skoal 15%; Grizzly 8%; and other 5%. The smokeless tobacco product first tried by subjects was Copenhagen 25%; Skoal 29%; Kool 26%; Hawken 8%; Redman 6%; and other 6%. The product reported as the brand first used “regularly” was Copenhagen 23%; Skoal 31%; Kool 40%; Hawken 3%; Redman 2% and other 1%. The majority of the users reported using a flavored product: 63% at initiation; 70% for their first regular brand and 57% for current brand.

Conclusions: Half of this sample initiated their smokeless tobacco use with brands that delivered lower nicotine levels, but by the time subjects were seeking treatment an additional quarter of those subjects had moved to the higher nicotine brands. The majority of subjects started with a flavored brand of tobacco and reported continued use of a flavored product. New multiple flavored smokeless tobacco products, with expanded brand names, are being test marketed. It will be important to monitor these products to evaluate their contribution to initiating smokeless tobacco use.

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POS3-53

RELATIONSHIP BETWEEN CIGARETTE USE AND MOOD/ANXIETY DISORDERS AMONG PREGNANT SUBSTANCE-DEPENDENT WOMEN

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Objective: Among the general pregnant population, significant associations exist between mental disorders and lifetime nicotine dependence. This study investigates the association between cigarette use and mood/anxiety disorders among pregnant substance-dependent patients.

Methods: Pregnant methadone-maintained women (N=122) completed the Addiction Severity Index and Structured Clinical Interview for DSM-IV. At treatment entry, participants were categorized into groups based on past 30 days cigarette use: no smoking (0 cigarettes/day; n=15), light smoking (1-10 cigarettes/day; n=55), and heavy smoking (11+ cigarettes/day; n=52).

Results: Rates of current major depressive disorder were 13.3%, 52.7%, and 44.2% for no, light and heavy cigarette users, respectively. Rates of current post-traumatic stress disorder were 7.1%, 44.6% and 36.5% for no, light and heavy cigarette users, respectively. Rates of current substance-induced mood disorder were 0.0%, 12.7% and 16.4% for no, light and heavy cigarette use respectively. Any cigarette smoking during pregnancy significantly predicted current major depressive and posttraumatic stress disorders (p = 0.025 and 0.036, respectively). No significant association was found between cigarette use and substance-induced mood disorders (p = 0.276).

Conclusion: Among pregnant methadone-maintained women, significant associations exist between major depressive and posttraumatic stress disorders, but not substance-induced mood disorders, and cigarette use. These results support those from a general pregnant population (Goodwin et al Obstet Gynecol. 2007:109:875-88). These findings have implications for the mental and physical health of methadone-maintained women and their children. Thus, cigarette smoking may be a useful marker and low cost mechanism for identifying pregnant substance-depend-ent patients who are at higher risk for having one of these psychiatric disorders.

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POS3-54

**“REAL WORLD” SMOKING CESSATION TREATMENT OUTCOMES AMONG DIVERSE LOW-INCOME SMOKERS**

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Prior research suggests that racial minority smokers experience more difficulty with cessation than Caucasian smokers, and access formal treatment less often. There has been speculation that treatment may yield different results in minority smokers. However, evidence regarding the effectiveness of cessation treatments in minority smokers is limited because clinical trials have been predominantly conducted among Caucasians. The purpose of this prospective, observational cohort study was to compare long-term cessation outcomes among four racial groups after an aided quit attempt using nicotine replacement therapy (NRT). Stratified on race, we randomly selected a cohort of low-income smokers (N=1782) who recently filled a prescription for nicotine replacement using Minnesota HealthCare Programs (e.g., Medicaid) pharmacy claims databases between July 5th through September 2006. Using a mixed-mode survey protocol (mailed, self-administered survey plus telephone follow-up) approximately 6 months after the index prescription fill date for NRT, we assessed smoking abstinence outcomes. The overall survey response rate was 59.3% (n=1088, 95% CI 56.0%, 62.5%) with 788 respondents for the mailed survey and 250 respondents for the phone survey. Among survey respondents, at six months, 7-day point prevalence abstinence rates (Chisq=3.43, df=3, p=0.33) and 30-day abstinence rates (Chisq=8.89, df=3, p=0.02) did not vary significantly by the mailed survey. 7-day abstinence rates were 13.3% for Caucasians (95% CI 9.1%, 17.7%), 14.7% for African Americans (95% CI 9.9%, 20.1%), and 20.7% for Asians (95% CI 12.0%, 32.9%). 30-day abstinence rates were 9.7% for Caucasians (95% CI 6.7%, 12.8%), 8.4% for African Americans (95% CI 5.2%, 11.5%), 8.7% for Native Americans (95% CI 5.4%, 12.0%) and 18.3% for Asians (95% CI 9.9%, 26.7%). Results indicate smoking cessation treatment including NRT yields similar results across racial groups. Given documented racial disparities in use of cessation treatments, interventions are needed to improve access and utilization of evidence-based treatments in low-income minority groups.

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POS3-55

**DIFFERENCES BETWEEN PUERTO RICAN, DOMINICAN, AND NON-LATINO WHITE SMOKERS IN ATTITUDES, BELIEFS, AND SMOKING HISTORY**

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Smoking rates among Latinos varies by acculturation level (Abaro-Lanza, 2005). Because Puerto Rico (PR) is a territory of the US, there is a circular pattern of migration compared to other Latino subgroups, which is associated with greater acculturation. Among Latinos, higher acculturation levels have been associated with greater smoking, which lends support to the nativity or mortality paradox (Turner, 2006). We hypothesized that PRs would have more severe smoking behaviors than those from the Dominican Republic (DRs), and that attitudes regarding quitting (motivation and confidence to quit) would be more positive for DRs compared to PRs and Non-Latino Whites (NLWs). Participants (N=162; PR n=66; DR n=30; NLWs born in US, 79 female, M age=35) were from two separate studies on motivating parents of children with asthma to quit smoking (PAQS, Parents of Asthmatics to Quit Smoking). Descriptive analyses examined demographic, psychosocial, smoking history and beliefs, acculturation, and ETS smoking behavior. ANCOVAs controlled for age and education. Results show that PRs were significantly more nicotine dependent (p<0.005), smoked more cigs/day (p<0.001), had less motivation to quit (p<0.005), and had less confidence to quit (p<0.05) than DRs. DRs reported greater daily hassles (p<0.005) compared to NLWs. A greater proportion of DRs also had a total household smoking ban for their home (80.0%) compared to PRs (43.9%) and NLWs (33.6%) (p<0.05). Fewer DRs were categorized in precontemplation (3.1%) compared to PRs (16.1%) and Caucasians (10.9%). Results provide evidence for the Latino nativity/mortality paradox.

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POS3-56

**TOBACCO CESSATION IN ECONOMICALLY DISADVANTAGED DOMINICAN REPUBLIC COMMUNITIES**


This paper reports results of the first organized tobacco control effort in the Dominican Republic. Six economically disadvantaged communities were matched on geographic characteristics (2 urban, 2 peri-urban, 2 rural) and randomized to intervention or control conditions using a lagged treatment design. Community-partnered interventions included awareness-raising (radio PSA’s, talks, health fairs, materials) and intervention resources (health care provider training, tobacco control specialists, radio and in-person classes, materials), with a one-year treatment-control comparison period followed by a second year in which all communities received intervention. Surveys were conducted at baseline and at the end of each two-year period (1050 household surveys, 402 smoker cohort surveys per year). Results indicated increased exposure to awareness raising activities in intervention communities in year 1 (e.g., increased exposure to information on risks of smoking through radio, grocery stores, schools, health care sites; p<0.001) that continued into year 2, with less consistent implementation in control communities when interventions were implemented in year 2. Social acceptability of smoking decreased in intervention communities (p<0.001) over time, with a nonsignificant similar trend in control communities in year 2. Use of cessation resources increased in intervention communities (p<0.001); this effect was replicated in control communities. No effect on health care provider behaviors was found. Significantly higher unadjusted quit rates were found among smokers in intervention communities in year 1, and quit rates continued to increase in year 2 (p<0.005). This effect was replicated for control communities in year 2 (p<0.005). Results suggested the effectiveness of the intervention, with indication of processes that supported the change as well as areas for further impact.

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POS3-57

**STUDY OF SMOKING CESSATION PAST EXPERIENCE AMONG SMOKERS VISITED SMOKING CESSATION SERVICE**

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The purpose of the present work is to explore some peculiarities regarding smokers’ past experience of smoking cessation. Materials and methods: 238 current smokers aged 20 -70 years visiting smoking cessation service were interviewed before the counseling with using structured questionnaire to detect their smoking behavior and prior quit experience. 55% of smokers in the study cohort have smoked 20 years and more and 34% more than 30 years.

Results: The majority of smokers visited smoking cessation service (78%) had previously tried to quit at least once. Out of these 65% had only one attempt to quit and 35% had 2 and more attempts. The special analysis revealed that the most often main reason of a quit attempt among women was a pregnancy (70%) and among men, bad feeling or a disease (80%). It is noteworthy that only 3% of women and 7% of men had tried to quit on a physician advice. Moreover the majority of smokers tried to quit on own not using any special methods. The study revealed great variation of a relapse time. Almost half of smokers (48%) had relapse in the first month after stopping smoking and thereafter it considerably declines in the next months. Nonetheless, 16% of smokers had relapse after more than 1-year abstinence and 4% for after 2-year abstinence. Depression or anxiety, alcohol use, smoking urges were the most often reasons of a relapse.

Conclusion: These findings again confirm that great majority of current smokers need skilled smoking cessation assistance and they could not receive any professional counseling or assistance in quitting tobacco in Russian state Public Health Service. So there is a critical need for the creation and implementation of a community based intervention to provide smokers with skilled smoking cessation assistance including relapse prevention measures.

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Some, but not all, studies report that exercise promotes higher abstinence rates and greater withdrawal relief in comparison to an equal contact control condition. These inconsistencies may result from an unclear definition and execution of ‘Moderate’ and ‘Vigorous’ intensity exercise prescribed in these studies. Verbal descriptions of exercise intensity (moderate or hard/vigorous) do not always correspond to an identified heart-rate (HR) categories proposed by the American College of Sports Medicine (ACSM). Because the prescribed exercise level may span categorically across different intensity levels in the same protocols, it is unknown if inconsistent results regarding the efficacy of exercise are due to differences in exercise intensity or other factors. We examined the cessation and withdrawal outcomes by partitioning and reanalyzing data from subjects who exercised at identifiable intensity levels. In this study, 92 sedentary female smokers were instructed to exercise at an intensity level of 60-80% of their HR-Max 3 times a week. An additional 57 subjects attended Equal contact control group sessions at the same rate. We recorded exercise data during 3 weeks pre- and 2 weeks of post-cessation. During this 5-week period the exercise group exercised on average at 78.0% intensity of their HR-Max (range 60.5-103.5%). Based on the recorded data, subjects were classified as having exercised at either the ‘Moderate’ or the ‘Hard/Vigorous’ intensity level using the new ACSM exercise intensity criteria. The subjects at the ‘Vigorous’ intensity level had a mean HR-Max of 84.6%, and those in ‘Moderate’ level 71.3%. At the 4-month follow-up, abstinence rates were 37.1% for ‘Vigorous’ exercisers, 17.1% for ‘Moderate’ (p=.04), and 23.0% for Equal contact control group (p=.11). At 1-week follow-up, abstinence rates were 37.1% for ‘Vigorous’ exercisers, 17.1% for ‘Moderate’ (p=.04), and 23.0% for Equal contact control group (p=.11). At 1-week follow-up, abstinence rates were 37.1% for ‘Vigorous’ exercisers, 17.1% for ‘Moderate’ (p=.04), and 23.0% for Equal contact control group (p=.11). At 1-week follow-up, abstinence rates were 37.1% for ‘Vigorous’ exercisers, 17.1% for ‘Moderate’ (p=.04), and 23.0% for Equal contact control group (p=.11). At 1-week follow-up, abstinence rates were 37.1% for ‘Vigorous’ exercisers, 17.1% for ‘Moderate’ (p=.04), and 23.0% for Equal contact control group (p=.11). At 1-week follow-up, abstinence rates were 37.1% for ‘Vigorous’ exercisers, 17.1% for ‘Moderate’ (p=.04), and 23.0% for Equal contact control group (p=.11).
POS3-60

IMPORTANT OTHER AUTONOMY SUPPORT AND MOTIVATION TO STOP SMOKING

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Additional research is needed to understand factors that predict maintenance of tobacco abstinence. One domain of interest is assessing and changing the broader social network of smokers trying to quit to support abstinence. Indeed, the 2000 Public Health Service Guideline estimates that arranging extra-treatment support increases tobacco abstinence by 50%. Self-determination theory posits that autonomy support from the health care climate (HCCAS) and important others (IOAS) has the potential to internalize motivation for cessation and to influence tobacco abstinence. Participants were 376 individuals enrolled in the Smokers’ Health Project (SHP). Data reported are from baseline assessments and reflect participants’ intention to quit in the next 30 days. On average, participants smoked 19.4 cigarettes per day and had been smoking 27.9 years. We predicted that IOAS (measured on the Important Other Climate Questionnaire) would be associated with greater autonomous self-regulation (ASR) and perceived competence for cessation, independent of HCCAS (measured on the modified Health Care Climate Questionnaire). ASR and perceived competence for cessation would, in turn, be associated with greater likelihood of intention to quit. First, IOAS was uniquely associated with ASR for cessation (b=16, p<0.01; HCCAS was not (b=0.06, p>0.50). Both HCCAS (b=16, p<0.01) and IOAS (b=21, p<0.001) uniquely predicted perceived competence for cessation, with IOAS as the stronger predictor. ASR and perceived competence for cessation, in turn, predicted intention to quit (b=0.40 and 0.12 for ASR and perceived competence respectively, p<0.05). Together, IOAS and HCCAS predict the daily intake of important non-professionals in the smokers’ lives. SHP is designed to intervene with important others to encourage autonomy support away from the study, and after the intervention is over to facilitate maintenance of abstinence.

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POS3-61

NICOTINE METABOLISM IN ORIENTAL MALAY SMOKERS

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Objective: To determine distribution of nicotine metabolism in Oriental Malay smokers. Method: A cross sectional study was carried out in Malaysia between April 2005 and June 2005. A total of 69 Oriental subjects were recruited. Demographic data was assessed using self-report questionnaire and nicotine dependence was assessed using the Fagerström Test of Nicotine Dependence (FTND). Blood samples were taken to measure plasma nicotine and plasma cotinine 2 hours after chewing a piece of 2 mg nicotine gum. Nicotine metabolism was determined by calculating the ratio of plasma cotinine/nicotine.

Results: The subjects were mainly males (n=60), mean age 34 years, single, educated up to first degree or above, who smoked mean 14 cigarettes/day and smoked filtered standard cigarettes. They started smoking at mean age 16.9 years old and regularly smoked at mean age 19.5 years old, and had FTND score of 2.6. There was wide variability in nicotine metabolism among Oriental Malay smokers as evident from the wide range of plasma cotinine/nicotine ratios (range 0.0 - 2548). A proportion of the Oriental Malay smokers (22.8%) had a deficient capability of converting nicotine to cotinine (Poor Metabolizers (PM)), and 14% of the Oriental Malay smokers metabolized nicotine rapidly (Ultra-Rapid Metabolizers (UM)). The Oriental Malays who had poor nicotine metabolic status had generally stopped smoking for > 6 months before the study, smoked fewer cigarettes, started smoking at an older age and were less nicotine dependent than those with ultrapid nicotine metabolic status.

Conclusion: Our findings suggest variability in the distribution of nicotine metabolism among Oriental Malay smokers. These findings may have important implications with regard to optimizing treatments in smoking cessation programs in Oriental Malay smokers.

This study was conducted while the first author was at Institute of Psychiatry, King’s College London, United Kingdom. Supported by grant from King’s College London Postgraduate Research Fund 2005, 2004 and 2005 and grant from University of Malaya, Kuala Lumpur.

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POS3-62

IMPACT OF HEALTHCARE CONCERNS OF SMOKERS WITH MENTAL ILLNESS


Purpose: Clinicians commonly perceive that patients with psychiatric co-morbidities are less able and less willing to quit smoking. We studied the impact of mental illness on the quit attempts of smokers enrolled in treatment for tobacco dependence.

Methods: IRB approval was obtained. Questionnaires elicited self-reported information on demographics, current medication usage, medical history, and obstacles/reasons for quitting. 615 [psych] smokers vs. 970 [non-psych] smokers reported a medical history of depression/anxiety and/or taking medication: antidepressant, or anxiolytic, or anti-anxiety medication. Behavior modification and pharmacotherapy were utilized to promote smoking cessation. At 30-day mark, quit status was validated via carbon monoxide. One-year follow up was done. Data analysis SAS®.

Results: Psych group reported more co-morbidities: cardiac: 52% vs. 40% (p<0.0001), cancer 11% vs. 5% (p=0.001), pulmonary asthma/COPD 55% vs. 19% (p<0.0001). Psych group was more likely to have been hospitalized in the previous year 19% vs. 13% (p=0.001), more likely to be quitting due to: pressure from their MD 27% vs. 18% (p<0.0001), and more likely to report stress of a major health problem: 73% vs. 51% (p<0.0001). Psych group were less likely to be motivated to quit based on a recent change in health status (p<0.0001). 51% psy vs. 37% non-psych report: cigarettes control my life (p<0.0001), and report they would continue to smoke even if sick in bed 61% vs. 47% (p<0.0001). Short-term [30-day] quit rate 49% vs. 57% (p=0.0002) and the long-term [1-year] quit rate 30% vs. 33% (p=0.11).

Conclusions: Our cohort revealed 40% smokers with psychiatric co-morbidity yet short term and long-term quit rates are quite substantial. Addressing the unique healthcare issues of smokers with mental illness is a promising strategy to increase cessation rates in this cohort of smokers. Psychiatrists/Psychologists have a unique opportunity to incorporate tobacco dependence education into their treatment plans.

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POS3-63

THE UNIVERSITY OF WISCONSIN'S TRANSDISCIPLINARY TOBACCO USE RESEARCH CENTER (TTURC-2): PREDICTORS OF CAROTID ATHEROSCLEROSIS IN CURRENT SMOKERS


Carotid intima-media thickness (CIMT) and carotid plaque presence are well-established markers of subclinical atherosclerosis that independently predict future cardiovascular (CV) events. Smoking is a risk factor for increased CIMT, however the predictors of carotid atherosclerosis among smokers and non-smokers are not well understood. The purpose of this study was to determine predictors of carotid atherosclerosis among current smokers in the UW-CTRI TTURC-2 Cohort 1, a longitudinal study evaluating the effects of continued smoking and smoking cessation on CV risk factors and atherosclerosis progression. B-mode ultrasound images of the common, bulb, and internal carotid artery segments were obtained with a high-resolution line array transducer (CV70, Siemens Medical Solutions, Mountain View, WA). The mean far wall CIMT of each common carotid artery was measured using a semi-automated border detection program. Multivariable linear regression models were created to determine associations between CV risk factors and CIMT. Multivariable logistic regression models were used to identify predictors of carotid plaque presence and to calculate odds ratios (OR) and 95% confidence intervals. CIMT was measured in 155 current smokers. Preliminary data from 568 subjects (mean [standard deviation] age 44.9 [11.2] years, 60% female, 86% white, 12% African-American) were available for analysis. They had smoked for 38.8 (26.8) pack-years. Composite mean CIMT was 0.696 (0.115) mm. Predictors of CIMT (model R2=0.457, p<0.001) were increasing age (p<0.001), waist circumference (p<0.001), systolic blood pressure (p<0.001), pack-years (p<0.001), and increased number of cigarettes smoked (p<0.001). The total/HDL cholesterol ratio (OR 1.27 [1.09-1.49], p<0.002), age (OR 1.21 [1.05-1.39], p=0.002), pack-years (OR 1.10 [1.04-1.18], p=0.004), and waist circumference (OR 0.97 [0.94-0.98], p=0.01) predicted the presence of carotid plaques. Among smokers, carotid atherosclerosis is associated with standard CV risk factors, as well as increasing waist circumference and pack-years smoking. CV risk factors should be aggressively treated along with continued efforts at smoking cessation.

This study was conducted at the University of Wisconsin and supported by NIH Grant # P50-DA0197-06.

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POS3-64
IS IT WHO WE KNOW?: SOCIAL NETWORKS PREDICT SMOKING RELAPSE
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Recent research suggests that social networks play an important role in risk for negative health outcomes (Christakis & Fowler, 2007). In smoking cessation research, such network analyses are rare. Some studies have linked smoking cessation failure to a lack of social support (e.g. Lu et al., 2003). Other studies have found the having a lot of friends who smoke predicts relapse (McKee, et al., 2003). However, few studies have completed in depth social network measures to determine the relative importance of such variables. In the current study (n=1504, 58% female, 83% Caucasian), we conducted an in depth, validated assessment of the social network (e.g. network size, amount of social support, number of network members who are smokers, number of members who are drinkers). We then assessed the relations of these variables to smoking relapse during a clinical trial. We first conducted a series of univariate logistic regressions (controlling for gender, treatment, and FTND score) to determine which social network variables were associated with relapse at 12 weeks post-quit. Then, using Homser and Lemeshow’s (2000) model-building strategies, we formed best-fitting models of social network variables that predicted smoking relapse at 12 weeks post-quit. The best-fitting model included two variables associated with higher rates of relapse (percent of network who were family members; number of contact days with heavy drinkers) and four variables associated with lower rates of relapse (having a spouse/partner; number of smoker friends in network; number of non-smokers in network; number of men in network). We will also present results regarding gender differences in social networks. Thus, we found that it was not the amount of social support per se or network size that supported abstinence from smoking; it was the composition of the network. Specifically, the likelihood of relapse was lower if the smoker had a partner/spouse and if the social network comprised a relatively high number of non-smokers/ex-smokers, and men.

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POS3-65
TRAIT HOSTILITY AS A PREDICTOR OF SMOKING CESSATION TREATMENT OUTCOME
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Trait hostility has been implicated as a risk factor for poor smoking cessation treatment outcome in a prior study (Kahler et al, 2004). However, this initial study included only smokers with a history of major depressive disorder, relied solely on the Cook Medley Hostility scale as an index of hostility, and did not include measures of related constructs such as aggression, anger, and neuroticism. In the present study, we sought to replicate and extend these findings by examining the ability of trait hostility to predict smoking cessation outcome in comparison to aggression, anger, and neuroticism. Subjects were 92 smokers seeking cessation treatment in a trial designed for heavy social alcohol drinkers. Results indicated that the abbreviated version of the Cook-Medley scale (Strong et al., 2005), which focuses narrowly on social maltraitment, mistrust, and cynicism, did not significantly predict smoking abstinence over 6 months, whereas the hostility subscale of the Aggression Questionnaire (Bryant and Smith, 2001), which focuses on perceptions of having bad luck and feeling bitter about life, did. Related constructs such as physical aggression, verbal aggression, trait anger, neuroticism, and depressive symptoms did not account for the association between hostility and poor smoking outcome. Results indicate that the facet of hostility most relevant to smoking cessation outcome may be the tendency to believe that one has bad luck and has gotten a raw deal out of life. Further examination of how this worldview contributes to smoking cessation failure is warranted as this facet of hostility may prove a valuable target for smoking cessation interventions.

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POS3-66
A BRIEF SEVEN DAY ESTIMATE OF ALCOHOL CONSUMPTION FOR USE IN SMOKING CESSATION CLINICAL TRIALS
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Evidence from several clinical trials suggests that drinking alcohol during a smoking cessation attempt increases the likelihood of relapse to cigarettes. Moreover, alcohol is frequently cited as a precipitant of smoking relapse, and alcohol consumption is associated with behaviors that may favor smoking. Given these sentiments of drinking behavior should be included in smoking cessation clinical trials. However, most studies do not do so, often because of the extra time burden required for these assessments. In order to maximize the amount of information to be gleaned about daily alcohol consumption while limiting the assessment burden, we sought to examine the relationship between short and longer periods of monitoring for a number of drinking metrics that can be derived from the Timeline Followback (TLFB), including percentage of days abstinent, percentage of heavy drinking days, and drinks per drinking day. In the TLFB method, retrospective reports of the number of standard drinks consumed on each day during a specified period are obtained using a calendar with memory prompts. Data from participants (N = 634) in two smoking cessation clinical trials were used to examine the relationship between short and longer periods of monitoring for the TLFB (7 days vs. 1 month) on alcohol use. Drinking was examined within each treatment (high vs. low risk) and across the treatment period. Absolute values were used to examine the relationship between short and longer periods of monitoring for the TLFB (7 days vs. 1 month) on alcohol use. Drinking was examined within each treatment (high vs. low risk) and across the treatment period. Absolute values were used to examine the relationship between short and longer periods of monitoring. High correlations (range: 0.64 to .98) were found between short (7 & 14 days) and longer (30 & 60 days) time windows for baseline drinking data. Overall, inter-correlations between time windows of baseline drinking data and drinking data over the smoking cessation treatment period were in the moderate to high range (ranged from 0.36 to .90). These data suggest that a 1-week measure of drinking at baseline provides a good representation of baseline drinking. During treatment, however, longer monitoring periods seem warranted. When drinking during the last week of treatment was compared to the entire treatment period, reductions in drinking from baseline were only modestly related. Thus, using a 7-day estimate of alcohol use over 7 days at baseline and weekly during treatment could be used to capture alcohol drinking in smoking cessation clinical trials.

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POS3-67
COMPARING BLACKS' AND WHITES' ATTITUDES AND BELIEFS ABOUT GENETIC TESTING FOR NICOTINE ADDICTION: A COMMUNITY-BASED QUALITATIVE STUDY

Background: Emerging research may make it possible to tailor pharmacological treatment for tobacco dependence by genotype. However, many patients lack awareness and basic knowledge about genetic testing, especially those from racial/ethnic minorities. This work explored patients’ attitudes about using genetic testing to match smokers to optimal pharmacotherapy.

Methods: Six focus groups were conducted with Black participants and 6 with White participants in Montgomery, AL and Baltimore, MD. 8 groups consisted of smokers only. We used a structured interview guide with questions about participants’ beliefs about the relative importance of genetics in addiction to tobacco, benefits and barriers to taking a test that would match them to the best pharmacotherapy, and their likelihood of taking this test. Data were analyzed using thematic content analysis.

Results: 81 Blacks and 55 Whites participated in the focus groups: half were female, with a mean age of 45 years. More than half did believe genetics played a significant role in becoming addicted to nicotine; Blacks were more likely than Whites to express a distrust in the link between genetics and addiction. Nicotine. Reasons for taking the test included proving the gene/addiction connection and a relatively vague sense that more information would be helpful. Reasons for not taking the test included skepticism about the usefulness of the test, concerns about the “demotivating” consequences of the test results, and worries about who will have access to the test results. The most frequently cited barrier was concern that the test results may have negative emotional implications for individuals and their families (e.g., engendering hopelessness). Nevertheless when asked to rate their likelihood of taking the test, it was very likely (to Blacks) and moderately likely (to Whites) that they would take it and whites were more likely (mean=4.7) than Blacks (mean=3.6). Conclusions: The majority of participants speculated that they would be willing to undergo testing; Whites were more willing to do so than Blacks. Participants identified some benefits to tailoring smoking treatment by genotype but raised important concerns.

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POS3-68  SMOking and Dimensions of DEPRESSION

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We examined longitudinally how smoking behavior is associated with three dimensions of depression among Finnish adult twins (4504 men, 5469 women). Smoking behavior was measured in 1975 and 1981 classified as either never smokers or ever smokers (including persistent and former smokers). Depressive symptoms were measured with the Beck Depression Inventory (BDI) score in 1990. Dimensions of depression defined by factor analysis were Negative Attitudes Towards Self (NATS), Performance Impairment (PI), and weight loss (WL). Due to skewed distributions, each dimension score was used as a dichotomous outcome (low/high). In the multiple logistic regression models the Odds Ratios (OR) with 95% Confidence Intervals (CI) of ever versus never smoking (reference category) were calculated for the risk of a high BDI dimension score. The analyses were adjusted for potential confounders (socio-demographic and -economic background, other health behaviors, chronic somatic conditions, social network, emotional support, life events, neuroticism, life satisfaction, self-assurance, conscientiousness, hostility, openness). Further, we controlled for familial confounding by analyzing twins pair discordant for a depression dimension as matched cases and controls in the conditional logistic regressions. Finally, we controlled for genetic influences by conducting similar analyses in monozygotic (MZ) and dizygotic (DZ) pairs. Based on logistic regressions, among men ever-smoking was a risk factor for all dimensions: NATS (OR=1.3, 95% CI 1.0-1.5), PI (1.2, 1.0-1.4), and WL (OR=1.5, 1.2-1.8). Among women smoking was not related to any of the dimensions. Discordant twin pair analyses among men showed that ever-smoking remained associated with NATS (OR=1.9, 1.0-3.5) (n=307 pairs). When stratified by zygosity the association was significant only among the DZ (OR=2.0, 1.0-4.2) pairs. Among female pairs ever smoking was associated with PI (OR=1.7, 1.0-2.9) (n=460 pairs), with no difference by zygosity (MZ OR=1.7, 0.4-7.5; DZ OR=1.6, 0.9-2.9). We conclude that association of smoking with depression may have different patterns among men than women.

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POS3-69  KEY DECISION-POINTS IN CONDUCTING CUE-EXPOSURE THERAPY FOR SMOKING CESSATION

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Cue-exposure has received significant attention and interest as a treatment option for addictive behaviors. Steeped in the principles of Pavlovian learning and extinction, cue exposure therapy (CET) involves repeated exposure to substance-associated cues in the absence of drug ingestion to extinguish conditioned cravings and reduce the likelihood of relapse. To date, the efficacy of CET in the treatment of a variety of addictive disorders has been disappointing, but recent research has shifted toward identifying ways to improve CET. One challenge toward that effort is the lack of standardized, basic research-based methods for conducting CET. This overview, based on the development of procedures of an ongoing CET study, will highlight important methodological decision-points to be considered in designing and implementing CET studies for smoking cessation. Key decisions to consider include: cue presentation modality (e.g., in vivo, imaginal, photographic, video); selection of cues (e.g., proximal, distal, affective, personal); number, duration, and timing of cues and sessions; selection of cue reactivity measures; and translation of recent basic research findings into clinical application. Practical and theoretical advantages and disadvantages of each decision-point will be discussed. Research is needed to determine and systematize optimal methodological parameters for CET. Future efforts to improve CET efficacy for smoking cessation should be guided by contemporary animal extinction research and theory, findings from CET research on substance abuse and other disorders, as well as practical and clinical considerations.

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POS3-70  DECREASES IN POSITIVE MOOD PREDICT RELAPSE AMONG DEPRESSION PRONE SMOKERS FOLLOWING CESSATION TREATMENT WITH BUPROPION AND CBT FOR DEPRESSION

David R. Strong*, Christopher W. Kahler, Ana M. Abrantes, Elizabeth Lloyd-Richardson, Raymond Niaura, and Richard A. Brown, Warren Alpert Medical School of Brown University; Butler Hospital

Smokers prone to depression may be more susceptible to increases in negative affect (NA) and decreases in positive (PA) prior to and following cessation treatment. Given the importance of affective changes in predicting relapse to smoking, the current study examined the effects of bupropion and cognitive behavior therapy for depression (CBT) on changes in PA, NA, craving, and withdrawal severity among smokers with varying levels of depression proneness. Participants were 524 smokers (47.5% female, 44.27 years) who were randomized to one of four 12-week treatments: (1) standard, cognitive-behavioral smoking cessation treatment (ST) plus bupropion; (2) ST plus placebo; (3) standard cessation treatment combined with CBT plus bupropion; and (4) CBT plus placebo. Depression proneness was assessed with the Depression Proneness Inventory (DPI) prior to treatment. PA and NA were assessed using the PANAS along with measures of smoking behavior and withdrawal symptoms prior to and weekly during treatment. Follow-up assessments occurred 2, 6, and 12 months after treatment. RESULTS: Using linear mixed-models, neither bupropion nor CBT had an effect on decreases in PA or increases in NA prior to quit date (p > .10). Bupropion did attenuate increases in NA and craving on quit date (p < 0.01) but did not attenuate decreases in PA (p > 0.10). Survival analyses suggested that decreases in PA prior to quit date and levels of PA on quit day were significantly related to risk for early lapse (p's < .01). Increases in NA were not related to risk for lapse (p > .10). Depression prone smokers had lower levels of PA and higher levels of NA both prior to quitting (p < 0.01) and after cessation (p < 0.01). There was a significant interaction between decreases in mood prior to quit date and baseline levels of Depression Proneness in predicting the risk for smoking lapse (p < 0.02). Depression proned smokers with decreased positive mood prior to quit day were at particularly high risk for earlier lapse and significantly less likely to be abstinent at 12 months. (OR = 0.51; p < .05).

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FEELING BETTER AND SMOKING LESS: THE RELATIONSHIP BETWEEN TRAUMA SYMPTOMS AND SMOKING OVER TIME

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Objective: Although it is well documented that individuals who have experienced traumatic events smoke cigarettes at significantly higher rates than individuals without trauma exposure, little is known regarding the specific relationship between smoking and trauma-related symptoms. This purpose of this present study was to explore the course of smoking over time in a traumatized population.

Method: The study was conducted using a naturalistic dataset from participants who were in individual or group therapy and/or mediation management for trauma-related disorders at a Boston VA. Participants were 288 female veterans who had experienced one or more traumatic events. Results were determined by a self-report of demographic questions related to smoking and trauma symptoms as reported on the Trauma Symptom Inventory (TSI).

Results: Consistent with previous cross-sectional research, across time points more trauma symptomatology was associated with higher rates of smoking. Longitudinally, smoking decreased sharply among women with higher negative affect but remained relatively constant among women with lower affect scores over time. Among women with fluctuating negative affect over time, increases in symptomatology were associated with increases in smoking; decreases in symptomatology were associated with decreases in smoking.

Conclusions: The findings are in concordance with previous research suggesting the existence of a relationship between smoking behavior and trauma-related symptoms. In addition, our results suggest that for individuals with trauma histories, particularly those high in negative affect, decreased smoking may be one positive effect of trauma-focused treatment. Given the negative consequences associated with smoking, encouraging the development of healthier coping strategies to manage negative affect may be a powerful way to improve both the physical and psychological well being of trauma victims.

This work was supported by a VA Rehabilitation and Research Development Career Development Award and resources were provided by the National Center for PTSD, Women’s Health Sciences Division.

PREDICTORS OF TREATMENT COMPLETION AMONG COLLEGE STUDENTS IN A TOBACCO CESSATION PROGRAM

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Treatment completion has been shown to predict successful cessation among individuals participating in various forms of tobacco cessation programs. However, it is not known if any participant characteristics reliably predict whether or not an individual is likely to complete treatment. Such information may improve the efficacy of tobacco cessation programs, as it could identify specific areas for intervention that would increase treatment adherence and thereby improve cessation rates. The present study examined what baseline characteristics of participants predicted treatment completion among college smokers enrolled in the Act Now Tobacco Quit Program at the University of Mississippi. Between August 2004 and September 2006, 182 participants self-selected into the program and completed an intake session and treatment sessions. Treatment consisted of a series of individual sessions that followed an evidence-based tobacco cessation protocol developed in accordance with CDC and NIMH guidelines. Due to the lack of existing research on this question, a wide variety of baseline participant variables were analyzed in terms of their potential relationships to treatment completion outcomes. Treatment completion outcome (i.e., “completed” or “did not complete”) from each participant’s program record was the dependent variable across analyses. Treatment completion was defined as having completed at least four treatment sessions, the number of sessions all participants were encouraged to complete before making a quit attempt. A univariate analysis was conducted for each predictor variable to assess its relationship with treatment completion outcome. Significant effects were found for parents’ smoking status, presence of previous quit attempts lasting at least three months, desire to quit smoking, and class standing (p<0.05). Age, weight gain concern, confidence in one’s ability to quit for good, and importance of quitting were also predictive of outcome (p<0.10). These results suggest multiple areas that warrant consideration in the design and implementation of tobacco interventions aimed at college students.

Funded by a grant from The Partnership for a Healthy Mississippi through the ACT Center at the University of Mississippi Medical Center.

CONTINGENCY MANAGEMENT IN AN ADOLESCENT SMOKING CESSATION MEDICATION TRIAL: RETENTION AND OUTCOMES

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Objective: Recent reports have shown that contingency management (CM), a behavioral intervention, may decrease smoking behavior among adolescents. This study seeks to explore associations between a CM intervention and study retention and smoking cessation outcome in adolescents participating in medication trial.

Methods: In an ongoing study of bupropion SR and a CM intervention (escalating reinforcement schedule) for smoking cessation in adolescents, 19 participants have been randomized to CM-only and 29 have been randomized to placebo-only (neither group receiving medication). Retention and biologically verified (CO, cotinine) point-prevalence abstinence rates were examined.

Results: Point prevalence abstinence was higher in CM group as compared to placebo group (p<0.04). In addition, there was a trend for better retention among the CM group. Conclusion: Preliminary results indicate that among adolescent smokers, CM may improve smoking cessation and may potentially improve retention. With additional data available, further results will be presented at the meeting.

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**POS3-74**

**TOBACCO AND OTHER DRUG USE AND RELATED COGNITIONS AMONG YOUTH IN SUBSTANCE ABUSE TREATMENT**

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Rates of smoking and nicotine dependence among youth with substance use disorders (SUDs) are substantially higher than in their non-SUD peers. Evidence exists for the value of interventions designed to address tobacco use among individuals with SUDs, yet little is known regarding their motivations for smoking cessation. The current study examined tobacco use and related cognitions (importance of quitting, motivation for abstinence) among youth in SUD treatment. Participants were 179 adolescents who were in inpatient \((n = 90)\) or outpatient \((n = 89)\) SUD treatment and had ever smoked cigarettes at least weekly. They were 45\% female, a mean age of 16.3 years \((SD = 1.2)\), range: 13-18.8, and 72\% were White, 18\% Hispanic, 5\% Asian-American, and 7\% other. During treatment, teens were administered the Structured Clinical Interview, the Teen Smoking Questionnaire, the Personal Involvement Screen of the Personal Experiences Inventory, and the modified Fagerstrom Tolerance Questionnaire (mFTQ). Greater nicotine dependence on the mFTQ at pretreatment was associated with greater severity of alcohol or drug use \((r = .29, p<.01)\). Teens’ ratings of the importance of quitting smoking were positively associated with their ratings of the importance of not drinking \((r = .26, p<.01)\) and not using drugs \((r = .30, p<.01)\). However, teens’ motivation to quit smoking was negatively associated with their motivation to quit using drugs \((r = -.16, p<.05)\) and unrelated to their motivation to stop drinking \((r = -.10, n.s.)\). Thus, modest but significant associations were found between the severity of SUD teens’ tobacco and other substance use as well as ratings of the importance of abstinence from these substances of abuse. However, teens’ motivations for abstinence are not in concert across substances. The latter finding may reflect SUD treatment providers’ discouragement of efforts to quit smoking when ceasing use of other substances due to concerns that sobriety may be compromised. Further research should explore how this difference in motivation across substances might affect the efficacy of smoking cessation interventions for SUD youth.

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**POS3-75**

**TECHNOLOGY VS. INTERPERSONAL CONTACT: ADOLESCENT SMOKERS’ PREFERENCES FOR CESSATION PROGRAM FORMATS**

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Smoking is a disease of pediatric onset. Almost 90\% of current adult smokers became addicted to tobacco at or before age 18. Approximately 26\% of middle school students and 51.9\% of high school students have tried cigarette smoking. Many of these students recognize the dangers of smoking soon after onset and attempt cessation, only to find that they are already addicted. For example, in 2004, 55.4\% of high school smokers indicated that they wanted to stop smoking, but less than 30\% were successful at abstaining from cigarettes for even one month. Recently, there has been an explosion in research aimed at helping teens quit smoking. Many cessation programs have utilized computer and e-mail formats in hopes that youth would be more comfortable and thereby more successful with these methods. However, little research has explored teens’ own perceptions of these formats. This issue is important, because if teens dislike the methodology of quit programs, they will be less likely to participate in these programs. Our research explores differences in teen preferences for smoking cessation, particularly in a sample of 192 adolescent smokers enrolled in a quit program, participants were asked about potential formats for cessation programs. Analysis of variance indicated that there were significant differences in teen preferences for 15 different formats for cessation programs, \(F(14, 149.88) = 0.001\). Formats with considerable interpersonal contact, such as those led by teachers and other students, were rated significantly more favorably than formats relying on technology, such as web-based programs or those delivered by e-mail. These results suggest that the recent focus on programs delivered by technology may be misplaced, and that, in fact, teens appreciate interpersonal contact when considering the merits of quit programs.

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**POS3-76**

**CHARACTERISTICS AND COMORBIDITIES OF ADOLESCENTS ENTERING A SMOKING CESSATION STUDY**

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Objective: While it is clear that nicotine dependence generally begins in adolescence, little is known about the characteristics and comorbidities of nicotine dependent adolescents, particularly those presenting to smoking cessation treatment programs or studies. This study seeks to identify common characteristics and comorbidities among adolescents enrolling in a smoking cessation study.

Methods: In an ongoing study of bupropion SR and a contingency management intervention for smoking cessation in adolescents, 82 participants to date have been systematically assessed using validated instruments. Current major depression and comorbid substance use disorders as well as lifetime history of bipolar, psychotic, and eating disorders were exclusionary for this study.

Results: High rates of lifetime psychiatric comorbidity (54\%) were noted among enrollees, including depressive disorders (27\%), ADHD (26\%), cannabis use disorders (18\%), alcohol use disorders (13\%), and anxiety disorders (11\%), despite significant psychiatric exclusion criteria. Participants with ADHD began smoking at an earlier age and reported more severe nicotine withdrawal symptoms than those without ADHD.

Conclusion: Among smoking cessation treatment seeking adolescents in our study sample, 54\% reported a history of at least one psychiatric comorbidity. Clinicians should be aware of the potential presence and impact of comorbidities when encountering adolescents with nicotine dependence.

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**POS3-77**

**ADOLESCENT SMOKING-INDUCED NAUSEA AND DIZZINESS AND PROGRESSION FROM FIRST CIGARETTE TO DAILY SMOKING: PRELIMINARY FINDINGS**

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Few studies have examined the relationship between initial sensitivity to cigarettes and the temoral trajectory of smoking. The purpose of this analysis was to explore whether smoking-induced nausea and dizziness were associated with smoking trajectory in an adolescent population. Data were gathered from 83 adolescent participants enrolled in a tobacco-cessation trial (58\% Female, 69\% European American, age 15.3 ± 1.33 years, cigarettes per day 18.6 ± 7.46, Fagerstrom Test for Nicotine Dependence 7.1 ± 1.24). The composite Diagnostic Interview Schedule (DIDS) for DSM-IV tobacco dependence criteria was utilized. Participants were asked, “Did nausea or dizziness stop after you used tobacco for awhile?” Smoking-trajectory intervals were calculated retrospectively from participants’ self-report using four time points (first puff, first cigarette, daily smoking, and treatment request). Participants who reported experiencing nausea or dizziness for a longer period of time (i.e. who answered “No”) after initiating smoking took longer to progress from first cigarette to daily smoking than those who stated that nausea or dizziness stopped shortly after initiating tobacco use (i.e., who answered “Yes”), \(t(81) = -2.28, p=.025\). These findings support that self-reported nausea and dizziness even after continued use of tobacco may influence the rate of adolescent progression from first cigarette to daily smoking. Further research on smoking-induced nausea and dizziness at initiation is warranted to further elucidate its potential influence on the smoking trajectory of adolescents.

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Adult former smokers show post-cessation weight gain averaging eight pounds. The purpose of this investigation was to examine weight gain following abstinence in a group of treatment-seeking adolescent smokers taking part in a double-blind placebo-controlled NRT trial. Participants visited the clinic weekly during the treatment phase for 11 weeks. Weight gain was examined during treatment following at least 3 consecutive abstinent visits and at 3-months post-treatment. Participants were 116 adolescent smokers, mean age 15.1 ± 1.3, 69% female, 72% European American, mean CPD 18.8 ± 8.6, mean FTND 7.0 ± 1.3, mean Body Mass Index (BMI) 25.1 ± 6.25. Weight gain did not differ by study arm during the treatment phase. Results indicated that adolescents who were abstinent for at least 3 consecutive visits gained an average of 3.66 (SD 6.14) pounds compared to an average of 1.71 (SD 4.94) pounds for adolescents who were not abstinent for at least 3 consecutive visits. This difference approached significance, t(117) = -1.45, p = .07, Cohen’s d = .35. At 3 months post treatment (n = 48 completers), participants who were point prevalent abstinent had gained an average of .018 (SD 5.53) pounds while those who were not abstinent had gained an average of 5.04 (SD 7.95) pounds, t(46) = 1.95, p = .03, Cohen’s d = .73. To examine why non-abstainers gained more weight than abstainers at 3-month follow up, a logistic regression was performed with the following predictors: consecutive abstinent visits, weight gained during treatment, and consecutive abstinent visits X weight gain during treatment. The logistic regression showed that weight gain during treatment was a significant negative predictor of 3-month post-treatment abstinence (odds ratio, .684; 95% CI, .456 - .921) as weight gain increased, likelihood of abstinence at 3-months post treatment decreased. Future research should continue to examine how post-cessation weight gain may increase the likelihood of resumption of smoking among adolescents.

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ACP ALCOHOL USE AMONG ADOLESCENT SMOKERS PARTICIPATING IN SMOKING CESSATION TREATMENT
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Cigarettes and alcohol are two commonly used substances among adolescents. The Youth Risk Behavior Surveillance conducted by the CDC in 2005 found 23% of high school students smoked at least one cigarette and 43.3% consumed alcohol in the 30 days prior to answering the survey. Furthermore, cigarette and alcohol use frequently occur comorbidly among this population (Hoffman et al, 2001). While it has been observed that adult drinkers may have more difficulty quitting smoking than non-drinkers (Zimmerman et al, 1990), there is little in the current literature that examines alcohol use among treatment seeking adolescent smokers. The current study examined changes in alcohol use patterns of 48 high school students enrolled in a one-month smoking cessation program. In addition, we also sought to determine if there were any differences in drinking patterns during treatment, by abstinence status during treatment. Self reported alcohol and cigarette use was collected using the Timeline Follow Back (Sobell & Sobell, 1992). Of the 46 students entering treatment, 21 reported at least one drink during the baseline period. We measured drinking by frequency (days of consumption per week) as well as quantity (drinks per week). Drinkers here averaged 0.79 days drinking per week or 5.73 drinks per week at baseline. Using a random effect regression model to evaluate changes in drinking over time, we observed no significant change from baseline to treatment endpoint in either quantity (p = 0.67) of drinks or in frequency (p = 0.41) of drinking episodes by week. Additionally, no significant differences were found between smokers who remained abstinent from nicotine during treatment and those who did not. Due to the small sample size these results need to be interpreted with caution. In summary, we found no significant changes in alcohol drinking behavior during participation in a smoking cessation program in treatment seeking adolescent smokers.

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POS3-80 THE EFFECTS OF SEX AND HORMONAL CONTRACEPTIVE USE ON NICOTINE WITHDRAWAL SYMPTOMS IN ADOLESCENTS
Patricia J. Dickmann, B.A.*, Marc E. Mooney, Ph.D., Dorothy K. Hatsukami, Ph.D., Sharon S. Allen, M.D., Ph.D., University of Minnesota

Background: Nicotine withdrawal has been demonstrated to predict abstinence, and studies show that withdrawal severity may be greater in women than men. It has been suggested that such differences may be partially attributed to female sex hormones, which are in turn influenced by hormonal contraceptive use. While these areas have been well-studied in adults, few studies have investigated withdrawal differences by gender in adolescents. The current study will investigate differences in withdrawal symptoms between adolescent males, adolescent females, and adolescent females using hormonal contraceptives.

Methods: Data from a placebo-controlled, randomized, double-blind trial of the transdermal nicotine patch for smoking cessation in a sample of adolescent smokers were analyzed. In this trial, 100 adolescents completed a 2-week baseline assessment period, followed by a 10-week treatment period when cessation was attempted. Analyses focused on weeks 3 and 4 of cessation, when the greatest number of subjects achieved 7-day, biochemically-confirmed abstinence.

Results: A total of 100 participants (67% female; mean age = 16.8 years, SD = 1.5) recruited from local area high schools were included in the present analysis. Results of repeated measures ANCOVA showed that females (mean = 10.1, SD = 0.7) had significantly higher total withdrawal scores as measured by the Minnesota Nicotine Withdrawal Scale than males [mean = 7.9, SD = 0.8, F(1,77.6) = 4.01, p = 0.0486]. A similar, but non-significant relationship was seen for total withdrawal score excluding the craving item. Results showed no effect of hormonal contraceptives on withdrawal and no evidence that hormonal contraceptives affect total withdrawal score and craving.

Conclusions: The current findings suggest that adolescent females show more nicotine withdrawal symptoms following smoking cessation than do adolescent males. The use of hormonal contraceptives does not significantly affect the presence of withdrawal symptoms. Addressing the different levels of nicotine withdrawal in males and females may be useful in enhancing the success of adolescent smoking cessation. This research was supported by NIDA grants R01 DA14535 and P50 DA09259 and DA13333. The first author was supported by grants from the Minnesota Medical Foundation and the Minnesota Academy of Family Physicians.

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POS3-81 RATE OF NICOTINE METABOLISM AND ADOLESCENT SMOKING TOPOGRAPHY
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Adult slow nicotine metabolizers smoke fewer cigarettes daily and weekly, and have lower smoke exposure carbon monoxide and plasma nicotine levels compared to normal and fast metabolizers. Linked to this, evidence is emerging that nicotine metabolism might also influence smoking topography (mean and total puff volume), a quantifiable measure of smoking behavior. The present study investigated the association of rate of adolescent nicotine metabolism with smoking topography in a sample of treatment-seeking adolescent smokers prior to treatment. The ratio of 3-hydroxycotinine to cotinine (3HOCOT/COT) served to quantify nicotine metabolism. Smoking topography measures included mean puff volume, total puff volume, inter-puff interval, puff duration, and puff velocity. Participants were 77 adolescent smokers (66% female, 66% European American, mean age 15.2 ± 1.2, mean CPD 19.0 ± 8.6, mean FTND 7.0 ± 1.2) who took part in a three-armed randomized double-blind, double-dummy, placebo-controlled nicotine replacement therapy trial. Partial Pearson correlation coefficient analysis controlling for CPD, ethnicity and gender indicated that the relationship between 3OH/COT/COT and puff volume (r = .183), 3OH/COT and total puff volume (r = .218) and 3OH/COT/COT and puff duration (r = .152) approached significance (p = .06, p = .08 and p = .09 respectively) suggesting that as nicotine metabolism increases, puff volume and puff duration also increase. No significant relationship between 3OH/COT/COT and inter-puff interval or puff velocity was found. These findings suggest that, as among adult smokers, rate of metabolism may alter smoking behavior among dependent adolescent smokers. A broader sample of adolescent smokers is necessary to clarify the relationship between the rate of nicotine metabolism and smoking behavior and overall smoke exposure.

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Few studies have examined predictors of smoking cessation in African Americans, a group who experiences numerous health disparities associated with cigarette smoking. We examined predictors of cessation in 50 urban low- and middle-income African American smokers. Participants enrolled in an intensive six-session group program delivered in the community, and received a one month supply of transdermal nicotine patch. Predictors of cessation outcome included subject characteristics (Beck Depression score at baseline) and smoking factors (cigarettes smoked daily, FTND scores, number of prior quit attempts, and nicotine patch adherence), as well as age, education, and therapist factors (therapist sex, race, and competency score), and program factors (wrap sheets, CO measures, avoid-alter-substitute skills, deep breathing, triggers, weight and health, HALT, and stinking thinking). To identify predictors of quit status from the quit date through four weeks at the end of treatment, a Generalized Estimating Equations model with a logit link function was fitted for each variable of interest, while controlling for the effect of time. Intent-to-treat analyses revealed that 34% of participants were biochemically confirmed as quit smoking at one month post quit date. Lower depression scores (p<.05), higher nicotine patch adherence (p=.02), and higher perceived helpfulness ratings of wrap sheets (p=.02) all significantly predicted quitting success during the first month of treatment. However, when each of the three variables were included in an overall model, no single factor was predictive of smoking cessation except that the effect of perceived helpfulness ratings of wrap sheets was marginally significant [p=.08]. Results stress the importance of identifying person (depression) and program (adherence to patch or wrap sheets) factors to improve quit rates in African American smokers.

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POS4-2 PARTICIPANT USE OF QUITTING METHODS NOT RECOMMENDED IN THEIR RESEARCH PROTOCOL: RESULTS FROM A LARGE WEB-BASED SMOKING CESSATION PROGRAM

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To date, Web-based tobacco cessation interventions have not evaluated the extent to which participants use treatment methods during randomized controlled trials (RCTs) that are not explicitly recommended as a part of their assigned protocol ("other programs"). Yet it seems likely that observed outcomes reflect some combination of the effects of participant activities guided by both the RCT protocol and their use of other treatment programs. Of 1,028 participants completing a 3-month follow-up assessment in a large, 2-armed Web-based smoking cessation RCT (SHIP; Smokers’ Health Enhancement Program), 2.3% reported that they used group counseling, 1.7% used individual counseling, 4.5% used hypnotherapy, 12.6% used self-help smoking cessation pamphlets, and 9.0% used other Web-based smoking cessation programs. Of 909 participants completing a 6-month follow-up assessment, 1.5% reported that they used group counseling, 1.0% used individual counseling, 2.8% used hypnotherapy, 5.9% used self-help smoking cessation pamphlets, and 7.4% used other Web-based smoking cessation programs. We used multivariate logistic regression tests to examine the possible effect of other programs on smoking abstinence (7-day point prevalence) at follow-up. At 3-month follow-up smoking abstinence was negatively related to use of pamphlets (OR=0.54, CI=0.36 - 0.92, P < .001) and positively related to use of other Web programs (OR=2.86, CI=1.80 - 4.54; P< .001) while 6-month smoking abstinence was positively related to use other Web programs (OR=2.57, CI=1.55 - 4.26; P< .001). We discuss possible interpretations regarding the causality of these results and the likelihood that participants recruited to online RCTs through online marketing may be predisposed to use other Web-based programs. In addition, we offer recommendations for ways that future research can more fully evaluate this important phenomenon while avoiding any encouragement of other program usage simply by asking questions about its use. This study was supported by grant R01-CA79946 from the National Cancer Institute.

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POS4-3 SPONTANEOUS VERSUS PLANNED QUITTING: WHO DOES WHAT AND HOW SUCCESSFUL IS IT?

Stuart G Ferguson, PhD*, Pinney Associates; Robert West, PhD, University College London; Joseph G Gitcheil, BA; Mark A Sembower, MS; Saul Shiffman, PhD, Pinney Associates

Traditionally, smokers have been encouraged to prepare for cessation in advance of a pre-set quit date, with the expectation that preparation would improve their chance of success. However, a recent survey of UK smokers found that a substantial proportion of quit attempts involved no pre-planning, and that these spontaneous quit attempts were actually more likely to be successful. We set out to further explore the nature of spontaneous quit attempts in a US sample (900 smokers, 800 ex-smokers who had quit within the last ten years) recruited from a market research database for an online survey. When asked how planned their most recent quit attempt was, 40.4% of subjects reported that it was spontaneous (Smokers: 32.3%; Ex-smokers: 50.6%). The odds of a spontaneous quit attempt lasting 6 months or more were twice that of a pre-planned attempt (68.4% vs 43.1%; OR=2.86; CI=2.52-3.62). Subjects who made a spontaneous quit attempt were more likely to: have no college education; report smoking their first cigarette of the day more than 30 mins after waking; and, report that they did not use pharmacotherapy. Controlling for these variables did not substantially change the association with 6-month abstinence (adjusted-OR=2.56, CI=1.98-3.30). The results confirm that a substantial proportion of quit attempts are spontaneous, and that such attempts can be a successful route to cessation. Given the frequency of such attempts, methods of making treatment available to assist spontaneous quitting should be considered.

This study was funded by GlaxoSmithKline Consumer Healthcare (GSKCH). SF, JG, MS & SS serve as consultants to GSKCH on an exclusive basis on matters relating to smoking cessation. SS and JG also have an interest in a venture to develop a new nicotine replacement medication. RW undertakes research and consultancy for manufacturers of cessation medications and has a share of a patent in a novel nicotine delivery device.

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POS4-4
TRUTH OR CONSEQUENCES: A TOBACCO PREVENTION CAMPAIGN DESIGNED TO REACH RURAL YOUTH
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Legacy’s truth® campaign is a national, anti-tobacco countermarketing campaign designed to reduce smoking among high sensation seeking youth. Several studies have documented the effectiveness of the campaign. As a result of declining funds available for the campaign in recent years, Legacy shifted the bulk of the campaign media buy from broadcast to cable television. Greater use of cable television has been an effective means to reach the target audience more cost-effectively, however, the uneven penetration of cable nationwide has resulted in lower levels of truth® campaign exposure among youth in lower population-density communities. This is of concern because there is historically a pronounced disparity in smoking between urban and rural adolescents. In order to correct this disparity, Legacy sought funding from the CDC to embark on a countermarketing effort called, “truth or consequences.” The campaign is designed to reduce smoking rates among youth living in lower population-density communities through an increase in the media weight of truth and a complementary grants program. The campaign evaluation, which is currently under way and frequent smokers were included in the sample. Analysis of paid media on confirmed awareness of truth ads, beliefs about tobacco and the tobacco industry and tobacco use initiation. The target population for intervention was youth aged 12 to 17 living in designated market areas (DMAs) with lower population densities, which had received a lower truth delivery. Randomly selected youth (n=1,750) in eight DMAs in Colorado, Iowa, Montana, Nebraska, South Dakota, Tennessee, New Mexico, and Washington were chosen for this longitudinal study. By September 2007, Legacy had increased the gross ratings points (GRPs) in the treatment DMAs up to the current mean national GRP level by supplementing each market with a local broadcast television ad buy. Comparison respondents (n=1,750) were selected from areas that were not expected to receive media delivery exceeding the national cable buy. Results from the longitudinal study will be presented.

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POS4-5
TEEN COGNITIONS PROJECT: QUALITATIVE ANALYSIS OF INFREQUENT AND FREQUENT PRECONTEMPLATIVE ADOLESCENT SMOKERS
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While youth smoking rates have declined over the last decade, recent national data show a startling of this trend. In order to continue to successfully address smoking prevalence among youth, the social and psychological processes behind adolescents’ smoking behavior must be explored. The current study was designed to reveal smoking-related cognitions that are relevant and salient to adolescents. The study utilized data from the Hutchinson Study of High School Smoking, a large group randomized trial that is evaluating the effectiveness of an adolescent smoking cessation telephone counseling intervention. Motivational Interviewing was used to facilitate a client-centered, individually tailored interaction between counselors and participants. Qualitative analysis was conducted on a random sample of 40 (20 female, 20 male) taped interviews with adolescent smokers who did not intend to quit in the next six months. Both infrequent and frequent smokers were included in the sample. Analysis revealed differences between male and female smokers in regard to frequency, smoking identity, reasons to smoke and reasons to quit. Controlling for frequency, females were more likely than males to identify as a smoker (1:7:1), and discuss reasons for smoking (1:7:1) and reasons for quitting (2:1:1). Qualitative analysis was used to further explore these findings not only in terms of context, but also in terms of adolescents’ smoking identity, reasons to smoke, reasons to quit and readiness to change. Implications of the study’s findings are discussed as well as recommendations for future research and intervention efforts.

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POS4-6
A COMPARISON OF TWO METHODS FOR EXAMINING THE STRUCTURE AN ADOLESCENT TOBACCO CESSATION RESOURSE
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The American Lung Association, Why Do You Smoke? (WDS) is a self-report questionnaire widely used to help adult smokers identify primary motivations for using tobacco. It is comprised of eight subscales, each with three items representing primary smoking motivations (“Stimulations,” “Handling,” “Pleasure,” “Craft,” “Psychological,” “Habit,” “Peer,” and “Independence”). Since adolescent smoking cessation is hampered by limited appropriate cessation resources, the development of useful and effective instruments tailored for them is extremely important. Respondents in this study were all minors (<18 years of age) enrolled in a tobacco education and cessation program (n=251). Using methods described initially by Thurstone (1945) and later by Gorsuch (1983), the pattern and structure of this self-assessment was examined using a correlated multiple group component factor analysis (CMG/FA). The results of this technique as a confirmatory approach were compared with results from structural equation modeling (SEM). Findings of each method are presented in parallel. Results indicated that the pattern coefficient matrix supported the hypothesized subscales through an examination of confidence intervals available from the CMG/FA and the SEM. Examination of the model fit indices from the SEM indicated some problems with model fit. For example, the test of model fit, c2 (244, N=251) = 935.89, p < 0.0000, indicated poor model fit, although chi-square fit indices are very susceptible to sample size. Other model fit indicators, measurement invariance tests, and cross-group comparisons will be presented. The implications for the use of the WDS questionnaire. Results showed that the level of endorsement (as evidenced by subscale means and standard deviations) was relatively large across the eight subscales. While the SEM was less supportive of the WDS from a psychometric perspective, the CMG/FA provides excellent credence for the continued use of the WDS in intervention programs targeting adolescents.

This work was funded in part by the Texas Department of State Health Services.

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POS4-7
INFLUENCE OF GRAPHIC WARNING LABELS ON YOUNG ADULTS’ URGE TO SMOKE
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Warning labels on cigarette packs in 16 countries now (or will soon) convey vivid images of the health risks of smoking. Although better knowledge about these risks and increased motivations to quit smoking are associated with exposure to graphic warning labels, their use is controversial. Some research predicts that the labels may backfire by provoking defensive reactions toward fearful imagery and by reinforcing favorable responses to smoking. This experiment tested whether exposure to graphic warning labels decreased or increased craving among minimally deprived smokers. We selected 10 warning labels from Australia, Canada, and the EU based on young adult smokers’ ratings of negative emotion (fear, disgust), personal relevance, and perceived effectiveness. To create experimental stimuli, we altered 10 digital images of top-selling U.S. cigarette brands to show a graphic warning label covering 50% of each pack. Daily smokers (n=69, ages 18-35, 66% male) were paid to abstain from smoking for 12 hours before a lab session. After obtaining a breath sample to confirm overnight abstinence (CO <12 ppm), participants were randomly assigned to evaluate 10 pictures of either the packs with graphic warning labels or packages of nontobacco products, such as soap, playing cards, and cassettes. SuperLab Pro controlled the timing and sequence of the images and collected ratings on semantic difference scales. Participants completed measures of mood, craving, and quit intentions before and after exposure. At the conclusion, participants were escorted to an outdoor break area where a confederate measured elapsed time (sec) until a cigarette was lit. Smokers exposed to the graphic warning labels reported a greater reduction in craving (p<.03), expressed greater intentions to quit (p<.01), and waited longer to start smoking (p<.11) than the control group. These findings contradict concerns about a boomerang effect and complement the use of the WDS questionnaire. Results showed that the level of endorsement (as evidenced by subscale means and standard deviations) was relatively large across the eight subscales. While the SEM was less supportive of the WDS from a psychometric perspective, the CMG/FA provides excellent credence for the continued use of the WDS in intervention programs targeting adolescents.

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SMOKING PREVALENCE, ADVICE TO QUIT, AND INTEREST IN INTERVENTIONS AMONG COLLEGE STUDENTS AT AN ON-CAMPUS HEALTH CENTER

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The prevalence of cigarette smoking among college students is higher than the national average. College students often do not believe that they are at risk for nicotine, and the health effects of smoking may not yet be realized. Little formal emphasis has been given to the types of interventions that would be of interest to college smokers. The purposes of this study were (1) to estimate the prevalence of cigarette smoking among patients at student health services, and (2) to conduct a cigarette smoking needs assessment by assessing the extent to which students have interest in smoking cessation, have ever received professional advice to quit, have interest in professional cessation assistance, and which types of assistance would be of interest. Students seen at Health Services (N = 355) students completed a brief, anonymous survey during their visit between May and August of 2007. Results indicated that 21.2% of students smoked cigarettes within the past month. Of the smokers, more were women (54.1%), and college seniors (29.7%). Additionally, 43.2% of smokers reported that they had received professional advice to quit. One-half of smokers reported interest in quitting (50%), however only 18.9% were interested in professional help or cessation resources. Of seven intervention options listed, student smokers were most interested in personalized consultation such as assessment and advice (13.5%), followed by medication (9.5%), nicotine replacement (9.5%), self-help materials (6.8%), individual counseling (5.6%), telephone counseling (2.7%), and group counseling (1.4%). In conclusion, more attention is needed on intervening with clinical populations of college smokers. Fewer than half of smokers seen at student health recalled being advised to quit smoking by a health care provider. Most smokers were not interested in tobacco intervention, although professional consultation was the preferred method. Future research is needed on increasing the frequency of provider interventions among student smokers who are seen in health services.

This study was supported by Syracuse University.

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ROLE OF ONLINE PEER EMAIL SUPPORT AS PART OF A COLLEGE SMOKING CESSATION WEBSITE

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Background: The internet is a promising channel help young smokers to quit. The RealU study (n=517) demonstrated the efficacy of incorporating tailored feedback and peer email support in a college cessation website (30-day abstinence RealU 41%* vs. control 23%, p=0.01). Our objective now is to examine the role of peer email support in this intervention.

Methods: Participants randomized to the intervention condition (n=257) were asked to make 20-weekly visits to the study website over 2 semesters. Participants also received weekly email written by one of nine peer coaches (Epals) encouraging a healthy lifestyle and smoking abstinence. This included eight “Question of the Week” contests (e.g., What are some things you like and dislike about smoking?) to encourage replies. The number of participant emails was tracked. Ten follow-up survey items assessed perceived supportiveness of the peer coach (e.g., My Epal was helpful. My Epal cared about me. My Epal was impersonal, etc.) using a 1-5 likert scale were combined into one global support scale (Epal support scale alpha=0.87). Results: Participants wrote back to their Epal an average of 4.6 (STD=3.6, min=0, max=15) times. Male gender and increased frequency of smoking at baseline predicted less participant email writing but were not related to perceived Epal support. The number of participant emails strongly predicted 30-day abstinence at the end of the study (21% abstinence 0-1 emails [n=47], 38% for 2-3 emails [n=52], 53% for 4-6 emails [n=83], and 58% for 7 or more emails [n=58], p<0.001). Perceived Epal support did not predict abstinence among the few who were abstinent in the prior 30 days (low support=9.2 days, moderate support=6.3 days, high support=4.7 days, p<0.05). These differences persist after controlling for baseline factors (age, gender, days smoking).

Conclusions: In this study, greater peer engagement via email was associated with increased abstinence rates and greater perceived support was associated with reduced frequency of smoking. These findings suggest that online peer support may be an important strategy when delivering internet-assisted cessation programs to young adults.

ClearWay Minnesota

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AUTONOMOUS REGULATION AND SELF-EVALUATION IN A SAMPLE OF COLLEGE SMOKERS: IS NEGATIVE SELF-EVALUATION ASSOCIATED WITH THE “WRONG” KIND OF MOTIVATION TO QUIT?

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Cigarette smoking is a leading cause of death in the United States and smoking rates among college students have been rising. Motivating college students to quit is a pressing public health concern. One line of research based on social cognitive theory (SCT) provides evidence that (negative) self-evaluation increases motivation to quit smoking. However, research based on Self-Determination Theory (SDT) indicates that negative self-evaluation (e.g., guilt or shame) is associated with a more external or controlled form of motivation that is not as likely to lead to successful behavior change as when individuals are more internally or autonomously regulated. The purpose of this study was to examine the association between self-evaluation (from SCT) and autonomous and controlled regulation (from SDT). We hypothesized that self-evaluation would be significantly associated with controlled regulation but not with autonomous regulation. We examined associations among 295 students who were members of Greek houses (mean age = 19.5, SD=1.1, 55% male, 97% White) and who completed baseline alcohol decreased from 21 to 16 cigarettes weekly with the ban (p=.066), but there was no difference in pre- and post-ban bar and restaurant smoking. Interest in quitting smoking increased with the ban (p=.081). Smokers consumed more alcohol than non-smokers both pre- and post-ban (p=.07), and both groups tended to increase alcohol use in bars and restaurants after the ban (p=.118). Perceptions of ban effects on smoking and alcohol use were unrelated stronger to the objective measure results. For example, among smokers, 53% believed the ban reduced their own smoking (versus 5% believed it increased), and 44% believed the ban reduced their friends’ smoking (versus 6% believed it increased). Nonsmokers’ perceptions of ban-related changes in friends’ smoking were similar. Smokers’ perceived ban-related changes in alcohol use paralleled their cigarette changes. This small-sample, uncontrolled longitudinal study suggests that community smoking bans may help reduce smoking in college students, but alcohol consumption may increase while perceived use decreases. No funding.

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LONGITUDINAL STUDY OF A COMMUNITY SMOKING BAN ON UNDERGRADUATE SMOKING, ALCOHOL USE, AND PERCEIVED BAN EFFECTS

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There is a dearth of longitudinal research on building smoking ban effects. We capitalized on an impending community indoor smoking ban in a college town by assessing undergraduates’ smoking and alcohol consumption just prior to the ban and 3 months post-ban. To help gauge alcohol use changes in smokers, we recruited a comparison group of non-smokers who were exposed to an indoor smoking ban and alcohol consumption measures. No statistical analyses met the .05 significance threshold, but several results approached significance in the expected direction. Tobacco consumed with alcohol decreased from 21 to 16 cigarettes weekly with the ban (p=.066), but there was no difference in pre- and post-ban bar and restaurant smoking. Interest in quitting smoking increased with the ban (p=.081). Smokers consumed more alcohol than non-smokers both pre- and post-ban (p=.07), and both groups tended to increase alcohol use in bars and restaurants after the ban (p=.118). Perceptions of ban effects on smoking and alcohol use were unrelated stronger to the objective measure results. For example, among smokers, 53% believed the ban reduced their own smoking (versus 5% believed it increased), and 44% believed the ban reduced their friends’ smoking (versus 6% believed it increased). Nonsmokers’ perceptions of ban-related changes in friends’ smoking were similar. Smokers’ perceived ban-related changes in alcohol use paralleled their cigarette changes. This small-sample, uncontrolled longitudinal study suggests that community smoking bans may help reduce smoking in college students, but alcohol consumption may increase while perceived use decreases. No funding.

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POS4-13 ABSTINENCE AND RELAPSE RATES RELATED TO A CAMPUS-BASED QUIT & WIN CONTEST

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Background: Quit & Win contests have been used to promote smoking cessation in various communities, but little research has examined this approach among college smokers.

Methods: In Spring 2006, Quit & Win contests were conducted on 4 campuses (two 2-year, two 4-year) targeting students who smoked at least 10 days per month. Participants completed a baseline survey and provided a urine sample prior to joining the contest. Participants were asked to abstain completely from smoking for one month. A follow-up survey was conducted online at the completion of the contest.

Results: Those who reported abstinence for the month were entered into a drawing for a $3000 grand prize. Potential prizewinners were notified and needed to provide a urine sample (within 24-48 hrs) to validate self-report. Participants were surveyed again 2 weeks after the contest to assess abstinence. Urine cotinine was measured in a random selection of 30 baseline urine samples and samples from a random selection of 30 participants who claimed to be abstinent during the contest to assess the validity of self-report.

Results: In total 588 participants enrolled across all campuses. Participants smoked an average of 9.8 ± 6.7 cigarettes/day on 26.7 ± 6.7 days/month. The response rate for the end-of-contest survey was 74% with 72% of respondents reporting abstinence during the contest (ITT abstinence 53%). When surveyed 2 weeks later, half of those who reported abstinence during the contest (51%) had resumed smoking. Of the 30 baseline urine samples, 28 tested positive for cotinine (confirmation rate 94%). Of 22 participants reporting no smoking or NRT use, 17 were negative for cotinine. Among the 8 participants who reported NRT use, NNAL levels (a tobacco specific carcinogen) were negative for all 8 (<0.10 pmol/ml). Thus, the overall confirmation rate at contest end was 83% (28/34) and 94% (22/23).

Conclusion: This study suggests that, while Quit & Win contests may be effective at facilitating short-term abstinence, Urine validation testing suggests that self-reports are accurate in a large majority (but not all) cases. Further research is needed to identify strategies to prevent post-contest relapse.

POS4-15 QUITLINK - INTERNET ASSISTANCE FOR SMOKING CESSATION: 13-MONTH FOLLOW-UP

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Few studies have experimentally evaluated long-term cessation rates among cigarette smokers who receive internet assistance in quitting. In the 2003-04 quit attempt of the American Cancer Society's (ACS) web site were offered a link for smokers who wanted help in quitting via the Internet. The 6451 who enrolled were randomized to receive subsequently emailed access to a targeted, minimally interactive ACS internet site with text, photographs and graphics providing stage-based quitting advice and peer modeling, or to one of five tailored, interactive sites provided by the following research partners: Centre for Addiction and Mental Health, Oregon Center for Applied Science, QuitNet, ProChange, and SmokeClinic. Follow-up surveys done online and by telephone interviews at approximately 13 months after randomization yielded 2468 respondents (38%) and found no significant overall differences among those assigned to the different WEB sites. At baseline, 1961 participants (30%) reported an indicator of depression and this group had significantly lower 13-month quit rates than those who did not report the indicator (all enrolled, 8% vs. 12%, p < 0.001; followed only, 25% vs. 31%, p < 0.005). When the 4,490 participants (70%) who did not report an indicator of depression at baseline are separated for analysis, the more interactive, tailored sites, as a whole, were associated with higher quitting rates than the less interactive ACS targeted site: 13% vs. 10% (p=0.044) among 4,490 enrolled and 32% vs. 26% (p=0.056) among 1,798 followed. Additional analyses showed that men were more likely to succeed at the more interactive sites, but was strongly related to 13-month quitting success when analyzed at both the site level and the individual level. Medication use was also assessed at follow-up and 50.6% of respondents reported using NRT or bupropion. Those who reported using NRT or bupropion were significantly more likely to report being quit at 13 months than those who did not (32% vs 25%, p < 0.001).This study provides evidence that tailored, interactive web sites can help cigarette smokers, who do not report an indicator of depression at baseline, quit and maintain cessation.

This research was funded by the American Cancer Society. Our research partners, Centre for Addiction and Mental Health, Oregon Center for Applied Science, QuitNet, ProChange, and SmokeClinic, provided free access to their WEB sites to study participants.

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POS4-16  WEB-BASED SMOKING CESSATION COMPONENTS AND TAILORING DEPTH: RESULTS OF A RANDOMIZED TRIAL


Background and objective: General practitioners (GPs) are an important source of smoking cessation advice. We tested the hypothesis that compared to a model, which encouraged management within a consultation, a model encouraging referral by GPs of their patients who smoke to a specialist service would result in increased smoking cessation and would be acceptable to both GPs and their patients.

Design and participants: Cluster randomized controlled trial in which practices were randomized to one of two intervention arms, at a rate of 1:2: (1) standard in-practice GP management (n=311), or (2) referral to a specialist triage system that allowed smokers to choose from two alternative forms of assistance provided by the Victorian Quitline (callback counseling or the Internet-based QuitCoach) (n=728).

Between March and December 2004, 45 practices in Victoria, Australia recruited 1,039 adult current smokers.

Main outcome measures: Sustained abstinence of >= two months duration at 3 months follow-up, and >= ten months duration at 12 months.

Results: At 3-month follow-up, with missing data coded as smokers, patients randomized to the referral condition were twice as likely to report sustained abstinence than those in the in-practice group (5.9% compared with 2.9%; OR=2.06 (95% CI 1.19-3.56)). At 12-month follow-up, patients in the referral group had over three times the odds of sustained abstinence (4.4% compared with 1.6%); OR=3.43 (95% CI 1.09-10.74). The effect was mediated by the amount of external (outside the consultation) help received.

Conclusions: More smokers quit in the referral condition than in the in-practice condition, because they received more help from outside the consultation, while getting the same amount of help within it.

Implications: This study provided evidence that GPs referring smokers to an evidence-based cessation service can result in increased cessation, and is acceptable to both GPs and smokers. Referral should become the normative strategy for management of small practices in general practice.

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POS4-17  THE ROLE OF ENGAGEMENT IN A TAILORED WEB-BASED SMOKING CESSATION PROGRAM: RESULTS OF A RANDOMIZED TRIAL

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Background: Web-based programs for health promotion, disease prevention, and disease management often experience high rates of attrition. Three questions are particularly relevant to this issue. First, does engagement in program content actually influence long-term outcomes? Second, which users are most likely to drop out? Third, are there intervention strategies that appear to influence long-term outcomes? Second, which users are most likely to drop out or disengage with the program? Third, are there intervention strategies that appear to influence long-term outcomes?

Methods: A randomized trial of 1,848 smokers used a fractional factorial design to assign users to combinations of five different treatment components of a web-based smoking cessation intervention that included a free course of nicotine patch. The program included: an introduction section, a section focusing on smoking cessation intervention that included a free course of nicotine replacement therapy (patch). The program was randomized using variations of 5 components: high- versus low-tailored success story, outcome expectation, and efficacy expectation messages; high- versus low-personalized message, and multiple versus single exposure to the message.

Measurements: Primary outcome was seven-day abstinence at six-month follow-up.

Findings: Abstinence was most influenced by high-personalized message content and high-tailored success stories. High-tailored outcome and efficacy expectation materials moderately influenced cessation. Message exposures had no overall effect on cessation. Cessation rates increased with the cumulative number of active treatment component suggestions, suggesting an independent contribution to cessation outcomes. Cummulative assignment of the three tailoring depth factors also resulted in increasing rates of six-month cessation, demonstrating an effect of tailoring depth.

Conclusion: The study identified relevant components of smoking cessation interventions that should be generalizable to other cessation interventions. The study also demonstrates the importance of higher-depth tailoring in smoking cessation programs. Finally, the fractional factorial design allowed efficient examination of the impact of specific cessation intervention components and the impact of increasing tailoring depth. The rapidly changing interfaces, software, and capabilities of e-health are likely to require such dynamic experimental approaches to intervention discovery.

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POS4-18  MASS DISSEMINABLE APPROACHES FOR ENHANCING SMOKING CESSATION IN GENERAL PRACTICE – A CLUSTER RANDOMISED TRIAL

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Background and objective: General practitioners (GPs) are an important source of smoking cessation advice. We tested the hypothesis that compared to a model, which encouraged management within a consultation, a model encouraging referral by GPs of their patients who smoke to a specialist service would result in increased smoking cessation and would be acceptable to both GPs and their patients.

Design and participants: Cluster randomized controlled trial in which practices were randomized to one of two intervention arms, at a rate of 1:2: (1) standard in-practice GP management (n=311), or (2) referral to a specialist triage system that allowed smokers to choose from two alternative forms of assistance provided by the Victorian Quitline (callback counseling or the Internet-based QuitCoach) (n=728).

Between March and December 2004, 45 practices in Victoria, Australia recruited 1,039 adult current smokers.

Main outcome measures: Sustained abstinence of >= two months duration at 3 months follow-up, and >= ten months duration at 12 months.

Results: At 3-month follow-up, with missing data coded as smokers, patients randomized to the referral condition were twice as likely to report sustained abstinence than those in the in-practice group (5.9% compared with 2.9%; OR=2.06 (95% CI 1.19-3.56)). At 12-month follow-up, patients in the referral group had over three times the odds of sustained abstinence (4.4% compared with 1.6%); OR=3.43 (95% CI 1.09-10.74). The effect was mediated by the amount of external (outside the consultation) help received.

Conclusions: More smokers quit in the referral condition than in the in-practice condition, because they received more help from outside the consultation, while getting the same amount of help within it.

Implications: This study provided evidence that GPs referring smokers to an evidence-based cessation service can result in increased cessation, and is acceptable to both GPs and smokers. Referral should become the normative strategy for management of small practices in general practice.

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POS4-19  CHANGE IN ONLINE CIGARETTE PURCHASING BEHAVIOR AFTER CREDIT CARD COMPANIES STOPPED PAYING FOR CIGARETTES PURCHASED OVER THE INTERNET

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Background: The Internet has become an increasingly popular way that smokers purchase cigarettes. The main attraction of Internet purchasing is the opportunity to conveniently acquire less expensive cigarettes sold without state and federal excises taxes. Tax avoidance is illegal and thus customers who avoid paying taxes can be held accountable for the excises taxes. Because transactions on the Internet involve credit cards an electronic record of purchases is available. In 2005 State Attorney General threatened to sue the major credit card companies demanding that they turn over information about customer purchases of cigarettes online. In April 2005 a settlement was reached whereby the credit companies voluntarily agreed to no longer allow their credit cards to be used for online cigarette purchases. This paper examines the impact of this agreement on reports of Internet purchasing of cigarettes in a cohort of smokers assessed before and after the agreement to ban the use of major credit cards for online cigarettes sales.

Methods: The data for this analysis from two population-based random-digit dialed telephone studies including 8,400 New York State smokers who completed the New York Adult Tobacco Survey (NYATS) between July 2003 and March 2006; and 4,386 U.S. smokers who completed at least one of the International Tobacco Control Policy Evaluation Surveys (ITC) between 2002 and 2005. Multivariate logistic regression was used to compare online cigarette purchase rates before and after March 2005.

Results: The Internet cigarette purchase rate dropped from 10% between July 2003 and March 2005 (before the agreement) to 4% between April 2005 and March 2006 (after the agreement) in New York State (OR=0.47, 95% CI=0.30, 0.76), and from 1.2% to 0.4% at the national level (OR=0.36, 95% CI=0.15, 0.89). In contrast, rates of buying low/untaxed cigarettes from Indian Reservations remained unchanged during the study period.

Conclusion: The online cigarette purchase rate significantly decreased since March 2005 without a concurrent increase in other tax avoidance behavior.

This study was supported by NYS DOH and by grants from the U.S. National Cancer Institute, The Roswell Park Cancer Institute, and the U.S. Department of Health and Human Services, Centers for Tobacco Use Research Center (TTURC), P50 CA111236, and from R01 CA100362), and the Robert Wood Johnson Foundation (#045734).

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SRNT: Poster Session 4

POS4-20  TOBACCO USE AND cessation knowledge, Attitudes, and practices among medical students in the dominican republic: RESULTS FROM THE GHPS

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Lack of knowledge or formal training and physician's smoking status are recognized as significant barriers to engaging physicians in delivering tobacco cessation interventions. This study reports on the first ever implementation of the Global Health Professional Survey (GHPS) in the Dominican Republic (DR) to assess tobacco use and knowledge, attitudes and practices among medical students, as the first step in introducing a tobacco control curriculum into medical schools. We performed a secondary analysis of data obtained from 149 third-year medical students using an adapted Spanish GHPS. Over a third (33%) of medical students reported that they ever tried cigarettes and 9.4% were current smokers. 35.7% of whom began smoking after enrolling in medical school. 74.5% reported exposure to secondhand smoke during the past week in places other than their homes. 70% said there was no official policy banning smoking in school buildings and clinics. A low proportion (25.2%) received formal training in smoking cessation. Females and non-smokers were significantly more likely to believe that health professionals should give advice about smoking and tobacco cessation to their patients. Only 59.1% believed that patients want their advice to stop smoking. Four variables were significantly associated with students' perceptions of patients' receptiveness to health professionals' advice to quit smoking: belief that health care providers should advise their patients who use other tobacco products to quit (OR=5.1, 95% CI 1.2-21.0), belief that patients' chances of quitting smoking are increased if a health professional advises them to quit (OR=43.4, 95% CI 4.7-387.6); training about the dangers of smoking during medical school (OR=0.04, 95% CI 0.004-0.45); training about people's motivation to smoke (OR=3.5, 95% CI 1.3-9.7). Results will be compared to other GHPS countries and provide a first look at tobacco use factors among DR medical students.

NIH FIC R01TW00945 (Ossip-Klein, PI).

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POS4-21  training Psychiatrists and Mental Health Professionals to Treat Tobacco Dependence


Although smoking rates are elevated in individuals with a mental illness, psychiatrists have not traditionally received training in treating tobacco. Training mental health professionals can increase their awareness and knowledge of tobacco treatment and ultimately increase access to treatment for mentally ill smokers. We developed a 2-day curriculum delivered in live training events in November 2006 and March 2007 to 71 participants. The curriculum emphasized motivational and pharmacotherapy techniques for addressing tobacco use in mentally ill smokers. Continuing education credits were provided to all participants. Sixty-nine trainees completed pre- and post-tests to evaluate knowledge acquisition as well as a baseline survey of attitudes and beliefs. Participants included 34 psychiatrists (49%), 23 nurses (33%), 5 psychologists (7%) and 6 counselors or social workers (9%). Scores on the pretest were low (mean score of 47%) correct, with poor knowledge of pharmacological and psychosocial treatments, and nicotine withdrawal. Posttest scores were significantly improved (mean score 90% correct) with a significant increase in score of 6.38 points from pretest to posttest (t(df) = -22.8; p<0.0001). More than 90% of participants indicated that helping patients to stop smoking was part of the psychiatrist and mental health nurse's role. Although 80% reported that they usually ask about smoking status, fewer reported recommending NRT (34%), prescribing pharmacotherapy (29%) or referring smokers to a telephone quitline (26%). Less than 12% felt that prior education had prepared them to help patients quit smoking. Participants described the training experience as worthwhile, reporting that they learned new skills and planned to apply what they learned. Trainings are being repeated this year due to ongoing demand from practitioners. Further follow-up should evaluate changes in practices after training.

This work was supported by the American Legacy Foundation and an unrestricted educational grant from Pfizer, Inc.

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POS4-22  qualitative evaluation of a PDA-based 5A educational training tool for medical students, residents and physicians

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There is an increasing need to develop new strategies and interventions to encourage smoking cessation in a patient population. Evidence has shown that physician advice to quit smoking increases smoking cessation rates by as much as 30%. Handheld-assisted technology devices, such as personal digital assistants (PDA), have become a popular tool among physicians, residents, and medical students in recent years. The use of PDAs presents a novel way to educate medical learners regarding smoking cessation. A PDA model that takes the user through each of the 5A’s of Brief Office Intervention was developed that includes sample scripts and links for additional information. Key Informant and Focus Group feedback was obtained from samples of medical students, residents, and practicing physicians at the University of Rochester and the University of Toronto. Qualitative findings demonstrated that participants from each group were receptive to PDA-based programs for smoking cessation education, and provided detailed suggestions for improvements in navigation and content. Medical students, for example, thought the PDA-based training was beneficial because it provided an interactive “hands on” experience regarding smoking cessation. One participant noted, “The PDA training help me because it was framed as if we were a clinical encounter, and it gave prompts of how to word questions and responses to the patient. It was as if we were interacting with a patient — it wasn’t just reading an article on the internet.” Overall, the results of these pilot programs were favorable and participants liked using this novel training method.

Funding was provided in part by a contract with the New York State Department of Health, and from the Dean’s Excellence Award (Selby, P.I.), University of Toronto.

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POS4-23  evaluation of a PDA-based tobacco dependence educational program for medical students

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Loma Linda University medical students receive 4 hours of training (2 hours didactic, 2 hours in small group workshop) in medical management of tobacco dependence interventions during the orientation week to their third year (clinical). A pre- and post-test were given to determine the level of improved knowledge from this four hour training session. A PDA program (using HanDbase software) was developed for the workshop to teach the students a structured interview question sequence to follow with tobacco users. During their family medicine and internal medicine clerkships they are given two more hours of tobacco treatment knowledge and skills training. They are required to interview 10 tobacco users with the PDA guide. In their senior year they have four hours of clinical observation in a stop smoking class and clinic at a VA hospital and can choose an additional 2 or 4 week “Stop Smoking” elective with more research or clinical training. The standardized Objective Structured Clinical Examination (OSCE) during the first month on their 4th year has demonstrated a 95% of students ask about smoking in a patient with a presenting complaint of “Cough”, 89% in a case with Chest Pain, but only a 75% rate in a diabetic case. The consistent curriculum enhancement in student's interview and counseling skills over the last 10 years has resulted in a highly satisfactory performance in asking and advising about tobacco use by the beginning of the 4th year of training. We are now trying to improve the recognition of diabetes, metabolic syndrome and tobacco use in the curriculum as related risk factors for lifestyle intervention.

Funding was provided by institutional support of Loma Linda University, and in part by a grant from the National Cancer Institute.

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POS4-24  QUITLINES: AN EFFICIENT AND EQUITABLE RECRUITMENT SOURCE FOR CESSATION TRIALS


Aim: To report on the effectiveness of a national Quitline as the sole source of participants recruited into a randomized controlled smoking cessation intervention trial.

Design: Retrospective analysis of one year of participant recruitment data from a large (n=1100) smoking cessation intervention trial in New Zealand. Numbers and proportions of participants taking part at each stage in the study recruitment, randomization and follow-up process were measured and analyzed.

Findings: Of the 26,369 callers to the New Zealand Quitline over a one-year period, 68% indicated an interest in taking part in research, 28% of whom met eligibility criteria assessed at registration. Of the 1,317 callers in this group able to be contacted by phone call, 76% agreed to take part in the trial. After further checkingeligibility, 851 (3.2% of all callers) entered the trial and were randomized. Weighting the ratio of calls back in favor of Maori (indigenous New Zealanders) callers ensured adequate representation in the study.

Conclusions: Quitlines have good potential to be an efficient and equitable means of recruiting and randomizing participants into cessation trials.

Health Research Council of New Zealand National Heart Foundation of New Zealand.

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POS4-25  STATE SMOKING CESSATION QUITLINES AND SMOKERS WITH MENTAL ILLNESS


Objectives: Every state currently has a smoking cessation Quitline, but it is unclear whether these Quitlines meet the unique needs of smokers with mental illness. Smokers with mental illness are usually interested in quitting but have a higher prevalence of smoking and lower rate of success at quitting. As an initial needs assessment, we surveyed state Quitlines to learn how they work with mentally ill callers.

Methods: We contacted the operating agencies of each state Quitline to assess whether they: accept calls from mentally ill smokers, train their counselors to address specific needs of mentally ill smokers, and have self-help materials tailored for the mentally ill. Some Quitline representatives brought up additional topics that we identified as being important to providing telephone care for mentally ill smokers. Within two months, we re-contacted each person to have them verify our information about their Quitline(s). We also asked them to address the additional topics that surfaced during discussions with other Quitlines, if they had not already done so.

Results: Seventeen representatives for 45 Quitlines (88%) responded to our first inquiry and 33 of the initially responding Quitlines (65%) responded to our second set of inquiries. All surveyed Quitlines accept calls from mentally ill smokers, and all either train their counselors about the mentally ill or their counselors have past training in mental health. In addition, all encourage mentally ill callers to discuss quitting with their usual health care provider. However, only four surveyed states (12%) screen callers for mental illness, few (18%) use specific counseling protocols for mentally ill callers, and even fewer (7%) have self-help materials tailored for the mentally ill. Some Quitline representatives brought up additional topics that we identified as being important to providing telephone care for mentally ill smokers. Within two months, we re-contacted each person to have them verify our information about their Quitline(s). We also asked them to address the additional topics that surfaced during discussions with other Quitlines, if they had not already done so.

Results: The 4 group cluster analysis yielded distinct and interpretable groups. High utilizers (17% of sample) made extensive use of community features, interactive tools, and information guides/resources were used to perform cluster analysis identifying utilization pattern. A mixed mode survey assessed cessation 6-months after enrollment (response rate 78%).

Results: The 4 group cluster analysis yielded distinct and interpretable groups. High utilizers (17% of sample) made extensive use of community features, interactive tools, and information guides. Tool and Guide users (20% of sample) made use of interactive tools and guides but had limited use of community features. Tool users (24% of sample) used primarily interactive tools. Low utilizers (39% of sample) had limited use of all resources. Nearly all members of the high utilizer group had 10 or more contacts with the online community. Seven day point prevalence abstinence rates at 6-months were strongly related to cluster assignment (High utilizer 26.3%, Tool and Guide Users15.4%, Tool Users 17.4%, Low utilizer 10.1%, p<0.001).

Conclusions: Engagement with the online community was associated with a pattern of high utilization of all website features and increased abstinence at 6 months. There was little evidence that differences that were observed in people using tools with or without information guides. Strategies to encourage engagement with online smoking cessation communities may be beneficial.

Clearway Minnesota.

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POS4-26  ENGAGING SMOKERS FOR TELEPHONE COUNSELING

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Members of racial/ethnic minority groups and low socioeconomic (SES) status groups bear a higher share of tobacco related diseases and deaths, and little data are available on how to engage these groups in interventions. The current study addressed promotional strategies to reach underserved populations through quitlines. Targeted groups were African American, Hispanic, Asian American, American Indian, and Low SES. Data were gathered from 21 interviews and 23 surveys with quitline representatives across the US to assess promotional strategies and call rates from each targeted group. Data were analyzed in three ways. First, a rubric for calculating success ratios for reaching each group was developed and will be presented, based on reported call rates and BFHSS and SAMSHA data on % smokers from each group for each state. Success ratios ranged from 0-6.0% across groups, with most consistently high success ratios found for African Americans. Data will also be presented by region for each underserved group. Second, interview data were analyzed using two methods: all transcripts were coded to identify frequency of use of a range of strategies that will be presented, and a selected group of transcripts were analyzed using qualitative and anthropological methods, and challenges, successes, historical contexts, and strategies used by high success ratio states from each group will be presented. For example, offering free NRT seemed not to be necessary for success. Density/sparsity of a group, historical factors, and a range of cultural factors are important for quitlines to consider when designing promotions, especially when there are budget restrictions. Overall, calculation of success ratios can assist states in tracking their penetration into underserved groups. Examination of overall success ratios can identify variations in reach. Identification of issues and strategies used by successful states can provide areas for further systematic research.

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POS4-27  SMOKING CESSATION WEBSITE UTILIZATION PATTERNS PREDICT CESSATION OUTCOMES

Colleen Kilt, Ph.D., Andrea Mercurio, Ph.D., Larry An*, M.D., Jasjit Ahluwalia, M.D., M.P.H., University of Minnesota; Jessie Saul, Ph.D., Barbara Schillo, Ph.D., Clearway Minnesota; Lys Severson, Ph.D., QuitNet; Nathan Cobb, M.D., Massachusetts General Hospital; Sharmlyn Evered, Blue Cross Blue Shield of Minnesota Center for Prevention; Michael Luxenour, Ph.D., Promotional Data Analysts, Inc.

Background: Prior studies have reported a relationship between the number of cessation website visits and quit rates, however little is known about how the use of specific website features may influence cessation outcomes. This information is critical to inform the design of more engaging and effective cessation websites.

Objective: To determine the relationship between website utilization patterns and cessation outcomes at 6-month follow-up.

Methods: Quitplan.com (powered by QuitNet) is an interactive website that offers a full range of online cessation services to Minnesota residents. We examined detailed utilization data on 685 registered users who consented to participate in a 6-month follow-up survey. Scales characterizing use of different website components (e.g., online community features, interactive tools, informational guides/resouces) were used to perform cluster analysis identifying utilization pattern. A mixed mode survey assessed cessation 6-months after enrollment (response rate 78%).

Results: The 4 group cluster analysis yielded distinct and interpretable groups. High utilizers (17% of sample) made extensive use of community features, interactive tools, and information guides. Tool and Guide users (20% of sample) made use of interactive tools and guides but had limited use of community features. Tool users (24% of sample) used primarily interactive tools. Low utilizers (39% of sample) had limited use of all resources. Nearly all members of the high utilizer group had 10 or more contacts with the online community. Seven day point prevalence abstinence rates at 6-months were strongly related to cluster assignment (High utilizer 26.3%, Tool and Guide Users15.4%, Tool Users 17.4%, Low utilizer 10.1%, p<0.001).

Conclusions: Engagement with the online community was associated with a pattern of high utilization of all website features and increased abstinence at 6 months. There was little evidence that differences that were observed in people using tools with or without information guides. Strategies to encourage engagement with online smoking cessation communities may be beneficial.

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POS4-28 TOBACCO TREATMENT PRACTICES OF PHARMACISTS IN A FRONTIER STATE

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Pharmacists are one of the most accessible health care providers, especially for more than nine million Americans who live in areas designated as frontier, which often do not have physicians, nurses, or dentists nearby. This study assessed tobacco treatment practices and opinions of pharmacists throughout Montana, where a majority (54%) live in frontier areas. Investigators of a course providing continuing education to pharmacists in Montana distributed a paper-and-pencil survey to attendees at 11 sites throughout the state. Seventy-nine percent (201/253) completed the survey. The pharmacists were sent a reminder postcard 4 weeks later. Non-respondents were contacted by phone. This analysis was restricted to 136 pharmacists who delivered at least one consultation during the study period. The outcome measure was if pharmacists used tobacco cessation services and if they followed-up with patients. Using the Cochran-Mantel-Haenszel test, significant differences were observed in the proportion of pharmacists who used cessation strategies in the three pharmacies (p=.054) and by store ownership (p=.047). Those in chain (n= 65) versus independent (n=71) pharmacies were more likely to report barriers related to time [x2 (1, N=136)=3.72, p=.054] and training (19%). Those in chain (n= 65) versus independent (n=71) pharmacies were more likely to report barriers related to time [x2 (1, N=136)=3.72, p=.054] and training (19%).

Results: All reviewed studies had weaknesses in methodology, including bias in selection of patients, in the interpretation of results, and in the assessment of outcome measures. Overall, 38% of smokers said they would be interested in a WATI. Number of cigarettes smoked per day was unrelated to level of interest in WATI. Smokers who have access to the Internet than non-smokers. As access to the Internet continues to expand, does this finding remain true? Are more smokers are interested in web-assisted tobacco interventions (WATI)? These questions are important to determine the potential role that WATI might play in promoting tobacco cessation.

Conclusions: Adding a brief tobacco order set to an existing computerized hospital order entry system dramatically increased the hospital's provision of evidence-based tobacco treatment and helped to improve the hospital's scores on publicly-reported quality-of-care standards from below 50th percentile to approaching 90th percentile. This system-level intervention was simple, low-cost, easy to maintain and is a generalizable model for U.S. hospitals.

Background: Physicians have the potential to reduce the harm due to smoking by providing cessation advice to patients and advising smokers about second-hand smoke. While surveys of practice show that most physicians ask patients about smoking status, few follow up with specific advice. Undergraduate and CE tobacco-related training has been shown to increase interventions in clinical trials, but the effect might not continue and reviews of the effects of education have not included environmental factors that may be related to tobacco-related interventions.

Method: We carried out a systematic literature review in accordance with the Better Practices Model, focusing on transfer of tobacco-related knowledge to practicing physicians. We searched English language literature from 1990 - 2006 for studies with target audience of physicians. We systematically reviewed and rated all studies. The intervention included education and systemic factors that might influence physician practice. We limited the systematic review and ratings to randomized controlled trials (RCTs) of interventions, but other types of studies were considered to give context to the results. All studies were reviewed and rated by two reviewers (different combinations of investigators), and differences were resolved.

Results: Many studies assessed=2, assisted=2, and followed-up= 0.2. Many (48%) did not assist any smokers to quit in the preceding 30 days. Most frequently cited barriers to providing cessation services included lack of time (52%), reimbursement (26%), and training (19%). Those in chain (n= 65) versus independent (n=71) pharmacies were more likely to report barriers related to time [x2 (1, N=136)=3.72, p=.054] and training (19%).

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Corresponding Author: John A. Cunningham*, Centre for Addiction and Mental Health

Background: Previous research has found that current smokers are less likely to have access to the Internet than non-smokers. As access to the Internet continues to expand, does this finding remain true? Are more smokers are interested in web-assisted tobacco interventions (WATI)? These questions are important to determine the potential role that WATI might play in promoting tobacco cessation.

Methods: A random digit dialing telephone survey of 8466 adult respondents, 18 years and older, in Ontario, Canada (survey conducted September 2006 to August 2007). All respondents were asked their smoking status and whether they used the Internet (used at home or work in the past 12 months; where used; how often used in the past 12 months). To assess level of interest in WATI, current smokers were asked whether they would be interested in a Web-assisted tobacco intervention. These questions are important to determine the potential role that WATI might play in promoting tobacco cessation.

Results: Current smokers were marginally less likely to have access to the Internet than non-smokers (73% versus 78% accessed in the last year) and, of those who had access to the Internet, smokers used the Internet less often than non-smokers. Overall, 38% of smokers said they would be interested in a WATI. Number of cigarettes smoked per day was unrelated to level of interest in WATI. Smokers who accessed the Internet were more interested in WATI than smokers who did not access the Internet (45% versus 20%).

Conclusions: Smokers are less likely to have access to the Internet than non-smokers and are less interested in WATI. These results indicate that WATIs have a substantial audience among smokers and, given the growing body of evidence regarding their efficacy and safety, WATIs could have a significant role to play in promoting tobacco cessation.

Data for this study came from a population telephone survey funded by the Ontario Problem Gambling Research Centre (an arms length funding agency sponsored by the Ontario Government).

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**POS4-32** CAN WE BRIEZE SMOKERS TO QUIT?

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**Background/Objective:** Cash incentives are useful tools to motivate behavior change. In Nov 2006, Roswell Park Cancer Institute partnered with community organizations in Western New York (WNY) to promote an incentive-based population-wide quit smoking intervention. The program offered adult smokers a chance to win a single cash prize of $5,000 if they stopped smoking between Jan 15-Feb 15, 2007. Participants registered by email or via the website. A follow-up survey was conducted 6-7 months later in July-Aug 2007 to (1) assess quit rates; (2) determine the percentage of smokers willing to enter a new contest (Aug 15-Oct 15); and (3) assess interest in New York State Smokers’ Quitline (NYSSQL) services.

**Methods:** During the promotional period, 3,859 contest entries were received with usable contact information for 3,842. Those who provided an email address were sent a web-based survey (n=332). A random sample of those that did not provide an email were selected for a telephone interview (n=142). Initial non-responders of the web survey were randomly assigned the IVR callback and half to the live counselor service. The survey asked about efforts to quit during the contest and smoking status. 224 participants completed the survey (17% web, 83% phone) for a 47% response rate.

**Results:** The 3,859 entries represent about 2% of the adult smoking population in WNY. 86% of respondents indicated the contest was very or somewhat important in getting them to think about quitting; 98% reported quitting for at least 24 hours during the contest and 50% reported not smoking at follow-up. Assuming all non-responders are smokers, the quit rate is 24%. Among current smokers, 81% agreed to be enrolled in a second contest, and among these, almost everyone (99%) was interested in receiving NYSSQL services.

**Conclusions:** The answer to the question, “Can we bribe smokers to quit?” appears to be YES. The cost per participant was about $22, suggesting that a contest format to motivate smokers to quit can be highly cost effective. Importantly, participants acknowledged that the contest motivated them to make a quit attempt and reinforced their effort to remain smokefree.

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**POS4-34** EVALUATING THE PERFORMANCE INDICATOR MONITORING SYSTEM: FROM DEVELOPMENT TO IMPLEMENTATION AND USE


**Objective:** The Smoke-free Ontario Strategy (SFOS) is a complex, comprehensive strategy for tobacco control. This strategy funds multiple programs to implement activities at local, regional and provincial levels. Multiple stakeholders in the strategy identified a need for the development of a system to monitor the performance of funded programs. The Performance Indicators Monitoring System (PIMS) was developed by the Ontario Tobacco Research Unit to provide on going monitoring of SFOS funded programs. PIMS was developed to be user-based, dynamic, responsive, and work-saving. The system is constructed from a set of core indicators of program inputs, activities, outputs, and outcomes.

**Methods:** A bottom-up approach to indicator development was utilized in which the Ministry and its funded partners were directly engaged in the process of indicator development. The 2007-08 fiscal year represents the inauguration of PIMS. Thus, preliminary findings from the formation evaluative of the system will be shared. PIMS is being evaluated through semi-structured interviews with a convenience sample of users and an on-line survey disseminated to all PIMS users. Findings will be presented and situated within the comprehensive model for evaluating the Smoke-Free Ontario Strategy.

**Results:** The development, implementation and use of the system will be described. After an overview of PIMS, preliminary formative evaluation data will be presented. How these findings can influence policy development will be highlighted.

**Learning Objectives:** A greater understanding of the benefits and limitations of a performance monitoring system to support program management and accountability requirements will be gained. Insights will be gained into methods, measures and usefulness of formative evaluation of such systems.

**Ontario Ministry of Health Promotion and the Ontario Ministry of Health and Long-term Care.**

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**POS4-35** CURRENT PRACTICE AND TRAINING NEEDS OF PRIMARY CARE PROVIDERS REGARDING TOBACCO CESSATION IN ADOLESCENTS

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The Pennsylvania Primary Care Research Network for Adolescent Smoking Cessation is a consortium of adolescent health professionals dedicated to exploring novel methods for effective intervention with adolescents who use tobacco. In May 2007, the Network conducted a survey of primary care providers (PCPs) regarding their experience with screening for and responding to adolescent tobacco use. A secondary aim was to assess PCPs perceived need for training and resources.

**Methods:** Using a Zoomerang(tm) platform, an internet link to a 19-item survey was emailed to 3856 PCPs in Pennsylvania (PA). A repeat mailing was issued two weeks later. The mailing list was compiled from the memberships of the PA Chapters of the American Academy of Pediatrics and the American Academy of Family Physicians. Traditional mail was used when no email address was available, and paper responses were manually entered. Selected results from 480 surveys are reported here.

**Results:** Routine screening was reported by 97% of PCPs, with 91% of responses indicating that the PCP asks about tobacco use during an office visit. A minority (27%) of PCPs stated that they employ a tracking system. PCPs were asked to report how they respond to an adolescent who is contemplating cessation versus one who is not in 2 items that listed the same 14 choices. Discussing risks of use and rewards of quitting were the two most frequent responses in either scenario (contemplators: 84%, 86%; pre-contemplators: 91%, 88%). Only 23% of PCPs reported that they had ever attended a tobacco-focused CME event. A large majority (93%) reported a willingness to use internet-based resources to aid tobacco cessation, while only 13% reported current use of the internet for this purpose.

**Conclusions:** The results of this survey suggest that while PCPs in PA regularly screen adolescents for tobacco use, very few utilize office-based resources for screening or systematically tracking tobacco use. Overall, PCPs reported a relatively narrow array of intervention techniques that do not vary by the adolescents’ readiness to change. Finally, PCPs reported a need for CME opportunities and a willingness to utilize web-based resources.

**Commonwealth of Pennsylvania Department of Health.**

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THE INTRODUCTION OF “LOW TAR” CIGARETTES IN CHINA: FINDINGS FROM TOBACCO INDUSTRY DOCUMENTS

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Introduction: China has the highest smoking rate in the world with 320 million smokers. China is also a growing market for Transnational Tobacco Companies (TTC’s). It is therefore important to identify strategies the TTC’s have used to enter the Chinese market and promote their cigarette brands. One strategy that has been successful in Western countries has been the use of “low tar” cigarettes to target health-concerned smokers. This paper will examine how the TTC’s introduced and promoted “low tar” cigarettes.

Methods: Tobacco industry documents were searched online using a combination of search terms in the American Legacy Tobacco Documents library. This presentation will focus on a selection of over 4,000 documents retrieved.

Results: In addition to the terms “light” or “mild,” etc. the TTC’s tested the use of Chinese words to convey a sense of healthiness or prestige for “low tar” brands. Similar to Western countries, packaging for “low tar” brands was lighter in color to convey a sense of healthiness. Advertising also focused on incorporating a descriptor such as “light” and was targeted towards women and youth/young adults. Smokers in China perceived these brands as less harmful and appealing for health concerned smokers, however many felt that they were lacking in taste. The trend towards “low tar” cigarettes, however, has not yet been as dominant as in Western countries in China. It is anticipated, however, that the popularity of “low tar” cigarettes will increase as smokers in China become more health-conscious.

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IDENTIFYING MEDIATORS IN A SUCCESSFUL WEB-BASED SMOKELESS TOBACCO CESSATION PROGRAM

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While Web-based tobacco cessation interventions have begun to emerge, few have examined for possible underlying mechanisms that could help to explain outcomes results obtained. Improving our understanding of these mechanisms can lead to developing more effective intervention designs. We describe secondary analysis of data from ChewFree.com, a successful Web-based smokeless tobacco cessation trial. This randomized controlled trial included over 2500 adult participants and represents the largest trial of smokeless tobacco cessation to date. In this report we describe our search for putative mediators of tobacco abstinence at 3 and 6 months. Two variables were found that satisfied the criteria for mediating the effects of condition on treatment: changes in participant self-efficacy and a measure of program exposure (combining number and overall duration of program visits). In conjunction with describing our findings, we describe our methodology including our use of a non-parametric bootstrapping approach to test for simple and multiple mediation and our use of recursive partitioning (classification and regression trees) to identify differences in participant subgroups related to these mediator variables. The results of this analysis will be used to describe some of the complexity of dose-response relationships between self-efficacy and exposure on tobacco abstinence outcomes. Additional discussion will focus on the implications for Web-based interventions focused on other health behaviors.

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DEPENDENCE FEATURES AMONG WATERPIPE USERS

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Waterpipe is a traditional tobacco use method in the Middle East that recently has spread globally, including to the U.S. Because little is known about nicotine dependence among waterpipe users, we conducted a formative study, using qualitative methodology, to investigate potential signs and symptoms of dependence. Fifteen focus groups were conducted (n=64) stratified by gender. A topic guide was developed based on positive reinforcement, negative reinforcement, and social/cognitive models of nicotine dependence. Subjects included those who smoked weekly (n=21; 32.8%), and daily (n=43; 67.2%). Most participants believed that individuals who smoked waterpipe occasionally (not every day) were unlikely to become dependent. There was consensus that craving, withdrawal symptoms, and frequent (e.g., daily) use are the most consistent and reliable features of dependence. Daily users often engaged in behavioral accommodation to ensure ready access to waterpipe, in such ways as shifting from smoking only in restaurants to home or work, storing waterpines in places one frequents, and carrying waterpipe all the time. Both weekly and daily users reported that their smoking was often motivated by the desire to relax and socialize. Other motivations to smoke that were reported mainly by daily users included to avoid withdrawal, to cope with emotional distress, and because they cannot stop and assume that quitting will be very difficult. Some daily users but not weekly users used to smoke alone, and smoked in the morning, which was not part of social activity and seemed motivated at dosing nicotine. These data indicate that waterpipe users, particularly daily users, report signs and symptoms of dependence.

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EFFECTS OF INTERACTIVE SYSTEM AND GRAPHIC DESIGN RICHNESS IN WEB-BASED SMOKING CESSATION: RESULTS OF A RANDOMIZED TRIAL


Objective: To determine the effects of an expert system versus user navigated system, and rich graphics versus simple text-based graphics in a web-based program for smoking cessation and relapse prevention.

Methods: Using a randomized factorial design, 189 participants who had just completed six-month follow-up from a web-based smoking cessation program (smokers and recent quitters) received combinations of two intervention factors in a new web-based smoking cessation and prevention program. At the new “baseline,” participants received either: (1) a web-based expert system that recommended specific smoking cessation topics based on the “baseline” survey, or (2) a web-based user-navigated system that required the user to select specific cessation topics. The two interactive system conditions (ISC) were crosswalked with two levels of graphic design richness (GDR): (1) a rich graphic design, or (2) a simple text-based design. Point prevalent smoking cessation was assessed by telephone interview six months later.

Results: ISC and GDR influenced six-month cessation differentially by both the participant’s baseline smoking status and their NFC. Among participants who were smokers at baseline, those with high NFC and assigned to the user-navigated system condition were more likely to have quit smoking six months later than those assigned to the expert system condition. Conversely, smokers with low NFC assigned to the expert system condition were more likely to quit smoking than those assigned to the user-navigated system condition. Regardless of NFC, participants who were smokers at baseline and assigned the simple text-based graphics condition were more likely to quit smoking than those assigned to the rich graphics condition. However, among participants who had recently quit at baseline, a GDR X NFC interaction was found: those with high NFC assigned to the rich graphics condition were more likely to remain non-smokers than those assigned to the simple text-based graphics condition while participants with low NFC assigned to the text-based graphics condition were more likely to remain non-smokers than those assigned to the rich graphics condition.

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POS4-40  ARIZONA'S EXPERIENCE: COMBINING CESSATION SERVICES WITH AN NRT+ BENEFIT — CLIENT USE AND EFFECTIVENESS

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Background: The Arizona Department of Health Services Tobacco Education and Prevention Program offers a 50% medication benefit to clients 18 years and older who are enrolled in their intensive cessation services. This benefit consists of a voucher covering 50% of the cost of both over-the-counter NRT and prescription pharmaceuticals (NRT+). The current study sought to determine the utilization patterns of this NRT+ benefit, and the impact of program funded NRT+ on quit rates.

Methods: NRT+ billing data was matched to client data, collected based on follow-up interviews with cessation service participants, and 3 and 6 months following their cessation service. Patterns of voucher redemption, type and duration of benefit, were examined by client demographics and by addiction level. Logistic regression was used to determine the effect of NRT+ on quit rates.

Results: Forty percent of clients in cessation services had redeemed an NRT+ voucher, most for the patch only (64%). Voucher redemption differed by gender (42% of females had redeemed vouchers, 37% of males), age (48% of those over age 55, 19% of 18-24 year olds), ethnicity (45% of self-identified Whites, 26% of American Indian clients, 25% of Black clients, 24% of Hispanic clients), health insurance status (42% of insured, 29% of uninsured), addiction level (46% of highly addicted, 35% for low addiction levels) and service type (45% of class participants, 28% of phone-based counseling clients). The likelihood of continuous abstinence differed between those who did and did not redeem NRT+ vouchers and by the number of weeks of redemption. At 3 month follow-up, those with increasing duration of patch redemption had increased likelihood of continuous abstinence compared to those not redeeming NRT+: 3-4 wks of vouch of M=1.71 (95% CI: 1.49-1.93); 5-6 wks OR=2.13 (95% CI: 1.91-2.35); 8+ wks OR=3.13 (95% CI: 2.77-3.49). This trend continued at 6 month follow-up: 5-6 wks of vouchers OR=1.67 (95% CI: 1.48-1.86); 8+ wks OR=2.4 (95% CI: 2.10-2.73).

Conclusion: A program sponsored NRT+ benefit is utilized by program participants and improves clients’ ability to abstain from tobacco use.

Arizona Department of Health Services Tobacco Education and Prevention Program.

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POS4-41  STIMULATING LOCAL NEWSPAPER COVERAGE SUPPORTING TOBACCO CONTROL WITH A TECHNICAL ASSISTANCE WEBSITE

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Strategic use of local media is a best practice for tobacco control recommended by CDC. A multimedia, highly interactive Augmented website supporting local tobacco control coalitions was recently developed and tested in Colorado as a module on strategic media use, as well as modules on other CDC best practices, online resources (news, webcasts, local data), and communication devices (calendar, contacts for state staff and coalition members, forums). It was compared to a flat, non-interactive, text-based Core website in a pair-matched group-randomized experimental design (n=34 coalitions). Stories (n=351) on tobacco control published in local daily and weekly newspapers in coalition service areas (n=37 Augm, n=30 Core) over 6 months were coded for focus (intercoder reliability kappa=0.88), topic (0.86), environment and population (0.85), point of view (0.80), and type (0.89). Treatment group did not affect overall number of articles (Augmented n=187, 53%; Core n=164, 47%; chi-square=1.51, p=0.220) or mean number per coalition (Augmented M=14.4, Core M=12.6, t=0.32, p=0.749). However, newspapers in Augmented coalition areas printed a greater proportion of stories on local/regional issues (79%; national/international issues=21%) than in Core coalition areas (66%; 34%; Fisher Exact Test (0.016) of repair. At 3 month follow-up, those with increasing duration of patch redemption had increased likelihood of continuous abstinence compared to those not redeeming NRT+: 3-4 wks of vouch of M=1.71 (95% CI: 1.49-1.93); 5-6 wks OR=2.13 (95% CI: 1.91-2.35); 8+ wks OR=3.13 (95% CI: 2.77-3.49). This trend continued at 6 month follow-up: 5-6 wks of vouchers OR=1.67 (95% CI: 1.48-1.86); 8+ wks OR=2.4 (95% CI: 2.10-2.73).

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POS4-42  DO OFFERS OF QUITLINE SERVICES AFFECT QUIT RATES?

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Background/Objective: Quitlines provide behavioral counseling and other cessation services to aid smokers trying to quit. Between April and July 2006, a cohort of adult smokers in Western New York, previously identified in 2005, were offered immediate quitline assistance upon completion of a telephone interview assessing tobacco use.—41% accepted the offer. Concurrently, a random sample of adult smokers in WNY was given the survey without the offer of quitline assistance. Both groups of smokers were followed one year later to assess whether the offer of quitline services affected quit rates.

Methods: In 2006, 121 adult smokers originally identified in 2005 were given a 30-minute survey to assess current tobacco use, and at the end of the survey, smokers could choose to be transferred to the New York State Smokers’ Quitline in order to receive cessation services. During the same period, 309 adult smokers were recruited through a random-digit-dial survey to participate in an identical survey, but were not given the quitline offer. The two groups did not differ on demographic or nicotine dependence characteristics. Between April and July 2007, 259 participants completed the follow-up survey (n=73 given the offer, n=186 not given the offer) for a 60% response rate.

Results: The quit rate at follow-up was 9.6% among smokers offered quitline referral compared to 12.9% among those not offered the referral. Among the smokers offered the quitline referral to the quitline, the quit rate was 13.8% among those who accepted the referral compared to 3.4% among those who did not.

Conclusions: Proactively offering quitline services to smokers did not increase the population quit rate. The higher quit rate observed among smokers who accepted the referral to the quitline compared to those who did not suggests that self-selection factors may account for the higher quit success typically attributed to quitline services. Funding has been provided by the New York State Department of Health.

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POS4-43  FINANCIAL CONSEQUENCES OF LONG-TERM SMOKING CESSATION

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Background: Financial consequences of quitting smoking have never been investigated. We examined the association of smoking cessation with the subsequent likelihood of experiencing financial stress and level of material well-being.

Methods: Data came from waves 1, 2 and 3 (2001-2004) of the Household Income and Labour Dynamics in Australia survey. The size of the subsample of smokers in wave 1 who also participated in waves 2 and 3 was 1,747. We compared respondents who reported to have been a smoker in all three waves with those who were a smoker only in wave 1. Eight questionnaire items were used to construct a binary financial stress indicator. Material well-being was measured with a single item scored 1 (very poor) through 6 (prosperous).

Results: The odds of experiencing financial stress in wave 3 was 42% (95% CI: 6 to 74%: p=0.028) smaller for quitters than continued smokers. Being a quitter was associated with an increase of 0.14 (95% CI: 0.02 to 0.26, p=0.025) units of material well-being in wave 3.

Conclusions: Interventions to encourage smoking cessation among disadvantaged groups are likely to enhance their material conditions and standards of living, and to reduce socio-economic disparities in mortality.

Victorian Health Promotion Foundation (VicHealth), Australia.

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POS4-44  IMPROVING LOCAL TOBACCO CONTROL COALITIONS WITH WEB-BASED TECHNICAL ASSISTANCE  
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Community tobacco control is often achieved by local coalitions of activists. The Internet may be an effective at providing technical assistance to these coalitions. Coalitions led by local health departments and county nursing services in Colorado (n=34) were enrolled in a pair-matched group-randomized experimental design comparing an Augmented website with rich multimedia features (e.g., training modules, online resources, and communication devices) to a flat, non-interactive, text-based Core website. For 18 months, coalitions were randomized to either Augmented or Core, preceded by a 9-month run-in with Core only. Website use was tracked throughout the 663 coalition leaders and members completed posttests on the quality of coalition functioning (i.e., 339 Independently rated, Evaluated, R of 1-7) and 31% Core coalitions; 7,162 sessions; 32,201 page views); 164 post-survey respondents had visited them. Analyses of composite ratings averaged across respondents within coalitions revealed that Augmented coalitions were rated more favorably on conflict resolution (M=3.10) than Core coalitions (M=2.93) (t=1.73, p=0.029). Members, but not leaders, in Augmented coalitions rated leadership satisfaction (Core M=2.94, Augmented M=3.19; t=2.07, p=0.047), conflict resolution (Core M=2.83, Augmented M=3.10; t=2.21, p=0.039), and shared mission (Core M=2.84, Augmented M=3.17; t=1.86, p=0.072) more favorably than in Core coalitions. Among all respondents, website use and organization involvement were positively related (r=0.42, p=0.018). However, greater use by coalition leaders was positively associated with members’ evaluation of organization involvement (r=0.55, p<0.002), but members’ use was unrelated to members’ organization involvement. A media-rich technical assistance website may have improved the functioning of local tobacco control coalitions by improving members’ understanding of coalition goals and creating a sense of shared mission and satisfaction with coalition leaders. While more use of either website increased everyone’s involvement, leaders’ use of the websites was particularly instrumental for engendering involvement by members. This project was supported by a grant from the U.S. National Cancer Institute (CA86199). 

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POS4-45  LEGACY’S EX: IMPLEMENTATION AND EVALUATION OF A SMOKING CESSATION CAMPAIGN  

“EX” is a comprehensive smoking cessation campaign recently piloted by American Legacy Foundation in four U.S. cities: Grand Rapids, Baltimore, San Antonio and Buffalo. The media component of the campaign consists of television advertising designed to drive smokers to cessation services (Phase I) and to change knowledge, beliefs and attitudes related to successful quitting (Phase II). Other key campaign components include EX branded telephone and Internet counseling, a free quit manual and, for some individuals, free nicotine replacement therapy. The EX campaign is based on the body of scientific evidence about effective cessation and social support. Evaluation of “EX” is being conducted in each pilot site. A comprehensive evaluation, including a telephone survey of a large cross-sectional sample of the general population (n=1000) and a smaller longitudinal sample of smokers (n=212) is being conducted in Grand Rapids. Telephone surveys are also being used to collect cross-sectional data (n=500) from African American and Hispanic smokers in Baltimore and San Antonio, respectively. Call Volume and web traffic data are being collected at the point of service. Preliminary results show that more than 50% of smokers in two of the three primary evaluation sites cited above can accurately describe one of the Phase II advertisements, and that about two-thirds of smokers in these three sites agree that “EX has information that could be very helpful in my next quit attempt.” Call volume and web traffic data appear to be linked with campaign activity. This study was funded by American Legacy Foundation.

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POS4-46  SMOKELESS TOBACCO USE IN ARKANSAS  
Carolyn Dresler, M.D., M.P.A.* and Thaer Baroud, M.S.H.A., M.A.

Although cigarettes are the most prevalent form of tobacco products used in Arkansas, there has been a consistent downward trend in their consumption. However, according to recent USDA reports, consumption of smokeless tobacco (SLT) products has been recently increasing nationwide. This increase raises a public health concern that tobacco industry promotion of SLT products, particularly new types will thwart the state’s prevention efforts. We examined patterns and trends for SLT consumption in AR for 2004-2006 using data from CA Nielsen’s Scantrack Information System, which collects point-of-sale data based on the scanning of product UPC codes. CA Nielsen receives data weekly on a category basis from different types of outlets, including supermarkets (that gross over 2 million dollars, accounting for 96% of food stores), drug stores (that gross over 1 million dollars, accounting for 95% of drug stores), convenience stores (100% of convenience stores as defined by the National Association of Convenience Stores), as well as sales data from Wal-Mart and other mass merchandisers. Data was also obtained from 2006 ATS and 2005 YTS surveys. In 2005, the YTS showed 11.6% of HS students (3.4% female; 19.5% male) and were predominantly white. In the 2006 ATS, overall prevalence was 6.4% (0.6% female; 12.7% male) with 7.2% white and 3.2% Black. Time trends for the YTS and ATS for the state will be presented. “The other tobacco products” (predominantly smokeless) consumption for Arkansas increased 54.3% from 2000-2006 BUT a 2.7% decline from 2004-2006. Results from the recently acquired Nielsen data for smokeless sales will be presented. The use of smokeless tobacco consumption has remained relatively consistent in the YTS and ATS, only decreasing by 1.9% from 2003 to 2004. This decline has been a new decline in “other tobacco products” consumption. With the potential for new smokeless tobaccos on the horizon, it will be important to closely follow the types of products as revealed by Nielsen data. Funding is from the Arkansas Department of Health.

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POS4-47  SMOKING BY INCOME AND EDUCATION: DIFFERENCES BETWEEN HISPANICS/LATINOS AND NON-HISPANIC WHITES  
Dennis R. Trinidad, Ph.D., M.P.H.*, Univ. of Southern California; Sherry L. Emery, Ph.D., M.B.A., Univ. of Illinois, Chicago; Martha M. White, M.S., Univ. of California, San Diego; Eliseo J. Perez-Stable, M.D., Univ. of California, San Francisco

Since the release of the 1986 Surgeon General’s Report on smoking, a generally inverse relationship between smoking and socioeconomic status has been approximated by income and education, has persisted. This has also been found in California (CA), which has the largest and most comprehensive tobacco control program in the US. Little is known, however, about this relationship over time for the two largest racial/ethnic groups in CA: Hispanics/Latinos (HL) and non-Hispanic Whites (WH). The California Tobacco Surveys (CTS; n>3,000/year, ~66% response rate/year) and other mass merchandisers. Data was also obtained from 2005-2007 YTS surveys. The “other tobacco products” (predominantly smokeless) consumption for Arkansas increased 54.3% from 2000-2006 BUT a 2.7% decline from 2004-2006. Results from the recently acquired Nielsen data for smokeless sales will be presented. The use of smokeless tobacco consumption has remained relatively consistent in the YTS and ATS, only decreasing by 1.9% from 2003 to 2004. This decline has been a new decline in “other tobacco products” consumption. With the potential for new smokeless tobaccos on the horizon, it will be important to closely follow the types of products as revealed by Nielsen data. Funding is from the Arkansas Department of Health.

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**POS4-48**

**THE EFFECT OF SOCIAL CONTEXTS ON WEST AFRICAN IMMIGRANTS’ SMOKING BEHAVIOR**

Alexandra Pierce, Ph.D.*; Wilder Research

Social contexts strongly influence smoking behavior. Those that encourage smoking include peer pressure and social environments in which smoking is an acceptable activity. Those that discourage smoking include social disapproval and clean indoor air laws. These social context influences may be particularly influential in new immigrant communities. This paper describes findings from interviews with 118 West African immigrant and refugee men ages 18 and over in Minneapolis and its north-west suburb, conducted through a community-academic research partnership with the African Assistance Program. Adult male smokers (n=76) and former smokers (n=42) from Cameroon, Ghana, Liberia, and Sierra Leone were asked about their smoking histories in their home countries and in the U.S., and about the social contexts surrounding their smoking and their quit attempts. Results indicate that social factors that effectively limited smoking in home countries have lost their effectiveness because the social context for smoking in the U.S. is very different. Respondents report that heavy smoking is increasing among West African men because: a) it is much easier to smoke without incurring social consequences in the U.S.; b) community support for cessation treatment is lacking; and c) the cessation treatments available in the U.S. are not appropriate for West African men. We conclude that smoking cessation interventions for West African immigrants must be framed within social contexts. We also propose a design for a researcher and immigrant community organization partnerships to conceptualize, design, implement, and evaluate smoking cessation interventions that respond to the social contexts influencing immigrant communities’ smoking behavior and interest in cessation treatment.

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**POS4-49**

**A RANDOMIZED CONTROLLED TRIAL OF A SMOKING REDUCTION INTERVENTION IN PROMOTING CESSATION AMONG CHINESE SMOKERS WITH NO INTENTION TO QUIT**

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Background: Many smokers are unable or unwilling to quit smoking abruptly. There is evidence that reduction in cigarette consumption could result in improved health and provide an intermediate step before complete cessation. We conducted this first smoking reduction trial in Hong Kong, starting in 2004.

Methods: 1,154 Chinese adult smokers who smoked at least 2 cigarettes daily and had no intention to quit smoking were recruited. 478 (41.4%) were randomized into the A1 group (smoking reduction counseling + 1 week NRT prescription + NRT adherence intervention), 450 (39.0%) into the A2 group (smoking reduction counseling + 1 week NRT prescription) and 226 (19.6%) into the control group (self-help cessation material). The intervention groups received face-to-face counseling at baseline, 1 week, and 1 month; and telephone follow up at 3 months on NRT usage. At 6 months, smoking status of all the participants was assessed via telephone.

Results: At baseline, 946 (82%) of the participants were male, 67.8% married, mean age was 42 years, 39.5% had secondary education and 83.4% were currently employed. On average, they smoked 19.8 cigarettes daily, and had been smoking for 24.2 years. 45.5% had severe and 31.3% had moderate level of nicotine dependence. No statistically significant difference was observed in baseline variables across the three groups except more females were in the intervention group A1 (A1: 22.2%, A2: 16.4%, B: 12.4%; p=0.004). 87.3% (987/1113) were successfully followed up at 6 months. More participants in the combined intervention group (A1+A2) reported quitting in the past 7 days (16.3% vs. 10.4%; p=0.013; Odds ratio=1.59) and had reduced cigarette consumption by at least 50% (39.3% vs. 15.8%; p=0.001, Odds ratio=2.52) than the controls at 6 months by intention to treat analysis.

Conclusion: Our study shows that smoking reduction intervention can promote smoking cessation among smokers not motivated to quit but interested in reducing smoking. The findings provide evidence for smoking reduction intervention as an alternative approach to increase cessation.

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**POS4-50**

**SMOKING CARE AND POLICIES IN MENTAL HEALTH SERVICES IN AUSTRALIA: HEALTHCARE PROVISION OR BEHAVIOUR MANAGEMENT?**


Introduction: This study aimed to describe current smoking policies, routine smoking assessment and care provided to inpatients in public mental health units in New South Wales.

Methods: A cross-sectional questionnaire of all public mental health inpatient service units in NSW (N=131), was conducted of which 123 responded. The questionnaire assessed current smoking assessment and care practices for mental health inpatients, and current smoking policies and procedures.

Results: Over 98% of respondents reported a total ban on smoking indoors, and 69% reported restrictions were enforced at all times for all patients, staff and visitors. Fifty per cent of respondents reported their unit assessed all smoking patients, however 37% of units recorded smoking status. Only 21% of respondents reported all smoking patients were asked about their interest in quitting. Controlling access to cigarettes was the most frequent form of smoking related care (29% of units always control access to cigarettes), compared to providing quit advice (17%), providing information about how to quit smoking (9%), or prescribing NRT (9%). Thirty nine per cent of respondents reported they provided cigarettes to patients when the patient ran out. Thirty-six per cent of respondents reported instances of patients starting smoking after admission.

Conclusions: The data presented in this study is the first comprehensive indication of smoking restrictions, smoking management and smoking care in public mental health services in NSW. The results suggest a lack of uniformity in smoking restrictions across the state, and an emphasis on behavior management rather than healthcare provision.

This study was supported by funding from the Commonwealth Department of Health and Aging.

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**POS4-51**

**STAGE TRANSITIONS OF SMOKING CESSATION AMONG CHINESE YOUTH WHO CALLED THE YOUTH QUITLINE IN HONG KONG**

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Tobacco smoking among youth presents a significant and growing public health problem worldwide. In Hong Kong, over 80% of daily smokers started weekly smoking before the age of 20. Although quitting at an early age can largely reduce the health hazards, most smoking cessation services in Hong Kong are targeted at adults, and the utilization of youth smokers is low. A youth-oriented smoking cessation hotline (Youth Quitline) was implemented from August 2005 onwards to publicize quitting among youth smokers, and to encourage and support those who want to quit by providing tailor-made advice and counseling through the telephone. The Transtheoretical model of behavior change (TTM), has been widely used in the past two decades to explain behavioral changes in smoking cessation, was applied to motivate youths’ intention to quit smoking by moving up the stages of change (pre-contemplation, contemplation, preparation, action, and maintenance). Traditional outcome measurements such as point prevalence and program abstinence have been found to be deficient when exploring the stage transitions in TTM, and the results is always under-powered by small sample size. This presentation aims to evaluate the effectiveness of Youth Quitline with the aid of Latent Transition Analysis (LTA) as an alternative outcome measurement. Up to August 2007, 385 youth smokers aged 12 - 25 were recruited through school referrals and mass media campaigns. Trained youth volunteers delivered telephone smoking cessation counseling at baseline, 1 week and 1 month after recruitment based on TTM. At baseline, the stage proportions were 33% (pre-contemplation), 30% (contemplation), 26% (preparation), and 11% (action). At 6 months, the probability for pre-contemplators to move up the stages was 0.47, whereas the probability for quitters to sustain in the action stage was 0.38. Intervention groups showed an increase of pre-contemplators towards quitting, and prevent quitters from being relapsed. The findings could serve as a building block for healthcare professionals to design and implement smoking cessation interventions for youth smokers in the future.

The study was supported by the Health Care and Promotion Fund from the Health Welfare and Food Bureau, Hong Kong SAR Government (#18040084) and Hong Kong Council on Smoking and Health.

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**POS4-52 USE OF NICOTINE REPLACEMENT THERAPY FOR REASONS OTHER THAN QUITTING SMOKING: FINDINGS FROM THE ITC 4-COUNTRY SURVEY**

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Although nicotine replacement therapy (NRT) use has increased following its switch to over-the-counter (OTC) status, some population-based studies suggest that increased use comes at the cost of lower effectiveness. One potential explanation for this observation lies in how NRT is being used. When NRT becomes more available, smokers may use NRT for reasons other than quitting, such as for reducing rather than stopping smoking, or for temporary abstinence during times when smoking is prohibited. However, there is little research to date on patterns of ‘real-world’ NRT use. This study examined the use of NRT for reasons other than quitting smoking among smokers from four countries (Canada, US, UK, and Australia), including: 1) prevalence and correlates of non-standard use; 2) individual and country-level differences in reasons for NRT use; and 3) the associations between reasons for NRT use, access to NRT, and smoking restrictions. Data were collected by telephone interview from 6532 daily smokers in Canada (n=1660), US (n=1664), UK (n=1617), and Australia (n=1591) as part of the ITC 4-Country Survey conducted in 2005. Participants were asked about demographics, smoking behavior, use of stop-smoking medications (including reasons for use), and policy-related items. The results indicate that one-fifth of smokers had used NRT in the past year. Among NRT users, approximately one third used NRT for a reason other than quitting, including temporary abstinence or reducing the number of cigarettes smoked. The prevalence of non-standard NRT use was remarkably consistent across countries. Reasons for NRT use were associated with individual-level variables (education level, heaviness of smoking, quit intentions, and quit attempts), and policy-related items. The results values and using non-parametric methods and results were the same.

**POS4-53 COTININE INCREASE IN PATRONS EXPOSED TO TOBACCO SMOKE POLLUTION (TSP) IN A PUB IN THAILAND**

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Purpose: The purpose of this study was to assess levels of urine cotinine from pub patrons exposed to common, high levels of tobacco smoke pollution (TSP). Ten non-smokers consented to visit a pub in Chiang Mai, Thailand on 2 consecutive nights for four hours on each night. Patrons provided spot urine samples at baseline before the first visit to the pub (Day 0), at noon on the day after the first pub visit (Day 1), and noon the day after the second visit (Day 2).

Method: Urine samples collected from patrons were analyzed for cotinine using gas chromatography/mass spectroscopy. A TSI Sidepak AMS10 Aerosol Monitor was used to estimate exposure to tobacco smoke-derived particles of less than 2.5 microns (PM2.5).

Results: Patrons were evenly split by gender with an average age of 21.5 years. Area monitoring in the pub revealed exposure of 304 and 327 micrograms per cubic meter of TSP-PM2.5 on the first and second nights. The range of urine cotinine on Day 0 was 0-1 ng/mL; on Day 1, 0-4 ng/mL; and on Day 2 between 0 and 9 ng/mL. On Day 1, 40 % of the samples had cotinine levels increase 2 to 4 fold from Day 0; on Day 2, 80 % of the samples had cotinine levels increase 2 to 9 fold from Day 0. The mean urinary cotinine increased from 0.75 nanograms per milliliter (ng/ml) of urine at baseline, to 1.29 ng/ml on day 1, and 3.75 ng/ml on day 2. Paired-samples T tests reveal the increases from day 0 to day 2 and from day 1 to day 2 are statistically significant (p<0.01 for both). The analysis was also done using log-transformed values and using non-parametric methods and results were the same.

Conclusion: On average, cotinine levels of patrons at least doubled after each night’s exposure to high levels of smoke-derived particles from heavy smoking in this pub. The larger public needs to be informed that even occasional high exposures to TSP results in increased levels of cotinine, an indicator of toxic and carcinogenic smoke constituents. Smoking bans are the only effective way to remove TSP at its source.

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POS4-54 IMPLEMENTATION OF YOUTH QUITLINE: AN EXPERIENCE IN HONG KONG

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Objectives: In Hong Kong, a youth-oriented smoking cessation hotline (Youth Quitline) was implemented from August 2005 onwards to publicize quitting among youth smokers and provide peer-led telephone smoking cessation counseling.

Intervention: The counseling consisted of 3 telephone sessions (at baseline, 1-week and 1-month) and 2 follow-ups (at 3- and 6-months). Trained youth volunteers assessed callers’ smoking history and stage of readiness to quit during the first call. Smoking cessation interventions based on Transtheoretical Model were provided to encourage quitting. Smokers who reported quitting at 6-month were invited for biochemical validation. The Quitline operated in the afternoons/evenings. We promoted the service via mass media campaigns and making collaborations with schools, hospitals and NGOs.

Results: Up to 31 May 2007, the Quitline received 2173 calls from smokers, teachers, social workers, and relatives/friends of smokers. 949 (44%) were successfully handled, and 339 youth smokers aged 12 to 25 received baseline telephone counseling. About 40% intended to quit smoking within one week, but most perceived difficulties. At 6-months, 55% (123/240) had quit attempts (no smoking for 24 hours or more), 22.1% (53/240) did not smoke in the past 7 days, and 17.5% (42/240) did not smoke in the past 30 days. Among the remainders, 24% (45/240) reduced daily cigarette consumption by half or more. Data were analyzed by the intention-to-treat principles.

Discussions: Since the implementation of the new anti-smoking legislation on 1 January 2007, the Quitline received a 19% increase in telephone calls per month and 10% increase in monthly case recruitment. However, the effects faded gradually after the initial implementation of the new legislation. Continuous publicity is therefore necessary to capture the attention and motivate young smokers to quit. The Youth Quitline demonstrated effectiveness in promoting smoking cessation via youth volunteers, and most callers were satisfied with the service. The project is still on-going, and the preliminary results suggested feasibility to develop similar youth-oriented smoking cessation service in the community.

The study was supported by the Health Care and Promotion Fund from Health, Welfare and Food Bureau, Hong Kong SAR Government (#18040084) and Hong Kong Council on Smoking and Health.

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POS4-55 TOBACCO USE IN RELATION TO ALCOHOL USE, BMI, BLOOD PRESSURE, AND OTHER HEALTH CONDITIONS AMONG RESIDENTS OF AN URBAN TOWNSHIP IN SOUTH AFRICA

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Chronic diseases such as hypertension and stroke are increasing and becoming significant health problems in South Africa, even among the poor. Although smoking rates have declined in South Africa, little is known about the relationship between current tobacco use and other behavioral risk factors such as alcohol use and obesity among residents of urban townships. The purpose of this study was to examine tobacco use in relation to alcohol use, obesity (BMI), and health conditions (i.e., blood pressure and self-reported heart attack, stroke, arthritis and diabetes). Data were from a baseline community survey administered to 695 residents (84.9% female, mean age = 34.4 years) of an urban township outside of Cape Town. Smoking rates were significantly higher for men than women so analyses were conducted separately for each gender. An independent samples t-test indicated that among females, tobacco users had significantly higher systolic blood pressure (p <.001), but this was not the case among males. Chi-square analyses revealed that both men and women who used tobacco had significantly higher rates of alcohol consumption (all p’s <.05). There were no associations for either men or women between smoking status and BMI or self-reported health conditions. Results suggest that tobacco use is not an additional risk factor for most individuals with higher BMI scores or other health conditions; however interventions for tobacco users in urban townships should focus on the interrelationship of tobacco and alcohol use.

Acknowledgement: Partial funding for the study was provided by the Provincial Government of the Western Cape and the National Research Foundation of South Africa.

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POS4-56 SMOKING AMONG COLLEGE STUDENTS IN KARACHI, PAKISTAN

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Background: In Pakistan smoking prevalence and related diseases are on the rise. However little is known about specific sub-populations, such as young adults.

Objective: The objective was to obtain information about the prevalence of cigarette smoking among college students in Karachi and build our understanding of the determinants of smoking with respect to family smoking, smoking in the home, tobacco use in relation to alcohol use, obesity (BMI), and health conditions.

Methodology: Data were collected as a part of a pilot project initiated by Jinnah University Karachi. Participants were 629 college students (432 males and 197 females) aged 18-25 years from ten universities in Karachi. Descriptive statistics and Logistic regression analyses were used to determine the results and conclusions.

Results: Thirty-nine percent of students had smoked a whole cigarette in their lifetime, whereas 25% had smoked 100 or more cigarettes in their lifetime. Overall, 23% of students (31% male and 6% female) were considered a current smoker (i.e., those who smoked 100 cigarettes in their life time and smoked in last 30 days) and their average age of smoking initiation was 17 years. Nicotine addiction and stress were perceived to be the major reasons for smoking (53% and 50%, respectively). Forty-seven percent of smokers were willing to join a cessation program. Sixty-three percent of smokers reported that public places should be smoke-free. Logistic regression analyses adjusted by age and gender suggested that parental influence, sibling influence, number of close friends who smoke and number of individuals who smoke at home were highly predictive of being a smoker.

Conclusion: Findings highlight the importance of cessation among this group and indicate strong support for smoke-free policies and cessation services, two of the key provisions in the WHO’s Framework Convention on Tobacco Control (FCTC), which has been ratified by Pakistan.

Higher Education Commission of Pakistan.

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POS4-57  SMOKING CESSATION: ISSUES FOR AUSTRALIAN METHADONE CLIENTS

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Smoking levels are especially high among clients of methadone programs, as they are for clients of drug and alcohol services generally. Whilst there has been some U.S. research exploring issues relating to smoking cessation for methadone clients, and a few intervention trials, there is as yet no published research addressing cessation for this high risk, disadvantaged group within the Australian context. This paper reports the results of a survey study where a self-administered questionnaire was completed by a sample of Australian methadone clients (n=103), examining smoking and cessation behaviors/motivations. Results are also reported from focus groups subsequently conducted to further explore the experiences and perspectives of methadone clients with respect to smoking cessation. As found in U.S. studies, smoking levels among the survey respondents were high (84% currently smoking). A quit ratio of 9.6% reflects a substantially lower rate of cessation than occurs for the general population, but is on a par with quit rates reported for this client group in the U.S. Methadone clients who smoke are much less likely to successfully cease smoking than are smokers in the general population. Just over half the sample reported ever having tried to quit smoking, and with respect to the ‘stages’ of the Transtheoretical Model, 54% were in the Precontemplation stage, and the remainder (with the exception of one client in Preparation) in the Contemplation stage. Curiously, while only 27% of smokers who had ever tried to quit reported their most recent attempt as being within the last year, 58% of the same group indicated at least one period of smoking abstinence of 24 hours or more within the last year. It seems that a sizeable proportion of smokers are reporting abstinence for periods of 24 hours or more that occur outside of the context of something they would describe as ‘a serious quit attempt’. Focus group analysis highlighted several issues, including the role of ‘planning’ — or its absence — in smoking cessation among this client group. Implications for further research and the development of tailored interventions for this population are discussed.

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POS4-59  TOBACCO—MAJOR HEALTH HAZARD TO CHILDREN IN BOSNIA AND HERZEGOVINA

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Background: Bosnian statistics show that about eighty percent of tobacco users start before they are 18 years old. Smoking is a hard habit to break because tobacco contains nicotine, which is highly addictive. Nicotine is frequently the first substance of abuse used by children and youth in Bosnia and Herzegovina. Methods: We compare many studies articles passive smoking to lung cancer in nonsmoking adolescents, children and adults living with spouses who smoke. Exposure during childhood to environmental tobacco smoke may also be associated with development of cancer during adulthood. The first effect of passive smoking to be documented in Bosnian children was an increased rate of illnesses affecting the lower respiratory tract. Results: Results of epidemiologic studies at children in Sarajevo, Bosnia and Herzegovina, provide strong evidence that exposure of children to environmental tobacco smoke is associated with increased rates of lower respiratory illness and increased rates of asthma and sudden infant death syndrome. Discussion: The pediatrician should be prepared to discuss the issue of tobacco cessation at every opportunity. Some Bosnian teens who smoke say they start because they think it helps them look older, others smoke because they think it helps them relax. Conclusion: Tobacco advertising and promotion are appealing to young people and make a powerful impression influencing them to experiment with cigarettes, cigars, and smokeless tobacco. A tobacco-free environment is imperative, because tobacco is a major health hazard to infants, children, adolescents, and their families. Bosnia and Herzegovina is poor European country after the war that it needs urgent supporting program for tobacco cessation in children and adolescents.

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POS4-58  ENGAGING THE HUNGARIAN PUBLIC HEALTH WORKFORCE IN TOBACCO CONTROL ACTIVITIES

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Hungary has the highest percentage of smoking-related deaths in the European Union (21%); an estimated 34% of adults in Hungary smoke. The goal of this research is to assess the capacity of the Hungarian public health workforce to support and engage in tobacco control activities. Public health workers representing central (51%) and regional (49%) agencies responded to a mailed survey in the spring of 2007 (n=269). Respondents were predominantly women (90%) and either a never smoker (51%) or former smoker (28%). Eighty-two percent of respondents indicated that tobacco prevention and cessation programs are offered at their agencies, focused predominately on school-based education (76%). Almost all respondents believe it very important to prevent initiation of tobacco use among young people (97%), to eliminate exposure to secondhand smoke (82%), and to promote quitting (84%). They report that role modeling (74%), family programs (64%), teachers (78%), health care providers (78%), and public health workers (65%) are primarily responsible for reducing tobacco use in Hungary. About two-thirds felt that it was important to enforce existing policies related to tobacco, while fewer supported creation of new policies (44%). Additionally, individuals reported that it is not the responsibility of law enforcement (76%), restaurant owners (64%), and/or government (63%) to reduce tobacco use in Hungary. In conclusion, the public health workforce strongly endorses tobacco prevention and cessation programs in Hungary and support the role of family, health care workers, and public health to reduce consumption. However, they are less enthusiastic about involvement from government even though comprehen- sive tobacco control programs which include government-sponsored initiatives are important to reduce the prevalence and acceptability of tobacco use. Opportunities for public health workforce capacity building will be discussed.

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POS4-60  NOT JUST FOR COWBOYS: THE ROLL-YOUR-OWN CIGARETTE MARKET IN CANADA

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Introduction: Even though the use and prevalence of roll-your-own cigarettes (YRO) has been declining over the past decades, RYO remains important. Given the paucity of research examining RYO use, there is a need to better understand the current and potential future context of RYO use in Canada.

Methods: Data from the 2002 Canadian Tobacco Use Monitoring Survey (CTUMS) were used to examine characteristics associated with different patterns of RYO tobacco use among current smokers.

Results: In Canada, 17% (n=925,000) of current smokers reported smoking RYO. When compared to manufactured cigarette (MC) smokers, RYO users were heavier smokers (averaging 19.2 (±9.2) cigarettes per day compared to 13.8 (±8.9) cigarettes per day), more addicted to nicotine (Chi-Square=133.3, df=9, p<0.001), and less likely to consider quitting smoking (Chi-Square=116.1, df=3, p<0.001). Smokers with middle income (OR 7.35) or low income (OR 13.07) were substantially more likely to smoke RYO tobacco all of the time compared to smokers with high income. Conversely, smokers who had completed secondary school (OR 0.45) or university (OR 0.13) were less likely to smoke RYO most of the time compared to smokers who had not completed secondary school.

Discussion: This study demonstrates that RYO tobacco use is not a negligible problem within Canada. Characteristics that differentiated RYO smokers from MC smokers were identified, with smokers of RYO’s being older, less educated and poorer. In addition, RYO smokers smoked more cigarettes and were more addicted than MC smokers. These findings provide valuable new insight for developing future tobacco control initiatives for this population of smokers.

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POS4-61  SOCIO-ECONOMIC VARIATIONS IN TOBACCO CONSUMPTION, INTENTION TO QUIT, AND SELF-EFFICACY TO QUIT AMONG MALE SMOKERS IN THAILAND AND MALAYSIA: RESULTS FROM THE ITC-SEA SURVEY

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Aim: To examine the association of socioeconomic position with cigarette consumption, intention to quit and self-efficacy to quit among male smokers in Thailand and Malaysia.

Design and setting: The data were based on a survey of adult smokers conducted in early 2005 in Thailand and Malaysia as part of the International Tobacco Control South-East Asia (ITC-SEA) project.

Participants: 1,846 men in Thailand and 1,906 men in Malaysia.

Measurement: Participants were asked questions on daily cigarette consumption, intention to quit and self-efficacy to quit in face-to-face interviews. Findings: In Thailand, there was an association between higher income and higher cigarette consumption (p = 0.026); being employed and having an intention to quit (p = 0.028); and higher education and lower self-efficacy (p = 0.008). In Malaysia, there was an association between being employed and higher cigarette consumption (p = 0.003), and between higher income and self-efficacy (p < 0.001).

Conclusion: Socio-economic and cultural conditions, as well as tobacco control policies and tobacco industry activities, shape the determinants of smoking behavior and beliefs. Existing knowledge from high-income countries about disparities in smoking should not be readily generalized to other countries.

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POS4-62  THE EFFECT OF SMOKE-FREE POLICIES ON SALES TURNOVER IN TASMANIAN BARS

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Aim: Tasmania was the first state in Australia to introduce smoke-free laws in bars, pubs and licensed clubs on January 1, 2006. The aim of this study is to assess the impact of the smoke-free law on sales turnover in Tasmanian bars.

Methods: Data on pub, bar, tavern and licensed club sales turnover for the period January 2000 to March 2007 were obtained from the Australian Bureau of Statistics. Two outcomes were employed: ratio of monthly turnover for pubs, taverns, bars and clubs in Victoria; ratio of monthly turnover for pubs, taverns, bars and clubs to total monthly retail turnover (minus pubs, taverns, bars and clubs turnover) in Tasmania.

Results: Linear regression analysis showed that the introduction of smoke-free legislation had no effect on either outcome.

Conclusion: Bar owners and government policymakers should be reassured that they can adopt and maintain smoke-free legislation to protect worker and patrons from exposure to second-hand smoke in bars without fear of adverse effects on patronage.

Victorian Health Promotion Foundation (VicHealth).

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POS4-63  ASSOCIATION OF SOCIAL DISADVANTAGE AND ALCOHOL MISUSE WITH SMOKING CESSATION IN SOUTH AFRICA

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Objectives: Both smoking and alcohol abuse have been associated with social disadvantage in South Africa. Studies from developed countries suggest alcohol use may influence the success of smoking cessation. However, little is known of this comorbidity in South Africa. This study therefore sought to: 1) characterize smokers who had made a quit attempt and those who succeeded in quitting and, 2) explore the influence of problem drinking in smoking cessation.

Methods: Analyzing the 1998 South African Demographic and Health Survey—the largest nationally representative and yet the only publicly available dataset—we characterized those who made a quit attempt within the whole population of ever smokers. We also compared successful quitters to those who made a quit attempt, but still continued smoking. The CAGE scale was used to define problem-drinking (score ≥2).

Results: Those who made a quit attempt were more likely to be female, white, have ≤12 years of schooling, have higher socioeconomic status, believe smoking is harmful, not have others smoke at home and reported either current or past history of problem drinking. Similar characteristics were detected for those who succeeded quitting, except that successful quitting was not associated with ethnicity/race and educational level. In addition, light smokers (smoking 1-10 Cigarettes/day) and those reporting current problem drinking were less likely to succeed in quitting compared to heavy smokers or never drinkers respectively.

Conclusions: Interventions targeting the poor smokers with drinking-problems may improve quit rates in South Africa. Furthermore, there is need to prioritize “light” smokers in cessation programs.

No funding.

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POS4-64  DEMOGRAPHIC CHARACTERISTICS AND TOBACCO USE AMONG RESIDENTS OF AN URBAN TOWNSHIP IN SOUTH AFRICA

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During the 1990s South Africa experienced a migration of population from rural to urban areas, however little is known about the smoking habits among the residents of urban townships. The purpose of this study was to explore the relationship between demographic characteristics (gender, education level, employment status, economic status, and length of residence in the township), and smoking among residents of Khayelitsha, an urban township outside of Cape Town South Africa. Participants included residents of 695 households (84.9% female, mean age = 34.5 years) who responded to an epidemiological survey on chronic disease. Overall, the smoking prevalence was 9.8% among females, and 48.6% among males. Mean age at initiation was 18.7, (SD = 13.71), and 55% reported at least one quit attempt. An independent samples t-test revealed that smokers were older than non-smokers (M = 39.12, SD = 15.08). There was a significant association between education level and smoking status (p < .003) among females, with levels of smoking declining as level of education rose. Males were more likely to have attempted to quit smoking than females (p < .036). Surprisingly, analyses regarding length of time residing in Cape Town and employment status revealed no significant associations. Our results are consistent with recent studies that have found similar levels and patterns of smoking in South Africans residing outside of townships. This study informs the development of interventions to encourage and assist residents of urban townships to quit.

Acknowledgement: Partial funding for the study was provided by the Provincial Government of the Western Cape and the National Research Foundation of South Africa.

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POS4-65  A MULTI-HOSPITAL TOBACCO FREE INITIATIVE

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The University of Rochester Medical Center, along with several other large area hospitals, planned for and simultaneously implemented successful “Tobacco Free Campus” initiatives in November 2006. This coordinated initiative required that each system plan accordingly for the training of employees, clinicians, support staff and for the provision of tobacco treatment services (directly, or via referral). In order to efficiently and competently inform each of these aspects of a system-wide initiative, accurate information was needed on the prevalence of tobacco use among employees, staff, faculty, and clinicians in each system. A multi-system surveillance initiative was implemented, using a brief survey for all employees of several of the partnering institutions. Summary data will be presented from the baseline measures, as well as the November 2007 follow-up surveillance data. Also presented will be Lessons Learned from the year-long planning and implementation phases, including details on topics categorized by the specific sub-committees that coordinated each area (e.g., Inpatient Procedures, Visitors and Outpatients, On-Site Nicotine Replacement, Smoking Cessation resources, Clinician Training, Policy Changes, Signage, Security, Perimeter Maps, and Public Relations). The effort was successful in instituting system-wide changes in all of the participating hospitals in a large metropolitan area (only one large local hospital did not participate). A community-wide consortium meeting convened each month for a year, and subcommittees within each hospital allowed planners to break up the initiative into manageable pieces. The extended timeline of one year was appropriate for overcoming fears, biases, and barriers that then enabled “buy-in” and support from leadership as well as employees.

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POS4-66  CHARACTERISTICS OF SMOKERS WHO LIVE IN SMOKE-FREE HOUSEHOLDS

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As the dangers of secondhand smoke become better known, more and more households are becoming smoke-free. Although most of these households are composed of only nonsmokers, there does exist a subgroup of smokers who leaves their home to smoke. The purpose of this research is to describe the socio-demographic, smoking and belief characteristics of smokers who do not smoke inside their homes. This research analyzed data from the National Study on Environmental Tobacco Smoke in the Home (2002). Only respondents who reported that they were current smokers (daily or occasional) were included in the analysis (N=2303). Logistic regression analyses were conducted to identify bivariate and multivariate predictors of going outside to smoke. Results showed that 34.5% of smokers reported leaving their household to smoke. Compared with smokers from Ontario, smokers in British Columbia were significantly more likely to leave their home to smoke [OR=2.06, 95% CI 1.45-2.94], whereas smokers in Quebec were significantly less likely to do so [OR=0.27, 95% CI 0.20-0.37]. Respondents whose household income was greater than $70 000 were significantly more likely to leave their home to smoke than those with a household income below $70 000 [OR=1.51, 95% CI 1.17-1.94]. Nicotine dependence, measured using the Heaviness of Smoking Index (HSI), was also a strong predictor of going outside to smoke. Compared to smokers with an HSI score of 0 (i.e., occasional smokers), smokers with scores of 1-3 and 4-6 were significantly less likely to leave their home to smoke [OR=0.26, 95% CI 0.21-0.33 and OR=0.08, 95% CI 0.05-0.11, respectively]. Respondents who believed that second-hand smoke was a cause of lung cancer, heart attacks in nonsmokers, problems in children's ears, SIDS, and chest problems in children were also more likely to leave their home to smoke compared to those who didn’t think so or were unsure [OR=1.12, 95% CI 1.03-1.22]. A better understanding of who does and does not smoke at home will assist in the development of appropriate programs and policies to reduce smoking in this important environment.

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POS4-68  PREDICTING IMPLEMENTATION OF HOME SMOKING RESTRICTIONS AMONG AFRICAN AMERICAN LIGHT SMOKERS

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A number of studies have addressed the practice of Home Smoking Restrictions (HSR) among moderate and heavy smokers. Limited information is available about HSR among light smokers. The prevalence of light smoking is increasing, approaching 50% among African American smokers. Better understanding of the use of HSR by light smokers could inform light smoking cessation interventions. This analysis identifies predictors of implementation of HSR among African American light smokers. Data were obtained from a 2x2 factorial study in which 755 African American light smokers (mean cigarettes per day 7.5) were randomly assigned to receive 8 weeks of nicotine gum or placebo plus six sessions of health education or motivational interviews. Variables assessed at baseline included, demographics, presence of HSR, depressive symptoms, perceived stress, motivation and confidence to quit, and number of cigarettes smoked per day. Individuals who had no HSR at baseline (n=299) were evaluated again at week 26 for change in motivation and confidence since baseline, and implementation of HSR. T-tests were used for continuous variables and Chi-squares for categorical variables. A logistic regression was fitted using a backward selection method for the outcome of implementing HSR at Week 26. Of those who reported no HSR at baseline, 44.1% reported the implementation of HSR at Week 26. Odds of implementing HSR increased with confidence to quit at baseline (OR=1.29; 95% CI=1.14-1.44) and female gender (OR=1.96; 95% CI=1.12-3.43). Odds of implementing smoking restriction decreased with increasing age (OR=0.97; 95% CI=0.95-0.99) and reduced confidence to quit between baseline and week 26 (OR=0.87; 95% CI=0.81-0.94). Confidence to quit, gender and age predicts the implementation of HSR by African American light smokers. Programs are needed to enhance the implementation of HSR among African Americans, especially for male and older smokers.

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POS4-69  THE EFFECT OF SMOKE-FREE POLICIES ON ELECTRONIC GAMING MACHINE EXPENDITURE IN VICTORIA, AUSTRALIA

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Objective: To examine the impact of smoke-free policies in Victorian gambling venues on electronic gaming machine (EGM) expenditure.

Method: We analyzed monthly EGM expenditure from July 1998 to December 2005, provided by the Victorian Commission for Gambling Regulation and the Office of the Liquor and Gambling Commissioner in South Australia. The outcome measure was the ratio of monthly expenditure for Victoria to monthly expenditure in South Australia. Intervention analysis and autoregressive integrated moving average (ARIMA) modeling were used to assess the impact of the smoke-free policy on expenditure.

Results: The smoke-free policy resulted in an abrupt, long-term decrease in the level of EGM expenditure. The mean level of monthly expenditure decreased by about 14%.

Conclusion: The smoke-free policy not only protects hospital workers and patrons from exposure to secondhand smoke but also has had an impact on slowing gambling losses.

Victorian Health Promotion Foundation (VicHealth).

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POS4-70  DRIFT OF SECOND-HAND SMOKE FROM OUTDOOR SMOKING AREAS TO THE INSIDE OF PUBS/BARS

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Aim: To assess the extent of drift of second-hand smoke (SHS) from semi-enclosed outdoor smoking areas to the inside of pubs.

Methods: A purposeful sample of pubs with semi-enclosed outdoor smoking areas were obtained in an urban setting (n=8 pubs on 10 occasions). Two portable real-time aerosol monitors used to measure fine particulate levels (PM2.5) simultaneously and the number of lit cigarettes and other environmental characteristics were recorded.

Results: There was relatively little SHS drift from outdoors to indoors if the connecting doors were infrequently opened. However, relatively high levels were reported indoors within two meters of connecting doors that were either continuously or frequently open (e.g., a mean level of PM2.5 exceeding 75 μg/m3 which was over 85% of the mean outdoor level recorded for one venue). The similarity in the PM2.5 patterns over time also clearly indicated that the same plumes of cigarette smoke were being measured both outside and inside simultaneously. Indoor measurements that were well away from the connecting door were much lower than those within two meters of the door (i.e., usually under 40% of the level near the door).

Conclusions: These results are preliminary and apply to just one winter season and so further data will be collected in the summer of 2007 (December in NZ). Nevertheless, they suggest that SHS drift may pose a health hazard and contribute to nuisance impacts on both workers and bar patrons who are inside these types of pubs. The most feasible policy option may be to set distance limits for smoking away from indoor areas as already undertaken by some jurisdictions in North America.

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POS4-71  SURVEY OF CESSATION TREATMENT BEST PRACTICES FOR SMOKERS WITH MENTAL ILLNESS AND SUBSTANCE USE DISORDERS

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There are limited data regarding tobacco dependence treatment best practices for smokers with mental health and/or substance use disorders or the proportion of these smokers seen in various tobacco treatment programs despite their high smoking prevalence. An online survey to assess current smoking cessation clinical practices for this population was completed by members of the Tobacco Cessation Leadership Network (TCLN), the Association of Tobacco Treatment Use and Dependence (ATTUD), an in-depth phone interview of specific services and recommended best practices was conducted with 24 respondents from the online survey and four members of the North American Quitline Consortium (NAQC). Survey respondents were tobacco treatment specialists, quitline managers and counselors’ mental health providers, and substance use treatment specialists. Of those surveyed online (n=105) 34% reported contracting for quitline services, 54% provided or contracted for tobacco treatment services other than quitlines and 12% reported providing other services that did not fit into these categories. Nearly half (49%) of these programs routinely collect provider training data (MH, ETOH or substance abuse (SA) disorder history) or staff data at intake. Reasons for not collecting these data were due to: “other program priorities” (34%), “data have not been considered for inclusion” (32%), or “staff not trained to screen and chart this kind of information” (24%). About 40% of these programs provide specialized or tailored treatment for those with MH, ETOH or SA disorders. Over 75% reported partnerships with mental health and/or substance use disorder agencies or treatment programs. The interview data revealed that smokers with mental health and/or substance use disorders are interested and able to quit but treatment for these groups required greater involvement of more types of providers. There was general agreement that these tobacco users require lengthier and more tailored treatment coupled with flexible cessation goals than other tobacco users and that systemic changes in smoke free policies and provider attitudes are necessary.

American Legacy Foundation.

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POS4-72  SMOKING CESSATION INTERVENTIONS FOR PERSONS WITH MENTAL ILLNESSES: A RANDOMIZED TRIAL

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Persons with mental illnesses have increased prevalence of tobacco use, and greater rates of associated morbidity and mortality. Tobacco use prevalence among this population is over 40% nationally, twice that of the general population (Lasser et al., 2000). Previous studies have found that although these individuals may be hard-to-treat the general population, smoking cessation rates remain substantially lower than those of the general population (Baker et al., 2006). The University of Colorado at Denver and Health Sciences Center (UCDHS) has been working in partnership with the Colorado Department of Public Health and Environment (CDPHE) to pilot cessation interventions at community mental health centers statewide. The pilot is a 2-year, randomized study comparing the effectiveness of two tobacco cessation treatments — use of the Colorado Quitline and NRT compared to this intervention augmented by a 10-session wellness group at the community mental health centers. The primary hypotheses are that: (1) In comparison to treatment as usual, brief assessment and referral to the National Jewish Quitline will significantly increase tobacco cessation rates and reduce daily cigarette consumption, and (2) in comparison to treatment as usual and to brief assessment and referral to the National Jewish Quitline (intervention #1), participants who also receive a community wellness group (intervention #2) will have significantly higher tobacco cessation rates and reductions of daily cigarette consumption. A total of 123 individuals have enrolled in the study, with the majority having psychotic disorders. Three and six month outcome data will be presented. The main dependent variables will be self-reported smoking (cigarettes per day in the last 7 days) and CO monitor readings (an objective measure of cigarette use). Demographics (geographic area, age, ethnicity/race) and diagnoses (psychiatric and substance abuse) will be captured. Results for standard clinical measures of psychiatric functioning, quality of life, self-efficacy, motivation stage-readiness will also be presented.

This study is funded by the Colorado Department of Public Health and Environment, through the State Tobacco Education and Prevention Partnership.

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POS4-73  ITC “BUTTS AND SPIT” STUDY: COLLECTING BIOLOGIC SAMPLES FROM POPULATION-BASED SAMPLES TO EVALUATE PUBLIC HEALTH POLICY

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The objective of this study is to assess the feasibility of collecting saliva and spent cigarette butts through different modes of data collection from smokers in different countries and to assess the impact of the European Union “10/1/10” standard, which limits machine tested levels of tar, nicotine, and carbon monoxide, on biomarkers of smoke exposure. Saliva and cigarette butt collection containers were mailed to a random sample of a total of 600 daily smokers of factory made cigarettes who were newly recruited into the ITC-4 country (UK, USA, Canada, and Australia) study in late 2006. Additionally, investigators in Mexico and Uruguay collected saliva and cigarette butt samples face to face from 175 daily smokers following their completion of the ITC survey. Sample collection fieldwork and preliminary analyses on the saliva and cigarette butt samples have been completed. A 52% overall response rate to the mail-based collection and a 92% overall response rate for the face-to-face biospecimen collection were achieved. A direct comparison between cotinine levels of smokers in the UK (subject to the EU 10/1/10 policy) and smokers in the remainder of the countries showed significant differences $(F(1)=6.17, p<0.013)$ in mean cotinine values $(\text{UK}=265.1; \text{5 remaining countries}=157.1)$. Overall, a significant country effect was observed $F(5)=14.07, p<0.001$. Tar staining patterns on cigarette butts were used to measure differences in puffing intensity between UK smokers and smokers from other countries. Initial analysis of the 1,531 cigarette butts obtained for analysis showed a significant overall country effect for Central and Edge staining scores $(p<0.001)$. A direct comparison between cigarette butts obtained in the UK and those collected from smokers in the remaining 5 countries showed no significant difference in either Center or Edge staining scores. The approaches used in this study show that it is possible to collect biologic and physical materials from the general population of smokers. This information can be used to supplement policy evaluation efforts as well as open up new research collaborations with basic scientists.

This study was conducted while the first author was at Roswell Park Cancer Institute. This study was jointly funded by: Roswell Park TTURC (“Transdisciplinary Tobacco Use Research Center”) (a/k/a “Building the Evidence Base for Tobacco Control Policies”, NIH P50 CA111236), and The Robert Wood Johnson Foundation (“Do National Level Tobacco Policies Decrease Smoking: A Four-country Tobacco Policy Study”, 45734).

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POS4-74  BUTT LENGTHS DIFFER BY AREA DEPRIVATION LEVEL: A FIELD STUDY TO EXPLORE INTENSIVE SMOKING

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Aim: We aimed to collect cigarette butts in a range of residential areas, to assess any differences in cigarette butt lengths, and in proportions of roll-your-own cigarettes (RYOs).

Methods: Two high, two medium and two low deprivation areas, as classified by deciles of the NZ Deprivation Index, were purposefully selected for the Wellington region. A one square kilometer zone was marked out in each. Over two two-hour collection periods, all cigarette butts outside any exclusion zones (e.g., bus stops) were collected from the footpaths and gutters for each area. Butts were systematically classified and measured. A mixed model of analysis, treating location clusters nested within deprivation level areas as a random effect, was used to assess differences in mean length of butts.

Results: There were no substantive difficulties identified with collecting the butts from the field sites. A total of 6,262 cigarette butts and separate filters were collected, of which 3,509 (56.0%) were measurable manufactured cigarette butts, 1,069 were discarded manufactured butts, 1,450 RYO butts and 236 RYO filters. The RYO butts were not measured, due to the extent of their degradation. The manufactured cigarette butt lengths were significantly shorter in the most deprived areas, relative to the least deprived areas $(p=0.035)$. Deformed manufactured cigarette butts (i.e., those potentially that were stubbed out) also showed the same pattern of decreasing butt length with increasing deprivation level $(p=0.011$ between the most and least deprived areas). There was no significant difference between deprivation areas in the proportion of RYO material found.

Conclusions: The shorter mean butt length in the most deprived areas is consistent with more intensive smoking among smokers in those areas. This finding is consistent with other evidence of increased price sensitivity of poorer smokers and with basic economic theory. Nevertheless, further evidence on actual smoking behavior in the field is necessary to better interpret these preliminary findings.

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POS4-75  SMOCKERS ATTITUDES AND BEHAVIOURS TOWARDS HEALTH PROFESSIONALS’ ADVICE TO QUIT SMOKING: 2002-2007

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Health professionals (HPs) play a key role in smoking cessation. However, few reports of views of the general public exist. Ontario survey data from 2002 show that relatively few smokers report they would ask pharmacists and dentists for advice. Campaigns training HPs to provide cessation advice have been in place in Ontario for over four years although no formal Ontario cessation guidelines exist. Here, we assess changes between 2002 and 2007 in smokers’ receipt of advice and likelihood of seeking quit advice from HPs.

Methods: Twelve-month follow-up data on 1517 smokers were compiled from the Ontario Tobacco Survey between 2006 and 2007. Respondents were asked if they had been advised to quit smoking by a physician, a pharmacist, or a dentist over the year, and how likely they would be to seek advice from each. Data were compared to results from the 2002 CAMH Monitor, which asked Ontario smokers the same questions. Design-based chi-square and logistic regression were used to examine the relationship between likelihood of seeking advice, type of HP, and demographics.

Results: Among respondents surveyed in 2006-07 who saw their HP in the last year, 55% reported being advised to quit by a physician, 44% by a dentist, and 15% by a pharmacist respectively, a significant increase from 2002. Forty-six percent indicated they would be “very likely” to ask physicians for advice, 16% for dentists, and 12% for pharmacists. As in 2002, females and older respondents were more likely to indicate they would be “very likely” to ask physicians and pharmacists for quit advice $(p<0.01)$. Respondents advised to quit by a health professional were more likely to seek advice from that HP if they were ready to quit. Multivariate analyses confirmed these results.

Conclusions: More Ontario smokers report receiving quit advice from a HP than five years ago. Also, smokers who are advised to quit by their HP are more likely to ask for advice when they are ready to quit. Nevertheless, room for improvement exists, to increase the implementation of evidence-based interventions in clinical practice and encourage trained providers to inform smokers that they are available to help them quit.

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POS4-76 RELATIONSHIPS BETWEEN EMPLOYMENT CHARACTERISTICS, JOB STRESS AND SMOKING CESSION


Lower social class and blue-collar occupations are associated with a higher prevalence of smoking and lower rate of quitting smoking in the United States. The Tobacco Longitudinal Care Study is a randomized controlled trial designed to compare a tobacco treatment model that includes longitudinal (conducted for one year) telephone counseling, pharmaceutical treatment, interim smoking reduction and recycling for relapsed smokers, to 8 weeks of usual, discrete care. Subjects are recruited from labor unions and worksites in Minnesota. The purpose of this analysis is to examine relationships between education, income, occupational class (worker, supervisor or manager), rank (blue collar, clerical or professional), job stress (demand and control), and short-term smoking abstinence. In the study cohort prior to randomization to expand our understanding of the observation that blue-collar workers are less likely to quit smoking, 383 men and women; 60% female and mean age 42.7 years, were included. At 21 days, 7-day point prevalence abstinence was 44%. Univariate analyses showed male gender (p=0.079), some college education (p=0.101), personal income (p=0.082), >30 minutes to first cigarette (p=0.056), not living with a smoker (p=0.011), higher occupational class (p=0.007), clerical or professional rank (p=0.033), and job control (p=0.128) were associated with 7 day abstinence 21 days after the quit date. We included factors from the univariate analysis with p<0.15, plus gender, in a multivariate model. The only significant factors (p<0.05) that had independent negative associations with smoking abstinence were living with a smoker (OR 0.61, 95% CI 0.40, 0.94, p=0.024), lower occupational class (being a worker compared to being a supervisor or manager) (OR 0.55, 95% CI 0.35, 0.84, p=0.007), and time to first cigarette <30 minutes (OR 0.61, 95% CI 0.39, 0.94, p=0.025). There were no significant interactions. These results suggest that occupational class plays a more important role in explaining lower short-term smoking cessation among blue-collar workers than income or education.

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POS4-77 DO CULTURALLY SPECIFIC INTERVENTIONS ENHANCE THE PATHWAY TO SMOKING CESSION? EXAMINING THE CONSSENSUS AMONG AFRICAN AMERICAN SMOKERS

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Culturally specific (CS) tobacco interventions are one response to the distinct ethnic differences in smoking-related characteristics and health disparities. However, few randomized controlled studies have directly tested CS interventions against non-CS comparison groups. The present study used a dismantling design to test whether the efficacy of self-help materials is due to elements of cultural specificity in addition to the tobacco cessation content. African American smokers (N = 255) were randomized to one of two conditions: standard booklet (N = 129) or culturally specific (CS) booklet (N = 123). Aside from the culturally specific components of the CS guide, the content of both interventions was identical. That is, the content was held constant except for cultural specificity. The CS intervention was Pathways to Freedom and the standard intervention was an adapted version of Pathways. The follow-up assessment was completed by 72% of participants, who were mostly low income, female, and moderately nicotine dependent. The content and length of the interventions were identical, yet varied in their degree of cultural specificity. A positive effect of cultural specificity was hypothesized for content evaluation, readiness to quit smoking, and actual behavior change. Evidence suggested that the CS material was more effective at capturing attention, providing encouragement, and gaining interest compared to standard materials, however greater credibility was found for standard materials. Contrary to the hypotheses, the standardized intervention led to greater readiness to quit smoking and more 24-hour quit attempts compared to the CS intervention. In conclusion, CS interventions may be preferred more than standard approaches. However, high quality standardized interventions, may lead to greater behavior change. Implications for contemporary minority health interventions and cultural specificity are discussed.

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POS4-78 HOW INTERESTED ARE SMOKERS IN NICOTINE REPLACEMENT THERAPY?

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Introduction: Recognizing the costs of smoking to the individual and society, several public health initiatives have explored the advantages of free distribution of NRT as a means of promoting tobacco cessation. Based on the popularity of these mass distribution efforts, claims have been made that a significant impact could be made on the prevalence of smoking if NRT was distributed to all interested smokers. The assumption in this statement is that a significant proportion of smokers would actually be interested in receiving free NRT and would use in an attempt to quit. Is this assumption true?

Methods: A Random Digit Dialing sample of 825 daily smokers who had smoked at least 10 cigarettes per day at some point in their life. Smokers were asked about their intentions regarding smoking (maintain, reduce, quit, increase) as well as their interest in NRT.

Results: Many smokers were interested in NRT, with 58.9% saying they would be interested in NRT if it were offered for free. Of those interested, almost all (93.8%) said that they would use the NRT to help them quit for good and more than half (61.1%) of those interested said they would use the NRT within a week if it were sent to their home. There were also differences in level of interest by smokers’ future intentions regarding smoking, with those smokers intending to quit being more interested than those who were planning to reduce.

Discussion: These findings indicate that there is a substantial population of smokers who would be willing to engage in public health initiatives to reduce the prevalence of smoking through the distribution of free NRT. New to this study is information regarding what recipients of free NRT would do with this aid—quit smoking, stay on NRT as long as needed to quit smoking, and use the NRT very soon after receiving it to initiate a quit attempt. These responses lend confidence to the utility of mass NRT distribution.

Johnson and Johnson Consumer Group of Companies.

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POS4-79 FOCUS GROUPS IN SUPPORT OF PUBLIC HEALTH INTERVENTIONS AMONG TORONTO LESBIAN, BISEXUAL, GAY AND TRANSGENDER SMOKERS AND FORMER SMOKERS

Gala Arh, M.Ed.*, and Nadia Minian, Ph.D.

Objective: While little is known about tobacco use among lesbian, bisexual, gay and transgender (LBGT) populations, studies in the United States have found high rates of smoking among LBGT individuals. Our pilot study sought to ascertain attributes of the Toronto Church and Wellesley neighborhood that facilitate tobacco use among LBGT individuals. As a method of data collection, focus groups have yet to be recognized for their nascent health promotion capacity. Using our example of focus groups conducted with LBGT smokers and former smokers we illustrate how focus groups can be used to translate and disseminate research findings, while building stronger communities, and generating therapeutic support.

Methods: Recruiting participants who identify as LBGT, are smokers or former smokers, over the age of 19 and live, work or play in the Church and Wellesley neighborhood, we conducted two focus groups with 15 participants. Participants were given research findings regarding Toronto LBGT smoking rates while we posed open-ended questions to gathered data.

Results: Address the challenge faced by researchers to remain critically reflective about the process of translating social science into public health practice, all participants received pertinent health information during the data collection process. Further, given that there is evidence suggesting that knowledge transfer is facilitated by intensive social interactions, the focus groups provided a mechanism for sharing individual and collective experiences.

Conclusion: Tobacco policy and programs aimed at reaching marginalized or disenfranchised populations need to be developed and implemented to meet the specific needs of these individuals. Given that homophobia and heterosexism contribute to high levels of daily stress adversely affecting the health of LBGT individuals, further research is required which seeks to support individuals and the community while exploring community relevant topics. A multifaceted approach is thus necessary to gain meaningful insight into LBGT use of tobacco.

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POS4-80 LINGERING EFFECTS OF SMOKING ON MEMORY IN POSTMENOPAUSAL EX-SMOKERS

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Components of tobacco smoke have been subjected to scientific scrutiny for their cognitive effects. Nicotine for example, has demonstrated acute effects on memory, cognitive processing and attention (Emert et al., 2001; Ceballos et al., 2006). Further evidence of the link between smoking and morphological changes was demonstrated by Galliatt et al. (2006), who presents evidence of volumetric changes across brain regions comparing smokers to never smokers. Given the emphasis on quitting smoking and recent data on the recovery of health function following cessation of smoking (NIA, 2007), it seems timely to examine cognitive effects that could persist long after the individual has stopped. This study examines in a group of older women, the effects of having been a past smoker on memory tasks from the Neuropsychological Assessment Battery. Participants were part of a larger longitudinal study designed to explore relationships between physical/mental health and health-habits (including alcohol consumption) on postmenopausal cognitive status. Sixty-nine women who reported never having had a smoking habit were compared with 31 postmenopausal ex-smokers. The groups did not differ on age, years of education, level of alcohol consumption, or years since menopause onset (p's >.10). ANOVA indicated a significant main effect on immediate and delayed word-list recall (p's < .0009), immediate and delayed story recall (p's < .002). There was no significant difference in immediate or delayed recognition for figural information (p's >.05). While this study is limited in its ability to demonstrate causation, it provides compelling evidence for further examination of lingering smoking effects on memory. Two findings are particularly noteworthy: First, only verbal memory, not spatial memory, appears to be affected. Second, memory for “real world” items such as names, addresses and medication instructions appear to be particularly vulnerable. Further study should examine these variables in a longitudinal design aimed at tracking recovery of memory processes.

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POS4-81 THE EFFECT OF A BRIEF HEALTH RISK ASSESSMENT ON MOTIVATION TO QUIT SMOKING: THE GET PHIT! TRIAL

Jennifer McClure*, Evette Ludman, Amy Mohlein-tzky, Julie Richards, Chester Pabiniaik, & Lou Grothaus, Group Health Center for Health Studies

Most smokers want to quit someday, just not necessarily today. Effective interventions are needed to increase smokers’ motivation to quit and facilitate treatment uptake. We evaluated the impact of a brief, community-based motivational intervention. Smokers (n = 542; mean age = 51 years; 53% female) participated in a free health-risk screening and were randomized to receive either personalized feedback on their CO exposure, lung functioning, and smoking-related symptoms (experimental condition), or their diet, physical activity, and BMI (control condition). Everyone also received advice to quit smoking and access to free cessation counseling. Participants were surveyed immediately pre- and post-intervention. There were no pre-treatment differences in groups’ motivation or plans to quit. Post-intervention, more treatment group participants rated their personalized feedback as upsetting (p < .001). 37% had measurable lung impairment by spirometry assessment and their mean expired CO level was 26 ppm. When asked what information was upsetting, 55% indicated their CO level, 31% their lung functioning, and 12% the link between their smoking and health history. Despite this effect, compared to controls treatment participants were no more likely to report they would quit smoking as a result of the intervention (p = .06) or that they planned to use the free cessation services. Controlling for baseline motivation, treatment participants were more motivated than controls (p < .05), but there was no difference in the proportion who planned to quit smoking in the next 1 or 6 months. The results suggest providing feedback on smokers’ tobacco-related health risks has an emotional impact, but may not motivate plans for quitting, at least not at that moment. Implications of these results and impact at subsequent one-month follow-up will be presented.

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POS4-82 RECRUITING PATIENTS FOR SMOKING CESSATION COUNSELING: A COMPARISON OF THREE DIRECT MAIL APPROACHES


Objective: Health care systems are very interested in increasing smoking cessation treatment rates, yet how to do so efficiently remains a dilemma. Two previous studies in the Veterans Health Administration (VA) suggested direct mail response rates of 10-20% among smokers. We compared three direct-mail approaches for recruiting smokers to telephone counseling.

Methods: We used data from the mandatory electronic clinical reminder to identify all smokers at the VA New York Harbor Healthcare System and randomly assigned them to one of three groups: invitation letter only, letter plus lottery ($250 prize), and letter plus free medication offer. When a patient responded to the letter, a Telephone Care Coordinator provided initial counseling and transferred consenting patients to the state Quitline, which provided additional telephone counseling and follow-up. All patients received smoking cessation medications (either nicotine patches or bupropion). The enrolled patients are contacted six months after enrollment to determine if they are abstinent. We also assessed the costs of the program, excluding development costs (e.g., IRR and FTC), but including salary, supplies, and 3rd postage.

Results: After mailing initial recruitment letters to 2,039 patients, 31 patients (2%) actively withdrew from the study. 14 had died and 85 (4%) of the letters were returned as undeliverable. Among the remaining 1,908 patients, 68 (3%) enrolled in the study — 14 for letter only, 16 for lottery, and 28 for free medication. Of the 1,908 enrolling, only seventeen (25%) consented to transfer to the New York State Quitline. Long-term follow-up is still pending. Program costs included salary ($9,250) and mailing costs ($2,996). The cost per enrolled patient was $188.

Conclusions: Although long-term follow-up is still pending, our recruitment has been low thus far, with no major differences between groups. In spite of the modest response, the cost per enroled patient is still quite reasonable for a health promotion intervention.

Veterans Health Administration Health Services Research & Development Service.

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POS4-83 KNOWLEDGE OF NITROSAMINES AMONG SMOKERS AND NITROSAMINE LEVELS IN SMOKE

Richard J. O’Connor, Ph.D., Brian V. Fix, M.A., Roswell Park Cancer Institute, for the ITC Collaboration

Tobacco-specific nitrosamines, including NNK and NNNK are potent carcinogens found in tobacco and tobacco smoke. Levels of nitrosamines vary widely across countries, driven primarily by differences in tobacco blend. For example, levels of nitrosamines are nearly 10 fold higher in popular US brands compared to popular brands in Australia and Canada. Despite these differences, there is little data on whether smokers in these countries are aware of nitrosamines, and whether this knowledge is related to smoke nitrosamine levels. The current study examines data from Wave 3 of the ITC 4 country survey of smokers in the US, Canada, Australia, and UK, as well as smoke chemistry data on popular brands used by those smokers. Interview data were available on 10168 participants, and smoke chemistry data were available on brands smoked by 1789 of those participants. Nearly half of smokers within each country reported that they did not know whether cigarette smoke contains nitrosamines (46.8% overall), while 31% responded No and 22% responded Yes [X2(6)=28.0, p<.001]. In multivariate models, younger smokers (aged 18-34) were more likely to be aware of nitrosamines than smokers aged 55 or more. As Heavyness of Smoking Index score increased, knowledge of nitrosamines decreased [OR = 0.95, 95% CI: 0.92, 0.99]; Significant country effects were observed for nicotine-additive yields of NNK (F[5,174] = 9.9, p<.001), and NNK (F[5,174] = 9.9, p<.001). As anticipated, the US showed the highest levels of NNN (139.4 ng/mg Nic) and NNK (85.8 ng/mg Nic), while Australia showed the lowest (9.5 ng NNK/mg Nic; 10.7 ng NNK/mg Nic). The high levels of ‘Don’t Know’ responses across countries indicate a general ignorance among smokers of the specific constituents of cigarette smoke, meaning information campaigns describing smoke emissions might be an avenue for health promotion to explore.

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POS4-84  HOME CLEAN INDOOR AIR POLICIES AMONG UNDERSERVED MATERNFUL SMOKERS: IMPLICATIONS FOR CONSUMPTION, QUIT ATTEMPTS AND ETS EXPOSURE

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The purpose of this study was to assess differences in clean indoor air (CIA) home policies among new mothers and to determine the impact of those policies on cigarette exposure, quit behaviors, and children's ETS exposure. This study examined Philadelphia FRESH baseline data, a behavioral counseling intervention trial for urban, low-income, maternal smokers who report smoking at least 5 cigarettes/day and whose children under the age of 4 years old are exposed to ETS. To determine the relationships between the existence of CIA home policies and tobacco consumption, quit attempts, and children's exposure to ETS, we examined baseline data from 189 new mothers.

Results: There was a significant difference (F=3.8, p<0.05) in mothers' cigarette consumption if smoking was not allowed (10.2 cigarettes, sd=4.5), only special guests are allowed to smoke (7.9 cigarettes, sd=4.6), smoking is allowed only in designated areas (10.45 cigarettes, sd=4.8), and smoking is allowed anywhere in the home (12.8 cigarettes, sd=5.5). There was also a significant difference (F=6.4, p<0.01) in reported child's ETS exposure in homes where smoking is not allowed (3.8 cigarettes, sd=3.8), only special guests are allowed to smoke (3.9 cigarettes, sd=2.7), smoking is allowed only in designated areas (5.3 cigarettes, sd=4.7), and smoking is allowed anywhere in the home (8.4 cigarettes, sd=5.8). There was no significant difference in baseline intent to quit smoking within one month or six months based on baseline differences in CIA home policies.

Conclusion: CIA home policies may be an effective tool to reduce children's exposure to ETS, and may lead to reduction in smoking mothers' tobacco consumption. Future directions and treatment implications of promoting CIA home policies will be discussed.

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POS4-85  PARENTAL RULES AFFECT PREVALENCE OF SECONDHAND SMOKE EXPOSURE IN HOME AND CAR

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Secondhand smoke (SHS) exposure is associated with many childhood health problems, including asthma and other respiratory symptoms, and middle ear effusion. These adverse health outcomes can lead to school absences for children. One way to protect children from SHS exposure is to make family rules about smoking in the home and car. This study was carried out to assess the influence of family rule-making and enforcement related to smoking in the home and car in relation to SHS exposure prevalent in children. This study used data from the 2006 South Carolina Youth Tobacco Survey, a school-based survey of a statewide random sample of 2,748 middle and high school students. Of these students the records of 1,808 never smokers (defined as <1 whole cigarettes in lifetime) were included in the present study. Overall 78% of youths reported rules about smoking in the home and 74% reported rules about smoking in the car. The prevalence of SHS exposure in the home and car were 27% and 33% respectively. The prevalence of SHS exposure during the past 7 days was significantly lower among youths whose families had rules against smoking in the home than among youths from homes with no rules (81% versus 39%, p-value <0.001). Similarly, the prevalence of SHS exposure during the past 7 days was significantly lower among youths whose families had rules against smoking in the car than in homes with no rules (98% versus 72%, p-value <0.001). Mothers' cigarette consumption, quit attempts, and children's ETS exposure were seen in families where the rules against smoking were adhered to (15%) or not adhered to (64%). Similar associations were observed for rules and rule adherence about smoking in the car. Rules against smoking in the home and car are protective against SHS exposure. Parents who are unable or unwilling to stop smoking should make and adhere to strong smoking rules for children.

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POS4-86  TRENDS AND INNOVATIONS IN U.S. QUITLINES, 2004-2006: FINDINGS FROM THE NORTH AMERICAN QUITLINE CONSORTIUM


Tobacco cessation quitlines in the United States have grown rapidly and changed in a short period of time. In 1999, only six states had quitlines. By 2005, all 50 states, plus the District of Columbia and Puerto Rico, had quitlines in place. Over time, quitlines have not only grown in number, but also changed in terms of services offered and technologies used to reach tobacco users. A growing number of states are also working with health care delivery systems, insurers, and other partners to seamlessly integrate quitline services into ongoing health care delivery. In this session, data from the 2004, 2005 and 2006 North American Quitline Consortium Survey of State Quitlines will be presented. Survey response rates were 98% (2004), 100% (2005), and 100% (2006). Key changes seen in quitline services over time include increased use of web-based interactive counseling [15.8% (2004), 26.9% (2005), 30.8% (2006)] and a larger number of quitlines offering free medications to callers [21.1% (2004); 34.6% (2005); 46.2% (2006)]. Median funding for quitline services and promotion has modestly fluctuated over time (2004: $2,606,530; 2005: $4,216,050; 2006: $5,150,000); promotion funding has increased over time (2004: $325,000; 2005: $193,750; 2006: $167,500). Additional data on quitline operations, services, and utilization will also be presented. These results demonstrate how U.S. quitlines have changed over time in terms of services and funding. In part, these changes may be due to the influence of the National Network of Tobacco Cessation Quitlines implemented by the U.S. Department of Health and Human Services in 2004; other potential influences include a growing appreciation for and funding of tobacco control efforts at the state level and improvements in state fiscal circumstances. Further research is required to monitor these changes and to determine whether other external factors may affect state quitlines.

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POS4-87  IMPACT OF MASS MEDIA CAMPAIGN ON ADULT SMOKING CESSATION

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Television anti-smoking campaigns have been shown to be effective for preventing smoking initiation in youth, but there has been less research on their impact on adult smoking. Between 1994 and 2001 the Commonwealth of Massachusetts implemented a high intensity mass media campaign that included hard-hitting ads targeting the general public (in support of tobacco control policies); adult smokers (to encourage quitting), as well as youth. This study of a population-based cohort of over 1700 adult smokers improves on the usual methods of evaluating media campaigns by including an objective measure of campaign exposure—volume of broadcast (gross rating points or GRPs) as determined by a commercial TV ratings organization. Data are from a statewide RDD telephone survey of Massachusetts’ adults interviewed between January 2000 and June 2001 and re-interviewed two years later. The retention rate for baseline smokers was 56%. The measure of campaign exposure was the total GRPs for all state-sponsored anti-tobacco advertisements for the 24 months prior to the individual’s date of interview according to the media market in which the individual lived. Logistic analysis was used to predict smoking status reported at the follow-up interview as a function of number of GRPs, controlling for gender, age, education, ethnicity, and level of nicotine dependence. Results indicated that increasing volume of broadcast was a significant independent predictor of cessation at follow-up (OR = 1.010; p<0.001). This means that for every increase of 100 GRPs per month during the prior two years, the likelihood of quitting increased by 21%. Compared to smokers who had the lowest level of exposure (about 280 GRPs per month), those who had the highest level (about 838 GRPs per month), were more than four times as likely to be an ex-smoker two years later. This study suggests that sustained, high quality mass media campaigns with high levels of population exposure contribute to increased rates of adult smoking cessation.

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WHEN SMOKERS MOVE OUT AND NONSMokers MOVE IN: TOBACCO SMOKE POLLUTION AND EXPOSURE TO RESIDUAL ETS


This study examined whether homes occupied by smokers remain contaminated with environmental tobacco smoke (ETS) pollutants when they move out and non-smokers move in, and whether nonsmokers are exposed to residual ETS through contaminated dust, air, and surfaces in these homes. In Part 1, we measured 100 homes occupied by smokers within 50 homes of their last known smoking location. Before they moved out, participants were interviewed and household dust, air, and surfaces were examined for nicotine concentration. Children's urine samples were analyzed for cotinine concentration. In Part 2, the smoking residents were contacted and recruited if they were all nonsmokers. Dust, air, and surface samples and the youngest resident's urine were examined for evidence of ETS. Participants in Part 1 smoker homes reported a mean of 48.09 (95% CI=37.29 to 61.93) cigarettes/week smoked inside their homes and a mean of 11.68 (95% CI=6.03 to 21.90) cigarettes/week exposure to their children <11 years old (n=35). Preliminary analyses indicate that children in smoker homes had higher mean urine cotinine concentration (5.10 ng/ml [95% CI=3.60 to 7.19]) than children in nonsmoker homes (4.28 ng/ml [95% CI=3.95 to 4.60]; p<0.01). Mean air nicotine in living rooms was higher (1.81 megagrams per cubic meter [95% CI=1.31 to 2.43]) in smoker homes than nonsmoking homes (0.02 megagrams per cubic meter [95% CI=0.01 to 0.03]; p<0.01). These results confirm findings from our previous study, demonstrating that air, dust, and surfaces of smoker homes are contaminated with residual ETS. After the change of occupancy, mean airborne nicotine (micrograms per cubic meter) in Part 2 living rooms was 0.25 (95% CI=0.07 to 0.47) in former smoker homes and 0.14 (95% CI=0.03 to 0.34) in former nonsmoker homes, and 0.13 (95% CI=0.04 to 0.22) in former smoker home bedrooms (not measured in nonsmoker homes). Air nicotine loading showed a significant decrease in living rooms and bedrooms for smoker homes only (p<0.01). There were no differences for nonsmoker homes or children's urine cotinine. We will present additional findings based on available data for household dust and surface contamination.

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UPTAKE AND CHEMICAL CHARACTERIZATION OF FINE AND ULTRAFINE PARTICLES BY SMOKERS OF MENTHOL AND NON-MENTHOL CIGARETTES


Cigarette smoke is a complex mixture that includes more than 60 recognized volatile and semi-volatile carcinogens. The more potent carcinogens definitively linked to lung cancer are found among the particle-based semi-volatile compounds, such as the tobacco-specific nitrosamines (TSNAs). Research on the deposition of mainstream smoke in the respiratory tract of smokers is meager, and even less is known about the identity and distribution of the particle-bound carcinogens as a function of particle size, especially those in the ultrafine range (diameter <0.1 μm). Real-time measurements of particle size distribution and concentration in the breath exhaled of active cigarette smokers smoking menthol and non-menthol cigarettes were made. Exhaled fine and ultrafine particles were collected and chemically characterized for some TSNAs and polycyclic aromatic hydrocarbons. Smoking topography data were collected using dual-pressure transducers, and these data were downloaded to a smoking machine equipped with a high-resolution syringe pump driver to generate the simulated inhaled mainstream smoke. Similar particle distribution and concentration and chemical characterization measurements were made on the simulated inhaled mainstream smoke. Particle deposition in the respiratory tract was estimated as the difference between the simulated inhaled mainstream smoke and the exhaled breath as a function of particle size. Prior to smoking, subjects were fitted with an ambulatory respiratory inductive plethysmography device (Lifeshirt®) to collect inhalation parameters and breath volume to assess the effect of breath holding and exhalation time periods. These measurements supplement the data on cigarette smoke exposure obtained from standard smoking topography measurements, viz., puff volume, puff duration, and interpuff interval. Data will be presented on the crossover comparisons of particle distribution, concentration, chemical characterization, and smoking topography for smokers smoking menthol and non-menthol cigarettes.

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INCREASES IN HEMOGLOBIN ADDUCTS OF 4-AMINOBIPHENYL AND IN URINARY NNAL AMONG NONSMOKERS EXPOSED TO SIDESTREAM SMOKE UNDER CONTROLLED CONDITIONS

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We have monitored changes in the tobacco-associated carcinogen 4-aminobiphenyl and the tobacco-specific carcinogen NNAL measured in nonsmokers following exposure to sidestream smoke in a controlled environment. Participants were individually exposed for 4 hours to the sidestream smoke generated by Marlboro King Filter, HP or Newport 100 Filter HP, menthol cigarettes using a smoking machine. Carbon monoxide levels were maintained at approximately 8 ppm during the exposure, and the mean integrated nicotine dosage was 147 μg/m3. The air exchange rate averaged 0.72 exchanges per hour. Hemoglobin adducts of 4-aminobiphenyl were measured by gas chromatography/tandem mass spectrometry, and both serum cotinine and urinary NNAL were measured by HPLC API-tandem mass spectrometric procedures. At 2-hr post exposure, the mean (95% CI) serum cotinine concentration was 3.07 mg/mL (2.79, 3.37), representing a 2.66 mg/mL increase over the mean pre-exposure concentration. Also at 2-hours post exposure, 4-aminobiphenyl hemoglobin adduct concentrations increased from 29.3 (22.9, 37.3) pg/g Hgb to 36.2 (28.6, 45.7) pg/g Hgb when adjusted for air nicotine and exchange rates. Total urinary NNAL concentrations were significantly increased from 7.42 (5.35, 10.3) pg/mL pre-exposure to 20.7 (17.0, 24.4) pg/mL post-exposure, after adjusting for air nicotine, exchange rate and urinary creatinine. These results indicate that measurable increases in carcinogenic association with (or specific for) tobacco smoke can be detected following brief exposures to moderate concentrations of sidestream smoke under controlled conditions. Although the single dose increase in carcinogen biomarker concentration was small, the cumulative dosage resulting from regular exposure to secondhand smoke over time could represent a significant carcinogenic risk for nonsmokers. This study was funded by the Centers for Disease Control and Prevention.

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This study was funded by the Centers for Disease Control and Prevention.

POS4-91 INCREASES IN HEMOGLOBIN ADDUCTS OF 4-AMINOBIPHENYL AND IN URINARY NNAL AMONG NONSMOKERS EXPOSED TO SIDESTREAM SMOKE UNDER CONTROLLED CONDITIONS

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This study was funded by the Centers for Disease Control and Prevention.
NICOTINE VACCINE VS PLACEBO FOR SMOKING CESSATION: LONG-TERM ABSTINENCE AND QUITTING
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Background: This study assessed the therapeutic potential of a nicotine vaccine under development (3’-aminomethylnicotine-P. aeruginosa r Exoprotein A Conjugate; NicVAX®) that produces specific anti-nicotine antibodies (Ab), reducing nicotine entry into the brain. Early analyses demonstrated that high anti-nicotine Ab increased cessation rates in healthy adults smoking at least 15 cigarettes/d, assigned to 200 µg NicVAX or placebo (1:1:1), on 2 schedules. Target quit date (TQD) was 1 wk after the 2nd injection (end of wk 5 or wk 7). Brief behavioral counseling was provided 1 wk prior to TQD and at 4 subsequent visits. Electronic diaries recorded cigarette use prior to TQD and at 4 subsequent visits. Pre-specified analyses of abstinence expired carbon monoxide no more than 8 ppm. Pre-specified analyses of abstinence included (1) the top 30% of Ab titers, and (2) ITT by treatment.

Methods: Randomized, double-blind, placebo-controlled multicenter clinical trial of 301 healthy adults smoking at least 15 cigarettes/d, assigned to 200 µg or 400 µg of nicotine vaccine or placebo (1:1:1), on 2 schedules. Target quit date (TQD) was 1 wk after the 2nd injection (end of wk 5 or wk 7). Brief behavioral counseling was provided 1 wk prior to TQD and at 4 subsequent visits. Electronic diaries recorded cigarette use daily (mo1-6) then weekly (mo7-12). Self-reported abstinence was confirmed by expired carbon monoxide no more than 8 ppm. Pre-specified analyses of abstinence included (1) the top 30% of Ab titers, and (2) ITT by treatment.

Results: Subjects (48% male) averaged 48 yrs old, 24 cigarettes/d, and a FTND score of 24, the proportion of subjects who achieved the primary endpoint as well as total long-term abstinence.

Conclusion: A nicotine vaccine increased long-term tobacco abstinence over placebo. Anti-nicotine antibody response predicted quitting rates, and continuing to quit after counseling ended. High levels of anti-nicotine antibodies may contribute to long-term abstinence.
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Varenicline tartrate, a novel nicotinic acetylcholine receptor partial agonist that is selective for the α4β2 nicotinic acetylcholine receptor, has been specifically developed for smoking cessation. Its pharmacokinetic (PK) properties and tolerability in healthy volunteer Chinese smokers aged 18-45 years, were evaluated in an open-label, non-randomized study conducted over 17 days at a single center in China. Subjects (n=41; 50% of subjects were single; 1 mg dose of varenicline at bedtime on days 1 and 10 and 1 mg varenicline BID after breakfast and dinner (12-hr dosing interval) on days 4-9. Varenicline in plasma and urine was assayed using a reversed-phase, liquid chromatography mass spectrometric method. Maximum plasma concentrations of varenicline (Cmax) were achieved typically within 2 to 3 hrs of oral administration. Following administration of multiple oral doses of varenicline, steady-state conditions were attained within 4 days. Accumulation of varenicline on repeat administration was shown by values of Cmax and AUC(0-12) (area under the plasma concentration vs. time curve from 0 to 12 hrs) that were 1.93-fold and 2.10-fold larger, respectively, at steady state than following a single dose. The mean elimination half-life following single and multiple dosing was 18.3 hrs. respectively. Variability in Cmax and AUC parameters was low as demonstrated by coefficients of variation of <20%. Mean renal clearance (CLR) was similar for both dosing regimens (6.90 L/hr and 6.05 L/hr). The large variation in CLR among individual subjects was attributed to highly variable amounts of unchanged varenicline excreted in urine over the 12-hr urine collection period. Although the evidence of time-concentration-dependent changes in the PK properties of varenicline upon repeat dosing, since the ratio of AUC(0-12) at steady state to AUC(0-inf) on day 1 was found to be nearly 1. Varenicline was safe and well tolerated; adverse events were mild in severity and there were no abnormal laboratory tests. Results are consistent with those of previous varenicline PK studies.

POS5-4
EVALUATION OF TOBACCO USE AND DEPENDENCE CLINICAL PRACTICE GUIDELINES IN HOSPITALS IN A LARGE NORTHERN RURAL REGION OF CANADA

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This study was designed to assess the extent to which the Tobacco Use and Dependence Clinical Practice Guidelines have been implemented in hospitals in Northwestern Ontario, Canada. NW Ontario is a large northern rural region covering over 450,000 sq miles from the Manitoba and Minnesota borders and north shore of Lake Superior to Hudson’s Bay, yet it is serviced by only 13 hospitals. It is sparsely populated (24,000), with high rates of comorbid conditions and a time-dependent changes in the PK properties of varenicline upon repeat dosing, since the ratio of AUC(0-12) at steady state to AUC(0-inf) on day 1 was found to be nearly 1. Varenicline was safe and well tolerated; adverse events were mild in severity and there were no abnormal laboratory tests. Results are consistent with those of previous varenicline PK studies.

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POS5-5
DOES PRE-QUITTING NICOTINE REPLACEMENT THERAPY IMPROVE QUITTING SUCCESS COMPARED WITH USUAL TREATMENT? FINDINGS FROM THE PONIO TRIAL

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Several small controlled studies have suggested that treatment with Nicotine Replacement Therapy (NRT) prior to quitting may improve the chances of quitting success, and there are sound theoretical bases for expecting that this might be so. To definitively test this hypothesis in a pragmatic setting, between mid-2006 and 2007 we randomized 1100 smokers calling the New Zealand Quitline to receive either “usual treatment” (eight weeks of NRT patches and/or gum plus three support calls) or two weeks of NRT patches and/or gum while still smoking ad libitum prior to the nominated Quit day followed by “usual treatment” (i.e., a total of 10 weeks NRT). Preliminary analysis of self-reported quit rates at three months post-randomization using intention-to-treat analysis on both seven-day point prevalence data and Russell Standard continuous abstinence show no significant difference between intervention and usual treatment groups (27% and 28% respectively for seven day point prevalence abstinence, relative risk 0.97, 95% confidence interval 0.79-1.18; 24% and 26% respectively for Russell Standard, RR 0.94, 95% confidence interval 0.76-1.15). These data suggest that two weeks of pre-quit NRT followed by eight weeks of NRT confers no additional quitting benefit over eight weeks of NRT alone. Further analyses of self-reported and biochemically validated quitting data at six months post-randomization and associated secondary analyses will be undertaken but are not yet available.

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POS5-6
PATTERNS OF COMPLEMENTARY AND ALTERNATIVE MEDICINE USE OF ADULT SMOKERS IN THE U.S.

Myra Muramoto, M.D.*; Lysbeth Ford, M.P.H., Mikel Aickin, Ph.D.

Objectives: The purpose of this study is to assess the patterns of complementary and alternative medicine (CAM) use among smokers in the United States.

Methods: The data used here were from the 2002 Alternative Health/ Complementary and Alternative Medicine (CAM) Supplement to the National Health Interview Survey. Information of 12 types of CAM use in the past 12 months was obtained from a representative sample of 31, 044 people over the age of 18. The interviews are age and socio-economically representative of the civilian non-institutionalized population of the United States. Statistical analysis was performed using the “survey” command in STATA software package to account for the complex sample design of the NHIS.

Results: Of the survey sample, 22.6% report being current smokers or are smokers whose status is not confirmed. Thirty-six percent of adults reported using some form of CAM therapy during the past 12 months, excluding prayer specifically for health reasons (1). The proportion of smokers who use at least 1 out of 12 CAM practices in the previous 12 months (acupuncture, ayurveda, biofeedback, chelation therapy, chiropractic care, energy therapy, folk medicine hypnosis, massage, naturopathy, herbs, homeopathic treatment) is similar to non-smokers (25.0% versus 25.6%, respectively). CAM use varies by region and is similar to CAM use among smokers: 18.8 versus 18.0% in the Northeast; 23.9% versus 27.4% in the Midwest; 30.8% versus 32.3% in the South; and 26.5% versus 22.4% in the West. Approximately the same proportion of smokers used the 12 CAM practices examined in this analysis as in the general population. Of the adults who report smoking, 18.5% were smokers. Of the adults who report using chiropractic care, 20.3% were smokers. Of the adults who report using massage therapy, 20.0% were smokers.


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POS5-7

IS NRT BEING USED BY THOSE FOR WHOM IT IS INDICATED? A COHORT STUDY OF CURRENT SMOKERS

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While various smoking cessation resources are readily available to help smokers quit, not all treatments are appropriate for all smokers. In Ontario, nicotine replacement therapy (NRT) has been available over-the-counter since 1999. However, there is little research to indicate if NRT is being used by smokers for whom it is indicated: those with higher levels of addiction, intentions to quit, and concurrent use of behavioral supports. We examined NRT use among a cohort of smokers. Longitudinal data on 2070 adult current smokers at baseline were compiled from the first four waves of the Ontario Tobacco Survey, a regionally-stratified longitudinal RDD survey conducted between 2005-07 in Ontario, Canada (RR=84%). NRT use was defined as use of NRT patch, gum or inhaler at follow-up. Design-based analyses were used to examine characteristics of NRT users at follow-up as well as the relationship between NRT use and heaviness of smoking (HSI), 6-month quit intentions, and behavioral supports. Overall, 14% of smokers used NRT at follow-up. NRT use was higher among smokers who had ever made two or more serious quit attempts compared to fewer attempts (17% vs. 10%) and those who had used NRT in the past (23% vs. 7%). There were no differences with respect to age, sex, education and confidence in ability to quit. Overall, NRT use was higher among smokers with any of the positive indications for use (HSI >3), 6-month quit intention, and behavioral supports; p<0.001 for each association). Those with two or more indications for NRT use were more likely to be users at follow-up than those with one or no indications (40% vs. 18% vs. 7%, respectively; p<0.001). Among those who have never previously used NRT, only those receiving behavioral support were more likely to use NRT. While those who have used NRT in the past were more likely to use it at follow-up, those with no previous use were more likely to use NRT while receiving behavioral support. Overall, our analysis identifies NRT use was more likely to occur among those with positive indications for NRT use.

Smoke Free Ontario Strategy. Ontario Ministries of Health Promotion and Health and Long Term Care.

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POS5-8

UTILIZATION OF TOBACCO TREATMENT MEDICATIONS AMONG MAINE MEDICAID ENROLLEES, 1997 TO 2004

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Background: Among smokers having insurance, coverage for treatment medications plays a role in their use. Little is known about use of tobacco treatment therapies among Medicaid beneficiaries.

Purpose: Across a 7-year interval, this study describes the type, frequency of use, and quit attempts annually of tobacco medications among a Medicaid cohort provided insurance coverage for any nicotine replacement therapy (NRT) and bupropion.

Methods: Secondary analysis of Maine Medicaid administrative data, of adults aged 18 to 65 having a pharmacy claim for any form of NRT or bupropion, from January 1997 to December 2004. Individuals with a bupropion claim and diagnosis of depression were excluded from the analysis (24.9%).

Results: Across the seven, 12-month intervals, 94,989 enrollees had an NRT or bupropion claim. Use of bupropion and nicotine inhaler increased over the study interval, partially replacing nicotine patch use. Pharmacy claims increased from 5.3% of adults in 1997 to 8.1% in 1999, then gradually increasing to 6.4% after limits were placed on benefits in 2001. Using state prevalence data for 2003, an estimated 15.8% of smokers used NRT. Use of NRT increased among those with higher levels of addiction, intentions to quit, and concurrent use of behavioral supports. 43.3% of enrollees had a single treatment episode during a 12-month interval, defined as a contiguous supply of drug with <30 days interruption. Less than 4% had more than two treatment episodes in a year.

Conclusions: Pharmacy claims data are limited by inability to identify smokers, but can be used to examine patterns of tobacco medication use and estimate use frequency among populations with benefits. This 7-year evaluation shows that almost 1 of 4 mid-aged and older smokers who are Medicaid enrollees annually used a medication to quit. With exclusion of individuals with depression diagnoses, the actual use is likely higher.

This study was conducted when the first author was at Maine Medical Center. Funded by Maine Health Access Foundation.

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POS5-9

SLEEP DISTURBANCE AMONG WOMEN SMOKERS ENROLLED IN A RANDOMIZED CONTROLLED SMOKING CESSATION TRIAL

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Sleep disturbance is a common, bothersome symptom typically accompanying acute nicotine withdrawal. Disruptions in sleep can result in increased irritability, poor concentration, and psychomotor mood. Negative effects such as these are likely to exacerbate other symptoms experienced with nicotine withdrawal (e.g., anxiety), and may promote relapse to smoking. In an on-going randomized controlled smoking cessation trial, we obtained baseline data from 88 smokers regarding self-reported sleeping patterns using the Insomnia Severity Index (ISI; alpha=.78). All participants were women (mean age=42.6; SD=10.0) who smoked for an average of 26.1 (SD=9.8) years, and had a mean score of 3.6 (SD=1.3) on the Fagerstrom Test for Nicotine Dependence (FTND). According to the ISI, upon entering the study, 4.5% (n=4) of the participants had clinical insomnia of severe intensity, 13.6% (n=12) had clinical insomnia of moderate intensity, 39.8% (n=35) had sub-threshold insomnia, and 42% (n=35) had no clinically significant insomnia. These data suggest that it may be useful to incorporate sleep hygiene into smoking cessation protocols in order to help minimize relapse to smoking. In addition, our data suggest that it is important for researchers to assess the baseline sleeping patterns of participants enrolling into a smoking cessation trial, as further disruptions to sleep can occur with nicotine withdrawal, intensifying an already existing clinical condition. Additional baseline descriptive data from this study will also be presented.

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POS5-10

ASSESSING SMOKING CESSATION IN CLINICAL TRIALS: THE NEED FOR BOTH SELF-REPORT AND BIOCHEMICAL VALIDATION

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Background: In smoking cessation trials, biochemical validation is the gold standard of abstinence assessment. Self-reported abstinence data are also collected. Agreement between these measures has been examined previously, with varying results.

Methods: Using data from an ongoing multi-center, double-blind, placebo-controlled clinical trial examining the efficacy of varenicline following an acute coronary syndrome, we compared self-reported and biochemically-validated abstinence. Self-reported abstinence was defined as having an expired carbon monoxide (CO) reading ≤3 ppm. Results: At the time of analysis, data were available for 150 patients at baseline and 75 patients at 52-week follow-up. At 52 weeks, biochemical validation coincided with self-reported smoking status for 64 of 75 patients (kappa=0.70, 95% confidence interval=0.53, 0.86). Of the 11 discordant measures, 10 involved a self-report of smoking but a negative CO reading. These 10 patients had a median CO level of 7 ppm and reported having smoked a median of 15 cigarettes in the last week. Biochemically-validated abstinence was defined as having an expired carbon monoxide (CO) reading ≤3 ppm.

Conclusions: Biochemical validation with CO monitors only evaluates short-term abstinence and thus, biochemical validation and self-report should be used as complementary measures. The presence of biochemical validation may elicit more accurate self-reported smoking information.

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WITHDRAWN

WITHDRAWN
A QUALITATIVE REVIEW OF PULMONARY CARE CLINIC STAFF PERCEPTIONS REGARDING SMOKING CESSATION IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

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Cigarette smoking results in approximately 440,000 deaths in the United States each year, or nearly 40% of all deaths (CDC, 2004b; Mokdad et al., 2004). About 10 million people in the US have been diagnosed with Chronic Obstructive Pulmonary Disease (COPD), the fourth leading cause of death. More than 90% of deaths from COPD are attributable to smoking (USDHHS, 2004). Females who smoke are almost 13 times as likely and male smokers are nearly 12 times as likely to die from COPD compared to nonsmokers of the same gender (USDHHS, 2004). Fortunately, smoking cessation among COPD patients results in a significant reduction in symptoms and increased longevity. Unfortunately, US public hospitals, with a mission to serve the poor and underserved, rarely offer smoking cessation services that benefit older, heavily addicted smokers typical of this population. We interviewed the pulmonary staff (physicians and nurses) at a large health-care provider for the medically indigent and heavy addicted smokers typical of this population in a Midwestern City in order to help develop and pilot a culturally tailored smoking cessation program for COPD patients for the urban poor. The data was analyzed for prevalent themes that staff indicated of importance to patients, nurses, and doctors. When trying to help COPD patients quit smoking, staff generally believed that treatment must be based on the patient’s particular circumstance, and public hospitals lack the personnel and resources to offer such individualized services. Further, staff felt time constraints negatively impacted their ability to intervene more effectively. Therefore, formative research designed to develop effective and affordable tobacco cessation programs in public hospitals is needed. This study will lay the foundation for the design and implementation of specific strategies to address poor, medically complex patients in tobacco control.

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RELATIONSHIP BETWEEN PRIOR TRAINING IN TOBACCO CONTROL AND KNOWLEDGE, ATTITUDES AND CLINICAL PRACTICE AMONG HEALTH CARE PROFESSIONALS IN GUANGZHOU, CHINA

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Purpose: To examine the relationship between prior training in tobacco control and knowledge, attitude, and practice in smoking cessation interventions among Guangzhou health care professionals.

Methods: A cross-sectional survey was conducted in June 2006 to all healthcare professionals with immediate patient contact of the 11 hospitals under Guangzhou Public Health Bureau. Their knowledge (general and disease-specific), attitudes, 5A’s (Ask, Advise, Assess, Assist, Arrange) practice in smoking cessation and the number of hours spent in previous training in tobacco control were measured.

Results: 2584 health care professionals completed the questionnaire, with a response rate of 50.2%. 76.0% of the subjects were female, 47.2% aged 40 years or below, 40% were doctors and 60% were nurses. Excluding missing data, 17.1% (427/2494) had received no, 40.9% had 1-10 hours, and 42.0% had more than 10 hours training in tobacco control. MANOVA results showed that subjects who had no training in tobacco control had more negative attitudes toward the role in tobacco control (no training: 3.11±0.66, 1-10 hours: 3.19±0.50, >10 hours: 3.18±0.59; p<.001) but more positive in their responsibility to provide cessation intervention to all patients (2.63±0.66, 2.57±0.64, 2.49±0.71; p<.046) (1="Strongly Disagree" to 4="Strongly Agree"), and practiced less patients quit smoking. MANOVA results showed that subjects who had no training in tobacco control reported less confidence in their general and specific knowledge, and attitude towards tobacco advertisement and promotion in tobacco control.

Conclusion: Guangzhou health care professionals with prior training in tobacco control were more likely to provide smoking cessation to their patients. However, future training should emphasize on providing basic and advanced knowledge on the health effects and epidemics of smoking and to highlight the important role of health care professionals in tobacco control.

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WHO RECEIVES TOBACCO COUNSELING FROM PHYSICIANS? RESULTS FROM THE 2005 NATIONAL AMBULATORY MEDICAL CARE SURVEY (NAMCS)

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Objective: This study examined factors associated with receiving tobacco counseling from a physician during a routine outpatient visit.

Methods: The 2005 NAMCS database contains physician documentation of clinical activities occurring during target outpatient visits. Patients were stratified into three categories based on smoking status: current, former, and never. These groups were initially compared regarding demographic characteristics. Primary analyses examined differences among current smokers who received vs. did not receive tobacco counseling. Clinical and demographic variables were examined, as well as physician factors. Logistic regression was the primary data analytic method.

Results: Of 11,827, adults, 20.5% (n=2,420) were current smokers, of whom 21.7% (n=525) received tobacco counseling. About 78% of current smokers were not associated with having received counseling, while payer source and geographic region were. Medicaid recipients (OR=1.39, 1.02-1.91) and self-payers (OR=1.54, 1.02-2.34) were more likely to receive counseling than those with private insurance. Patients residing in southern (OR=0.74, 0.55-0.99) and western (OR=0.66, 0.45-0.96) states were less likely to receive counseling than those in northeastern region. Greater likelihood of counseling was associated with the presence of comorbid asthma (OR=2.08, 1.05-4.18), and ischemic heart disease (OR=2.41, 1.37-4.26), and ischemic heart disease (OR=1.68, 1.08-2.62). However diabetes showed an inverse relationship (OR=0.46, 0.30-0.70). Visit length for counseled patients was more likely to last 20 minutes (OR=1.27, 1.02-1.60), during which other patients’ individual needs were provided (OR=2.39, 2.11 to 2.69). A specialist was less likely to counsel (OR=0.48, 0.37-0.62), CONCLUSION: A majority of current smokers did not receive tobacco counseling. These findings identify factors that influence the likelihood of tobacco counseling, including comorbidities, payer status and region. Treatment training programs for providers should emphasize the role of the tobacco reliance assessment and increase the focus on primary prevention.

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SMOKING RELAPSE PREVENTION IN CANCER PATIENTS: PATIENT AND PROVIDER PERSPECTIVES

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Immediate smoking cessation is medically warranted for cancer patients. Many cancer patients make a quit attempt at the time of diagnosis; yet little information is available regarding relapse. The goal of Phase I of the current study was to utilize qualitative research methods to identify patient and provider perspectives on smoking cessation and relapse, and to elicit preferences for intervention modality and content. Participants included 20 lung or head/neck cancer patients who had made a quit attempt since their cancer diagnosis. Additional interviews were conducted with 11 oncology health professionals (i.e., surgeons, nurses) working directly with patients. The general theme that emerged was that stress and fear associated with diagnosis provided strong motivation to quit. Most patients and providers identified smoking reoccurrence, but not reduced cancer treatment efficacy, as a primary risk of continuing to smoke. Nearly all providers reported that they assess for smoking behaviors and advise patients to quit. Nevertheless, most said that they did not provide medication prescriptions or other treatment, preferring to refer patients to other resources. Most patients reported difficulty refraining from smoking in the same situations that have been identified as risk factors in general population studies (i.e., eating and drinking, experiencing negative affect, being around other smokers). Regarding preferred intervention modality, half of patients and providers suggested video. Both patients and providers had difficulty identifying cessation challenges and intervention content uniquely relevant for cancer patients, indicating that extensive tailoring may not be necessary when developing an intervention for this highly motivated population. Additional patient and provider perspectives on smoking relapse will be reported during the poster. These qualitative findings will be further examined in Phase II of the current project, a longitudinal, quantitative study that will allow us to test emotional, cognitive, and physical predictors of relapse. Information gained from this formative research will guide future intervention development.

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POS5-15  TOBACCO TREATMENT ADHERENCE IN NEWLY DIAGNOSED CANCER PATIENTS

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Smoking by newly diagnosed cancer patients represents a unique challenge, with no consensus on optimal treatment for this special population. Smokers scheduled for cancer surgery were recruited for a controlled trial of adherence to either usual care (counseling, NRT), or usual care + scheduled reduced smoking (SRS) guided by a handheld computer (HHC). We report here only on the SRS study arm. Patients chose a quit date, and the handheld used an algorithm to taper and schedule the number of cigarettes allowed to smoke each day. Of the 49 total patients, two groups were identified. Seventeen patients chose a quit date. There was no significant difference in the mean follow-up time for the two groups. This suggests that patients may benefit from a quit date, but the lack of a significant difference in follow-up time suggests that further research is needed to identify optimal quit dates. The handheld both prompted patients to smoke on schedule and assessed biopsychosocial variables at each day's end (EOD). Patients could change the original quit date (QOD) either by entering early quit attempts or by postponing the QOD.

POS5-16  SMOKING AND RECURRENT DISEASE IN A HEAD AND NECK CANCER POPULATION RECEIVING RADIOThERAPY

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Cigarette smoking during radiotherapy for head and neck cancer has been shown to reduce response to radiotherapy and increase treatment complications. Few studies have however examined the effect of continued smoking during radiotherapy on rates of recurrence and persistent disease. We surveyed 32 patients who underwent radiotherapy as their primary treatment modality. Smoking status was obtained by patient self-report. Twenty out of these 32 patients were on bupropion-SR first then varenicline, which resulted in eight out of these 20 patients (40%) becoming abstinent at the 12 week follow-up. Among the 12 individuals who were on Varenicline first then bupropion-SR, 2 out of 12 (16%) were abstinent at 12 weeks. In a preliminary analysis, there were no significant differences in abstinence between the two mediation sequence groups (p = 0.117); we found no differences between the groups on demographic and baseline variables such as age, sex, gender, smoking history or negative affect. The combined abstinence rate among the two groups was 31.3%. There was no observed increase in reported side effects. The apparent better rate of abstinence resulting from adding varenicline to bupropion may simply be attributed to higher efficacy of varenicline or to the different hypothesized mechanism of action of these medications. However, the non-significance in the order of medication may be due to the small sample size. In this treatment resistant sample, a relatively high abstinence rate of 31.3% was achieved by adding a second medication. This merits further investigation. Details about this sample will be presented and future directions for research to study this observation will be discussed.

The program is funded by The University of Texas M. D. Anderson Cancer Center from proceeds of the State of Texas Tobacco Settlement Funds.

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POS5-17  DOES COMBINING BUPROPION-SR AND VARENICLINE MAKE A DIFFERENCE? A PRELIMINARY EFFICACY REPORT IN CANCER PATIENTS

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To our knowledge there are no published data on the efficacy of combining bupropion-SR and varenicline for tobacco cessation after failing to respond to one or the other. In a program designed to treat tobacco dependence in patients receiving care at a large cancer treatment center, we treated a total of 612 patients with FDA approved smoking cessation medications (Bupropion-SR and/or varenicline) in addition to providing patients with 6-8 sessions of intensive therapy (cognitive-behavioral and motivational interviewing). In a naturalistic open label design, 95 patients received bupropion-SR and 567 received varenicline. Fifty of these individuals received a combination of both bupropion and varenicline after failure to quit in 4-8 weeks on either medication alone. Post-treatment 12-week outcome data were available on 32 of these 50 patients; abstinence data was obtained by patient self-report. Twenty out of 32 patients were on bupropion-SR first then varenicline, which resulted in eight out of these 20 patients (40%) becoming abstinent at the 12 week follow-up. Among the 12 individuals who were on Varenicline first then bupropion-SR, 2 out of 12 (16%) were abstinent at 12 weeks. In a preliminary analysis, there were no significant differences in abstinence between the two medication sequence groups (p = 0.117); we found no differences between the groups on demographic and baseline variables such as age, sex, gender, smoking history or negative affect. The combined abstinence rate among the two groups was 31.3%. There was no observed increase in reported side effects. The apparent better rate of abstinence resulting from adding varenicline to bupropion may simply be attributed to higher efficacy of varenicline or to the different hypothesized mechanism of action of these medications. However, the non-significance in the order of medication may be due to the small sample size. In this treatment resistant sample, a relatively high abstinence rate of 31.3% was achieved by adding a second medication. This merits further investigation. Details about this sample will be presented and future directions for research to study this observation will be discussed.

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POS5-18  CORONARY REvascularization DOES NOT Affect SMOKING CESSATION IN PATIENTS FOLLOWING AN aCUTE coronary SYndrome

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Background: Approximately 20% of patients who suffer an enzyme-positive acute coronary syndrome (ACS) are smokers, many of whom are revascularized during hospitalization. However, the effect of undergoing revascularization on smoking behavior in these patients is unknown.

Methods: We examined the efficacy of bupropion-SR in smokers following an ACS in an ongoing double-blind, placebo-controlled, randomized clinical trial. We biochemically validated smoking status at entry and at 24, and 52 weeks.

Results: At the time of 12-week follow-up data were available for 73 revascularized patients and 50 medically treated patients. There were no clinically relevant differences at baseline, including smoking behavior, between the two groups. Among those that returned for follow-up, the proportion of patients who were smoking was 43% and 50%, respectively. The lost to follow-up rate was 34% among revascularized patients and 39% among medically treated patients. When patients lost to follow-up were treated as smokers, the proportion of patients smoking at 52 weeks was 62% among revascularized patients and 70% among medically treated patients.

Conclusions: Undergoing revascularization does not appear to affect the likelihood of quitting smoking at 52 weeks. Because half of our patients were receiving bupropion, actual smoking rates in untreated patients are likely to be even worse than reported here.

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POS5-19  SAFETY OF NICOTINE REPLACEMENT THERAPY IN SMOKERS ADMITTED TO HOSPITAL WITH ACUTE CORONARY SYNDROME

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Rationale: Nicotine replacement therapy (NRT) can be used to prevent nicotine withdrawal in hospitalized smokers. However, the safety of NRT in patients hospitalized with acute coronary syndrome (ACS) has rarely been studied. Additional data on the safety of NRT in this population would help health professionals weigh potential risks and benefits.

Objectives: To determine the impact of NRT on hospital mortality and potentially nicotine-related morbidity in patients with ACS. Methods: Medical charts for a consecutive series of smokers admitted with ACS to the University of Ottawa Heart Institute were reviewed. Propensity score matching was used to pair smokers initiating NRT during hospitalization with those that did not. The main outcome, composite hospital mortality and potentially nicotine-related morbidity, was compared between the matched groups (NRT vs. no-NRT). Relative risks and risk differences for the main outcome were calculated.

Results: The initial sample consisted of 495 smokers with ACS, of whom 271 received NRT and 224 did not receive NRT. Propensity-score matching resulted in 65 matched, 1:1 sets (72 randomly selected, 94 significantly different). They perceived a NRT and three patients not receiving NRT experienced hospital mortality or potentially nicotine-related morbidity. The composite rate of hospital mortality or potentially nicotine-related morbidity was 1.3% in the NRT group and 1.9% in the no-NRT group. The risk difference [95% CI] was not statistically significant but using McNemar’s test (P = 1.00). The relative risk in the NRT group compared to the no-NRT group was 0.67 (P = 0.66; 95% CI: 0.1 to 4.0). Conclusion: Retrospective evidence suggests that NRT did not increase hospital mortality or potentially nicotine-related morbidity in patients with ACS.

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POS5-20  THE EFFECTIVENESS OF SMOKING CESSATION COUNSELING TRAINING IN CHANGING THE KNOWLEDGE, ATTITUDES AND PRACTICE OF STAFF AND VOLUNTEERS OF COMMUNITY WOMAN ORGANISATIONS IN HONG KONG

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Background: A ‘Women Against Tobacco Taskforce’ (WATT) was set up to raise the health awareness of woman smokers and a one-day smoking cessation counseling training workshop was delivered to affiliates of WATT in Nov 2006. The objective was to: Train eight affiliates, of whom two were invited to complete a self-administered anonymous questionnaire immediately before, and 6 months via mail, after the workshop. Their baseline knowledge, attitudes, practice in smoking cessation before and changes at 6-month post-training were measured.

Results: 22 out of 28 participants (79%) completed the questionnaires at both time points. 95% were female, 95% aged 60 or below, and one (5%) had received smoking cessation training before. Overall, they had improvement in general knowledge (Mean: 5.15 vs. 4.5; p=.024) (out of 7 questions) of the health effects of smoking. Although insignificant, their attitudes towards banning of tobacco advertisement (Mean: 3.31 vs. 3.43) and their role in smoking cessation (Mean: 3.17 vs. 3.30) remained pre-trained (1=strongly disagree, 5=strongly agree). They perceived a more negative image of woman smokers (emotional, permissive, immature, unacceptable and rude) at 6 month follow up (Mean: 3.22 vs. 2.97, p=.001).

Comparing to pre-training, fewer participants (55% [12 out of 22] vs. 62.5% [15 out of 24], p=.14) had provided difference education counseling to clients in the past 6 months, post-training as the majority (70%) did not have contacts with any smokers. However for those who did not deliver smoking cessation interventions, all (100%) felt that they had gained the necessary knowledge and skills to help those who requested smoking cessation training before. Their self-efficacy to quit smoking had improved and sustained at 6 months after the training, but we need more innovative strategies to publicize the service, reach woman smokers, and motivate them to quit smoking.

Health acute care system.

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Is nicotine addiction a state or a trait? While it seems clear that there are ingrained genetic characteristics that make it more difficult for some to quit more than others, it is also apparent that even heavy smokers are able to alter their smoking habits in ways that seem to facilitate quitting. The most consistent predictors of smoking cessation are time to first cigarette of the day and amount smoked daily. Yet, few studies have examined whether delaying time to first cigarette or reductions in cigarette consumption predict the likelihood of achieving cessation. This study relies upon data from 2,086 smokers who originally participated in the Community Intervention Trial for Smoking Cessation (COMMIT) and provided phone surveys in 1988 and 2001, and who also completed a follow-up tobacco use telephone survey in 2005. In 2001, 9% of smokers reported delaying their time to first cigarette by 30 minutes or more since 1988 and 48% maintained this reduction into 2005. In addition, 22% reported decreasing their average daily cigarette consumption by at least 50% between 1988 and 2005. Of those who delayed the time to their first cigarette or decreased their daily number of cigarettes between 1988 and 2001, about half maintained these reductions but continued to smoke in 2005. Respondents that reduced consumption or delayed time to first cigarette were more likely to be older and of minority ethnicity. Those who delayed their time to first cigarette by at least 30 minutes between 1988 and 2001 (RR=1.7, 95% CI [1.3, 2.5]) or reduced their daily consumption by at least 50% between 1988 and 2005 (RR=2.0; 95% CI [1.1, 2.2]) were significantly more likely to have quit smoking in 2005 compared to those who remained the same in these measures. Those who self-select to change indicators of dependence (time to first cigarette and cigarettes per day) for a long period of time are more likely to quit smoking in the future; however, the success of these strategies to smokers who have a difficult time quitting is beneficial to public health.

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POS5-23 THE RELATIONSHIP BETWEEN SWITCHING TO LOW-TAR CIGARETTES AND THE LIKELIHOOD OF QUIT ATTEMPTS AND SMOKING CESSATION
Raymond Skeps, M.S.*, Martin C. Mahoney, Ph.D., M.D., K. Michael Cummings, Ph.D., Andrew Hyland, Ph.D.

So-called low yield cigarettes have been successfully marketed by cigarette manufacturers on the myth that they actually deliver lower levels of toxins to smokers. Many smokers also reported switching to low yield cigarettes in hopes that these so-called low yield cigarettes might make quitting smoking easier. This paper presents analyses of data from 1,386 smokers whose smoking habits were tracking between 1988 and 2005 as part of the Community Intervention Trial for Smoking Cessation (COMMIT). Data are restricted to smokers who completed detailed tobacco use phone surveys in 1993, 2001 and 2005, and who provided brand information in each survey. Reported brands were classified as ultralight (0-6 mg tar), light (7-15 mg tar), and regular (16+ mg tar) at each survey based on FTC reported machine smoking yields. Twenty-eight percent of smokers in the study switched from a higher to lower category brand to one that was lower in tar yield between 1993 and 2001. Those who switched from a higher to a lower yield brand were more likely to be female and less likely to be black, non-Hispanic. Twenty three percent of the respondents reported switching to light cigarette as a quit method but were no different from those who switched to lights for other reasons. Those who switched to lower tar cigarettes and an incremental quit method between 1993 and 2001 were more likely to report having made a quit attempt by 2005 (RR=2.6, 95% CI 1.7-4.0) compared to those who did not switch to low tar cigarettes; however, the quit rates of switchers were comparable to non-switchers (RR=1.1, 95% CI 0.7-1.8). Switching to a lower tar cigarette did not appear to influence the likelihood of cessation. However, quit attempts may be associated with switching.

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POS5-24 PHARMACIST-ASSISTED CESSATION: A DECADE OF EXPERIENCE
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In 1998, as part of a comprehensive approach to addressing tobacco, Providence Health & Services developed a “Pharmacist-Assisted” Cessation Class, which is a seven-week, 11-session, intensive group cessation class combined with pharmacist assistance appropriate pharmacotherapy, where nicotine patch, bupropion, or varenicline are provided at no additional out-of-pocket cost. These classes were designed to address tobacco use for 1) Impatiants who quit during hospitalization and need intensive outpatient cessation programs after discharge, 2) Outpatients who need local cessation programs that are evidence-based, accessible, and available without physician referral, and 3) Hospital employees who need onsite cessation programs. Over the past 5 years, these classes have had 12-month quit rates of 34% (cumulative rates of all participants attending at least one session who self report abstinence at one year, non-response counted as a smoking). In 2007 varenicline was added which resulted in quit rates of 44% (intent-to-treat, self-reported at six months for all participants attending at least one session, non-respondents counted as smokers). An “effectiveness analysis” for those who completed the class, using any medication, non-response considered smokers demonstrated a 56% six-month quit rate. This poster will describe key features of this intervention and will highlight findings of a program evaluation including organizational “lessons learned.” Pharmacy regulations, funding, and the need for collaborative care and pharmacist intervention in medication therapy under written protocols and agreements with providers. A summary of our Collaborative Drug Therapy Management Guideline will be made available as a handout along with other resources needed for developing, implementing, and maintaining a pharmacist-assisted cessation program, which has been summarized in a 50-page report funded by a grant from the Smoking Cessation Leadership Center. We hope to share this “best-practice” with other healthcare system administrators, researchers, staff, and clinicians who attend the SRNT annual meeting in Portland.

Major funding was by the Providence Tobacco Cessation & Prevention Program and a small amount of funding was provided by a grant from the Smoking Cessation Leadership Center at UCSF.

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POS5-25 PRAGMATIC CLINICAL EVALUATION OF A COMPUTERIZED ALGORITHM GENERATING PERSONALIZED TREATMENT RECOMMENDATIONS FOR SMOKING CESSATION

Background: Individual variation in the rate at which smokers metabolize nicotine may contribute to unpredictable response to nicotine replacement therapy. Such unpredictability may be attributable in part to genetic variation. Prior consideration of pharmacogenetic and biometric data to give advance indication of suitable treatment has the potential to maximise effectiveness.

Methods: We conducted a 12-month multi-centre pragmatic observational clinical evaluation of a novel computerized decision support program to guide NHS pharmacist prescribing according to questionnaire data and metabolic profile assessed by genetic analysis of a finger prick blood sample. Smoking status was validated by exhaled carbon monoxide and salivary cotinine. Quit rates were calculated as validated quitters/all those included + lost to follow-up.

Results: 203 smokers were invited to participate. Of these, 24(12%) did not complete online exercises required to generate a personalized treatment recommendations (PTR) and 44 participants (21%) did not set a quit date and were excluded. 135 participants (67% of those invited) received a PTR. Of these, 83 (62%) took medication in accordance with the PTR. 26 (19%) deviated from the PTR and 26 (19%) chose not to collect any medication. Median (range) age 45 (17,78) years, 39% male. Median (range) 20 (5, 40) cigarettes per day, 25 (3, 52) years smoking with 3 (0, 15) previous quit attempts. 35 of 39 participants (90% [95% CI 81%,99%]) were validated quitters at one week and 39 of 83 (48% [95% CI 37%,58%]) validated at four weeks. The number of weeks on PTR-led medication was found to be the single most important predictor of quitting (p=0.0029, odds ratio 2.42 [95% CI 1.36,4.34]). Genotyping was robust as confirmed by Hardy-Weinberg testing. Allele carriage vs. odds ratios for quitting were in agreement with previous findings.

Conclusions: These results suggest that personalized treatment recommendations are effective and quit rates may be higher than those achieved with current best practice. Further work is needed to enhance adherence to treatment recommendations, which may lead to further improvement in outcome.

Funding: g-Nostics Ltd. This study received full UK-wide Ethics approval and local Research Governance approval from the UK National Health Service.

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POS5-26 SMOKERS’ EXPECTANCIES FOR ABSTINENCE: A QUALITATIVE ANALYSIS
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Smokers’ expectancies regarding the effects of cigarette use are powerful predictors of smoking motivation and behavior. However, studies have not investigated the consequences that smokers expect when they attempt to quit smoking: abstinence-related expectancies. These expectancies likely have important implications for the treatment of tobacco dependence. For example, if smokers anticipate more negative consequences than positive consequences upon cessation, this may provide one explanation why relativelyfew smokers attempt to cease cigarette use. If smokers’ expectancies suggest that they are unaware of and therefore unprepared for the challenges associated with quitting, this may partially account for the high rates of postcessation relapse that characterize smokers’ quit attempts. Abstinence-related expectancies represent areas of smokers’ cognition that can be directly addressed by public health campaigns and individual treatments, thereby enhancing the efficacy of these interventions. The primary goal of this qualitative study was to gain insight into smokers’ expectancies for abstinence. Eight focus groups were conducted with 30 smokers diverse with respect to age, gender, and ethno-racial background. Content analyses indicated that smokers anticipate a variety of outcomes from abstinence. The most frequently reported expectancies included withdrawal symptoms, improved health outcomes, decreased monetary expense, weight gain, and improved appearance. Additional expectancies concerned social interactions and functional changes, sleep, relationships, loss of positive reinforcement, altered outcomes from alcohol and other drug use, NRT effectiveness, vigilance to cue reactivity, and cessation-related social support. Expectancies for negative consequences were offered as frequently as expectancies for positive consequences. This study provides an initial step in filling a gap in the research literature and providing a more complete understanding of smoking-related cognition. Implications for the treatment of tobacco dependence are discussed. This study was supported by the State of California Tobacco-Related Disease Research Program grant 16TDF-0049 and the NIDA grant F32 DA024482.

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**POS5-27**

**EFFECTS OF PHASE RELATED VARIABILITY OF PREMENSTRUAL AND WITHDRAWAL SYMPTOMS DURING AD LIBITUM SMOKING ON SMOKING CESSATION OUTCOMES**

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This study aimed to determine the effects of elevated premenstrual and withdrawal symptomatology during the luteal phase on likelihood of dropping out of the study, smoking lapse, and relapse to smoking. We hypothesized that women with greater phase-related variability in these symptoms would be less likely to complete the protocol and achieve smoking cessation. Regularly menstruating women smokers age 18-40 (n=25), not using hormones or psychotropic medications, were recruited for a study of menstrual cycle effects on relapse to smoking. Subjects tracked cigarettes/day, withdrawal symptoms using the Minnesota Nicotine Withdrawal Scale (MNWS), and premenstrual symptoms using the Shortened Premenstrual Assessment Form (PAAF) daily for two menstrual cycles (ad lib smoking in the 1st and attempted smoking cessation in the 2nd). Phase-related variability in symptomatology was computed by subtracting F phase scores from L phase scores obtained during the 1st (ad lib smoking) month. Logistic regression analyses were conducted to predict study completion, lapse (one puff), and relapse (7 consecutive days of slips) based on phase-related variability. Subjects were 30.0 (SD ± 5.2) years old and had 14.1 (SD ± 1.6) years of education. Seventy-six percent were White. They smoked a mean of 17.3 (SD ± 5.1) cigarettes/day and had a mean FTND score of 4.4 (SD ± 2.0). Phase-related variability was marginally associated with increased risk of relapse (7.9 ±6.2 x 5.0 ±7.3, Chi-square=3.35, p = 0.067). Variability in withdrawal and the interaction of premenstrual and withdrawal variability did not affect likelihood of relapse. Likelihood of protocol adherence and of smoking lapse were not predicted by either class of symptomatology. Our findings, if confirmed, suggest that women smokers who report greater phase-related variability in premenstrual symptomatology during ad lib smoking may require special attention to prevent relapse.

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**POS5-29**

**GENETIC ASSOCIATIONS WITH REGIONAL CEREBRAL BLOOD FLOW CHANGES DURING NICOTINE ABSTINENCE: A PRELIMINARY STUDY**

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We recently reported on a study (Wang et al., J. Neuroscience, 2007) using arterial spin labeling (ASL) perfusion MRI to characterize the neural substrates of abstinence-induced smoking urges. In this study (n=15) participated in two imaging sessions: (a) smoking as usual and (b) overnight (14-hours) abstinence. The present study explored the association of functional single nucleotide polymorphisms (SNPs) in the dopamine and opioid pathway with regional cerebral blood flow (rCBF) changes in abstinence vs. safety in this group of smokers (Dopamine D2 Receptor (DRD2 -141C Ins/Del), Catechol-O-Methyltransferase (COMT Val/Met), and the mu opioid receptor (OPRM1 Asn40Asp)). Two sample t tests were performed comparing rCBF changes (abstinence minus smoking) in regions of interest identified in our initial paper. Using a threshold of p<0.005 with small volume restricted multiple comparison correction, significantly greater rCBF increases were found in the DRD2-141 DelC (n=4) group compared to the Ins/Ins group (n=9) in the prefrontal cortex (PFC), right ventral lateral PFC (VLPFC), right dorsal lateral PFC (DLPFC), right ventral striatum (VStr), and left ventral striatum (VS). Significantly greater rCBF increases were also found in the COMT Val/Val (n=3) group compared to the *Met group (n=10) in the left DLPFC, and superior frontal cortex. The OPRM1 common Asn40 group (n=10) exhibited significant rCBF increases in the right superior temporal cortex, right inferior or temporal cortex, left parahippocampus, left insula, left vs. left thalamus, cingulate cortex and areas compared to the Asn40/Asp40 group (n=5). Combining the allele effects in this study with the findings in our report suggest that SNPs associated with reduced dopamine levels or signaling and/or increased mu opioid receptor levels may increase neural activation in regions associated with abstinence-induced smoking urges.

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**POS5-30**

**GENE AND GENE BY SEX EFFECTS ON INITIAL SENSITIVITY TO NICOTINE VIA NASAL SPRAY IN NONSMokers**

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Genetic variation may influence initial sensitivity to nicotine, perhaps helping to explain the heritability of smoking initiation. This study explored genetic influences on “initial” sensitivity to nicotine in young adult nonsmokers of European ethnicity (n=101; < 10 lifetime tobacco exposures). Nicotine (0, 5, 10 μg/kg) was administered via nasal spray. Dose order was counterbalanced across sessions. One dose was used per session and administered three times, once every 30 minutes. Nicotine sensitivity was measured across doses in the first three sessions through self-reported mood and “reward” measures, physiological responses (heart rate, blood pressure), and performance tasks (including Sternberg rapid information processing, or SRIP). Nicotine reinforcement was assessed in the fourth session using a nicotine vs. placebo spray choice procedure. Genotypes examined included functional variants in the dopamine D4 receptor (DRD4 VNTR), dopamine D2 receptor (DRD2 C957T SNP), the mu opioid receptor (OPRM1 A118G SNP), serotonin transporter (SLC6A4 5HTTLPR VNTR), and the COMT Val/Met promoter VNTR. We found associations here were interactions of genetic x dose. For DRD4, presence of the 7 repeat allele was associated with greater aversive responses to nicotine (decreases in “vigor”, “positive affect”, and SRIP performance; increases in “buzzed” and, in men only, “feel effects”) and reduced nicotine choice. A similar sex difference in “feel effects” was seen for DRD2 (AA > AG in men only). For SLC6A4 the strongest associations were seen in the long allele (LL), those with the short allele (SI or SL) tended to decrease nicotine liking but increase choice in men, while the opposite was seen in women. Other gene and gene x sex effects on nicotine responses will be discussed. These results suggest that genetic polymorphisms may influence initial sensitivity to nicotine prior to the onset of dependence and may do so differentially between men and women.

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POS5-31 DOPAMINE GENES INFLUENCE ACUTE SMOKING REINFORCEMENT DURING NEGATIVE MOOD

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Smoking reinforcement is often increased by negative mood and can be altered by actual and expected nicotine content in cigarettes. We explored the possible influence of gene variants in the dopamine reward pathway on the number of ad lib puffs from a cigarette as a function of mood induction, as well as actual and expected nicotine. Smokers of European ethnicity (n=97) participated in two sessions, involving negative or positive mood induction, after being randomized to one of four groups. These four groups comprised the 2 x 2 balanced-placebo design, corresponding to each combination of actual (0.6 mg vs. 0.05 mg) and expected (told nicotine, told denic) nicotine dose, which remained constant between sessions. After initial induction of negative or positive mood, subjects received dose instructions and sampled the assigned cigarette before smoking it ad lib during continued mood induction. Genotypes examined included functional variants in the dopamine D4 receptor (DRD4 VNTR), dopamine D2 receptor (DRD2 C957T SNP), ANKK1 TaqIA, dopamine transporter (DAT1), mu opioid receptor (OPRM1 A118G SNP), serotonin transporter (SLC6A4 5HTTLPR VNTR), and the MAOA (MAO-A promoter VNTR) genes. Interactions involving genotype x mood were of primary interest. The increase in ad lib puffs due to negative vs. positive mood was influenced by genotypes of DRD2 C957T (GG-AA vs. AG and DAT1) (presence of 9 repeat > absence of 9). Moreover, the increase in ad lib puffs due to negative mood was higher when nicotine (but not denic) cigarettes were greater in functions of DRD4 (presence of 7 repeat > absence of 7) and of ANKK1 TaqIA (AA or AG > GG). These findings should be considered tentative given the small number of subjects studied. However, they suggest that genes related to dopamine function may modulate mood effects on acute smoking reinforcement.

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POS5-32 CRAVING AND WITHDRAWAL ASSESSMENTS VARY BY TIME OF DAY OR LOCATION

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Typically, in clinical research, craving and withdrawal symptoms are only measured mid-day in the clinic with each visit. Yet, the magnitude of symptoms and the influences of abstinence or medication on those symptoms may differ if they are assessed elsewhere or at other times of day, notions examined in this study. Subjects were 209 adult smokers in a crossover study testing short-term effects of the patch on abstinence symptoms. They smoked ad lib during weeks 1 and 3, and were instructed to try to quit during weeks 2 and 4 while using nicotine (21 mg) or placebo patch. Abstinence was verified daily by CO<5 ppm. Subjects completed craving (GUS and VAS item), total withdrawal (MNWS), and positive and negative mood (Diener & Emmons) forms 3 times per day: mid-day in the clinic and twice in their natural environment (QSU and VAS item), total withdrawal (MNWS), and positive and negative mood, and perhaps greater effects of nicotine replacement on negative mood during abstinence.

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POS5-33 EFFECTS OF BUPROPION, THE ANKK1 TAQ1A POLYMORPHISM, AND SEX ON SMOKING CESSATION USING CIGARETTE CRAVING

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Cigarette smoking cue-induced craving has long been known to be predictive of relapse following smoking cessation and there is evidence that some of the individual variation in cue reactivity can be explained by sex and specific additive genetic factors. In a previous report we determined a significant drug x Taq1A genotype x craving interaction for smoking cessation. In a subsequent laboratory-based, randomized, placebo-controlled trial of bupropion, we sought to examine whether the ANK1 Taq1A polymorphism (which influences striatal dopamine D2 receptor density) or sex influenced treatment response to bupropion for reduction of cue-induced cigarette craving. Smokers (n=82) went a laboratory-based cue exposure protocol composed of baseline (no exposure), control (pencil cue), cigarette (lighted cigarette held but not smoked), and after timed smoking for each of three cigarettes. Repeated measures ANOVA demonstrated a marginally significant cue x drug x genotype x sex interaction (p = 0.058), where-by only males possessing either the 7-repeat or zero-repeat ANK1 genotype treated with bupropion exhibited phaseo demonstrating a significant reduction in craving during the smoking trials (p = 0.038). These preliminary findings may shed light on biobehavioral mechanisms underlying the moderating effects of dopaminergic genotype and sex on bupropion efficacy for craving reduction and smoking cessation.

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POS5-34 GENETIC VARIATION IN THE SEROTONIN PATHWAY AND SMOKING CESSATION WITH NICOTINE REPLACEMENT THERAPY: NEW DATA FROM THE PATCH IN PRACTICE TRIAL AND POOLED ANALYSES

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Evidence from animal and human studies suggests that serotonergic neurotransmission influences behavior. Thus, we examined the influence of genetic variants in the serotonin (5-HT) pathway on treatment response to nicotine replacement therapy (NRT) in treatment seeking smokers of Caucasian ancestry (N = 792) enrolled in the Patch in Practice Trial (PiP). Participants were genotyped for variants in the tryptophan hydroxylase (TPH1 A779C), 5-HT transport- er (SLC6A4 5-HTTLPR), and 5-HT1A receptor (HTR1A C-1019C) genes. We also conducted pooled analyses from all extant NRT clinical trials reporting 5-HT genotyping in order to maximize sample size to detect main effects of genotype on smoking cessation. Survival analyses were conducted for each genotype in the PiP Trial for continuous abstinence at end of treatment (EOT) and 6-month follow-up. Cox regression analysis did not demonstrate significant effects of any of the three geno- types on relapse to smoking: TPH1 (Reference AA, AC: HR 0.99, 95% CI 0.78, 1.24, p = 0.90; CC: HR 0.93, 95% CI 0.73, 1.18, p = 0.55); 5-HTTLPR (Reference LL: SL: HR 1.01, 95% CI 0.85, 1.20, p = 0.90; SS: HR 1.13, 95% CI 0.91, 1.39, p = 0.27); HTR1A (Reference CC; GG: HR 1.04, 95% CI 0.86, 1.25, p = 0.70; GG: HR 1.01, 95% CI 0.82, 1.24, p = 0.93). Review of the literature identified two recent pharmacogenetic NRT trials ([1] University of Pennsylvania (UPenn) Trial; [2] The Patch Trial): which were combined with the data from the PiP Trial for the only genotype comparison to each study (5-HTTLPR). Logistic regression analyses (N = 1,384) did not indicate a significant main effect of 5-HTTLPR genotype on continuous abstinence at EOT (Reference LL: SL: OR = 1.25, 95% CI 0.89, 1.74, p = 0.19; SS: OR = 1.31, 95% CI 0.86, 1.98, p = 0.21) or 26-week follow-up (Reference LL: SL: OR = 0.93, 95% CI 0.63, 1.38, p = 1.00). Despite the theo- retically important role of 5-HT in smoking, amongst patients treated with NRT, there does not appear to be a moderating effect of key 5-HT pathway genes and we can now rule out a clinically meaningful effect of the 5-HTTLPR for smoking cessation.

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POS5-35  RECURRENT ABstinence VIOLATION EFFECTS DURING LAPSE-RELAPSE PROGRESSION
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Smoking relapse is most often the end point of a process that unfolds over a period of days or weeks and is characterized by many intermittent lapses. According to Relapse Prevention (RP) theory, lapses produce the Abstinence Violation Effect (AVE), a set of cognitive and emotional responses that predispose quitters to further lapses and drive relapse progression in an accelerating downward spiral. However, the dynamic relationship between lapse responses and relapse progression has not been a focus of research. We used recurrence event survival analyses to investigate the way AVE-related cognitive and affective lapse responses influence subsequent lapse-relapse progression. Participants were 195 smokers who achieved abstinence and subsequently relapsed following behavioral smoking cessation therapy. Using electronic diaries for Ecological Momentary Assessment, participants recorded their reactions to each lapse in real time over a 2-month monitoring period. Results indicate that while participants’ responses to their first lapse were unrelated to whether they relapsed during the observation period, those who reported higher levels of Self-Efficacy following their first lapse had a slower rate of progression from each successive lapse to the next (HR=0.93, CI=0.89-0.97). Controlling for responses to the initial lapse, higher levels of Self-Efficacy following each subsequent lapse (HR=0.95, CI=0.92-0.99) were associated with slower progression to an additional lapse. Contrary to RP theory, higher Self-Blame (HR=0.99, CI=0.98-0.99) was associated with slower progression, as were incremental lapse-to-lapse increases in Guilt (HR=0.96, CI=0.92-0.99). In contrast, incremental increases in Negative Affect were associated with accelerated lapse progression (HR=1.04, CI=1.00-1.09). These data highlight the dynamic influence of cognitive and affective responses on progression from one lapse to the next during smoking cessation.

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POS5-36  PERCEIVED DRUG ASSIGNMENT AND TREATMENT OUTCOME IN SMOKERS GIVEN NICOTINE PATCH THERAPY
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This study assessed the relationship between treatment outcome and participants’ perceived drug assignment in smokers given nicotine patches using biologically verified cigarette abstinence and relapse status. To our knowledge, this is the first study to assess these relationships using multiple treatment outcome measures in a randomized clinical trial. Smokers (N = 424) were randomly assigned to receive either nicotine patches (NP) or placebo patches as part of an original study that examined the effects of combining nicotine replacement with self-help programs. Abstinence and relapse were assessed at 2, 6, and 12-month follow-ups. Participant’s perceived drug assignment, assessed at the 12-month follow-up, was obtained from 384 participants. Beliefs about drug assignment were related to abstinence at the 2- and 6-month follow-ups for the NP group, but not the placebo group. At both follow-ups, those in the NP group who believed they were on active medication were more likely to be abstinent compared to those who were on NP but believed they were on placebo. Perceived drug assignment was not related to abstinence at 12 months for either group. Survival analysis assessing relapse revealed that perceived drug assignment was significantly related to relapse status. Those who believed they had received NP were less likely to relapse than those who believed they received placebo, regardless of actual drug assignment. Our results suggest that there is a significant relationship between belief about drug assignment and treatment outcome. Future studies using multiple treatment outcome measures and assessments of beliefs about drug assignment over time are warranted to further our understanding of these relationships.

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POS5-37  SMOKERS’ EXPECTANCIES FOR BUPROPION: IMPLICATIONS FOR SMOKING CESSATION TREATMENT
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Drug expectancies play a role in motivation to use drugs as well as their subjective and behavioral effects. For example, the anticipation of pleasurable effects from smoking is associated with earlier smoking initiation, greater nicotine dependence, and increased risk of relapse. Similarly, maintaining strong expectancies that nicotine replacement therapies (NRT) will facilitate quitting is predictive of greater intentions to quit and NRT utilization and compliance. Relatively little is known, however, about smokers’ expectancies for other smoking pharmacotherapies (e.g., bupropion) and their potential impact on smoking cessation outcomes. The purpose of this study was to investigate: 1) demographic and smoking characteristics associated with bupropion expectancies, 2) the relationship between bupropion expectancies and beliefs about quitting, and 3) the role of bupropion expectancies in medication compliance and smoking outcomes among smokers (N=120) participating in a smoking treatment intervention.

300 mg bupropion SR therapy (1 week pre- and 6 weeks post-quit) and were randomly assigned to receive an intervention that emphasized either the benefits of quitting or the losses of continued smoking. Expectancies that bupropion would facilitate quitting were measured at baseline and treatment completion. Women exhibited stronger positive expectancies for bupropion than men at baseline and the end of treatment (p's < .05). Expectancies for bupropion were moderately associated with intentions to quit, confidence, motivation, expectation of quitting success, and perceived benefits of quitting (r values ranged from -0.23, p < .05). In addition, expectancies and baseline were predictive of medication compliance (p < .05). Among treatment completers, an increase in expectancies from baseline to end of treatment was associated with continuous abstinence (p < .05). The results provide preliminary support for the hypothesis that positive expectancies for bupropion are associated with other positive attitudes toward treatment, better medication compliance, and possibly better treatment response. Moreover, the findings suggest that these expectancies may differ by gender.

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POS5-38  USING VIRTUAL REALITY TO EXPLORE THINKING ABOUT SMOKING IN NICOTINE DEPENDENT YOUNG ADULTS
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Young adults, a large portion of the smoking population in the United States, appear to be unique and potentially vulnerable to biological and social factors that influence smoking. Although young adult smokers are in considerable transition in smoking behavior, little research has focused on their unique beliefs and responses to smoking cues. This study explored how many young adults thought about smoking when exposed to virtual reality (VR) environments with and without smoking cues. Twenty nicotine dependent young adults between the ages of 19 and 24 were exposed to four VR environments; a neutral room, consisting of narrated nature scenes, void of smoking cues; a paraphernalia room with visuals of cigarettes, ashtrays, and accompanying scents; a party room with music and the sights and smells of people smoking, drinking, and offering cigarettes; and a final neutral room identical to the first. The order of smoking cue rooms was counterbalanced across subjects. Participants provided a visual analog scale rating of how much they were thinking about smoking after exposure to each room. A repeated measures ANOVA revealed a main effect of room on thinking about smoking, F(3, 57) = 19.01, p<.0001, with participants reporting more thoughts about smoking in smoking rooms compared to neutral rooms. There was no difference in thinking about smoking between smoking rooms. Results confirm that, when presented with smoking cues in contextually appropriate VR environments, young adults display reactivity in the form of thinking more about smoking than when presented with neutral visual inter- actions, such as VR, have potential to reach young smokers, as they may hold greater acceptability and appeal with this population than more traditional cue exposure methods. This study demonstrates that virtual reality, as an emerging technology, may be a promising option for research, assessment, and treatment with nicotine dependent young adult smokers as it exposes participants to complex drug stimuli in a smoking environment.

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POS5-39  SMOKING CUE RESPONSES DECAY AFTER TWO WEEKS OF ABSTINENCE
Many studies report that smokers have increased craving, and physiological arousal when exposed to cigarette stimuli. In general, it is believed these responses are generated by learning processes (e.g., classical conditioning) and are associated with motivational factors that maintain nicotine dependence. However, much less is known about these responses in smokers who have quit, and the degree to which these responses are maintained or diminished in abstinent smokers. A subset of smokers (N = 63) from a larger project were used for this study. Participants were all treatment-seeking smokers randomly assigned to continue smoking or enter a two-week treatment program. Abstainers (n = 25) were continuously abstinent for at least 14 days at time of testing. Controls (n = 38) continued to smoke at their usual rate. Participants viewed a series (n = 12) of neutral pictures (e.g. household objects) or a series (n = 12) of cigarette pictures (e.g., lit cigarette in ashtray) displayed in random order. Participants rated each picture on a 1 to 9 scale (No Craving to Extreme Craving; Very Calm to Very Excited). There were main effects of picture type (F = 386.8, p < .01) and smoker group (F = 57.3, p < .01) on craving ratings, with cigarette pictures producing higher levels of craving than neutral and current smokers report higher craving than abstaining smokers. There were no significant interactions. On self-report of arousal, there was a significant interaction (F = 4.5, p < .05) between picture type and smoker group, with current smokers rating cigarette pictures as more arousing than abstaining smokers. This finding suggests a general decay of cue responses in quitting smokers, which is consistent with learning theories of nicotine dependence. Understanding this process will help broaden our knowledge of the mechanisms of cue reactivity and nicotine dependence.
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POS5-40  SYNAPTOSOMAL ASSAYS: A METHOD FOR IDENTIFYING SELECTIVE COMPOUNDS FOR ALPHA6BETA2*-NICOTINIC ACETYLCHOLINE RECEPTORS
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The VTA-nucleus accumbens pathway has been implicated in smoking reward. This pathway expresses numerous subtypes of nicotinic acetylcholine receptors (nAChRs), the site of action of nicotine. Compounds selective for this pathway may be useful as smoking cessation aids. The alpha6beta2* subtypes are more restricted to dopaminergic neurons than the widespread alpha4beta2* subtypes. The alpha3beta4* subtypes are widespread in the periphery, and activation of these subtypes may lead to undesirable side effects. nAChRs are ligand-gated cation channels, and many are located at nerve terminals. Different subtypes of nAChRs mediates release of different neurotransmitters from various regions of mouse brain. These subtypes have been identified via pharmacology of binding and release functions, subunit null mutations, selective toxins, and specific antibodies. We have devised a series of biochemical assays to evaluate function of several of these subtypes using synaptosomes prepared from mouse brain. We have subsequently used these assays to assess pharmacological properties (agonist, partial agonist, antagonist, EC50 and IC50 values) for a group of novel nicotinic compounds for activity at alpha6beta2*, alpha6beta2* and alpha3beta4* subtypes of nAChRs. Using this approach we have identified compounds with some selectivity for alpha6beta2*-nAChRs. For example, compounds TC1708, a partial agonist, TC 2429, a partial agonist, TC1962, a partial agonist, and TC1963, a full agonist, show some selectivity for alpha6beta2*-nAChR mediated function. Based on structures of these compounds, new compounds have been synthesized in an attempt to improve upon selectivity. Several series of compounds with structures, binding affinities and functional pharmacology will be presented in this poster.
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POS5-41  SMOKING AND NOT SMOKING AMONG LESBIAN, GAY, BISEXUAL AND TRANSGENDER PERSONS IN ARIZONA
John T. Daws, Ph.D.*, University of Arizona
The Arizona Adult Tobacco Survey (ATS) was administered to over 12,000 residents in 2002 and 2005. About 2.5% of the respondents identified themselves as lesbian, gay, bisexual, or transgender (LGBT). Heterosexuals were slightly less educated than LGBTs. There were no differences on age or income.
Initiation: Both heterosexuals and LGBTs smoked their first cigarette at about 15 years of age. The average heterosexual began regular smoking at age 18. LGBTs became regular smokers at a slightly younger age, 17, except for Hispanic LGBTs who did not begin regular smoking until their early 20s.
Prevalence: Current smoking prevalence is significantly higher for LGBTs (33%) than heterosexuals (20%). Lesbians have a much higher rate (36%) than heterosexual women (18%). The difference between men is not as large: 31% for LGBTs and 22% for heterosexuals. Among heterosexuals, many more non-Hispanic Whites smoke (22%) than non-Hispanic Blacks (16%) or Hispanics (13%). The pattern for LGBTs is the opposite. Smoking prevalences for Hispanics (68%) and non-Hispanic Blacks (50%) are nearly double the prevalence for non-Hispanic Whites (29%).
Consumption: In addition to higher prevalence, LGBTs report higher per day consumption. The average heterosexual smoker reported smoking 15 cigarettes per day. The average LGBT smoker reported smoking 25 cigarettes per day.
Cessation: At the end of January 2008, I will have 3- and 6-month follow-up data on about 3,000 clients who received cessation services from the Arizona Department of Health Services during the past fiscal year. There were nearly 400 LGBT clients in this cohort, the largest number ever. Pilot data from previous years suggest there may be differences in the outcomes of smoking cessation interventions between LGBT and heterosexual clients who are quitting smoking. Data on cessation rates among clients who are attempting to quit for a week or a month is being collected. Based on these data, we will be able to identify factors that lead to greater cessation success for LGBTs.
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POS5-42  UNDERSTANDING OF NICOTINE REPLACEMENT MEDICATION USAGE AND ADHERENCE AMONG CHINESE AMERICAN SMOKERS
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Low usage of nicotine replacement medications (NRT) among Chinese American smokers has been documented in population-based data. This study examined factors associating with NRT use among 100 Chinese American smokers who were randomized in a smoking cessation trial to receive free NRT (nicotine gum or lozenge of their choice), brief counseling calls, smoking schedules for smoking reduction and self-help materials matching with their readiness to quit smoking. Qualitative data on issues related to NRT usage reported by participants were collected from counseling calls. Participants had to smoke at least 5 cigarettes daily to be eligible. Baseline sample characteristics were 17% female, mean age = 47 (SD=12.2), mean cigarette smoked = 13.9 (SD = 8.1), 98% Chinese-speaking, 57% indicated strong desire to reduce smoking in the next 30 days, 46% were planning to quit smoking in the next 30 days, and 46.4% reported strong desire using medications to help quitting or reducing. 52% chose to receive nicotine gum and 32% selected nicotine lozenge. During the first counseling call (made between 2 to 6 weeks after mailing intervention materials), 42% reported using NRT at least 1 day. Among the users, 25% had stopped using NRT due to side effects or not getting enough benefit. 21% reported incorrect usage especially among the gum users, 19% reported feeling no effect from the medication, 7% complained about the packaging of the gum being too hard to open, 7% disliked the taste. Among those who did not use NRT, the reasons reported were concerns of side effect, worried about being dependent on the medication, and wanting to try quitting without assistance. Despite the study sample proportions of LGBT and heterosexual smokers who did not become regular smokers until much older, at about 23.
Funding: Tobacco Related Disease Research Program grant 14RT-0160H.
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POS5-43  A MIRROR TRACING TASK AS A MEASURE OF TASK PERSISTENCE IN SMOKERS WITH SCHIZOPHRENIA

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Task persistence has been measured behaviorally and via questionnaire format in several studies in both adult and adolescent smokers. The task persistence construct is relevant to tobacco dependence in that task persistence measures the tendency to persist in an effortful behavior and quitting smoking is an example such behavior. This study represents the first to use a mirror tracing task as a measure of task persistence in a sample of smokers with schizophrenia. Methods: Smokers with schizophrenia or schizoaffective disorder (N=35) seeking treatment for tobacco dependence in state-funded tobacco cessation clinics completed a mirror tracing task as a measure of task persistence before their target quit date. Results: While performance as measured by the mirror tracing task did not prospectively predict continuous abstinence for the first week after the target quit date after controlling for baseline cigarettes per day and motivation to quit smoking, F(3,21) = .875, p = .362, persistence was significantly related to participants’ previous longest quit attempt, r = .358, p = .038. Conclusions: While the hypothesis that persistence would prospectively predict treatment outcome was not supported - possibly due to the low sample size and the few (N=5) who successfully abstained - this study showed that a mirror tracing task is a tolerable and feasible strategy for measuring task persistence in smokers with schizophrenia and is related to past persistence in quitting smoking as measured by length of longest quit attempt. A behavioral measure may be particularly important in this population where cognitive difficulties may impair their ability to utilize instruments validated only in the general population.

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POS5-44  STARTLE PROBE P3 AMPLITUDE WHEN LOOKING AT CIGARETTE CUES

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The sudden onset of a brief, intense acoustic stimulus (i.e., a startle probe) elicits an event-related potential (ERP) that is modulated by emotional arousal. When participants look at either pleasant or unpleasant pictures, the amplitude of the P3 component elicited by the startle probe is reduced. This effect has been attributed to the reduction of the attentional resources available for processing the startle probe following the presentation of a motivationally relevant stimulus. Given that images of cigarette related cues activate the appetitive system in smokers, we hypothesized that these stimuli, like the emotionally arousing ones, would receive prioritized processing. This would lead to reduced amplitude of the P3 elicited by the startle probe during cigarette compared to neutral pictures. In a group of 30 smokers, ERPs were obtained from smoking (20), neutral (10), and cigarette (20) pictures. For each picture category (i.e. cigarette, pleasant, neutral, and unpleasant pictures), 24 startle probes were delivered for each picture category at each session. The voltage difference between each motivationally relevant category and the neutral category was calculated. The statistical significance of these differences was tested following a randomization procedure. The results showed a significant reduction of the P3 amplitude of startle probes delivered during the presentation of pleasant, unpleasant, and cigarette pictures. The temporal and topographic distributions of these differences were comparable across the different conditions and, confirming previous results, the largest amplitude reductions were observed over central and parietal areas of the scalp. These data indicate that cigarette cues, like other motivationally relevant stimuli, are preferentially processed, and fewer attentional resources remain available for other cognitive tasks.

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POS5-45  ACUTE NICOTINE IMPROVES NOVELTY DETECTION AND LONG-TERM REGONITION MEMORY IN NON-SMOCKERS AND HABITUAL SMOKERS

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Smokers report that a primary reason for continuing to smoke is for cognitive enhancement. These self-reports are consistent with prior research showing that habitual smokers perform better on various attention and memory tasks when satiated as compared to when abstinent. Nicotine has also been reported to enhance cognitive performance in nonsmokers, yet these findings are less frequent. It therefore remains unclear as to what extent improved cognitive performance due to nicotine, is reflecting the attenuation of withdrawal related-effects or inherent benefits. The extant data suggests nicotine can improve cognition, but little is known about nicotine’s modulation of attention processes related to novelty detection and long-term memory (LTM). Detecting novel information in the midst of environmental noise is a critical component of learning, as orienting to novel stimuli enhances attention mechanisms and improves LTM. Thus, the current study sought to investigate behavioral effects of nicotine on novelty detection and LTM recognition for perceptually, semantically, and emotionally processed words in both smokers and non-smokers. Over two experimental days, overnight deprived Smokers (N=24; M cigarettes/day=16.7, SD= 5.78, 95% CI: 21.7, 3.10±1.44) and Nonsmoker (N=24; mean age=23.5, SD=7.1) performed a series of three blocked (emotional, perceptual, and semantic) novel oddball word tasks, each of which were immediately followed by a subsequent memory recognition task. Participants were randomly assigned to wear a nicotine patch (Smokers = 14mg Nicoderm®; Nonsmokers = 7mg Habitrol®) on one day and placebo on the other. Nicotine, compared to placebo, enhanced novelty detection across all tasks in smokers and nonsmokers as evidenced by a decreasing in reaction times and increasing the rates of target detection. Nicotine also improved overall LTM recognition across all tasks in both groups. These findings suggest that nicotine may contain inherent benefits for attending to and learning new information amidst irrelevant environmental stimuli. Implications for understanding the effects of nicotine on novelty detection and long-term memory will be discussed.

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POS5-46  DOES AVOIDING EXPOSURE TO SMOKERS BUFFER THE IMPACT OF SPOUSES’ SMOKING ON YOUNG ADULT DAILY SMOKING?

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Young adults currently have the highest smoking prevalence of any age group and this prevalence has remained stagnant since 2004 (CDC, 2007). Thus, there is great public health need to identify factors associated with young adults’ smoking in order to develop better theories and interventions to prevent young adult smoking and to increase smoking cessation. As both theory and research suggest that social environments influence smoking and as young adulthood is the primary period when individuals form spousal/partner relationships, understanding the social modeling role of smoking by spouse/partner in young adult smoking is important. One way to potentially buffer the impact of this social modeling is avoiding exposure to smoking, for example, to ask smokers not to smoke around you. This study used a cross-sectional sample of 6,700 young adults age 28 to examine the association between spouse/partner smoking and young adult daily smoking as well its interaction with asking smokers not to smoke around you. The prevalence of young adult daily smoking was 10% for those having a non-smoking spouse/partner and 48% for those having a smoking spouse/partner. The odds of young adult daily smoking were 8.8 (OR = 8.78; CI: 7.10±1.44) times higher for those having a smoking spouse/partner as compared to those having a non-smoking spouse/partner. This association was high (OR = 8.82; 95% CI: 8.18, 11.78) among those who had a smoking spouse/partner and did not ask smokers not to smoke around them. However, there was no significant association (OR = 50; 95% CI: .22, 1.16) between having a smoking spouse/partner and young adult daily smoking among young adults who did ask smokers not to smoke around them. This interaction was significant (P < .001). The large association between spouse/partner smoking and young adult daily smoking suggests future longitudinal research on the role of spousal influence and selection would be valuable, as would research on the potential buffering role of avoiding smoking in ones social environment by asking smokers not to smoke around you. This study used a cross-sectional sample of 6,700 young adults and is reflecting the attenuation of withdrawal related-effects or inherent benefits. The extant data suggests nicotine can improve cognition, but little is known about nicotine’s modulation of attention processes related to novelty detection and long-term memory (LTM). Detecting novel information in the midst of environmental noise is a critical component of learning, as orienting to novel stimuli enhances attention mechanisms and improves LTM. Thus, the current study sought to investigate behavioral effects of nicotine on novelty detection and LTM recognition for perceptually, semantically, and emotionally processed words in both smokers and non-smokers. Over two experimental days, overnight deprived Smokers (N=24; M cigarettes/day=16.7, SD= 5.78, 95% CI: 21.7, 3.10±1.44) and Nonsmoker (N=24; mean age=23.5, SD=7.1) performed a series of three blocked (emotional, perceptual, and semantic) novel oddball word tasks, each of which were immediately followed by a subsequent memory recognition task. Participants were randomly assigned to wear a nicotine patch (Smokers = 14mg Nicoderm®; Nonsmokers = 7mg Habitrol®) on one day and placebo on the other. Nicotine, compared to placebo, enhanced novelty detection across all tasks in smokers and nonsmokers as evidenced by a decreasing in reaction times and increasing the rates of target detection. Nicotine also improved overall LTM recognition across all tasks in both groups. These findings suggest that nicotine may contain inherent benefits for attending to and learning new information amidst irrelevant environmental stimuli. Implications for understanding the effects of nicotine on novelty detection and long-term memory will be discussed.

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Nih/Nci Ca 109652.
POS5-47  TWENTY-YEAR PROSPECTIVE ASSOCIATION BETWEEN PARENTS’ QUITTING SMOKING AND THEIR YOUNG ADULT CHILDREN QUITTING SMOKING

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Young adults currently have the highest smoking prevalence of any age group and this prevalence has remained stagnant since 2004 (CDC, 2007). Thus, there is great public health need to identify factors associated with young adults’ quitting smoking. One potentially important social factor that could impact young adults’ quitting is their parents’ quitting smoking. In the first longitudinal study on this topic, we reported that parents’ quitting smoking occurring by age 8 is associated with a 1.8 times higher odds of their young adult children quitting smoking for at least 30 days at age 19 (Bricker et al., 2005). The current study extends the follow-up period to age 28 to examine the prospective relationship between parents’ quitting smoking by age 8 and their young adult children quitting smoking for at least 6 months two decades later at age 28. Participants were the 991 families in which parents were ever regular smokers who had a young adult child smoking at least weekly at age 17 who also reported their smoking status at age 28. Questionnaire data were gathered on par- ents and their young adult children (40% female and 91% Caucasian) in a cohort with a 84% retention rate. Analyses adjusted for child gender and parent education. Among daily smokers at age 17, parents’ quitting smoking by age 8 was associated with a 1.70 (OR = 1.70; 95% CI = 1.23, 2.36) times higher odds of quitting during young adulthood as compared to those whose parents did not quit. Among weekly smokers at age 17, these odds were 1.91 (OR = 1.91; 95% CI = 1.41, 2.58) times higher. The results reinforce our series of earlier findings that parents’ quitting smoking has a powerful and long-term association with their children’s smoking. The results suggest that interventions to help parents quit smoking when their children are young would be valuable.

NIH/NCI CA 109852.

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POS5-49  STIMULANT MEDICATION REDUCES ERRORS OF OMISSION IN CONTINUOUS PERFORMANCE TEST DURING SMOKING ABSTINENCE IN ADULTS WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER

Jean-G. Gehricke, Ph.D.*, Nuong Hong, B.A., Dustin Coker, B.A., and Timothy L. Wigal, Ph.D., University of California, Irvine

Little is known about the role of stimulant medication during smoking cessation in individuals with Attention Deficit Hyperactivity Disorder (ADHD). The purpose of the study was to examine if performance deficits associated with smoking abstinence in smokers with ADHD can be reduced by stimulant medication. Eight adult smokers with ADHD completed the Continuous Performance Test (CPT) under the following four conditions in counterbalanced order: (1) smoking abstinence with stimulant med- ication, (2) smoking abstinence with placebo, (3) smoking with stimulant medication, and (4) smoking with placebo. For the smoking abstinence condition, participants were asked to complete the CPT after overnight smoking abstinence, which was veri- fied by expired carbon monoxide testing. For the smoking condition, participants were asked to complete the CPT immediately after smoking their first cigarette of the day. A nonlinear multiple repeated measure test (Friedman test) revealed that errors of omission were significantly different between conditions (p = .028). Nonparametric post-hoc comparisons showed that errors of omission were highest during smoking abstinence with placebo compared to smoking abstinence with stimulants (p = .028) and smoking with stimulants (p = .043). A trend was found for increased errors of omission during smoking abstinence with placebo compared to smoking with placebo (p = .063). The findings indicate that stimulant medication reduces errors of omission independent of smoking abstinence. Therefore, stimulant medication may aid smok- ers with ADHD when trying to quit by reducing some of the performance deficits asso- ciated with smoking abstinence.

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POS5-48  SMOKERS’ RECEPTIVITY TO QUESION-FOCUSED MEDIA MESSAGES: DIFFERENCES BY LEVELS OF SMOKING, QUIT BEHAVIORS AND INTEREST IN QUITTING

Kevin C. Davis*, James M. Nonnemacher, Matthew C. Farrelly, and Erik Crankshaw, RTI International

Mass media campaigns are a prominent tool in promoting smoking cessation. These campaigns use a number of strategies including health effects messages, emotion, anti-industry themes, and promotion of quit lines. Cessation ads are commonly targeted toward all smokers collectively. However, little is known about which strategies are most effective and whether responses to ads differ by smoker characteristics including ciga- rette consumption and interest in quitting. In this study, we examine how receptivity to cessation ads varies by ad strategy and smoker type. We use data from the New York Media Tracking Survey, a web survey of 4,000 adult smokers in New York recruited from the Harris Poll Online. Participants were exposed to different types of cessation ads and were asked about their reactions to the ads. Receptivity was measured with a six-item scale that included items such as: “This ad is powerful” and “This ad is believ- able.” Factor analyses indicated a single scale with high reliability. We categorized smokers based on past quit attempts, cigarette consumption, and desire to quit. We used descriptive and multivariable analyses to examine how receptivity to cessation ads varies across ad strategies and smoker characteristics. Results show that smok- ers who have not tried quitting, have higher cigarette consumption, and low desire to quit have lower receptivity to each type of cessation ad. Smokers who smoke less and have greater desire to quit had the highest receptivity to all ads we tested and were especially more receptive to ads focused on quitting (p = .028), smoking less (e.g., calling a quit line or setting a quit date). Accordingly, these smokers are also less responsive to “why to quit” ads that use graphic images and emotion. In essence, these smokers are already motivated to quit. This study suggests that alternative message strategies may be needed for smokers who smoke more and have low interest in Quit- ting. Smokers clearly differ in their receptivity to cessation ads based on level of involvement with smoking. Thus, it may be inefficient to target smokers as a homoge- nous group. Targeting ads separately by smoker type may be more effective.

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POS5-50  EFFECTS OF SMOKING ON RATINGS OF FACIAL ATTRACTIVENESS

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The rewarding effects of nicotine have been well-reported in both humans and animals. More recently, animal studies have suggested that nicotine may also non- contingently enhance the rewarding value of other positive reinforcers, e.g., food. The ability of nicotine to potentiate the rewarding value of everyday positive reinforcers may be an important contributor to the maintenance of smoking behavior. The current study investigated the impact of nicotine on the rating of reinforcing visual stimuli (attractive faces). 99 participants (10 male) aged between 18 and 40 were recruited. All participants were regular non-dependent smokers (defined as smoking on average no more than 10 cigarettes per day, and not smoking within one hour of waking). Participants attended one session at which they smoked either a nicotine- containing (0.6 mg) or denicotinized (0.005 mg) cigarette whilst completing a com- puter task rating the attractiveness of 40 individual faces (20 male/20 female) on a scale of 1-7 (unattractive to very attractive, respectively). Group allocation was ran- domized and cigarette administration was double-blind. Baseline measures included self-report ratings of mood and nicotine dependence (Fagerstrom Test for Nicotine Dependence; visual analogue scales of mood and cigarette craving; Positive and Negative Affect Schedule). A three-way ANOVA with nicotine condition and partici- pant sex as between-subject factors and target sex as a within-subject factor revealed a significant main effect of nicotine (F[1,25]=6.19, p<.05). The nicotine group rated faces as significantly more attractive (M = 4.0, SD = 0.6) than the placebo group (M = 3.6, SD = 0.4). Additional analyses showed that nicotine groups did not differ on baseline ratings of mood or cigarette craving (ps >.05). These data provide sup- port for animal data that nicotine can potentiate the rewarding value of naturalistic positively reinforcing stimuli, and extend these findings to humans. Nicotine-induced enhancement of the pleasurable effects of contextual cues, which accompany ciga- rette smoking, may be an additional mechanism that drives the continuation of smok- ing behavior, and the development of dependence.

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POS5-51 MEASURING SMOKERS’ RECEPTIVITY TO CESSION-FOCUSED MEDIA MESSAGES

James M. Nonnemaker, Kevin C. Davis*, Matthew C. Farrelly, and Erik Crankshaw, RTI International

Cessation-focused campaigns have used a number of message strategies including health effects messages, emotional portrayals, and promotion of quit lines. However, the literature is relatively silent on which strategies are most effective. In addition, there is a lack of valid measures on how smokers mentally process, attend to, and respond to different types of cessation ads. Receptivity to ads can involve cognitive and emotional responses that may influence changes in behavioral precursors related to ad messages. There are currently no reliable item scales to assess smokers’ receptivity to cessation ads. Reliable measures of receptivity can enhance our ability to evaluate cessation message strategies and improve media planning. In this study, we develop and test the reliability of a new receptivity scale using measures based on the Elaboration Likelihood Model for message processing. We use data from the New York Media Tracking Survey, a web survey of 4,000 adult smokers in New York recruited from the Harris Poll Online. During each interview, study participants viewed specific cessation ads and answered questions about their reactions to the ads. Eight receptivity measures were assessed: “This ad is powerful; helpful; believable; annoying; depressing; made me stop and think; grabbed my attention; makes me want to smoke/quit smoking.” Principal factors analyses indicated 6 of the 8 receptivity items loaded into a single scale (“annoying” and “depressing” were excluded) and exhibited high reliability with Chronbach’s alpha > 0.90 for all ads. Receptivity was then calculated as a linear sum of the 6 items where higher scale values imply greater receptivity to ads. We found that smokers who were more receptive to ads were more likely to agree with attitudinal statements related to ad messages, suggesting scale validity. This study provides evidence of a reliable measure for smokers’ receptivity to cessation ads that may be useful in program media planning.

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POS5-52 INTRA-ETHNIC DIFFERENCES IN SMOKING AGE OF ONSET AMONG LATINOS IN THE UNITED STATES

Carlos F. Rios-Bedoya, M.P.H., Sc.D.*, Michigan State University

Aim: The aim of this study is to advance our understanding on intra-ethnic differences as they relate to smoking age of onset among Latinos living in the United States (US). Latinos were classified in four mutually exclusive categories: Cubans (C), Puerto Ricans (PR), Mexicans (M), and Central/South Americans (CS). We then estimated the degree of association that links specific Latino subgroups with age of smoking initiation among ever smokers.

Methods: The NLAAS conducted in 2002-2003 assessed a probability sample of community-dwelling Latino and Asian Americans residents of the US aged 18+ (N=4,449). The Latino sample consisted of 2,554 respondents. Latino ever smokers comprised 44% of that sample. The key response variable in this study is smoking age of onset. Multiple linear regression analysis was used to obtain estimates about the association between smoking age of onset and Latino subgroups. Sex, age at immigration, educational level, and language of interview (i.e., English or Spanish) were included in the model to obtain adjusted estimates.

Results: Average age of smoking initiation for C was 16.2 years (SD=5.0), PR 15.4 (SD=4.3), M 15.2 (SD=4.4), and CS 16.0 (SD=5.4). Based on a linear regression model, we observed a small to modest statistically robust association between average smoking initiation age and specific Latino subgroups. Puerto Ricans and Mexicans but not Central/South American smokers start smoking earlier than Cubans (p < 0.05). However, these differences disappeared after adjusting for the covariates mentioned above. Among these covariates, gender and language of interview were associated with smoking age of onset. Females start on average 1.4 years later than males (p<0.05) and those interviewed in Spanish delayed their smoking initiation by 1.5 years (p=0.05).

Discussion: Based on this initial evidence from a nationally representative sample of Latinos, we found no difference in smoking age of onset among these Latino subgroups after adjusting for several covariates. Our findings tend to indicate that these Latino subgroups are similar with respect to age of smoking initiation.

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POS5-53 CHARACTERISTICS AND HEALTH CONSEQUENCES OF INTERMITTENT SMOKING: LONG-TERM FOLLOW-UP AMONG FINNISH ADULT TWINS

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Objectives: Recently, the definition of a smoker being someone smoking daily has been challenged and issues of intermittent smoking are discussed. No consensus exists whether intermittent smoking represents a transitional stage towards daily smoking or smoking cessation or whether intermittent smokers consistently maintain their low tobacco use frequency. Although rich evidence exists on health consequences of smoking, less evidence is available on intermittent smoking. We examined characteristics and health consequences of intermittent cigarette smoking among Finnish adult twin population.

Methods: We used longitudinal data of 21,340 persons with smoking status from questionnaires in 1975 and 1981 and data on lung cancer incidence from 1982 to 2004 from the Finnish Cancer Registry. We identified 641 consistently intermittent smokers comprising 3% of the study population.

Results: Consistent intermittent smokers had higher education, less use of other tobacco products, healthier lifestyle and more favorable mental health profile in comparison to lifetime regular smokers. However, intermittent smokers mostly compared unfavorably with never smokers considering other lifestyle factors despite being better educated. Smoking behavior, including never, intermittent and regular smoking, showed substantial heritability 47% of variance being explained by genetic factors. There were total of 213 incident lung cancer cases including one case only among the intermittent smokers. The sex and age adjusted hazard ratios of lung cancer were not significantly elevated for the intermittent smokers, but more than 10-fold for all other smokers.

Conclusions: Consistent intermittent smokers seem to be better educated, show more favorable lifestyle and mental health characteristics in comparison to lifetime regular smokers. However, despite education, the intermittent smokers show less favorable characteristics in comparison to never smokers. In order to make conclusions on health consequences of intermittent smoking, further studies should investigate a wide range of outcomes, such as cardiovascular and non-malignant pulmonary outcomes.

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POS5-54  SOCIOECONOMIC VARIATION IN THE REACH OF VARIOUS SOURCES OF ANTI-SMOKING INFORMATION: FINDINGS FROM THE ITC 4-COUNTRY SURVEY

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Information on the risks of smoking and cessation can produce meaningful changes in knowledge, attitudes, and behavior. However, the literature examining socioeconomic status differences in the reach of different sources of health communications is sparse. This study used data from Wave 5 of the International Tobacco Control Four Country (ITC-4) Survey, conducted between October 2006 and February 2007. Respondents included nationally representative samples of 8243 adult smokers in Canada (n=2022), the United States (n=2034), the United Kingdom (n=2019), and Australia (n=2168). Participants were asked whether they had noticed anti-smoking information from each of 8 sources and whether they had been provided information to quit smoking from a healthcare professional. Income was used as a proxy for socioeconomic status. The results indicate that respondents were most likely to report noticing anti-smoking information from television, followed by magazines/newspapers, cigarette packs, posters/billboards, the radio, leaflets, tobacco shops, and the internet. Slightly more than half of respondents reported receiving anti-smoking information from a health professional in the past 6 months. Lower income respondents from all four countries were significantly less likely to report noticing anti-smoking information from television, the radio, magazines/newspapers, and posters/billboards. Income was not associated with noticing anti-smoking information on cigarette packs, in tobacco shops, or from leaflets, nor was it associated with being provided with stop smoking advice, referral, or prescription. Lower income respondents were more likely to report noticing anti-smoking information from the internet, and to be provided with pamphlets. Differences between countries in noticing anti-smoking information and receiving information from healthcare professionals will be discussed. Overall, the findings indicate that lower income smokers are not being reached by anti-smoking information in the media to the same extent as higher income smokers, whereas stop smoking information from healthcare professionals is provided to smokers relatively equally regardless of socioeconomic status.

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POS5-55  MOBILIZING PHARMACISTS FOR SMOKING PREVENTION AND CESSATION IN DEVELOPING COUNTRIES: AN URGENT PUBLIC HEALTH AGENDA

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Context: Smoking is one of the most preventable causes of premature death and morbidity worldwide. The medical community has a key role to play in combating the tobacco use. However, there is paucity of tobacco-use and cessation-related information from the need for and nature of smoking cessation services among physicians in developing countries, a detailed literature review was conducted during September to December 2007.

Findings: Based on the review of 82 different English language sources, we found regional variations in the current smoking prevalence, quitting intentions and cessation services among physicians. The prevalence (median) was highest in Central/Eastern Europe (37%) followed by Africa (29%), Central and South America (25%) and Asia (17.5%). There were significant gender differences in the smoking prevalence across studies with males smoking more than females. Smoking at work or in front of patients was commonly practiced by physicians in some countries and physicians infrequently provided cessation advice or counseling to patients. Organized smoking cessation programs for physicians did not exist in all these regions.

CONCLUSIONS: Tobacco use among physicians in developing countries remains a growing public health problem. To promote tobacco control and increase cessation in populations, there is a need to get physicians involved in the cessation activities. However, evidence-based smoking cessation programs targeting physicians in developing countries are scarce. Lack of interests among policy makers and researchers to focus on tobacco use reduction among physicians is a concern. As evidence-based smoking cessation interventions are already available in developed countries; testing and adopting them in the developing country settings should be a priority. This presentation will share the latest data on physicians’ smoking and cessation efforts in details.

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POS5-56  SMOKING STATUS AND SOCIAL AND HEALTH-RELATED CHARACTERISTICS AMONG OHIO APPALACHIAN WOMEN

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This investigation reports the associations between social and health-related characteristics and tobacco use status among adult Appalachian women enrolled in a cervical health study. A random sample was created from a complete listing of all women who visited fourteen Appalachian Ohio primary care and women’s health clinics. Eligibility criteria included age 18 or older, not pregnant, no history of invasive cervical cancer or hysterectomy, resident of an Ohio Appalachian county, and visit to clinic in past two years. Potentially eligible women (n=2903) were invited to participate in a survey about women’s health. After further screening to confirm eligibility, the clinic-based sample included 570 women who provided sociodemographic and health-related information. Women were categorized according to self-reported smoking status. Fifty-two percent were classified as never smokers, with 20.5% and 27.5% categorized as former and current smokers, respectively. A multinomial logistic regression model was fit to the data, with outcomes former and current smoker compared to never smoker. Variables significant in the univariate analyses were considered in the multivariable model and backward elimination was used to select factors significantly associated with smoking status. The final adjusted model indicated that women with low socioeconomic position (SEP) during childhood and at present were those three times more likely to be current smokers (OR=3.22; CI 1.56,6.43) as compared to never smokers and five times more likely to be current smokers (OR=5.32; CI 2.61,10.82).

Women with high SEP during childhood but low SEP at present were more likely to smoke (OR=2.69; CI 1.26, 5.71) compared to never smokers. Other factors that were significantly associated with current smoking included age 51+ (OR=0.41; CI 0.20.0.85), CES-D score 16+ (OR=1.91;CI 1.18, 3.10), first pregnancy before age 20 (OR=1.94; CI 1.21, 3.14), and alcohol use (up to one drink/week OR=2.61;CI 1.59,4.29 and more than 1 drink/week OR=3.36; CI 1.46,7.74). These findings indicate that social factors, depression and alcohol use are associated with past or current smoking.

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POS5-57

APPLYING CONSUMER DESIGN PRINCIPLES: A POPULATION-BASED STRATEGY TO INCREASE TOBACCO CESSATION

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Effective tobacco dependence treatments, both behavioral and pharmaceutical, are more numerous and available than ever before. Unfortunately, smokers have been slow to adopt proven products and services in their attempts to quit smoking. Nearly 80% of smokers still attempt to quit without assistance—seldom with success. To date, efforts to encourage smoking cessation and use of effective treatments have focused almost exclusively on the smoker. Little attention has been devoted to developing strategies to increase cessation through involvement of concerned friends and family, or “Health Influencers” (HIs) who want to help a smoker quit. This poster describes the process and initial results of a pilot project to apply principles of consumer design to activate HIs to encourage smokers to quit—and increase consumer demand for smoking cessation—as a novel population-based strategy to lower smoking prevalence. Building on results from 179 qualitative interviews with HIs (n=109), and 7 focus groups (n=32) University of Arizona researchers and IDEO, a world-renowned design firm applied a consumer-focused design process (observation, brainstorming, rapid prototyping, refining and implementation) to develop “Helpers Quit Kits” to engage and assist HIs in their efforts to encourage smokers to make a quit attempt. Consumer design principles were also used to connect the Quit Kits with the Helpers Community Resource Center (Helpers CoRC), an interactive website for HIs interested in helping someone quit tobacco. To stimulate thinking about more consumer-friendly approaches to smoking cessation, Quit Kits and the beta version Helpers CoRC were presented at a National conference of stakeholders in tobacco cessation: “Innovations in Building Consumer Demand for Tobacco Cessation Products and Services.” Participants included representatives from the business community, product design, pharmaceutical industry, leaders in communications, marketing and information technology, consumer groups, healthcare plans (providers, purchasers, payors, and patients), and representatives of other tobacco cessation collaboratives.

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POS5-58

FACTORS THAT INFLUENCE RETENTION IN A COMMUNITY CESSATION PROGRAM

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Program retention is likely to influence overall cessation rates. Therefore, an understanding of factors that influence retention may help improve program outcomes.

Methods: Between Aug 05 and Nov 07, 615 people participated in 29 community-based cessation programs in Philadelphia. Program structure included 6 group-counseling sessions, with free nicotine replacement distributed at class #3. Indicators of retention (dependent variables) included participation in at least 5 of the 6 scheduled meetings, completion of both pre and post surveys (pre/post), and dropout following class #3. Independent variables included age, gender, self-reported confidence in cessation, and residence within program zip code. Correlations were assessed using bivariate methods, with alpha <.05 considered significant.

Results: Participants’ mean age was 52 years (range 22 to 81), 70% were female, and 64% completed the program. 61% completed both pre and post test questionnaires. Participants were derived from an area encompassing 55 discrete zip codes, with 67% traveling to a program location outside of their residence zip code. 10% of the participants repeated the program. In a sample of 234 participants, 87% took advantage of free NRT offered by the program. Gender appears to correlate with retention; men were less likely to complete the program (r=0.05, p=0.03) and more likely to drop after class #3 (r=0.11, p=0.006). Age also correlated with likelihood of program completion (r=0.11, p=0.006), as well as pre/post (r=0.12, p=0.003). Neither confidence nor residence in a different zip correlated with retention indicators. Participation in class #3 was significantly correlated with program completion (r=0.39, p<0.001)

Discussion: Age and gender correlate with program retention indicators in this population of community-based cessation group participants. Programs seeking to improve retention rates should consider age and gender when designing interventions.


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POS5-59

DEMOGRAPHIC AND PSYCHOSOCIAL PROFILE OF SMOKING DURING PREGNANCY AMONG DOMINICAN REPUBLIC WOMEN

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Background: Factors that influence maternal smoking during pregnancy and its effects on the physical, behavioral and cognitive development of children are well analyzed/researched in the developed world. As the tobacco epidemic expands to include low to middle income countries, additional research is warranted to understand tobacco attitudes and practices among these populations.

Methods: Results from two surveys across 6 marginalized DR communities (2 small urban, 2 peri-urban, 2 remote rural) will be reported. The Surveillance included data on 1050 individuals (from 175 households per community) and Community Survey included 1049 community members. The sample used for this analysis is a subset of women (n=572) who had ever experienced a pregnancy.

Results: Descriptive data of the sub-sample show that 22.44% (n=127) of women who ever experienced a pregnancy smoked; 34.13% stopped smoking due to a pregnancy; and 46.03% received advice to quit because of pregnancy.

Conclusions: While smoking among men is often the first priority in global tobacco control initiatives, these data indicate that smoking among pregnant women is a significant problem. Data support the need for tobacco intervention targeting pregnant women, and indicate challenges and opportunities.

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POS5-60

AN ENVIRONMENTAL SCAN OF PROVINCIAL AND TERRITORIAL SMOKE-FREE POLICIES ON OUTDOOR PATIOS OF RESTAURANTS AND BARS IN CANADA

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As indoor smoking bans become more widespread across the world, as called for by Article 8 in the Framework Convention for Tobacco Control, smoking is moving to outdoor environments. Although most policies restricting or banning smoking have focused on indoor smoking, outdoor smoking is an emerging policy issue. This poster presents the range of Provincial and Territorial policies that currently exist in Canada to regulate outdoor hospitality environments, namely patio areas for restaurants and bars. A phone survey was conducted in April-May 2007 with bureaucrats from each of Canada’s 10 Provincial and 3 Territorial ministries responsible for legislation that regulates smoking in outdoor hospitality environments. The survey gathered data on how these environments were regulated including whether smoking was permitted, the requirement of designated smoking areas or distances from doorways, what any restrictions were in place concerning physical structures on patios such as walls or roofs or restrictions differentiating environments that permit or restrict the presence of minors. It was discovered that there is a range of policies across Canada creating a wide disparity of protection from tobacco smoke pollution. Two jurisdictions required 100% smoke-free patio environments and one province required “not 100% enclosed.” One Province required designated smoking areas on patios a minimum distance from doors. Most jurisdictions have restrictions on physical structures such as limits to wall heights, roofs, awnings or umbrellas. One province required that windows and doors not be left open between the smoke-free interior of venues and the outdoor environments where smoking was permitted. This poster uses a map of Canada to communicate the range of policies with each jurisdiction. Future work evaluating how these different policies impact air quality, both in outdoor environments and their adjacent indoor environments, will further help policy makers assess how to protect people from tobacco smoke pollution.

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POS5-61  CHINESE SMOKERS’ USE OF “LIGHT” OR “LOW TAR” CIGARETTES AND KNOWLEDGE OF HEALTH RISKS FROM SMOKING, HEALTH CONCERNS, AND QUITTING BEHAVIOR

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It is well known in the United States and other high-income countries that the tobacco industry has created and marketed “light/mild/low tar” brands to appeal to health concerned smokers. But little is known about the perceptions of “light/mild” brands in countries with high smoking prevalence. This paper presents findings from the International Tobacco Control (ITC) China Survey on the perception of “light/mild” brands in 7 cities in China: Beijing, Shanghai, Guangzhou, Zhengzhou, Changsha, Yinchuan, and Shenyang. In each city, a sample of 800 adult smokers and 200 adult non-smokers were randomly selected, via cluster sampling, and responded to a face-to-face survey. Multiple and logistic regression analyses were used to compare smokers who reported ever smoking a “light”, “mild” or “low tar” cigarette to those who had not. All analyses controlled for sex, age, ethnicity, city, income, education, daily/weekly smoking, heaviness of smoking (time to first cigarette and cigarettes per day). Consistent with previous findings among smokers in the West, Chinese smokers who reported that they had smoked “light”, “mild” or “low tar” cigarettes were more knowledgeable about the health harms of smoking, reported being more health concerned, and were more likely to have attempted to quit. They did not differ in the number of previous quit attempts or intention to quit. “Light”, “mild” or “low tar” cigarette smokers were significantly more likely to believe that “low tar” cigarettes are less harmful and that “light” cigarettes are smoother on the throat and chest. Ever trying these cigarettes were correlated with having a more negative attitude towards smoking, being more concerned about the health harms of smoking, reported being more health concerned, and who regret their smoking as a potential strategy to keep them smoking. This finding points to the urgent need to educate Chinese smokers on the myth of the light/mild cigarette.

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POS5-62  GENERAL HEALTH PROMOTION ACTION AND MAJOR HEALTH RELATED LIFESTYLE BEHAVIORS BETWEEN CURRENT, FORMER AND NEVER SMOKERS AMONG ADULTS IN HONG KONG

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Background and aim: Tailored intervention for smokers and non-smokers in promoting healthy lifestyles are needed to improve their health. This study investigated the differences between current smokers, former smokers and never smokers in their demographic and social economic factors, stages of changes in general health promotion action (GHPA) and health related lifestyle behaviors.

Methods: A population based cross-sectional survey was conducted by two-staged randomly selected sample via telephone interview towards Hong Kong Chinese adults. Smokers, former smokers and never smokers were compared with the three groups of factors by chi-squared tests.

Results: A total of 3129 adults aged 18-64 were interviewed from March to September of 1999. Prevalence of current smoking, former smoking and never smoking were 19.5%, 9.7% and 71.5% respectively. Based on stages of changes in GHPA, about 45% new smokers, 40% former smokers and 40% never smokers were in pre-action stage. Current smokers who had taking action for less than 6 months (action) or for at least 6 months and intend to continue in general health promotion action (maintenance). Current smokers when compared with never smokers were significantly taking less health promotion action included exercise in past month (40% vs. 51%), daily consumption of fruit (7% vs. 18%) and vegetables (40% vs. 53%), removal of fat when eating (68% vs. 87%), consumed alcohol (31% vs. 8%) and annual dental check up (30% vs. 31%).

Conclusion: Results in the South and in larger transport stations in urban Bangkok did show a statistically significant reduction in PM 2.5 (P<.05). Overall results were disappointing, pointing to the need for a more sustained public awareness program of new smoking ban regulations, and for a systematic monitoring program of PM 2.5 to collect evidence for boosting compliance of smoking regulations.

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POS5-63  EVALUATION OF CONSUMER USE OF THE INTERNET FOR SEEKING HEALTH CARE INFORMATION AMONG SMOokers AND NON-SMOKERS

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The Internet is a growing resource for health care information by consumers. An improved understanding of the characteristics of smokers who use the Internet can help developers of health information websites and web-assisted tobacco initiatives to develop appropriate information content for tobacco users. A survey was conducted to assess the population utilizing an oral health consumer website. The survey included questions on smoking history, demographics, and Internet use. Recruitment of survey subjects commenced in May 2006 and terminated in January 2007. 309 subjects completed the survey. The recruitment sources included weekly e-mail messages to Aetna Simple Steps to Better Dental Health dental health information e-mail subscribers, and a direct and prominently displayed link on the main web page of the Simple Steps to Better Dental Health website. Study participants were administered a tobacco survey based on their self-reported current smoking status. Survey response data were collected online and stored using MySQL database software prior to be converted into a format compatible with Statistical Package for the Social Sciences (SPSS). A 15.9% response rate (n=112) despite a were previously self-registered to receive oral health electronic mails from a consumer oriented oral health web site (Simple Steps to Better Dental Health). The tobacco survey examined the participants’ smoking status, readiness to quit, how they utilize Internet resources about dental care, current dental care, and dental health services. 14.2% of the respondents self-reported current tobacco use. 58.1% of those reporting tobacco use have used the Internet to obtain information about quitting. Current non-smokers reported using the Internet on a more regular basis than current smokers. The use of 94.7% and 88.6%, respectively. 66.3% of all respondents were female. 72.5% were age 50 or older. 78.6% had completed education beyond high school. 94% use the Internet daily, and this use is typically conducted from home (76.7%). 81.8% of smokers have used the Internet for more than eight years.

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POS5-64  COMPARISON OF SECONHAND SMOKE EXPOSURE LEVELS BEFORE AND AFTER A SMOKING BAN IN TRANSPORTATION CENTERS IN THAILAND

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Purpose: To assess changes in air particulate levels (PM 2.5) from smoking following a new regulation banning smoking in transportation stations in Thailand.

Method: Both prior to and following a new Ministry of Health ban of smoking in bus and train stations, a comprehensive study was collected from 30-40 transport stations in each of four regions in Thailand (South, Central, North and Northeast). In total, 147 pre-ban samples and 156 post-ban samples from the same or similar public bus or rail stations were collected. Conventional descriptive and analytical statistics were computed following environmental sampling computations.

Results: Surprisingly, the average pre-ban mean level of 57 micrograms per cubic meter only dropped to 53 micrograms per cubic meter, a non-significant change. Regionally however, exposure levels decreased significantly by 81 and 37% in Southern and Central (Bangkok) Health and with a significant increase of over 100% in the North and a significant 147% increase in the Northeast. The substantial unexpected increase in the Northeast can be explained by a number of factors including differences in pre and post sampling locations, travel patterns of regional residents, and other regional factors.

Conclusion: Results in the South and in larger transport stations in urban Bangkok did show a statistically significant reduction in PM 2.5 (P<.05). Overall results were disappointing, pointing to the need for a more sustained public awareness program of new smoking ban regulations, and for a systematic monitoring program of PM 2.5 to collect evidence for boosting compliance of smoking regulations.

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IS IT WHO YOU ARE, WHO YOU WORK WITH, OR WHERE YOU WORK? HOW INDIVIDUAL AND ORGANIZATIONAL CHARACTERISTICS ARE RELATED IN THE U.S. DHHS TOBACCO CONTROL NETWORK

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The Department of Health and Human Services (DHHS) has overall responsibility for planning, guiding, and funding tobacco control and research activities for the United States. Although multiple agencies within the DHHS are involved in tobacco control activities, efforts are not formally coordinated across the DHHS. However, trans-agency collaboration occurs in certain areas (e.g., cessation) and under certain circumstances (e.g., when policy decisions have dictated such collaboration). For example, collaboration between the National Institutes of Health (NIH) and the Centers for Disease Control and Prevention (CDC) is fairly common on cessation-related efforts such as the development and implementation of a national portal number for smoking cessation guidance. We conducted a survey of 84 individuals identified as tobacco control leaders in the 11 agencies working on tobacco control across the DHHS. We asked participants about individual characteristics such as job title and experience in tobacco control. In addition, we asked about which of the other DHHS tobacco control network members they had contact with and collaborated with. We hypothesized that patterns of communication and collaboration across the DHHS tobacco control network would differ based on individual-level and organization-level characteristics. Recently developed methodological tools in stochastic network modeling allow for the testing of network hypotheses like this one, which predict network structures based on attributes of actors or the connections between them. We developed stochastic network models to predict communication and collaboration patterns based specifically on job title and organizational affiliation. Understanding the influence of individual and organizational roles within the DHHS tobacco control network on communication and collaboration has implications for strategic planning for the DHHS network and other public health systems.

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HOW SAFE IS AN E-CIGARETTE? THE RESULTS OF INDEPENDENT CHEMICAL AND MICROBIOLOGICAL ANALYSIS

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Introduction: The Ruyan e-Cigarette is a vaporizing device for releasing nicotine for inhalation from specially impregnated pads. This device is not marketed as a medicine and has not been subjected to clinical trials. The e-Cigarette represents a novel form of nicotine delivery, using a medicine (nicotine) as established in Nicotine Replacement Therapy (NRT). Although now widely used in China, Austria and Turkey, the composition of this product has not been independently scrutinized. Aim: To investigate the chemical composition and concentration of substances contained within the cartridges of the Ruyan e-cigarette, prior to trials of such a product for a clinical trial. Method: A selection of Ruyan nicotine cartridges were sent for analysis to ESR laboratories (NZ) to investigate the accuracy of the total nicotine dose printed on the cartridge, and to test for the presence of known tobacco associated carcinogens, bacteria, and heavy metals. Results: The total, measured nicotine content was consistent with the alleged, printed dose (9mg, 11mg, 16mg cartridges yielded 5.86mg (98%), 10.0mg (91%), and 16.4mg (96%) of nicotine respectively). The nicotine released when cartridge was sealed with 300 puffs, which is calculated to deliver 0.80 mg of nicotine, using a 16 mg cartridge, during fifteen puffs or one "e-smoke." This is roughly half the nicotine dose delivered by smoking one manufactured cigarette (1.5 mg). Further analyses of an unused 6 mg cartridge tested negative for heavy metals, aerobic and anaerobic bacteria, benzo[a]pyrene and tobacco specific nitrosamines. Conclusion: The Ruyan e-cigarette cartridge was found to contain reliable quantities of nicotine and the 16 mg cartridge is estimated to deliver approximately half the dose of a manufactured cigarette. No other contaminants or carcinogens were found to preclude the use of such a product in a clinical trial. The work is funded by Ruyan Group Holdings Ltd Beijing the manufacturer of the e-cigarette, through the author's company Health New Zealand Ltd, and thereafter by subcontracts with independent New Zealand laboratories.

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DISTINCT BELIEFS, ATTITUDES, AND EXPERIENCES OF COLORADO LATINO SMOKERS: RESULTS OF A STATEWIDE SURVEY AND RELEVANCE FOR CESSATION INTERVENTIONS

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We conducted a phone survey of 1,010 Latino and 519 non-Latino adult smokers residing in Colorado in order to develop more effective and culturally appropriate smoking cessation interventions and to better understand the influence of individual and cultural variables. Survey items addressed groups of related variables: sociodemographic; smoking history; use of cessation resources; knowledge, attitudes and beliefs about both smoking and cessation methods; and health care system attitudes and experiences. The sample reflected the Colorado population in terms of age, education and income, with Latinos having significantly lower means on all variables. Though a majority of Latinos reported speaking English largely or exclusively, many (28%) speak largely Spanish. This was reflected in a measure of acculturation, which in turn accounted for significant variance in group differences. Latinos lower levels of dependence than did non-Latinos and both higher levels of motivation to quit and more quit attempts in the prior 12 months. Use of counseling to aid prior cessation attempts was low (<10%) in both groups, as was use of internet resources (about 2%). Reported rates of both Zyban and NRT use by Latinos was less than half that of non-Latinos. Latinos were distinct in reporting fatalistic attitudes about the benefits of quitting, misconceptions about smoking, and viewing the habit in moral and characterological terms. Family influence emerged as particularly promising in motivating cessation among Latinos. Rates of receipt of the 5A's was comparable in both groups, but substantial proportions of Latinos reported that both language barriers and concerns about mistreatment due to their ethnicity posed barriers to obtaining help in the health care system. Analysis by Colorado region showed that these were more alike than different. However, findings revealed two distinct geographic/sociodemographic subgroups: one with higher levels of dependence and lower levels of interest in quitting, and another with relatively less dependence, but greater interest in quitting—despite having less access to health care and social support.

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HEALTH LITERACY LEVELS OF TOBACCO CESSATION PRODUCTS

Stephanie Weiss, Sc.M., Robert Wood Johnson Foundation; Stephanie Smith-Simone, Ph.D., M.P.H., Children’s Hospital of Philadelphia

Smoking prevalence continues to be disproportionately higher among less educated, lower income adults compared to the rest of the U.S. population. Research shows that low income, less educated smokers want to quit and are no less likely to try to quit compared to other smokers. However, they are less likely to use evidence-based treatments and quit successfully. The Quitting and Reducing Tobacco Use Inventory of Products (QuiTIP) is a database compiled by the Campaign for Tobacco-Free Kids that catalogs products marketed and sold to consumers to reduce or quit use of tobacco products. QuiTIP includes all drugs approved by the FDA for tobacco cessation as well as a sample of products commonly marketed as homeopathic, herbal, nutritional, or as dietary supplements. We assessed the reading levels of product packaging, labeling, and instructions by using both the Simple Measure of Gobbledygook (SMOG) and the Flesch-Kincaid Reading Level. The average grade reading level of instructions for both FDA-approved and not approved cessation products were 6.4 versus 6.5 respectively (p<.001). However, the average grade reading level of claims (e.g., health, safety, and lifestyle) was 12.7 for FDA-approved products and 11.0 for products that were not FDA-approved (p<.001). Experts recommend that health information be written at a 5th - 6th grade reading level or below to ensure maximum comprehension among readers, demonstrating that there is vast room for improvement in designing packaging and products that will be easily understood and used by smokers who are trying to quit. Improving the packaging and directions of evidence-based tobacco cessation products so that they are preferably a 5th grade or below reading level may help less educated, low income smokers take advantage and correctly use products that will greatly increase their chances of successful quitting.

No funding.

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No funding.

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POS5-69  EVALUATING THE ACUTE EFFECTS OF ORAL, NON-COMBUSTIBLE POTENTIAL REDUCED EXPOSURE PRODUCTS FOR SMOKERS: A PRELIMINARY REPORT
Caroline Cobb, B.A.*; Janet Austin, M.S.; Barbara Kliglane, R.N., and Thomas Eissenberg, Ph.D., Virginia Commonwealth University

Several orally administered, non-combustible tobacco products are marketed to reduce smokers’ toxicant exposure. For example, Star Scientific markets a compressed tobacco tablet (Ariva), while R.J. Reynolds and Philip Morris market snuff products for smokers (i.e., Camel Snus and Marlboro Snus). If these oral potential reduced exposure products (PREPs) fail to suppress cigarette abstinence symptoms, or are other more costly, additional sessions, included to enhance experimental control, and exposure to polycyclic aromatic hydrocarbons (PAHs), which results in early spontaneous abortion, a condition commonly observed in women smokers. Benzo[a]pyrene (BaP) and dimethylbenz[a]anthracene (DMBA) are prototypical PAH compounds found in cigarette smoke and studies have shown that low-level exposure to PAHs can stimulate immune cells. The most abundant immune cell type in both human and rodent placenta is the uterine natural killer (uNK) cell, functioning in maternal spiral artery remodeling, cytokine release and maternal recognition of “foreign” placental cells. Our objective is to investigate putative immune-related mechanisms of embryonic resorption, associated with PAH-induced, maternal immune cell hyperstimulation.

Methods: Female ICR mice were exposed to a mixture of BaP-DMBA or vehicle once a week for 6 weeks and mated to ICR males. Females were dissected at day 9.5 (d9.5) post coitum and embryos were classified as live, dead or abnormal.

Results: Histological analyses revealed that d9.5 ICR placenta exposed to PAHs exhibit greater numbers of uNK cells compared to controls, which results in early spontaneous abortion, a condition commonly observed in women smokers. Benzo[a]pyrene (BaP) and dimethylbenz[a]anthracene (DMBA) are prototypical PAH compounds found in cigarette smoke and studies have shown that low-level exposure to PAHs can stimulate immune cells. The most abundant immune cell type in both human and rodent placenta is the uterine natural killer (uNK) cell, functioning in maternal spiral artery remodeling, cytokine release and maternal recognition of “foreign” placental cells. Our objective is to investigate putative immune-related mechanisms of embryonic resorption, associated with PAH-induced, maternal immune cell hyperstimulation.

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Conclusion: Preliminary evidence indicates that PAH exposure leads to upregulated levels of uNK cells in the maternal decidua. The increased presence of this cell type may contribute to the observed resorption phenotype and indicated immune-mediated abortion, possibly due to PAH-induced immune cell hyperstimulation.

Strategic Training Program in Tobacco Use in Special Populations, Canadian Tobacco Control Research Initiative.

CORRESPONDING AUTHOR: Jacqui Detmar, Ph.D.*, Postdoctoral Fellow, Samuel Lunenfeld Research Institute, Obstetrics and Gynecology, Mount Sinai Hospital, Toronto, Ontario, Canada

POS5-70  EXPOSURE TO POLYCYCLIC AROMATIC HYDROCARBONS PRIOR TO CONCEPTION INCREASES EMBRYONIC RESORPTION RATES AND IS ASSOCIATED WITH ELEVATED NUMBERS OF UTERINE NATURAL KILLER CELLS
Jacqui Detmar, Ph.D.*; Xuexuan Shang, M.D., and Andrea Jurisicova, Ph.D., Division of Reproductive Sciences, Department of Obstetrics and Gynecology and the Departments of Physiology, University of Toronto and the Samuel Lunenfeld Research Institute, Mount Sinai Hospital, Toronto, Ontario, Canada

We recently reported the development of a new animal model of pre-pregnancy exposure to polycyclic aromatic hydrocarbons (PAHs), which results in early spontaneous abortion, a condition commonly observed in women smokers. Benzo[a]pyrene (BaP) and dimethylbenz[a]anthracene (DMBA) are prototypical PAH compounds found in cigarette smoke and studies have shown that low-level exposure to PAHs can stimulate immune cells. The most abundant immune cell type in both human and rodent placenta is the uterine natural killer (uNK) cell, functioning in maternal spiral artery remodeling, cytokine release and maternal recognition of “foreign” placental cells. Our objective is to investigate putative immune-related mechanisms of embryonic resorption, associated with PAH-induced, maternal immune cell hyperstimulation.

Methods: Female ICR mice were exposed to a mixture of BaP-DMBA or vehicle once a week for 6 weeks and mated to ICR males. Females were dissected at day 9.5 (d9.5) post coitum and embryos were classified as live, dead or abnormal. Placentae were collected and fixed in formalin or stored at -80 degrees Celsius. Routine histological and immunoblotting techniques were used to determine uNK numbers and gene expression profiles.

Results: Histological analyses revealed that d9.5 ICR placenta exposed to PAHs exhibit greater numbers of uNK cells compared to controls, which results in early spontaneous abortion, a condition commonly observed in women smokers. Benzo[a]pyrene (BaP) and dimethylbenz[a]anthracene (DMBA) are prototypical PAH compounds found in cigarette smoke and studies have shown that low-level exposure to PAHs can stimulate immune cells. The most abundant immune cell type in both human and rodent placenta is the uterine natural killer (uNK) cell, functioning in maternal spiral artery remodeling, cytokine release and maternal recognition of “foreign” placental cells. Our objective is to investigate putative immune-related mechanisms of embryonic resorption, associated with PAH-induced, maternal immune cell hyperstimulation.

Conclusion: Preliminary evidence indicates that PAH exposure leads to upregulated levels of uNK cells in the maternal decidua. The increased presence of this cell type may contribute to the observed resorption phenotype and indicated immune-mediated abortion, possibly due to PAH-induced immune cell hyperstimulation.

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POS5-71  TRAINING HEAD START WORKERS TO INTERVENE WITH TOBACCO USERS AND TOBACCO FREE HOME ENVIRONMENTS
David A. Zanis, Ph.D.*, School of Social Administration, Temple University, Jennifer Ibrahim, Ph.D., School of Public Health, Temple University

Household tobacco use is the most common means of exposure to secondhand smoke for children. Federal Head Start programs have regular opportunities to work with low-income parents to develop household smokefree policies and reduce children’s exposure to secondhand smoke. However current regulations do not require Head Start staff to assess children’s exposure to secondhand smoke. Given the negative health implications for children, we surveyed 83 staff from four Head Start programs in Pennsylvania to assess their comfort level, knowledge, opinion, and behaviors associated with tobacco prevention and intervention. Staff also participated in a one-hour educational training on the consequences of secondhand smoke and was trained to engage parents, assess their household tobacco policy, advise families to develop a policy, and provide information on how to develop a policy. All participants completed a post-test following the training. Respondents were primarily women (98%), had a mean age of 42 (sd=12), and worked for Head Start for an average of 10 years; 28% were current smokers of which 68% reported an interest in quitting. Overall 24% permitted smoking in their own home. Significant pre/post test differences found that participants increased their knowledge about the proportion of adults who smoke in the U.S. (58% vs. 27%, t=11.9, df=82, p<.01). Participants also reported increased comfort level to intervene with families on tobacco control (t=1.7, df=82, p<.01). Participants increased their knowledge of valid referral resources (42% vs. 96%, t=12.3, df=82, p<.01). At baseline 35% agreed that they had sufficient training to help families develop a smokefree policy compared to 90% at the post test. Similarly 22% agreed that they could help a person quit smoking compared to 94% at the post-test. Overall, these data suggest that training Head Start workers increases their perceived knowledge and comfort to address tobacco use.

American Legacy Foundation.

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POS5-72  PRELIMINARY QUIT STATUS OUTCOMES IN A BEDSIDE POSTPARTUM SMOKING RELAPSE PREVENTION FEASIBILITY STUDY
Katherine F. Isselmann, M.P.H.*, and Bradley N. Collins, Ph.D., Temple University

Background: Among the 25-40% of pregnant smokers who are able to quit smoking, 50-80% of these women relapse within in a few weeks following delivery (Fingerhut, Kleiman, & Kendrick, 1990). Researchers investigating postpartum smoking relapse have found a potential positive relationship between breastfeeding duration and smoking relapse prevention (Ratner, Johnson, & Bottorf, 1999; Lu, Tong, & Oldenburg, 2001).

Purpose: A preliminary feasibility study was implemented to investigate the potential effects of a bedside, postpartum intervention educating smokers about the relationship between breastfeeding and postpartum relapse prevention efforts.

Methods: Women were recruited from a postpartum clinic in an urban hospital. Participants were either recent ex-smokers or were actively smoking prior to delivery, and had delivered in the previous 96 hours. Following informed consent, women received a brief counseling session that either combined information promoting smoking relapse prevention and breastfeeding and the potential relationship between the two activities (B+S group) or presented smoking relapse prevention advice alone (RP-only). Both groups were evaluated through a survey at baseline in person and at 1-follow-up by phone.

Results: To date, 24 mothers completed one-month follow-up. Over 90% were low-income and 50% were Hispanic and 25% African American. Within the B+S group (n=12), a greater proportion of mothers who quit smoking during pregnancy remained abstinent at 1-month compared to moms who did not quit smoking prior to delivery — with no such difference existing within the RP-only group (chi-sq = 4.0, p < .05). For all mothers, time of prenatal care initiation was related to smoking status at 1-month (chi-sq = 4.87, p < .05).

Conclusions: While sample size restrictions and lack of true control group in this feasibility study precluded formal effectiveness analysis, preliminary data suggests that further study is warranted. Aside from examining effectiveness of combining breastfeeding and smoking relapse prevention counseling for postpartum smokers, more research is needed to examine the timing and duration of general prenatal care on postpartum smoking outcomes.

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POS5-73  PREDICTING ATTENTION ACROSS PROJECT MILESTONES IN AN ETS REDUCTION TRIAL WITH UNDERSERVED, URBAN SMOKERS
Bradley N. Collins, Ph.D.1, Karen Jaffe, LSW1, E. Paul Wileyto, Ph.D.1, Natalie Tolley, M.P.H.1, Melbourne Howell, Ph.D.3, Janet Audrain-McGovern, Ph.D.1, Temple University Health Behavior Research Center, Department of Public Health, 1University of Pennsylvania Tobacco Use Research Center, 2San Diego State University Center for Behavioral Epidemiology and Community Health

In follow-up analyses to a preliminary retention study, we examined participant attrition across key milestones (baseline through follow-up) in an ongoing behavioral counseling trial targeting African American male smokers. The intervention includes 2 home sessions focusing on ETS reduction and 7 phone sessions to maintain smoke-free home goals and encourage quit attempts. Factors associated with retention (0=no, 1=yes) were explored at four time points, baseline interview, treatment start, end-of-treatment, and follow-up. At Time 1, with n=322 participants, there were no significant bivariate correlations between retention and demographic variables on the short eligibility screening. However, history of drug use and history of disconnected phones showed potential association. For later time points, we conducted logistic regression analyses examining hypothesized baseline and demographic variables as predictors of retention among the retained sample of participants. Results: only 66% of the time point LR analyses for the n=187 enrolled at Time 2 suggested that disconnected phones marginally predicted retention (OR=.27, p=.07), suggesting potential increased likelihood of dropout between screening and baseline interviews compared to participants with active phone service to first treatment session. Time 4 analyses with n=69 participants who completed the end-of-treatment interview suggested that being married (OR=5.83, p<.03), poverty (OR=4.53, p=.04) more years smoking (OR=1.20, p=.03), fewer cigarettes per day (.68, p=.04), and greater exposure to baby (OR=1.29, p=.03) predicted retention during follow-up. Full models will be presented along with discussion of analysis limitations and directions for future research that might enable higher retention of the most high-risk subgroups in prevention research. This is especially important to understand and correct health disparities for low income and racial/ethnic minorities.

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POS5-74  LONG-TERM COMPLIANCE WITH NEW YORK STATE’S CLEAN INDOOR AIR ACT AMONG HOSPITALITY VENUES IN ERIE AND NIAGARA COUNTIES

Objective: Effective July 24, 2003, the New York State Clean Indoor Air Act (CIAA) was amended to prohibit smoking in virtually all workplaces, including bars, restaurants, and bowling facilities. The objective of this study is to evaluate the extent to which venues within the New York State Counties of Erie and Niagara are in compliance with the law nearly four years after implementation.

Methods: Data were obtained from a random sample of 129 restaurants (n=97), bars (n=25), and bowling facilities (n=7) without active CIAA waivers throughout Erie and Niagara Counties. The sample was obtained from the New York State Department of Health. Observational assessments were completed on-site by trained surveyors between December 2006 and December 2007 at varying hours during all days of the week. Non-compliant venues were defined as those in which a patron or employee was observed actively smoking inside the establishment at the time of assessment.

Results: of the 131 assessed venues were found to have prominently posted and properly maintained “no smoking” signage required by law. Moreover, four percent of venues were found to be non-compliant with the CIAA at the time of assessment. No restaurants or bowling alleys were found to be non-compliant; however, active smoking was observed in 20% of the assessed bars, with the quantity of active smokers ranging between 1 and 5.

Conclusions: Compliance with the New York State’s CIAA in Erie and Niagara counties is universal in restaurants and bowling alleys nearly four years after its implementation. However, a substantial minority of bars continue to permit smoking in violation of the law. These data indicate the need for increased and continued education and enforcement of the CIAA in bars and taverns.

New York State Department of Health.

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POS5-75  ARE WE ASKING THE RIGHT QUESTIONS ABOUT SECONDHAND SMOKE?
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Background: There is no safe level of secondhand tobacco smoke (SHS) exposure for children or adults. Counseling guidelines recommend asking about SHS exposure and advising SHS elimination or reduction.

Objective: To describe how clinicians caring for children and adults ask about secondhand smoke in primary care.

Design: We conducted a random-digit-dial telephone survey of US households from Aug.-Nov. 2007. The sample was weighted by race and gender using the current US Census to represent the US population.

Results: Of 2,167 eligible respondents, 1,513 (68.5%) completed surveys. Of these, 1,114 (85.6%) reported having a usual source of care, and 89% of these had had a visit the year before the survey; 318 (24.6%) respondents were parents of children under age 18, 75% of whose children visited their primary care physician the year before the survey. Among adults with health care visits, 20.1% had been asked if a household member smoked, 15.1% had been asked if they were exposed to SHS, and 13.3% and 12.2% had been advised to keep their home or car smoke free. In contrast, among the 75.6% of parents who accompanied their child to the doctor in the past year, 42.7% had been asked if a household member smoked, and only 28.1% had been asked if the child was exposed to SHS. Only 30.3% were asked if smoking was allowed in the house, 23.4% were asked if smoking was allowed in the family vehicle, and 20.4 and 17.4% were advised to set strict rules to keep their home and car smoke-free. Pediatricians were more likely than family physicians to have asked about tobacco and to have delivered interventions. For example, 45.8% vs. 32.0% of surveyed parents said they were asked if smoking was allowed in the house; 17.8% vs. 7.0% were asked if the child was exposed to SHS; 30.3% were advised to keep their home smoke-free; and 17.3% vs. 11.3% were advised to tell their children to stop smoking.

Conclusions: Tobacco control efforts in health care should include interventions to eliminate SHS exposure. Rates of counseling about SHS in primary care are low. Strategies to increase primary care SHS screening and counseling are needed.

Flight Attendant Medical Research Institute.

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POS5-76  ENFORCING A POLICY BANNING OUTDOOR SMOKING ON A COLLEGE CAMPUS: EFFECTS OF A MULTI-COMPONENT APPROACH
Julee N. Stearns, Kari Jo Harris*, Rachel G. Kovach, Solomon W. Harrar, The University of Montana

Little is known about compliance with outdoor smoking bans and, further, data on effective strategies to enforce outdoor smoking bans is sparse. This observational study tested smokers’ response to an enforcement package implemented on one college campus to increase compliance with an existing policy. Thirty-nine research assistants observed 709 smokers outside four campus locations (dormitory, library, academic building, and student union). The trained observers scored compliance with the 25-foot outdoor smoking ban during 30-minute observation periods over three weeks. The intervention consisted of moving all cigarette receptacles outside the smoke-free zone, delineating the smoke-free zone with ground markings and improved signage, distributing reinforcement cards (redeemable for a soft drink) given to compliant smokers, and distributing reminder cards to non-compliant smokers. After one week of observation, the project staff introduced the enforcement package (week 2) and removed it during the third week of observation. During the intervention period, project staff distributed 170 reinforcement and 58 reminder cards. Overall the differences in compliance proportions across the three intervention periods was statistically significant [X2(2, N=709)=8.299, p<.000]. Step-down permutation method of adjustment for multiple comparisons showed all pairwise comparisons were significantly different (all adjusted-p’s <.000). The proportion of smokers who always complied with the outdoor smoking ban was 33% during the baseline observation period and increased significantly to 74% during the intervention period. Compliance was maintained at 54% during the observation-only follow up, which was significantly lower than during the intervention period but significantly higher than baseline levels. Compliance proportions also varied significantly by location in all three intervention periods, especially during baseline when compliance ranged from 16% at the academic building to 55% at the student union [X2(3, N=265)=34.074, p<.000]. Enforcing an outdoor smoking ban using a multiple component package increased compliance with the non-smoking policy on a college campus.

This project was supported by the UAB NUIC and The Office of Health Enhancement of the Curry Health Center at The University of Montana.

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POS5-77  DOES REBELLIOUSNESS PREDICT SMOKE UPTAKE AMONG ADOLESCENTS FROM THAILAND AND MALAYSIA? FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL (ITC) SOUTHEAST ASIA SURVEY


Although rebelliousness has been found to be associated with the uptake of cigarette smoking among youth in Western countries, virtually no studies have explored this link in non-Western countries. The current longitudinal study examined whether rebelliousness was assessed at baseline (Jan-Mar 2005) and the non-smoking youth sample, would predict future uptake of smoking among adolescents in Thailand and Malaysia. Data used for the analyses were from the first two waves (N=1594) of the ITC Southeast Asia Survey conducted in Thailand and Malaysia. Rebelliousness was measured using an average score of three items ("I ignore rules that get in the way of what I want to do", "I do things my parents wouldn't want me to", and "I get in trouble with authorities at school, work, or other places"). Logistic regression analyses were conducted to predict smoking status at Wave 2 (July 2006 - March 2007). Controlling for country, age, gender, depression, and number of friends that smoke, non-smoking youth with higher rebelliousness scores at Wave 1 who reported noticing anti-smoking messages on cigarette packages, were more likely to have initiated smoking at Wave 2 (Odds Ratio: 1.4, 95% CI: 1.1, 1.7; p=0.001). Specifically, for those who were in the lowest quartile of rebelliousness, only 16% had initiated smoking by Wave 2, whereas for those in the highest quartile of rebelliousness, 34% had initiated smoking by Wave 2. The findings highlight the importance of personality traits in understanding and predicting smoking among youth in non-Western countries.

This work was supported by grants R01 CA 100362 and P50 CA111236 (Roswell Park Transdisciplinary Tobacco Use Research Center) from the National Cancer Institute of the United States, Canadian Institutes of Health Research (75951), Thai Health Promotion Foundation, and the Malaysian Ministry of Health.

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POS5-78  EXPOSURE TO ANTI-SMOKING INFORMATION AMONG THAI AND MALAYSIAN YOUTH: FINDINGS FROM THE ITC SOUTHEAST ASIA SURVEY


Currently, 70% of the world’s 1.1 billion smokers are in developing countries, with over 50% in Asia alone. The prevalence of smoking among youth serves as a critical benchmark for tobacco control policy in Asia. The current work examines sources of exposure to anti-smoking information among youth in Thailand and Malaysia. The present data from Wave 1 (2005) and Wave 2 (2006) of the International Tobacco Control Southeast Asian (ITC-SEA) youth survey conducted in Thailand and Malaysia. Respondents included youth between the ages of 13 and 17 from both Wave 1 and Wave 2 surveys in Thailand (n=712) and Malaysia (n=411). Respondents were asked to report whether they had noticed advertising or information regarding the dangers of smoking from each of 8 sources. At Wave 1, Malaysian youth reported noticing advertising, smoking messages on a greater overall subset of sources than Thai youth. Malaysian youth were more likely to notice anti-smoking advertisements through television, radio, posters, billboards, and newspapers, whereas Thai youth were more likely to notice anti-smoking messages at the cinema, the disco, and on cigarette packages. At Wave 2, Malaysian youth reported significant increases in noticing anti-smoking messages through the radio only. In Thailand, there were significant increases in noticing information through TV, posters, newspapers, and magazines, and discs. The largest increase was in the proportion of Thai youth who reported noticing anti-smoking messages through magazines, which increased by approximately 13% between waves (from 66.0% to 79.2%) compared to no change in Malaysia (56.8% to 55.1%). Overall, the findings indicate that youth in both countries report significant exposure to anti-smoking messages, in particular, the results underscore the reach and effectiveness of large pictorial warnings labels that were introduced on Thai packages between Wave 1 and 2. These findings are particularly notable given that the vast majority of Thai respondents were non-smokers. The findings also provide support for the effectiveness of the comprehensive Malaysian media campaign, which was conducted during Waves 1 and 2 of this study.

This work was supported by grants R01 CA 100362 and P50 CA111236 (Roswell Park Transdisciplinary Tobacco Use Research Center) from the National Cancer Institute of the United States, Canadian Institutes of Health Research (75951), Thai Health Promotion Foundation, the Malaysian Ministry of Health, and the Centre for Behavioural Research and Program Evaluation of the National Cancer Institute of Canada/Canadian Cancer Society.

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POS5-79  ADOLESCENT SMOKING TOPOGRAPHY INDICATES INTRA-CIGARETTE TITRATION

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Research on smoking topography among adults relating to puff volume and level of tobacco dependence has produced equivocal findings, resulting in mixed interpretations. One constant to emerge from these studies is that dependent smokers are more likely to adjust smoking topography parameters in order to mitigate withdrawal symptoms. The present study examined the smoking topography of tobacco dependent adolescents volunteering for a smoking cessation treatment study (N=21; mean age= 16.4, SD= 0.98; 67% European American, 24% African American, 9% other; 38% male; mean FTND= 5.75, SD=2.05). Participants smoked one of their usual brand cigarettes while being monitored by computer topography interface (PitrowShine Technologies, Inc. Baltimore, Maryland). Smoking topography measures included mean puff volume, total puff volume, inter-puff interval, puff duration, and puff velocity. Based on the finding that all participants had at least 6 puffs per cigarette, a Repeated Measures ANOVA comparing participants’ first 3 to the last 3 puffs showed that the 3 initial puff volumes were significantly larger than the 3 final puff volumes (puff 1-6 volume (ml), means ± SD: 44 ± 17.1, 45 ± 13.4, 44 ± 11.3, 34 ± 15.6, 34 ± 11.4, 28 ± 10.0; p<0.001). This finding suggests intra-cigarette regulation of nicotine intake by altering puff volume. These results might also suggest that adolescent dependent smokers, much like adults, smoke to relieve tobacco craving and reduce smoking intensity when a threshold concentration of nicotine is reached. Further research should explore how therapeutic approaches to cessation (e.g., pharmacotherapy) might address various patterns of intra-cigarette puff volume regulation.

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POS5-80  A PROSPECTIVE EXAMINATION OF WITHDRAWAL SYMPTOMS AMONG ADOLESCENTS IN A SMOKING CESSATION TREATMENT PROGRAM


Very few randomized clinical trials of smoking cessation have been conducted with adolescent smokers. Consequently, very little is known about withdrawal symptoms, craving, and nicotine dependence among adolescent smokers, particularly those who are actively attempting to quit smoking. This study examined the frequency, intensity and time course of physiological (heart rate) and self-reported DSM-IV-based criteria for nicotine withdrawal, as well as craving and other proposed withdrawal symptoms, during a 10-week group smoking cessation intervention. In addition, the relationship between nicotine dependence, as assessed by a modified Fagerström Tolerance Questionnaire (mFTQ) and self-reported number of cigarettes smoked per day (CPD) are examined. Sixty-six adolescents (46 males, 17 females), ages 15-18, selected from community high schools in the San Francisco Bay area and completed 10 weeks of cognitive-behavioral group smoking cessation treatment. Withdrawal symptoms and craving were assessed at baseline and weekly sessions. The mFTQ was administered at baseline and CPD was assessed during the telephone screening and during weekly sessions. The mean age of the participants was 16.9 years old, they smoked an average of 11.2 CPD at screening, and 68% of the participants attended at least 7 out of 10 sessions. The results of this study add to the sparse literature that prospectively examines the time course of withdrawal symptoms and craving among adolescent smokers in a smoking cessation intervention.

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POS5-81 PREFERENCE FOR RISKY REWARDS IN DEPRESSED ADOLESCENT SMOKERS
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Background: Adolescents who suffer from depression also smoke at higher rates compared to normal adolescents. It has been proposed that even though depressed adolescents understand the risks associated with smoking, the rewarding properties of nicotine may drive a smoking, particularly salient behavior. This association has not been objectively explored using a laboratory task that assesses one’s preference for risky rewards.

Methods: As part of an ongoing longitudinal study, during diagnostic evaluation using a clinician administered standardized semi-structured interview. 11 adolescents with no personal or family history of psychiatric illness, 8 adolescents who were current smokers and 11 depressed adolescents who also smoked, completed a computerized decision-making task, the Wheel of Fortune (WOF). By providing the participants an opportunity to choose between clearly spelled out probabilities and real monetary outcomes, this task specifically assesses their preference for risky high rewards (RHR) on the winning sub-task and risky high losses (RHL) on the losing sub-task. The primary outcome variables of interest were the percentage of times the RHR and RHL choices were made.

Results: On the winning sub-task depressed adolescents who smoked took the RHR choice more often [Mean(M)=48.4, Standard Deviation (SD)=24.5] compared to smoking adolescents [M=35.5, SD=22.9] and significantly more often compared to depressed adolescents [M=19.9, SD=25.6]. Performance on the losing sub-task did not differentiate these three groups.

Conclusions: Nicotinic dependence and risk behaviors both owe their reinforcing properties to their actions on the brain reward pathways. On the WOF task, the prospect of winning real money by taking a risk (10% chance of winning $4) was fairly reinforcing for normal adolescents, but not for adolescent smokers who probably have a higher threshold due to a continued presence of nicotine in the brain. In the presence of a depressed mood state, nicotine by itself is not rewarding enough and the individual’s preference for risky rewards increases. The findings from this study would need to be confirmed in a study with a larger sample size.

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POS5-82 COPING MOTIVES AND NEGATIVE AFFECT RELIEF EXPECTANCIES FOR SMOKING PREDICT INCREASE IN NICOTINE DEPENDENCE AMONG ADOLESCENT SMOKERS
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Mounting evidence suggests that individuals smoke, in part, to regulate affective experience. Two conceptually similar constructs, smoking outcome expectancies (beliefs about the consequences of smoking) and smoking motives (trait-like strategic uses of smoking for achieving various means) have been implicated in the smoking/afflict relationship and are thought to capture potent incentives for smoking. Importantly, affectively laden smoking motives and expectancies have emerged as unique and powerful predictors of smoking behavior. The contribution of these constructs to the etiological pathway to nicotine dependence during adolescence, however, remains uninvestigated. The current study examined whether expectancies for smoking to relieve negative affect and coping motives for smoking, measured at baseline, were related to change in nicotine dependence six months later. Participants were 1263 9th and 10th grade adolescents (57% female, 57% Caucasian) in a longitudinal study of the natural history of smoking. Self-report measures included current anxious and depressive symptomatology, nicotine dependence (Nicotine Dependence Severity Scale (NDSS); Modified Fagerstrom Tolerance Questionnaire, (MFTQ)), smoking expectancies (Modified Smoking Consequences Questionnaire, (MFTQ)) and coping motives (Wills Tobacco Motives Inventory), all completed at both baseline and 6 months. Separate set-wise hierarchical linear regression analyses were conducted to determine the relative contribution of the motives and expectancies measures, to change in both respective nicotine dependence measures, independent of depressive and anxiety (because individuals high in these indices of affective distress may be more likely to smoke for coping related reasons). Results indicated that these respective expectancies and motives predicted increases in nicotine dependence (as assessed with both the NDSS and MFTQ) at six months, independent of depressive and anxiety symptoms (all ps < .01). Our findings are among the first to suggest that both motives and expectancies reflecting smoking to reduce negative affect among adolescents are associated with increases in nicotine dependence over time.

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POS5-83 PREVALENCE AND CORRELATES OF PURCHASING CONTRABAND CIGARETTES ON NATIVE RESERVES IN ONTARIO, CANADA
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Effective taxation policies provide the greatest impact on tobacco consumption and the related health burden. However, the availability of cheap, untaxed or partially taxed cigarettes can seriously undermine these policies, particularly for low socio-economic smokers. In this study, we estimate the prevalence of purchasing illegal contraband cigarettes on Native reserves in Ontario and identify the correlates of purchasing behaviors, assess the share of contraband relative to reported total cigarette consumption and quantify the financial impact on taxation revenue. Data were collected from the Ontario Tobacco Survey, a regionally stratified representative population survey designed to over-sample smokers (Response Rate = 64%). The present study focused on 1,382 adult current smokers who were interviewed between 2005 and 2006. Prevalence of purchasing cigarettes on reserves was assessed with descriptive statistics. A two-part model was used to analyze correlates of purchasing behaviors: logistic regression for participation in recent purchasing cigarettes on reserves and Ordinary Least Squares regression for reported recent purchases. Among current smokers, 37.0% reported ever purchasing cigarettes on reserves, 25.8% reported recent purchasing and 11.7% reported usually purchasing. Results of the two-part model showed that smoking characteristics were associated with participation in purchasing cigarettes on reserves and with amount of purchase, but socio-demographic characteristics were not associated with the former, but not the latter. Contraband cigarettes purchased on reserves resulted in tax losses of $122.2 million CAD, and contraband accounted for 14% of reported total cigarette consumption among economic smokers. This unintended harm to the drug market is subtle, but substantial smuggling of contraband cigarettes occurs through a reserve that straddles the international border with Canada, but worldwide, as recommended by the FCTC. Wherever indicated, governments should strengthen their contraband prevention measures so that tobacco taxation achieves its intended health benefits and protects existing tax revenue.

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POS5-84 THE CONTRABAND CIGARETTE MARKET AMONG ADOLESCENTS IN ONTARIO, CANADA
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The World Health Organization Framework Convention on Tobacco Control recognizes that the elimination of contraband-tobacco markets is an essential component of tobacco control. In Canada, an extensive trade in illicit tobacco products risks undermining governmental and public-health strategies for reducing the harms associated with tobacco use. Approximately 10-17% of cigarettes smoked by adults in Canada 2005-2006 were illicit, and 95% of all contraband cigarettes in Canada were manufactured on First Nations territories in Ontario and Quebec. At this time, however, the impact of contraband tobacco products on adolescent smoking patterns remains unknown. Using a drug-market perspective, the project examined the dynamics of adolescent cigarette acquisition, use, and distribution of contraband cigarettes. Our study employed a respondent driven sampling (RDS) procedure to collect a sample of 300 adolescent smokers, who completed a guided self-report survey. Eligible adolescents were between 16-18 years old, had purchased and sold at least one cigarette in the last 30 days, and reported residence in the Greater Toronto Area. We found the approximately 82% of adolescents reported purchasing native-manufactured contraband cigarettes in the last year. Contraband-cigarette smokers were more likely to be male and to be heavier smokers; they also reported an earlier age of smoking initiation, and indicated their friends as the primary source of carrot cigarettes. Fissionary data on the financial impact of contraband cigarette sales will be presented at a conference. In conclusion, there is an urgent need to address contraband cigarette sales to prevent smoking behavior amongst Canadian adolescents. This study was funded by the Ontario Ministry of Health and Long-Term Care.

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POS5-85 CONTRASTING SOCIAL REPRESENTATIONS OF DIFFERENT TOBACCO PRODUCT USERS

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Based on cultural stereotypes of various types of tobacco users, a representative sample of the Norwegian population was asked to ascribe a given set of 9 socio-psychological traits to, respectively, a typical pipe smoker, user of hand rolled (RYO) cigarettes, cigar smoker, user of manufactured cigarettes as well as a user of snus. The sample consists of pooled data from October 2006 and October 2007. Factor analysis reveals three underlyings dimensions across all groups of tobacco users (except for RYO smokers). These underlying dimensions are "unhealthy" and "unattractive" (and occasionally "not elegant"). This representation is labeled negative/outdated. Traits loading on the third dimension are "unhealthy" and "unattractive" (and occasionally "not elegant"). This representation is labeled negative/unattractive. Proceeding with these factors in the form of 15 factors scores, and controlling for tobacco user status and social background, we find that people who themselves use the actual tobacco product consider a typical user from their own group in a more positive light than what both former users and never users do. Social background variables do not show significant direct effects on social representations, suggesting that their influence is mediated via tobacco user status (itself structured by economic and cultural capital). These findings are interpreted as reflecting the argument that amongst groups who are threatened or stigmatized by the dominant social order (like all groups of smokers are today), with the possible exception of snus users) social representations function as group defense, serving to oppose the negative labeling of stigma. Potential plans to leave the group in the near future (by quitting use of tobacco) may serve to weaken group identity though. Taking actual users future cessation plans into consideration, this hypothesis is only partially confirmed.

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POS5-86 THE STABILITY AND PREDICTIVE VALIDITY OF THE TWO ITEMS IN THE HSI: FINDINGS FROM THE ITC 4-COUNTRY STUDY

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There is increasing recognition that the two measures in the heaviness of smoking Index (HSI): time to first cigarette of the day (TTFC), and daily consumption (CPD) are strong predictors of quitting behavior. This paper reports data from the ITC 4-country study to explore the stability of these two measures over 4 waves of the study and their wave-to-wave predictive validity for both making cessation attempts and success amongst those who try (3 replications). We also looked at the relative utility of the standard categorical scoring compared with a continuous score using the square root of cigarettes per day minus the natural logarithm of time to first cigarette in minutes. We found considerable stability of the measures with a small decrease as duration between measures increased. For a 3-year gap, the correlations were 0.74 and 0.73 for the continuous and categorical composite HSI measures, and were at least 0.66 for the individual components. Both TTFC and CPD independently predicted making quit attempts, and successful cessation among those who made quit attempts in each of the 3 wave-to-wave replications, and these effects were maintained when controlling for demographic factors. Both TTFC and CPD are fairly stable over time and are important predictors of quitting. There are only small effects of mode of computing the scores.

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POS5-87 ROLL-YOUR-OWN (RYO) CIGARETTES-PREVALENCE, REASONS FOR USE, AND THE USE OF FILTERS: FINDINGS FROM THE ITC FOUR COUNTRY SURVEY

(2002-06)

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Roll Your Own (YRO) cigarettes constitute an important form of tobacco use in many countries. To date, however, there have been few studies on comparing RYO use, predictors of RYO use, and the use of filters across countries and over time. This paper is the first extensive cross-country longitudinal comparative study of RYO cigarettes. We report findings from the ITC Four Country Survey on prevalence of RYO cigarettes, smokers’ motivations for smoking RYO, and the use of filters in Canada, the United States, the United Kingdom, and Australia (RDD phone survey of 2,000 adult smokers in each country). Findings on RYO prevalence are over five annual waves of the ITC Four Country Survey (2002-06); findings on motivations and filter use are from 2006 to 2006, overall prevalence of RYO increased from 20% to 23%. The increase in prevalence was highest in the UK (9%). This may reflect the UK industry’s marketing strategy of targeting young high-income smokers and positioning RYO as a product with “natural taste”, by associating RYO with the concept of being in control, and emphasizing its lower cost. Increased RYO prevalence also occurred in the U.S. (3.3%) and Australia (1.3%). RYO prevalence also increased among those of higher education. Reasons for smoking RYO were to reduce cost (91%), reduce smoking (60%), taste (55%), satisfaction (49%), and for health reasons (31%). Overall, 63% of RYO users reported “usually” using filters, 9% “sometimes”, and 28% “never”. Filter use was higher in Canada and Australia, among females, among heavier smokers, among those who want quit and among those who showed greater concern over the money they were spending on cigarettes. The findings highlight the increasing importance of RYO cigarettes and in changes in marketing and promotional activities for RYO. As countries throughout the world continue to recognize the importance of higher taxation in tobacco control policies (e.g., as included in the Framework Convention on Tobacco Control), and given the lower taxation rates in many countries on RYO, the importance of RYO cigarettes will continue to increase, as will the need to adjust taxation policies accordingly.

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POS5-88 CHANGING TOBACCO HABITS IN SWEDEN: INFLUENCE OF ENVIRONMENTAL AND PSYCHOLOGICAL FACTORS RELATED TO SMOKING AND USE OF SMOKELESS TOBACCO (“SNUS”)

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Background: Previous publications have, in epidemiological terms, described how the dominant kind of tobacco use among Swedish men has shifted from smoking to use of the smokeless tobacco, “snus”. The purpose of the current study was to analyze the role of some environmental and psychological factors in this process.

Material and Methods: The design of the study is based on the perspectives of the Symbolic Interactionism Theory that suggest that a person’s “Self” plays a major role in whether or not to initiate or maintain or quit a behavior such as smoking or using smokeless tobacco. “Self” aspects have been explored by in-depth interviews and interactions with factors such as acceptance of smoking or snus use in general, attitude to (potential or real) own tobacco use, proximity to different kinds of tobacco use in the immediate environment (current and during adolescence) has been explored by questions in the FSI and Tobacco Survey 2007 (N=90; 10).

Results: Many interviewees expressed strong awareness that their “Self” included “identity aspects” linked to actual habits: “I see myself as a snus user, it’s a part of who I am” and “I could never see myself trying a cigarette.” Survey data showed, for example, that self-acceptance of smoking was associated with absence of proximity to smoking. A large proportion of male smokers (76%), but a significantly smaller proportion of male snus users (46%), reported that their tobacco use made them feel uncomfortable while among other people. Among men with proximity to smoking during adolescence, 46% daily used smokeless tobacco, while of those with proximity to snus use and 26% of those without proximity to any tobacco use. Among smokers with a strong wish to quit, 36% expressed disapproval of smoking in general, compared to 19% of those with no wish to quit.

Key conclusions: While proximity to smoking encourages initiation of smoking, it seems that proximity to snus use does not. Disapproval of smoking encourages cessation of smoking. A continued shift from smoking to snus in Sweden, with a subsequently decreasing occurrence of proximity to smoking, may therefore favor a continued decrease in smoking.

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POS5-89 THE CANADIAN TOBACCO CONTROL NETWORK: NGOs AND “PRAGMATIC COLLABORATION”

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Introduction: Canada’s history with tobacco control is ripe with success. The tobacco control movement in Canada has been intricately linked with the work of civil society and collaboration across and within sectors. Despite the documented history of civil society participation and collaboration, there is a need for further systematic study. Purpose: To analyze the structure, function, and interactions among the Canadian tobacco control network(s).

Design: Twenty-six individuals participated in the study including 21 NGOs and 2 federal government branches. Each participant engaged in one semi-structured qualitative interview of approximately one hour. Interview transcripts were coded and the final stage of analysis yielded core themes and corresponding subthemes. Final thematic consensus was reached through joint discussion by the coders.

Results: Findings suggest that the tobacco “issues” are the points of collaboration — “pragmatic collaboration.” Findings suggest that the formal structure of this network was characterized by intra-organizational (vertical) and inter-organizational (horizontal) interactions. Our findings further suggest that informal structures were observed in the adolescent relative to satisfied condition in left insula and left postcentral gyrus. The insula forms representations of internal bodily states and has been shown to subserve cigarette craving (Brody et al., 2002) and smoking (Naqui et al., 2007). The present findings suggest the insula is a component of the dynamic network driving the insula activity. The profound decreased insula-default network connectivity following abstinence may reflect the emergence of an insula-centered network driven by withdrawal-induced changes in bodily state. Implications for understanding the relationship between insula and default mode within the framework of smoking addiction will be discussed.

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POS5-90 FUNCTIONAL CONNECTIVITY BETWEEN INSULA AND THE DEFAULT NETWORK IS DECREASED BY SMOKING ABSTINENCE

Brett Froeliger, Ph.D.*, Rachel V. Kozink, B.S., Avery M. Lutz, B.A., Jed E. Rose, Ph.D., and F. Joseph McClernon, Ph.D., Duke University Medical Center

Smoking abstinence has been shown to result in persistent changes in spontaneous brain activity using electroencephalographic measures (Gilbert et al., 1999, 2004). Recently, fMRI and PET methods have elucidated correlated spontaneous brain activity in the absence of task demands in a network of midline structures including the precuneus/medial prefrontal cortex and anterior cingulate cortex. This “default network” likely reflects non-goal directed, introspectively oriented cognition. The current study sought to evaluate the effects of smoking abstinence on the spatial distribution of this network. BOLD-fMRI images were collected for participants (n = 12; mean cigarettes per day = 17.08, SD = 3.37; mean age = 27.17, SD = 7.23) during a 5-minute eyes-closed resting period during two sessions: once following 24 hr abstinence, and once following smoking as usual. In each session, connectivity was observed between brain regions previously identified as comprising the default network. When session differences were examined, decreased default network connectivity was observed in the abstinent relative to satisfied condition in left insula and left postcentral gyrus. The insula forms representations of internal bodily states and has been shown to subserve cigarette craving (Brody et al., 2002) and smoking (Naqui et al., 2007). The present findings suggest the insula is a component of the dynamic network driving the insula activity. The profound decreased insula-default network connectivity following abstinence may reflect the emergence of an insula-centered network driven by withdrawal-induced changes in bodily state. Implications for understanding the relationship between insula and default mode within the framework of smoking addiction will be discussed.

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POS5-91 FETAL AND NEONATAL NICOTINE EXPOSURE IN WISTAR RATS CAUSES A PROGRESSION OF PANCREATIC MITOCHONDRIAL ALTERATIONS AND LEADS TO BETA CELL DYSFUNCTION


In Canada, nicotine replacement therapy (NRT) is recommended as a safe smoking cessation aid for pregnant women. However, there are current debates regarding the safety of NRT use during pregnancy. In rats, fetal and neonatal nicotine exposure causes pancreatic mitochondrial dysfunction (Weidinger et al., 2010) and aberrant oxidative metabolism. We hypothesized that maternal nicotine exposure during pregnancy results in postnatal mitochondrial dysfunction in the pancreas. Therefore in this study we examined the effect of fetal and neonatal exposure to nicotine on pancreatic mitochondrial structure and function during postnatal development. Female Wistar rats were given saline (control) or nicotine treatment (1 mg/kg) starting day 14 of gestation (weaning) or 4 days prior to mating until weaning. Male offspring were sacrificed at 3 (weaning) and 26 (adult) weeks of age for pancreas collection. Nicotine exposure resulted in increased islet reactive oxygen species (ROS) production at both weaning and 26 weeks of age (p<0.05). At weaning there was no significant effect of nicotine exposure on mitochondrial DNA (mtDNA) deletions or mitochondrial enzyme activity in the pancreas (p>0.05). However, by adulthood nicotine-exposed offspring had elevated mtDNA deletions and impaired enzyme activity relative to control animals (p<0.05). Beta cells from nicotine-exposed animals had mitochondrial structural abnormalities, which were observable by electron microscopy at weaning and progressively worsened with age. In addition, glucose-stimulated insulin secretion, an indicator of mitochondrial function in beta cells, was impaired at 26 weeks in the nicotine-exposed relative to saline-exposed offspring (p=0.05). Taken together, these data suggest that maternal nicotine use during pregnancy results in postnatal mitochondrial dysfunction that may explain, in part, the dysglycemia observed in the offspring from this animal model. We propose that nicotine, a pro-oxidant, causes increased ROS production, which in turn leads to the subsequent mitochondrial dysfunction. These results clearly indicate that further investigation into the safety of NRT use during pregnancy is warranted.

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Intra-ovarian IGF system. The effect of nicotine exposure on the mRNA expression of any other component of the IGF system was not significantly reduced IGFR-II mRNA expression (p<0.01) in the ovary. There was no significant difference in the expression of IGFBP1-6 in the whole ovary was determined by semi-quantitative reverse transcription-PCR. Results: Nicotine exposure significantly reduced IGF-I expression (p<0.01) relative to saline controls. Furthermore, nicotine-exposed offspring had significantly lower IGFBP1-6 expression (p<0.01) in the ovary. There was no effect of nicotine exposure on the mRNA expression of any other component of the intra-ovarian IGF system.

Conclusion: Results from this study suggest that the decreased fertility and increased follicular atresia in nicotine-exposed animals may be due, in part, to disruption of the IGF regulation in the ovary.

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POS5-94

LIMITED EFFECTIVENESS OF MONOMAINE OXIDASE INHIBITION ON ESTABLISHED NICOTINE SELF-ADMINISTRATION IN RATS

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Current smokers have abnormally low monoamine oxidase (MAO) activity and it has been suggested that MAO inhibition caused by cigarettes makes nicotine more reinforcing. This notion is based largely on intravenous self-administration studies in rats, showing that chronic treatment with MAO inhibitors can increase the reinforcing value of nicotine (Guillem et al., 2006; Villegier et al., 2007). However, these animal studies produced near-total MAO inhibition, far beyond the 30-40% reduction seen in smokers. In addition, these experiments focused on the acquisition of nicotine self-administration. We now report the effects of graded, irreversible MAO inhibition on established nicotine self-administration. Five separate experiments examined the potential of either a combination of clorgyline (0.01-1.0 mg/kg) and pargyline (0.05-4.0 mg/kg), or tranylcypromine (0.75-6.0 mg/kg) to alter nicotine self-administration. We tested both the standard “fast infusion/high dose” model of nicotine self-administration and/or (3) at a high degree of MAO-A and B inhibition (85 and 70%, respectively). Finally, MAO inhibitors appear to increase nicotine self-administration only under restricted conditions: (1) during acquisition of the behaviour and chronic treatment (shown previously), (2) in the traditional “fast/high” model of nicotine self-administration, and/or (3) at doses that produce MAO inhibition beyond that reported in smokers. Hence, MAO inhibition is unlikely to appreciably potentiate the reinforcing effects of nicotine in smokers.

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POS5-95

NICOTINE SELECTIVELY INCREASES VOLUNTARY ETHANOL INTAKE DURING ADOLESCENCE, BUT NOT LATER IN LIFE

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Combined use of alcohol and tobacco are highly prevalent in today’s society. Reported rates of tobacco use in alcoholics are as high as ninety percent. Most of these individuals begin use of these substances during adolescence. The present set of experiments aimed to determine the short- and long-term effects of nicotine or saline injection during adolescence on voluntary sweetened ethanol or sucrose-alone intake. Experiments 1 and 2 assessed the short-term effects of nicotine or saline on voluntary sweetened ethanol intake in adolescent (Exp. 1) or adult (Exp. 2) male rats. Rats were administered to an ethanol or sucrose-alone with a “lower” model that produces a reduced intake in adolescent-exposed (Exp. 3) or adult (Exp. 4) male rats. Nicotine and saline treated rats were assessed for voluntary ethanol intake in adolescent (Exp. 1) or adult (Exp. 2). All rats were subsequently assessed for voluntary ethanol intake in adolescent (Exp. 3) or adult (Exp. 4) male rats. Nicotine and saline pretreated rats were assessed for voluntary ethanol intake in adolescent (Exp. 3) or adult (Exp. 4) male rats. Therefore, the elevated ethanol intake observed in adolescents was not merely attributed to sucrose. Additionally, there were no significant differences in ethanol intake following the nicot ine treatment and saline controls, regardless of pretreatment in adolescent or adult rats. Taken together, nicotine pretreatment alone during adolescence or adulthood did not increase subsequent ethanol intake in life, however, nicotine did increase ethanol intake selectively in adolescents, but not adults. Together, these data highlight the unique vulnerability to the combined effects of ethanol and nicotine only during adolescence.

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POS5-96  SOCIAL FACILITATION IN UNDERGRADUATES: ENCOURAGING AND DISCOURAGING PEER SMOKING

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Peer influence can significantly promote or inhibit smoking. Many college students initiate, increase, or quit smoking, and peer social facilitation may play a role in these behavior changes. Our undergraduate survey study aimed to assess: 1) frequency of behaviors that encourage and discourage smoking; 2) how these behaviors vary by CDC-defined nonsmoker, some-day smoker, and daily smoker subgroups; and 3) whether demographic and college-level (age, gender, race, social class, and Greek status) predict these behaviors. Our 6-item social facilitation measure listed 3 smoking-encouraging and 3 smoking-discouraging behaviors [e.g., “How often have you: a) encouraged a student who smokes to have a cigarette?; b) encouraged a student who doesn’t smoke to try a cigarette?; c) asked a student not to smoke in your car or where you live?; and d) encouraged a student to quit smoking or cut down?] Subjects rated items on a 5-point scale: never-rarely-sometimes-often-very often. Data from 1,458 usable surveys (92.3% response rate) gathered from a random sample of undergraduate classes were analyzed. Factor analysis supported our proposed two-dimensional structure of the 6-item social facilitation measure. Results indicated that encouraging behaviors (e.g. daily smoker males versus daily smoker females, on- versus off-campus students, and juniors versus all other classes. Peer training interventions that target or employ groups that are already more likely to encourage or discourage smoking, respectively, may reduce college smoking.

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POS5-97  SYMPTOMS OF COUGH AND SHORTNESS OF BREATH AMONG OCCASIONAL YOUNG ADULT SMOKERS

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Background: Light and occasional smoking is highly prevalent among college students; however, the health risks associated with this behavior are not well known. Thus, the present study aims to examine the relationship between self-reported number of days smoked in the past 30 days and number of days experiencing (1) cough or sore throat and (2) shortness of breath or feeling tired during regular activities among college-age students.

Methods: A random sample of 25,000 UM undergraduates was invited by email to complete a 46-item online health screening survey assessing demographic, smoking-related, and health behavior variables, and physical symptoms of cough/sore throat and shortness of breath feeling tired after regular activities.

Results: The survey response rate was 26% (6,492/25,000). Among individuals who reported no smoking in the prior 30 days, smoking on 1-4 days, 5-10 days, 11-20 days, or 21-30 days the prevalence of one or more days of cough increased from 62.5% to 68.3%, 72.0%, 71.4%, and then 73.7%, respectively (p<0.001). Similarly, the prevalence of shortness of breath increased from 42.7% to 47.1%, 56.2%, 59.8%, and then 64.4%, among the same groups. Occasional smoking among college students could be accounted for by other health behaviors (e.g. days going out to a bar or party, days getting adequate sleep) and exposure to environmental tobacco smoke. Individuals smoking 5 or more days per month had a higher occurrence of shortness of breath even after controlling for these factors.

Conclusions: Occasional smoking among young adults increases the rates of cough and shortness of breath. Information on the immediate health effects and symptom levels related to intermittent smoking could contribute to efforts to encourage age cessation among young adults.

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POS5-98  INFLUENCE OF PTSD ON SMOKING STATUS AMONG IRAQ AND AFGHANISTAN VETERANS

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In the general population, posttraumatic stress disorder (PTSD) is associated with higher rates of smoking (45%; Lasser et al., 2000) versus the national average (23%; CDC, 2002). Rates of smoking are even higher among veterans with PTSD (60%; Beckham et al., 1997), twice that of VA enrollees (30%; Miller et al., 2001). Less is known about the influence of PTSD on smoking among returning Iraq and Afghan veterans. The aims of the present study are twofold: 1) examine the relationship between PTSD and smoking status among college-age students. The prevalence of shortness of breath increased from 42.7% to 47.1%, 56.2%, 59.8%, and then 64.4%, among the same groups. Occasional smoking among college students could be accounted for by other health behaviors (e.g. days going out to a bar or party, days getting adequate sleep) and exposure to environmental tobacco smoke. Individuals smoking 5 or more days per month had a higher occurrence of shortness of breath even after controlling for these factors.

Conclusions: Occasional smoking among young adults increases the rates of cough and shortness of breath. Information on the immediate health effects and symptom levels related to intermittent smoking could contribute to efforts to encourage age cessation among young adults.

This work was supported in part by National Institute on Drug Abuse (NIDA) grants R01-DA-13672 and K02-DA-16811 (to TPG), K12-DA-00167 (to AHW), Young Investigator (to KAS and AHW) and Independent Investigator (to TPG) Awards from the National Alliance for Research in Schizophrenia and Depression (NARSAD).

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POS5-99  A PRELIMINARY STUDY OF SUSTAINED-RELEASE BUPROPION FOR SMOKING CESSATION IN BIPOLAR DISORDER

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Objectives: Individuals with bipolar disorder smoke at higher rates (~67%) than the general population (~22%), and have great difficulty with quitting smoking. There have been no published smoking cessation trials for patients with bipolar disorder. The purpose of this study was to examine the safety and efficacy of sustained-release (SR) bupropion (BUP) compared to placebo (PLA) for smoking cessation in bipolar disorder.

Methods: A preliminary 10-week, double-blind, placebo-controlled trial of BUP (up to 300 mg/day) and behavioral smoking cessation therapy for five treatment-seeking outpatient smokers with bipolar disorder. The primary outcome measure was smoking abstinence during the last week of the trial (EOT, Days 63-70).

Results: Five participants were randomized into the study with n=2 receiving BUP and n=3 receiving PLA. One participant receiving BUP achieved EOT abstinence while no participants in the PLA group achieved abstinence. Side effects were modest, and comparable between study medication groups. Three participants, all receiving placebo medication, reported increases in hypomanic symptoms during the trial.

Conclusions: This study was the first trial of bupropion for smoking cessation in bipolar patients. The results provide preliminary evidence for the safety of bupropion for smokers with bipolar disorder.

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POS5-100 IMPACT OF UNDIAGNOSED COMORBIDITIES IN SMOKER’S WITH SUBSTANCE ABUSE/ALCOHOLISM DISORDERS
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Purpose: Tobacco use has historically been widely used by patients with substance abuse. Clinicians commonly perceive patients with substance abuse/alcoholism disorders to be unlikely candidates to quit smoking. We studied the differences and similarities in smokers with and without substance abuse disorders.

Methods: IRB approval was obtained. Questionnaires elicited information on demographics, medical history, obstacles/reasons for quitting, concurrent major stressors, past at attempts to quit smoking, and irrative co-morbidities such as sleep disturbances and depression. At 30-day mark, quit status was validated using a carbon monoxide monitor (Bedfont® hand-held). One-year follow-up was done. Data analyzed using SAS®.

Results: Smokers in SAAS group were twice as likely (25% vs. 12%) to have been referred to a tobacco cessation program than SAAS group (36% vs. 17%). More smokers quit smoking due to a “major current health problem” (p<0.0001). SAAS group was less likely to report they are “good sleepers” 70% vs. 82% (p=0.0008). SAAS group more often reported 64% vs. 50% (p=0.001) daytime sleepiness and that they were more likely 38% vs. 12% (p<0.0001) to have the highest level of SAAS reported (vs. 45%, p <0.0002) being depressed > 2 weeks in past year. SAAS group also reported depression > 2 years over lifespan (54% vs. 32%, p<0.0001), being depressed much of this past year (40% vs. 28%, p<0.007), and ever got professional help or took medications for depression (63% vs. 31%, p<0.0001). Short term (30-day) quit rate in SAAS group 53% vs. 56%; long term [1-year] 27% vs. 34%.

Conclusion: Our results imply that smokers with substance abuse/alcoholism disorders should be screened for depressive symptomatology and for the presence of sleep disorders. We hypothesize that if efforts are made to identify and treat underlying co-morbidities such as sleep disturbances and depression, it will improve quit smoking success. Further prospective studies are needed to test this hypothesis.

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POS5-101 REDUCING THE NUMBER OF CIGARETTES SMOKED AS A HARM REDUCTION APPROACH: EVIDENCE FROM LONG-TERM CANCER INCIDENCE DATA
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Objectives: Smoking reduction appears to predict a higher likelihood of subsequent cessation (Broms et al, N&T, in press), but does it result in better health outcomes? So far, two large Scandinavian longitudinal studies have examined the health outcomes of spontaneously reduced cigarette smoking with mainly negative results. The aim of this study was to examine among Finnish population whether smoking reduction over a six-year period (1975-1981) had impact on cancer incidence.

Methods: Longitudinal questionnaire data from two surveys in 1975 and 1981 among the Finnish adult twin cohort were linked with cancer incidence data from the Finnish Cancer Registry. Lung cancer and all smoking-related cancers were examined as the outcome measures.

Results: Based on smoking behavior between 1975 and 1981, a total of 4989 (mean age 34 years) subjects were identified as current smokers at both surveys. Out of them 42% had no change, 39% had increased and 20% had decreased their amount of smoking. Of the latter, five percent had less than 25%, 13% less than 50%, 4% less than 75% and 2% at least 75% reduction in their daily cigarette consumption. There were a total of 1005 incident smoking-related cancer cases by the end of year 2004. Survival analyses were conducted to estimate the risk of incident cancer in relation to changes in amount smoked between 1975 and 1981, adjusted for sex, age and amount of baseline smoking. Those who did not change their smoking were regarded as the reference group. Baseline smoking status expectedly and significantly predicted cancer incidence, while among current smokers at baseline a dose reduction was associated with lower cancer incidence (p<0.0001). Changes in amount smoked did not significantly impact the risk of overall smoking-related cancers or specifically lung cancer incidence.

Conclusion: We conclude that among continuing smokers reducing number of cigarettes smoked as much as may not provide measurable health benefits as measured by cancer incidence.

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POS5-102 SMOKING AND DIMENSIONS OF DEPRESSION
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Objectives: Our aim was to examine longitudinally how smoking is associated with dimensions of depression among Finnish adult twins (4504 men, 5469 women).

Methods: Smoking behavior was measured in 1975 and 1981 classified as either never smokers or ever smokers (including persistent and former smokers). Depressive symptoms were measured with the Beck Depression Inventory (BDI) score in 1990. Dimensions of depression defined by factor analysis were Negative Attitudes Toward Self (NATS), Performance Impairment (PI), and weight loss (WL). Due to skewed distributions, each dimension score was used as a dichotomous outcome (low/high). In the multiple logistic regression models the Odds Ratios (OR) with 95% Confidence Intervals (CI) of ever smoking compared to never smoking were calculated for the risk of a high BDI dimension score. The analyses were adjusted for several confounders (socio-demographic and -economic background, other health behaviors, chronic somatic conditions, social network, emotional support, life events, neuroticism, life satisfaction, self-assurance, conscientiousness, hostility, openness).

Results: Based on adjusted logistic regressions, among men ever-smoking was a risk factor for all dimensions: NATS (OR=1.3, 95% CI 1.0-1.5), PI (1.2, 1.0-1.4), and WL (OR=1.5, 1.2-1.8). Among women smoking was not significantly related to any of the dimensions. Among 307 discordant male twin pairs ever-smoking remained associated with NATS (OR=1.9, 1.0-3.5). When stratified by zygosity the association was significant only among the DZ (OR=2.0, 1.0-4.2) pairs. Among 460 discordant female pairs ever smoking became associated with PI (OR=1.7, 1.0-2.9), with no difference by zygosity (MZ OR=1.7, 0.4-7.5; DZ OR=1.6, 0.9-2.9).

Conclusion: Association of ever smoking with dimensions of depression may have different mechanisms among men than women.

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POS5-103 FEAR REACTIVITY TO CARBON-DIOXIDE INDUCED BODILY SENSATIONS AMONG HEAVY SMOKERS AND NON-SMOKERS: HOW SMOKING MAY INFLUENCE PANIC VULNERABILITY
Kenneth Abrams*, Michael Zvolensky, Melissa Blanki, Tom Eissenberg, Carleton College, University of Vermont, Virginia Commonwealth University

Individuals who smoke are more likely to experience panic attacks and develop panic disorder than those in the general population. One possible explanation is that smokers may experience a heightened fear response to somatic disturbances. To date, laboratory studies have tested this hypothesis directly. The present study examined 24 adult heavy smokers (10 females) in 12-hour nicotine withdrawal and 24 adult non-smokers (12 females) on subjective and physiological reactivity to a 4-minute carbon dioxide (CO2) re-breathing challenge. Results indicate that, despite decreased respiration during the challenge, smokers experienced a significantly greater increase in self-reported panic symptoms than non-smokers. Additionally, smokers reported significantly greater trait levels of suffocation fear prior to the challenge. Findings are discussed with respect to the role of smoking in panic vulnerability.

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POS5-104 RECRUITMENT OF COLLEGE STUDENT PARTICIPANTS IN A MOOD MANAGEMENT SMOKING CESSATION INTERVENTION

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Recent research demonstrates the positive correlation between cigarette smoking and depressive symptoms among college students. Furthermore, evidence suggests that smoking regulates negative affect and contributes to this relationship. College represents a time when students experience multiple interpersonal and academic challenges and when life-long smoking patterns might develop. Therefore, we designed and evaluated a 6-session combined behavioral counseling and mood management smoking cessation intervention for college students with depressive symptomatology. The current analysis describes the intervention and examines college student smoking prevalence estimates, depressive symptomatology, and motivation to quit from the first cohort of recruited participants. 489 students from introductory psychology courses completed screening measures assessing smoking status, depressive symptomatology, and motivation to quit smoking. 132 (27%) smoked at least 1 day out of the past 30 days; 32 (6.5%) smoked daily, and 71 (14.5%) met the smoking-related study inclusion criterion by smoking at least six days out of the past 30 days. 32 (45%) of those smoking at least six days evidenced clinically significant depressive symptomatology on the Center for Epidemiological Studies-Depression Scale. 28 (83.9%) of the depressed smokers indicated "mild" or greater interest in reducing smoking. The participants agreed to be contacted by the investigator for study recruitment and ultimately, 16 (67) persons agreed to participate and were randomized. Consistent with past research, results suggest that the intervention was effective for smoking cessation. Moreover, many smokers evidence elevated depressive symptoms and the overwhelming majority of these persons a degree of interest in cutting down on their use. Our data support the feasibility to recruit depressed college student smokers for clinical intervention research.

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POS5-105 COLLEGE STUDENT SMOKERS’ PERCEIVED RISK AND EXPECTED INVOLVEMENT IN OTHER HIGH-RISK ACTIVITIES

Magdalena Kulesza, M.A.*, and Amy L. Copeland, Ph.D., Louisiana State University

Cigarette smoking among college students poses significant health and social problems. Students who smoke cigarettes are more likely to engage in other risky behaviors such as binge drinking and unprotected sex. It is unclear whether smokers assess these behaviors as lower risk than do nonsmokers, or if they are more likely to involve themselves in behaviors they deem as high risk. In the present study, 303 college students reported their smoking behavior and their expected benefit, involvement and risk associated with high risk behaviors such as illicit drug use, heavy drinking, unprotected sex, aggressive or illegal behavior, and extreme sports. Distance methods of clinical supervision can efficiently enhance capacity and quality. A descriptive study of a multi-modal supervision project was conducted to assess feasibility.

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POS5-106 SMOKING BEHAVIORS IN PERSONS WITH SCHIZOPHRENIA DURING 8-WEEK BUPROPION TREATMENT

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Adult smoking prevalence in the United States is approximately 21%. However, persons with schizophrenia approach smoking prevalence as high as 83%. Past studies reported that smokers with schizophrenia prescribed atypical antipsychotic medications smoked less than those on typical antipsychotics. Aims were to examine differences in smoking topography and smoke constituent exposure among persons with schizophrenia on atypical (n=30) or typical (n=19) antipsychotic medications at baseline and at two, four, and eight weeks of bupropion therapy. In addition, potential predictors of smoke exposure at eight weeks were identified. A two-group repeated measures design was implemented with antipsychotic medication category as the strata. College smokers reported significantly lower nicotine and cotinine concentrations. Cotinine decreased from 309.5 ng/ml at baseline to 253.7 ng/ml at eight weeks. Persons taking typical antipsychotic medication had significantly higher CO boost than those prescribed atypical antipsychotics. Using a mixed effects model, change in smoking topography flow rate over the 8-week period explained 13.9% of the variance in pre-cigarette cotinine concentration at end of treatment, controlling for baseline cotinine level. Smoking flow rate change over time also explained 21.9% of nicotine pre-cigarette concentration. Change in cigarettes per day contributed 10% of the variance in post-cigarette cotinine level. Flow rate, or draw on the cigarette, and number of cigarettes per day are behaviors that changed over time during eight weeks of bupropion therapy and influenced a decrease in nicotine and cotinine exposure whether participants were prescribed atypical or typical antipsychotics. For the severely nicotine dependent who are unable or unwilling to quit smoking, a program of harm reduction may be an alternative.

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POS5-107 DISTANCE CLINICAL SUPERVISION TO INTEGRATE TOBACCO DEPENDENCE TREATMENT INTO MENTAL HEALTH CARE

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Rationale: Clinical supervision is important for maintaining quality care; however a lack of local expertise could limit quality and capacity for treating tobacco dependence. Distance methods of clinical supervision can efficiently enhance capacity and quality.

METHODS:

Clinical supervisors were interviewed about the treatment provided and the viability and usefulness of the distance process.

RESULTS: The clinical supervisors found that many of the clinicians had good skills for affirming patients’ quit attempts, and they had fidelity to the manual protocol. Clinicians had difficulty eliciting patients’ motivation and encouraging patients to discuss strengths and build efficacy. The clinicians were open to individual feedback and encouragement. The clinicians found that a common problem was frustration at relapses and at the challenge of integrating tobacco counseling into patient care. Clinical supervisors were interviewed about the treatment provided and the viability and usefulness of the distance process.

CONCLUSIONS: The clinical supervisors found that many of the clinicians had good skills for affirming patients’ quit attempts, and they had fidelity to the manual protocol. Clinicians had difficulty eliciting patients’ motivation and encouraging patients to discuss strengths and build efficacy. The clinicians were open to individual feedback and encouragement. The clinicians found that a common problem was frustration at relapses and at the challenge of integrating tobacco counseling into patient care. Clinical supervisors were interviewed about the treatment provided and the viability and usefulness of the distance process.

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US Department of Veteran Affairs: Cooperative Studies Program # 519.
POS5-108 RELATIONSHIP BETWEEN CIGARETTE SMOKING AND SYMPTOMS OF INATTENTION AND HYPERACTIVITY/IMPLICITY DURING CHILDHOOD IN TREATMENT-SEEKING, ALCOHOL DEPENDENT ADULTS

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Background: Previous research has found that ADHD is frequently comorbid with alcohol dependence, which may contribute to the high rates of cigarette smoking observed in this population. However, symptoms of inattention, hyperactivity, and impulsivity that fall below the ADHD diagnostic threshold may also be associated with smoking in this group, yet no studies to date have examined the cigarette smoking of alcohol dependent individuals across a spectrum of childhood ADHD symptomatology. We hypothesized that increasing levels of symptoms would be associated with increasing risk of lifetime smoking and nicotine dependence, greater severity of nicotine dependence, heavier smoking, and earlier onset of smoking.

Method: Individuals who were either seeking or already involved in residential or outpatient treatment for alcohol dependence (N=252) completed a semi-structured diagnostic assessment as well as measures of the severity of alcohol and nicotine dependence. Participants were classified into one of four symptom groups based on their self-report of ADHD symptoms during childhood: none, minimal (1-2 symptoms of inattention and/or hyperactivity/impulsivity), subthreshold (3 to 5 symptoms), or threshold (6+ symptoms).

Results: A substantial proportion of the sample reported subthreshold (n=42; 16.7%) or threshold (n=49; 19.4%) symptoms of inattention, hyperactivity and impulsivity during childhood. A higher number of self-reported ADHD symptoms were associated with increased likelihood of ever smoking, current smoking, nicotine dependence, and impaired concentration as part of nicotine withdrawal. However, no significant differences in age-at-onset of smoking, heaviness of smoking, or severity of nicotine dependence were found among the four symptom classes.

Conclusion: Inattention and hyperactivity/impulsivity are related to cigarette smoking and nicotine dependence among alcohol dependent individuals irrespective of the presence of diagnosable ADHD. Conceptualization of ADHD symptoms as occurring on a continuum may aid identification of and early intervention for individuals who are at highest risk for initiation and persistence of cigarette smoking.

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POS5-109 PSYCHOSOCIAL FACTORS ASSOCIATED WITH SUCCESSFUL TOBACCO CESSATION AMONG HIV-POSITIVE INDIVIDUALS

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The prevalence of tobacco use in the HIV-positive population ranges from 47-70%, which is more than 2 to 3 times higher than 10% of the general population. Furthermore, tobacco use among HIV-positive individuals is associated with a greater incidence and progression of tobacco-related diseases and conditions. Given these associations, tobacco cessation has the potential to vastly improve the health and well-being of this population. The purpose of this study is to examine the psychosocial characteristics of HIV-positive individuals who successfully quit smoking after participating in a randomized smoking cessation clinical trial. 444 HIV-positive smokers recruited from eight immunology clinics in the Northeastern U.S were assigned to one of two smoking cessation treatments—Standard Care plus nicotine replacement or Motivationally-Enhanced treatment plus nicotine replacement. The sample was 63% male and 37% female. The mean age was 42.07 (SD=7.68), the ethnic composition was as follows: European Americans 52% (n=230), African American 18% (n=82), Hispanic 16% (n=72), and 14% “Other.” Baseline and 6-month assessments included psychosocial measures and biochemically verified tobacco abstinence. Biochemically verified six-month abstinence rates in the two treatment conditions were not significantly different. A total of 100 participants were abstinent at six months. Post-treatment abstainers (n=100) and non-abstainers (n=344) were compared on baseline measures using ANOVA. Results indicated differences in motivation to quit (abstainers x=4.58, non-abstainers x=4.22), F(1, 442)=4.84, p<.05. Non-abstainers were found to use the nicotine patch for a greater number of weeks (abstainers x=5.08; non-abstainers x=3.83), F(1, 443)=12.0, p<.05. Given these findings, tobacco cessation interventions for HIV-positive populations may be enhanced through a greater emphasis on increasing motivation and knowledge of health risks as well as extending nicotine patch use.

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POS5-110 LC/MS-MS METHOD FOR DETERMINATION OF TOBACCO SPECIFIC NITROSAMINE METABOLITE NNAL IN HUMAN URINE

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Tobacco specific nitrosamines (TSNAs), found only in tobacco products, have been found to be carcinogenic and have been linked to tumors found in lungs, oral cavity, cervix and liver. Measurement of these TSNAs and their metabolic products may prove valuable in establishing biomarkers to study the carcinogenic nature of tobacco products. The tobacco specific nitrosamines NNAL and NNN along with their metabolic detoxification products NNAL-Glu, NNN-N-oxide, NNN-Glu and NNN-N-oxide have been proposed as potential markers for carcinogen uptake and metabolism. The purpose of this research would be to identify if populations have an increased or reduced cancer risk based on their relative TSNAs activation or deactivation pathway. As a first step, a specific and rapid method was developed for the determination of free NNAL based on a previously published method (Anal Chem., 77, 2005). The analysis of free NNAL in human urine was accomplished using liquid chromatography/atmospheric pressure ionization tandem mass spectrometry (LC/MS/MS). Sample preparation was comprised of a solid phase extraction using “molecularly imprinted polymers.” The HPLC method was appropriately modified based on the results of sensitivity, selectivity and matrix effect studies. Post column infusion studies conducted for the previously published method indicated the presence of an ion suppression matrix effect. The modified method was validated and was found to be linear in the 20 pg/mL to 2 ng/mL range. The limit of quantification (LOQ) for NNAL was 20 pg/mL with precision and accuracy within acceptable ranges. Future work would include development of simple methods for the other TSNAs and to develop a risk-scale evaluation tool using chemometric methods by elucidation of relationships between metabolite levels and perceived cancer risks.

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The Effect of Measurement on Estimates of Quit Intentions among Smokers

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Thirty-day and six-month quit intentions are often cited as key indicators for monitoring tobacco use. However, research examining their association with successful quits has demonstrated inconsistent results. Across sources, marked differences in prevalence rates of 30-day quit intentions have been observed. We examined two common measures of quit intentions, and hypothesize that method effects may explain disparities in findings. Baseline data from the 2005/06 Ontario Tobacco Survey (OTS) and the 2002 International Tobacco Control study (ITC) were compared to data from the 2005 Canadian Tobacco Use Monitoring Survey (CTUMS) and the 2005 Centre for Addiction and Mental Health Monitor (CAMH-M). The OTS and ITC determine quit intentions with a single question: Are you planning to quit smoking in the next month, in the next 6 months, sometime in the future beyond 6 months, or are you not planning to quit?— wording consistent with Stop, Think, Quit, and CAMH-M. We compared OTS intentions with two questions: Are you seriously considering quitting within the next 6 months/and… the next 30 days? Data were weighted to account for the sampling design. The OTS and ITC found that 39% and 45% of respondents, respectively, intended to quit within 6 months. Less than 15% intended to quit within the next 30 days in either survey. In contrast, data from CTUMS and CAMH-M suggest that over 50% of Ontarians intend to quit within six months, and approximately 25% intend to quit within 30 days. Differences in estimates may be due to several factors, including survey design, sample characteristics and question wording. Social Desirability Bias may play a role. The OTS and ITC question presents the options: not intending to quit; and intending to quit in more than six months. Literature suggests reading these options may make it seem more acceptable to admit having no immediate intentions to quit. However, other explanations require investigation. Our analyses demonstrate the need for careful attention in the development of questionnaire wording to reduce the impact of method effects on estimates of socially desirable and undesirable behaviors.

Smoking Free Ontario Strategy. Ontario Ministries of Health Promotion and Health and Long Term Care.

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Timeliness Follow-Back Versus Global Self-Reports of Inrequent Tobacco Smoking

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Methods to assess infrequent smoking are of concern among researchers, primarily because biochemical measures are not available to verify self-report smoking over a 30-day period. This study compares two methods to measure self-reported smoking in the past 30 days: the Timeline Follow-Back (TLFB), which is a calendar assisted recall, and two global questions commonly used in research “In the last 30 days, how many days did you smoke?” and “On the days that you smoked, how many cigarettes did you smoke?” A total of 252 college students (49% female, 96% white, mean age of 19) who smoked cigarettes between 1 and 29 days out of the past 30 days (non-daily smokers) completed computer-based assessments. As expected, values from the two measurement systems (TLFB and global questions) were highly correlated, including the total number of days smoked out of the past 30 days, the total number of cigarettes smoked in the past 30 days, and the average number of cigarettes smoked on smoking days (p<.001 for all three variables). However, dependent t-tests assessing if the differences between the measures (global questions minus TLFB) were significantly different from zero showed that the global questions significantly underestimated smoking relative to the TLFB. The global questions yielded 3.5 fewer cigarettes smoked out of the past 30 days (t=-3.57, df=251, p<.001) and 26 fewer cigarettes smoked per day (t=4.37, df=250, p<.001). There was no significant difference in days smoked out of the past 30 days. To address the concern that the values obtained were influenced by which measurement system was presented first (TLFB or global questions), we used t-tests to compared mean values obtained from two independent samples where the order of the measurement system was reversed. Results suggest that question order did not make a difference in the values obtained. To our knowledge, this is the first comparison of the TLFB and global measures of smoking among non-daily smokers. Results suggest that, compared to diary assisted recall, global questions commonly used survey research will underestimate cigarettes smoked by infrequent smokers.

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Routine Assessment of Sexual Orientation in Smokers Seeking Cessation Help

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Telephone-based cessation programs or quitlines, provide evidence-based services to diverse populations of smokers. At intake, quitline staff routinely capture client characteristics including contact information, smoking behavior, quitting history, and demographics, to provide appropriate service and to track program utilization. One proposed intake question is sexual orientation. Routinely assessing sexual orientation might communicate to members of the Lesbian, Gay, Bisexual, Transgendered (LGBT) community that the program accepts diverse lifestyles which, in turn, would lead to better outcomes. However, programs must balance the desire to provide service to callers quickly and the desire to know more about callers as they enter the program. Intake procedures that are long or intrusive can act as a barrier to treatment. This study was designed to determine the impact of routinely assessing sexual orientation at intake. Between 3/06-1/07 eligible callers (N=23,866) to the California Smokers’ Helpline were randomly assigned to be asked about sexual orientation or not asked. Differences in intake length were small (3% longer) but significant (p<.001). Asking did not result in higher rates of choosing counseling (83.0% of asked vs. 83.6% of not asked). Nor did it result in higher rates of receiving counseling among those opting for that service (74.9% of asked vs. 74.1% of not asked). Nearly 2% of callers refused to answer the question. Sexual orientation of respondents was: heterosexual/straight (93.6%), Gay/Lesbian (3.4%), bisexual (1.8%), other (1.2%). Qualitative information about comfort was assessed on a random sample of callers with over sampling of Gay/Lesbian, bisexual, refused to answer, and/or positive and negative comments. A Comfort Scale was developed and structured interviews rated. A frequent comment was that the question seemed irrelevant. A minority of callers stated the question was intrusive and a few callers stated they found the question useful. Self-identified Gays/Lesbians and bisexuals exhibited the same range of responses as self-identified heterosexuals.

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Breath Carbon Monoxide as a Biomarker for Smoking in an Urban Sample

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The purpose of this study was to explore the feasibility of determining a breath carbon monoxide (CO) cutoff level that optimally discriminated between smokers and nonsmokers using self-reported smoking status. We examined the CO cutoff level that optimally discriminated between smokers and nonsmokers in this sample with a smoking prevalence of 49%. The CO cutoff might be used when biochemical measures are not available to verify self-report smoking status. Smokers (n = 24), who were not interested in reducing or quitting smoking, and nonsmokers (n = 25) participated in a single laboratory session. Outcome measures were: breath CO level, semi-quantitative salivary cotinine concentration (NicAlert®), and self-reported smoking status and history. Smokers were 26 (SD 1.7) years old and had baseline CO and salivary cotinine (NicAlert®) levels of 21.4 (2.4) ppm and 4.9 (0.2), respectively. Nonsmokers were 34 (1.9) years old and had baseline CO and salivary cotinine levels of 1.8 (0.2) ppm and 0.04 (0.04), respectively. Receiver Operating Characteristic (ROC) analysis indicated that CO > 5 ppm was associated with 100% sensitivity (95% CI: 85.6-100.0) and 100% specificity (95% CI: 86.2-100.0) at a smoking prevalence of 49%. As expected, we found significant positive correlations between CO and number of cigarettes per day, number of years smoking, and pack years. Similar positive correlations were observed between salivary cotinine and the same measures. Caucasian smokers compared to African American smokers smoked more cigarettes per day (p = .05) and had higher CO (p < .05) and cotinine (p < .05) levels. There were no differences between male and female smokers. CO > 5 ppm was found to be the optimal cutoff to distinguish smokers versus nonsmokers in this sample with a smoking prevalence of 49%. The CO cutoff might differ in a sample that more closely reflects smoking prevalence in the general population (21%). The NicAlert® salivary cotinine test appears to be a valid measure of smoking status. Further study is required to distinguish between smokers, passive smokers, and nonsmokers. This study also suggests racial differences in smoking patterns in this urban sample.

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SEX DIFFERENCES IN CUE-ELICITED RESPONDING IN TOBACCO-DEPRIVED AND NONDEPRIVED SMOKERS


To understand the role tobacco craving plays in maintaining nicotine addiction and in relapse during quit attempts, researchers have used various methods to elicit craving in the laboratory. In this study, we compared the effectiveness of active imagery versus smoking cues in eliciting self-reported craving for tobacco and physiological responses. Smokers (n = 60, 30 males, 30 females) participated in two counterbalanced sessions, one after 12 hr of tobacco deprivation and the other after ad libitum smoking. At each session, participants were exposed in random order to four conditions: 1) imagery script consisting of smoking descriptors, 2) imagery script with no smoking descriptors, 3) smoking cues (holding a lit cigarette), and 4) neutral cues (holding a pencil). At baseline and for 30 min after each condition, physiological measures were assessed, and participants completed scales assessing cigarette craving and mood. Smokers in the tobacco-deprived condition reported greater craving than in the nondeprived condition at baseline and throughout the session. Deprived smokers showed no change in craving responses in the smoking-related imagery and cue conditions compared with neutral conditions; lack of change was not due to ceiling effects. In contrast, nondeprived smokers reported greater subjective tobacco craving only in response to smoking versus neutral cues. Heart rate and blood pressure were increased reliably by smoking cues, but not imagery. Males showed little difference in craving response between imagery and cue conditions and between deprived and nondeprived conditions. In contrast, females responded more robustly to smoking cues than imagery with respect to craving report and physiological response. Females also showed a greater increase in craving response and negative mood in the nondeprived condition. These findings suggest that smoking cues are more effective than imagery in eliciting tobacco craving and physiological responses in nondeprived smokers. The finding that females were more sensitive to smoking cues than males has implications for differential treatment of tobacco dependence.

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