SYM1A

CRAVING REACTIVITY TO SMOKING AND ALCOHOL CUES IN ALCOHOLIC AND NONALCOHOLIC SMOKERS

David Drobes*, Ph.D., University of South Florida

This study examined reactivity to drug-related and affective cues among male and female alcoholic (n=22) and nonalcoholic (n=19) smokers. Alcoholics and nonalcoholics were matched for age (34.6 years) and daily smoking amount (22.5 cigarettes), but as expected, alcoholics consumed alcohol more frequently (84% vs. 22% drinking days) and in greater amounts (12.7 vs. 2.9 drinks per drinking day) than nonalcoholics. After abstaining from smoking for 4 hours, each subject attended a laboratory session during which they viewed ten pictures from each of five categories (smoking-related, alcohol-related, pleasant affect, unpleasant affect, and neutral affect) for six seconds each in two sequences. In the first sequence of cue presentations, physiological measures were obtained continuously. In the second sequence, cravings and other subjective cue reactions were obtained. Both groups showed significant physiological arousal (heart rate and skin conductance) in response to smoking cues, whereas alcoholic smokers showed greater physiological reactivity to alcohol cues. The overall pattern of craving ratings indicated particularly strong cross-cue reactivity among the alcoholic smokers. That is, both alcohol and smoking cues elicited strong cravings to drink alcohol and cravings to smoke in this group. Among nonalcoholics, there were no sex differences in reported alcohol cravings, yet females reported stronger cravings to smoke in response to both smoking-related (p=.03) and unpleasant (p=.01) cues than men. Among alcoholics, males reported significantly stronger cravings to smoke in response to all cues except smoking-related cues (p=.02), to which males and females both reported substantial cravings. Males in this group also reported stronger cravings to drink alcohol in response to pleasant affect cues (p=.02). Overall, these findings indicate important individual differences in cue reactivity based on alcohol history: female smokers without a history of alcoholism reported stronger cue-elicited cravings to smoke than men, but within alcoholics, male smokers had more pronounced cue and cross-cue reactions to smoking and alcohol cues compared to women.

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SYM1B

THE RELATIONSHIP BETWEEN SMOKING URGE AND ALCOHOL CONSUMPTION

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The current study examined sex differences in smoking urges after alcohol consumption in heavy social drinker-smokers. Participants (aged 21-35) were male (n=21) and female (n=16) nonnicotine dependent, casual smokers averaging smoking 4.9 (±0.9) cigarettes per occasion, 3.9 days/week. Subjects also consumed 10 or more alcoholic drinks per week with regular weekly heavy drinking episodes (i.e., 5 +drinks/occasion for male, 4 for females). The within-subject study consisted of three evening sessions where subjects were given a 0, 2 or 4 alcoholic drink equivalent beverage, in random order. Subjects were smoke-free for three hours prior to and throughout testing. Main dependent measures were Time Line Follow-Back (TLFB)-derived estimates of past month daily alcohol and smoking behaviors, and the Brief Questionnaire of Smoking Urges (BQSU), completed at several intervals before and after beverage consumption in the laboratory. Results from the TLFB revealed significant increases in smoking as a function of alcohol drinking (mean 1.3 cigarettes on non-drinking days versus 2.7 and 5.8 cigarettes on light and heavy drinking days, respectively). While men and women were similar on baseline smoking and alcohol parameters, in the laboratory, women tended to have lower overall BQSU scores for both subfactors, i.e., urges for stimulation and urges to relieve negative affect (p<.06). Alcohol produced similar potent dose-dependent increases in smoking urges between the sexes but there was a significant sex difference in the relationship between smoking and drinking. Men showed a positive relationship between alcohol-induced smoking urges (high dose-placebo BQSU) and smoking behavior (TLFB #cigs binge day - #cigs non-drinking day) (r=.60, p=.001), but this relationship was not significant in women (r=.10, p=.3). The results suggest that smoking urges during alcohol drinking are directly associated with increases in smoking behavior in men but not women. It may be speculated that alcohol-induced increases in smoking in women are related to a more complex array of factors, such as direct effects of alcohol and other exteroceptive (mood, social setting, etc.) factors.

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SYM1C  THE EFFECTS OF NICOTINE ON ALCOHOL CONSUMPTION IN LIGHT SMOKERS

Harriet de Wit*, University of Chicago; Ashley Acheson, University of Chicago; Stephen Mahler, University of Michigan

This study examined the effects of transdermal nicotine on consumption of alcohol in light social smokers and drinkers. Male (n=22) and female (n=12) light smokers (1-5 cigarettes a day) participated in three sessions at one-week intervals. On each session they received a patch (0.7 or 14 mg nicotine), under double-blind conditions, followed two hours later by an alcohol consumption period. During the alcohol consumption period, they first consumed a required drink (0.2 g/kg) and then had 8 opportunities to choose between alcohol and varying, individualized amounts of money. The primary outcome measure was the amount of alcohol consumed in the choice phase. Secondary measures were the direct subjective effects nicotine before consumption of alcohol, and the subjective effects of the required dose of alcohol in the three nicotine conditions. Nicotine decreased alcohol consumption in women, but significantly increased alcohol consumption in men (dose x gender, p<0.02). Nicotine dose dependently increased ratings of nausea in about half of the subjects. Even when subjects who experienced nausea were excluded from the analysis, males consumed more alcohol after nicotine (14 mg) and women consumed less. Nicotine alone (14 mg) increased ratings of anxiety and high, decreased drug liking, and for women but not for men, it decreased ratings of positive mood and elation. Taken together, these findings suggest that there are pharmacological interactions between alcohol and nicotine, but that the interactions depend upon the sex of the subject.

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SYM1D  PSYCHOPHARMACOLOGIC INTERACTIONS BETWEEN ALCOHOL AND NICOTINIC AGENTS

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Epidemiological, clinical, and laboratory evidence have shown a high correlation between smoking and alcohol use, but the mechanisms underlying this association are not clear. Some previous research has suggested that nicotine increases, and mecamylamine attenuates, the reinforcing effects of alcohol. The purpose of this study was to further investigate pharmacological interactions between alcohol, nicotine, and the nicotinic antagonist mecamylamine. 32 subjects, who regularly smoke (1-5 cigarettes a day) participated in four laboratory sessions, presenting a 2 (mecamylamine 10 mg vs. placebo) x 2 (alcohol 0.8g/kg vs. placebo in males, and alcohol 0.7 g/kg vs. placebo in females) x 2 (21 mg/24 hours nicotine patch vs. placebo) design. Subjects also smoked controlled doses of nicotine and denicotinized cigarettes in each session. Alcohol was a between-subjects factor and nicotine patch, mecamylamine and cigarette type were within-subjects factors. Subjective effects of alcohol and placebo beverages as well as ratings of cigarettes were assessed. Preliminary results indicate that mecamylamine significantly attenuated the euphoric genetic effects of alcohol and this effect was offset by nicotine patch. Ratings of cigarette reward were increased by alcohol in the placebo patch condition but alcohol decreased ratings in the nicotine patch condition. These complex interactions between alcohol and nicotinic agents may help point the way to new therapeutic strategies for smoking cessation.

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SYM2A  ADVANCING CANDIDATE CHRNA4 SNPS: BIOINFORMATICS, CELL CULTURE, AND HUMAN POST-MORTEM BRAIN TISSUE ANALYSES

Heather M. Haughey*, Ph.D. David L. Allen, Ph.D., Kent E. Hutchison, Ph.D., University of Colorado at Boulder

The nicotinic α4β2 subunit gene (CHRNA4) is a prime target for research into the genetic factors influencing addiction. To better understand the role of this gene in tobacco use and dependence, we developed an integrative approach involving 1) bioinformatic analysis to screen and rank single nucleotide polymorphisms (SNPs); 2) in vitro reporter assays to determine the functional relevance of selected SNPs, and 3) gene expression assays in human post-mortem brain tissues from genotyped individuals. The NCBI SNP database was searched for validated SNPs located in the promoter, 5’ or 3’ untranslated regions (UTRs) of CHRNA4. To identify promoter SNPs that might change a transcription factor binding site, approximately 15 SNPs were screened using MatInspector 4.0. A total of 2 promoter SNPs (rs6122429 and rs6090387) and one 3’ UTR SNP (rs22286196) were chosen for functional studies. For the promoter SNPs, two “sensor constructs” consisting of 4 tandem copies of each SNP variant upstream of a minimal thymidine kinase promoter driving expression of a luciferase reporter gene were created. In addition, 2 constructs were created in which the entire 3’ UTR of the CHRNA4 gene containing the 3’ UTR SNP variants was placed 3’ to a luciferase reporter gene. The constructs were transfected into HEK293T cells; all 3 SNPs significantly altered luciferase activity. These results suggest that these SNPs may influence human gene expression. To validate these results, CHRNA4 mRNA levels in human post-mortem Pre-Frontal Cortex (PFC), Nucleus Accumbens (NA), and Ventral Tegmental Area (VTA) from 20 subjects were measured using real-time RT-PCR. Subjects with the AA genotype of SNP rs22286196 displayed significantly more CHRNA4 mRNA (normalized to B-Actin) in NA and PFC than those with the AG genotype. In summary, this integrative systematic approach to determine the functional relevance of selected CHRNA4 regulatory SNPs has provided useful insights into the role of genetic variation in regulating CHRNA4 expression.

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Genetic Variability in CHRNA4 Modulates Nicotine Sensitivity in Mice

Jerry A. Stitzel*, Ph.D., Jennifer Drapeau, B.A., Jeanne M. Wehner, Ph.D., Christopher M. Butt, Ph.D., University of Colorado at Boulder

Nicotine’s effects are a consequence of its ability to bind to a large and indeterminate number of nicotinic receptor (nAChR) subtypes that are located throughout the central and peripheral nervous systems. Therefore, in order to understand the neurobiological mechanism of nicotine addiction, it is essential to establish which nAChR subtypes are involved in the addiction process. Towards this objective, our laboratory utilizes a genetic strategy in the mouse in an attempt to establish which nAChR subtypes influence individual differences in response to nicotine. Our current focus is on a naturally occurring polymorphism in Chrn4, the gene that encodes the nAChR a4 subunit. The polymorphism leads to a threonine/alanine polymorphism at amino acid position 529 of the a4 subunit. Both biochemical and electrophysiological approaches indicate that the polymorphism alters the function of a4 containing nAChRs. Moreover, using various mouse populations, we have found that the Chrn4 polymorphism is associated with individual differences in acute nicotine sensitivity for several measures and influences individual differences in nicotine consumption. These data, along with the data to be presented by Drs. Haughey, Allen, and Hutchison, support the hypothesis that genetic variability in Chrn4/CHRNA4 in both mice and humans is a determinant of nicotine sensitivity/addiction liability. The apparent common role of genetic variability in Chrn4/CHRNA4 in modulating nicotine related behaviors in mice and humans suggests that future translational studies to evaluate human CHRNA4 polymorphisms in a mouse model are feasible.

Testing the Translation to Human Behavior: An Association with Nicotine Sensitivity in Humans

Kent E. Hutchison, Ph.D., Heather Haughey, Ph.D., David Allen, Ph.D., Angela Bryan, Ph.D., University of Colorado at Boulder

Based on data suggesting that two SNPs were associated with gene expression in cell culture as well as post-mortem brain tissue, analyses were conducted to determine whether these SNPs were functional on a behavioral level. To that end, regular tobacco smokers completed questionnaires regarding tobacco use and were then instructed to abstain from smoking for 8 hours prior to a laboratory appointment. After the 8 hours of abstinence, subjects were exposed to smoking cues and subsequently smoked three high nicotine (1.1 mg) cigarettes spaced 25 minutes apart. Measures of craving and affect were collected before and after exposure to the smoking cues. Measures of sensitivity to nicotine and affect were collected after each cigarette. Analyses revealed a significant association between both SNPs and sensitivity to nicotine. Specifically, RS2236196 was associated with the subjective physiological effects of smoking (e.g., heart pounding, dizziness), the subjective cognitive effects (e.g., alert, attentive), and stimulation as well as tension after smoking. Individuals with the G/G genotype demonstrated greater subjective sensitivity on these dimensions (e.g., alert, attentive), and stimulation as well as tension after smoking. Individuals with A/G genotype showed greater subjective sensitivity to nicotine, which in turn, may influence the etiology of tobacco dependence.

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Associations of Two CHRNA4 SNPs with Smoking Behavior and Abstinence in a Nicotine Replacement Therapy Trial

Christopher Jepson*, Ph.D., Freda Patterson, Ph.D., Caryn Lerman, Ph.D., Kent E. Hutchison, Ph.D., Neal Benowitz, M.D., and Margaret Rukstalis, M.D., University of Pennsylvania

We examined associations of two genetic variants in CHRNA4 with pre-treatment smoking behavior and post-treatment abstinence in an open label randomized clinical trial of transdermal nicotine patch (TN) versus nicotine nasal spray (NS). Two single nucleotide polymorphisms (SNPs) were examined: (1) 3′ UTR SNP rs2236196 and (2) 5′ promoter SNP rs6122429. Participants were 353 smokers of European ancestry who attended at least 1 treatment session. Treatment included 8 weeks of TN or NS plus 7 sessions of behavioral group counseling. Seven-day point prevalence abstinence, biochemically verified by breath CO, was assessed at end of treatment (EOT) and at 6 months post-target quit date (TQD). For the 5′ promoter SNP, 7 cases were AA, 84 were AG, and 262 were GG; for the purposes of the analysis, we treated AA and AG cases as a single group. For the 3′ UTR SNP, 190 cases were AA, 140 were AG, and 23 were GG; we treated AG and GG cases as a single group. Cases with AA or AG at the 5′ promoter SNP had significantly lower baseline scores on the Fagerstrom Test for Nicotine Dependence than did GG cases (mean(sd) = 5.07(2.17) for AA/AG, 5.69(2.24) for GG; p = .022). They also showed significantly fewer cigarettes per day at baseline (mean(sd) = 21.7(8.8) for AA/AG, 24.1(9.3) for GG; p = .029), and had marginally lower cotinine levels (mean(sd) = 231.2(101.4) for AA/AG, 256.4(127.3) for GG; p = .06). The 3′ UTR SNP was not significantly associated with these pre-treatment variables. In logistic regression analysis of abstinence at 6-month follow-up controlling for sex and pre-treatment nicotine dependence, the interaction between the 3′ UTR SNP and treatment group was significant (OR = 3.39, CI = (1.08, 10.62); p = .036). Among AA cases, abstinence rates were 20.7% on TN and 13.3% on NS; among AG or GG cases, rates were 13.7% on TN and 23.3% on NS. The main and interacting effects of the promoter SNP on abstinence were not significant. These preliminary data suggest that functional genetic variation in the CHRNA4 may be associated with nicotine dependence and smoking persistence, and that different CHRNA4 genetic variants may relate to these phenotypes.

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Adolescent tobacco use is a health problem of epidemic proportions since over three million adolescents smoke cigarettes in the United States (USDHHS, 1994). Each day, nearly 2000 children and adolescents in the United States under the age of 18 begin smoking (Johnston et al., 2003). Recent CDC data (MMWR, 2001) suggest that among adolescents who reported smoking daily at some point, 72.9% had tried to quit smoking while only 13.5% were former smokers. These statistics emphasize the importance of providing smoking cessation programs for this population of high-risk smokers. Yet, there are few empirically validated smoking cessation interventions for these young smokers (see review by Garrison et al., 2003). This symposium will present and discuss evidence from innovative ongoing research focused on developing adolescent- and young adult-specific smoking cessation interventions. Dr.’s Ping Sun and Steve Sussman will present outcome data from the dissemination of Project Ex in a classroom setting; Project Ex is a smoking prevention/cessation program originally developed for use in school-based clinics involving the inclusion of enjoyable, motivating activities to educate students about tobacco use and help them quit smoking. Dr. Karen Hanson will present evidence on the use of a “harm reduction” program combining nicotine replacement with cognitive behavioral therapy to reduce smoking in adolescent smokers. Dr. Suchitra Krishnan-Sarin will present preliminary results from a high school-based smoking cessation program involving Contingency management of abstinence in combination with Cognitive Behavioral Therapy. Dr. Peter Monti will present preliminary evidence from an ongoing trial of Contingency management in combination with a Motivational Intervention for college age smokers. Finally, Dr. Robin Mermelstein will serve as the discussant for this symposium and will comment on the methodological, ethical and policy issues related to these interventions and to achieving smoking cessation in this high risk population.

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SYM3A
SHORT-TERM EFFECTS OF PROJECT EX4: A CLASSROOM-BASED SMOKING PREVENTION AND CESSATION INTERVENTION PROGRAM

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OBJECTIVE: Researchers continue to try to develop effective teen tobacco use prevention and cessation programs. Three previous school clinic-based studies established the efficacy of Project EX for teen smoking cessation. This 4th study adapts Project EX to the classroom context, to render both prevention and cessation effects among high risk smoking and non-smoking youth. This paper reports the findings based on pretest and posttest surveys conducted immediately prior and post-intervention.

METHODS: An eight session classroom based curriculum was developed and tested with a randomized controlled trial that involved 6 program and 6 control continuation high schools (n=1097 students). Process evaluations involved self reports provided by students in the program condition on items attached to the posttest survey. Curriculum-targeted knowledge and smoking measures were assessed at both the pretest and posttest surveys, and were used to evaluate the program’s effect on the immediate outcomes. The immediate outcomes effects were analyzed with multilevel random coefficients models.

RESULTS: Program students provided favorable process ratings of the overall program and each session. Compared with the students in the control condition, students in the program condition showed a greater change in correct knowledge responses from pretest to posttest (b=+5.9%, p=0.0002). Students in the program condition also experienced a greater smoking reduction effect (b=+5.1%, p=0.025), weekly (b=+5.9%, p=0.057), and daily (b=+3.5%, p=0.058) smoking, and of number of times one smoked during the last 30 days (b=+3.5 times, p=0.024). Positive program effects were revealed among both smoking (p=0.063) and non-smoking (p=0.049) sub-samples.

CONCLUSIONS: EX4 immediate outcome results revealed favorable process evaluations, increases in knowledge, and decreases in smoking relative to a standard care control condition, with effects on behavior found both for baseline smokers and non-smokers.

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SYM3B
HARM REDUCTION: AN INTERVENTION FOR ADOLESCENT SMOKERS

Karen Hanson*, Ph.D., Emily Zylla, B.A., Sharon Allen, M.D., Ph.D., George Avery, Ph.D., M.P.A., and Dorothy Hatuskami, Ph.D., University of Minnesota, Tobacco Use Research Center, Minneapolis, Minnesota

This study examined the following aspects of smoking reduction among adolescents: (a) the most effective method, (b) reduction of smoking by 50% of baseline smoking, (c) rates of smoking cessation, and (d) levels of biomarkers to toxic exposure. The study design was a randomized, open-label trial of nicotine patch and nicotine gum that included a placebo condition. The intervention also provided intensive cognitive behavioral therapy. Participants (N=106) attended 4 treatment visits over 4 weeks and follow-up visits at 3- and 6-months. Participants were told to reduce their smoking by 25% of baseline smoking during the first week and by 50% of baseline smoking during the subsequent three weeks. The mean percent reduction of baseline smoking rates at the end-of-treatment was 51.7% (N=83). Participants in the nicotine patch group reduced their smoking significantly during the second and third weeks of treatment compared to those in the other treatment groups (both p<0.05), with no differences between treatment groups at the end-of-treatment (p=0.59). Additionally, no differences by treatment group were found for attaining a 50% reduction of baseline smoking. At the end-of-treatment, 57.5% (N=50) had reduced smoking by at least 50%. Point prevalence analysis (30-day abstinence rate) of participant abstinence indicated no significant differences between treatment groups (p=0.78). No participants attained a 30-day period of abstinence at the end-of-treatment. At the 3- and 6-month follow-up visits, 6.8% (N=7) and 4.7% (N=45) of participants achieved a 30-day period of abstinence, respectively. There was no relationship between NNAL concentrations and treatment group (p=0.84), visit (p=0.67) or the interaction of the two (p=0.30). In sum, most participants reduced smoking by at least 50% at the end-of-treatment. When participants were recruited for this study, they were interested to quit smoking, yet some participants attempted to quit and achieved short-term success. There was no significant reduction in NNAL at the end-of-treatment. Finally, there were few differences between treatment groups with regard to reducing or quitting smoking.

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SYM3C
CONTINGENCY MANAGEMENT FOR SMOKING CESSATION IN ADOLESCENT SMOKERS

Suchitra Krishnan-Sarin*, Dana Cavallo, Amanda McFetridge, Thomas Liss, Tricia Dahl, Yale University School of Medicine; Amy Duhig, Indiana University-Purdue University-Indianapolis

Contingency management (CM) approaches, in which desired behaviors (for e.g. abstinence from recently used drug use) are directly reinforced, have been successfully used to reduce tobacco use in non-treatment seeking as well as in treatment seeking adult smokers. However, despite the promise of CM for smoking cessation in adult smokers, there has been a paucity of research on CM as a treatment for adolescent smokers. This pilot study evaluated the use of contingency management (CM) in combination with weekly cognitive behavioral therapy (CBT) for smoking cessation in adolescent smokers. Twenty-eight adolescent smokers participated in a one-month, school-based smoking cessation program and were randomly assigned to receive either CM in combination with CBT or CBT alone. In the CM + CBT group, biochemical verification of abstinence was obtained using twice daily breath carbon monoxide levels and once daily semiquantitative urine cotinine levels during the first two weeks; followed by daily appointments during the third week and once every other day during the fourth week. Participants in this group were monetarily reinforced for staying abstinent on a schedule of escalating magnitude of reinforcement with a reset contingency. Participants in both groups received weekly CBT sessions. All daily appointments were conducted at local high schools and weekend appointments were held at other public locations. At the end of one week and one month of treatment, abstinence verified using quantitative urine cotinine levels was higher in participants in the CM + CBT group (one week: 78.7%; one month: 53.0%) when compared to the CBT alone group (one week: 7.2%; four weeks: 0%). These preliminary results provide a strong initial signal supporting the utility of CM techniques for smoking cessation in adolescents and demonstrate the feasibility of implementing such a program in a school setting.

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SYM3D
COMBINING MOTIVATIONAL ENHANCEMENT AND CONTINGENCY MANAGEMENT FOR YOUNG ADULT SMOKERS

P. Monti*, T. O’L. Tevyaw, J. Tidey, S. Colby, C. Kahler, N. Barnett, and D. Rohsenow, Brown University, Providence, RI

In this ongoing study, we examine the combined efficacy of motivational enhancement treatment (MET) with contingency management (CM) in decreasing smoking rates among college student smokers. In a 2 x 2 experimental design, 50 daily smokers (M=19.6 yrs, 24% women; 90% white, 4% Asian American, 6% African American; M cigs/day=12.4 ± 8.1), with baseline CO levels > 10 ppm (M=17.4 ± 5.6), have been randomly assigned to CM plus MET, CM plus Relaxation Control (REL), Noncontingent Reinforcement (NR) plus MET, or NR plus REL. Carbon monoxide (CO) samples are collected twice daily for 3 consecutive weeks. A fixed ratio ratio schedule of reinforcement is utilized, in which participants randomized to CM earn $5 for providing each CO sample plus escalating amounts of cash based on reductions from baseline CO levels during Week 1 and for CO < 5 ppm during Weeks 2-3, while those in NR earn $5 for providing each sample. Preliminary analyses examining smoking variables across the 3 weeks of treatment indicate significant between-groups differences on average CO levels (F (3, 46) = 5.25, p = .003) and longest duration of abstinence as measured by consecutive abstinent readings (F (3, 46) = 5.22, p = .003). Post-hoc tests show that participants randomized to both CM conditions have significantly lower average CO levels and significantly longer abstinence duration than those in NR + REL. One-month follow-up data indicate significant reductions from baseline on average number of cigarettes (F (3, 39) = 46.95, p < .001), average CO levels (F (3, 39) = 11.14, p = .002) and cotinine levels (F (3, 39) = 7.74, p = .009) across all groups. Results will be discussed in terms of the individual and combined short- and longer-term benefits of CM and MET in changing smoking rates among young adult smokers.

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SYM4
NOVEL CHANNELS AND MEDIA FOR DELIVERING SMOKING CESSATION SERVICES

Saul Shiffman*, Ph.D., University of Pittsburgh and Pinney Associates; Tim McAfee, Free & Clear; Robyn Whittaker, University of Auckland, New Zealand; David Wetter, Ph.D., Paul Cinciripini, Ph.D., UT M.D. Anderson Cancer Center; Victor Strecher, University of Michigan

Recent years have seen an explosion of innovations in how smoking cessation services are disseminated and delivered. This symposium focuses on the use of new delivery channels and media to deliver cessation services so as to increase their effectiveness, their overall reach, and their reach to specific populations previously lacking access to treatment. Tim McAfee describes the growing use of telephone quitlines, and their integration with delivery and dissemination of nicotine replacement therapy, noting how the offer of NRT substantially enhances enrollment in quitline counseling. Victor Strecher describes the use of computer-tailored programs delivered via the web, summarizing data from two large randomized trials demonstrating the effectiveness of web-based programs and the importance of tailoring for effectiveness. David Wetter and Paul Cinciripini describe the use of palmtop computer to implement sophisticated treatment algorithms that adapt and respond to quitters’ hour-to-hour experience as they quit smoking to provide timely guidance. They report on three studies with diverse populations. Robyn Whittaker describes a novel and successful program in New Zealand, using text messaging to deliver smoking cessation content to smokers’ cell phones, while also allowing users to pull down tips relevant to their current situation. All the presenters will identify advantages, promises, and challenges of each method, as well as presenting clinical data on their effectiveness and reach. Finally, Saul Shiffman, as discussant, will identify common themes and challenges, and comment on the promise of new media, singly and in combination, for disseminating effective smoking cessation treatment on a mass scale. Dr. Shiffman consults to GlaxoSmithKline Consumer Healthcare, which markets smoking cessation treatments, and has a financial interest in a new nicotine replacement treatment.

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SYM4A
QUITLINES AND NRT

Tim McAfee*, Terry Bush, Mona Deprey, Heidi Grossman, Susan Zbikowski, Free and Clear; Jennifer McClure, Group Health Cooperative; Cathryn Cushing, Oregon Department of Health

State-funded quitlines now exist in almost every state. Health plans and employers are increasingly providing more intense phone-based cessation services. While proven effective, quitlines are underutilized, with less than 0.5% to 3% of smokers/year calling state lines. Some health plans and employers have reached more (10-25%), with incentives, medication coverage and heavy promotion. In many states, mass media drives participation, but is expensive. We evaluated the impact of a free 2-week starter kit of patches on quit rates, call rates, satisfaction, and medication use, via a time-series trial. From a random sample of smokers receiving one counseling call from the Oregon Quit Line (ORQL) we completed phone surveys 6 months post-registration before (N= 268) and after (n = 614) the start of a free NRT campaign (October 1st, 2004). Those offered a starter kit were more likely to use the patch (86.2% vs. 41.8%, p<.01), with 47.2% getting additional patches, including 72.9% paying for them. 96% indicated free patches motivated them to call the ORQL. Post-promotion callers were more satisfied (89.8% vs. 84.8%, p<.04) and more were abstinent at least 30 days (28.8% vs. 14.9%, p<.001) at 6 months. ORQL enrollments averaged 481/month before and 2,064/month after launch. Results provide evidence for effectiveness of offering a starter kit of free patches along with telephone counseling. Presentation will review how phone programs maximize application of the science and art of cessation treatment by making live human interaction supported by computer-based protocols easily accessible. The promise and challenge is to markedly increase their reach, effectiveness and efficiency, including integrating phone programs with other forms of e-communication and increasing behavioral and medical sophistication within a chronic care model.

Funding: Oregon Dept. of Human Services, Tobacco Prevention and Education Program. CDC. Dr McAfee is an employee of and has an interest in Free & Clear, which provides telephone cessation services to 14 states and over 60 health plans and employers.

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SYM4B
WEB-BASED TAILORED SMOKING CESSATION

Victor Strecher*, University of Michigan; Saul Shiffman, Pinney Associates and University of Pittsburgh; Robert West, University College London; Jennifer McClure, Sarah Greene, Group Health Cooperative; Ronald Davis, Gwen Alexander, Henry Ford Health System

We examined the utility of the World Wide Web ("Web") in population-based smoking cessation efforts. In particular, two trials were analyzed for their overall efficacy and their moderating and mediating relationships. One trial randomized over 3,500 smokers who used a nicotine patch and enrolled in a web-based program to (1) a web-based computer-tailored smoking cessation program or (2) web-based untailored behavioral support materials. Tailored intervention yielded higher quit rates at 12 weeks (OR=1.34; p=0.0006). Moreover, the tailored intervention worked particularly well among smokers who reported tobacco-related illness, children in the household, and a higher frequency of alcohol consumption at baseline. Mediators of treatment effect included perceived message relevance (an indicator of tailoring) and adherence with the nicotine patch. The second study uses a multiphase optimization strategy (MOST) to study potentially active message and communications components of a web-based cessation program. The study includes over 1,800 smokers from two large health maintenance organizations. Seven-day continuous abstinence was determined through self-report at 6-month follow-up. Results indicate that deeper tailoring is associated with better cessation outcomes.

Studies were supported by GlaxoSmithKline Consumer Healthcare (GSKCH) and by the National Cancer Institute (P50 CA086254), respectively. The first three authors have consulted to and undertaken research for GSKCH and other manufacturers of cessation products. Dr. Strecher is a shareholder in HealthMedia, Inc., which developed the intervention tested in this study. Dr. Shiffman has a financial interest in a new nicotine replacement product.

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SYM4C
PALMTOP COMPUTER-DELIVERED TREATMENTS FOR SMOKING CESSATION

David Wetter*, Ph.D., Paul Cinciripini*, Ph.D., UT M.D. Anderson Cancer Center

Palmtop computer-delivered treatments (CDTs) have tremendous potential for advancing the treatment of nicotine dependence. Because CDTs can provide treatment in natural settings in real time, they may be able to directly address the episodic nature of high risk situations, craving, and relapse by providing interactive assistance precisely when needed to prevent a lapse, by preventing a lapse from becoming a full-blown relapse, or by facilitating “recycling” after relapse. CDTs can build on innovative research on tailoring and may be able to further the individualization process by tailoring each individual’s treatment based on acute events and experiences assessed in real time. Because most smokers prefer self-help approaches, CDTs also have the potential to increase the acceptability of behavioral treatments. Moreover, because CDTs can be accessed as frequently as desired, they may be able to deliver interventions of higher intensity (e.g., greater frequency and/or duration of contacts). In addition, CDTs could be easily adapted and widely disseminated for use with special populations, as a stand-alone treatment, or as an adjuvant to brief advice, cessation programs, inpatient programs, etc. The investigators describe three randomized clinical trials investigating CDTs for smoking cessation and relapse prevention. The aim of Project WIN was to prevent relapse among women smokers who quit using the patch and a traditional group behavioral program. The CDT in WIN was individualized for each woman using ecological momentary assessment procedures. Project CASSI used a CDT to implement a behavioral treatment program (scheduled reduced smoking) that had been previously demonstrated to be efficacious. Finally, Break Free is an ongoing trial evaluating a culturally tailored CDT designed for urban African American smokers.

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SYM4D
A NOVEL SMOKING CESSATION INTERVENTION USING MOBILE PHONE TEXT MESSAGING

Anthony Rodgers, Tim Corbett, Dale Bramley, Tania Riddell, Mary Williams, Ruey-Bin Lin, Mark Jones, *Robyn Whittaker, University of Auckland, New Zealand

Most young adults now own a mobile phone, presenting a new medium for smoking cessation initiatives. A New Zealand RCT tested the effectiveness of a mobile phone text messaging smoking cessation programme. 1705 smokers who wanted to quit, were aged >15 years and owned a mobile phone were randomised to an intervention group that received regular, personalised text messages providing smoking cessation advice, support and distraction, or to a control group. All participants received a free month of text messaging. Follow-up data were available for 1624 (95%) at 6 weeks and 1265 (74%) at 6 months. More participants had quit at 6 weeks in the intervention compared to the control group: 239 (28%) vs. 109 (13%), RR 2.29 (1.79, 2.70), p<0.0001. This effect was consistent across age, sex, income level and geographic location. The intervention was as effective for Maori (indigenous New Zealanders) as non-Maori, providing the potential to reduce disparities in tobacco-induced diseases for ethnic minorities. The benefits of this medium are that programmes can be affordable, personalised, age-appropriate and not location-dependent. Mobile phones have been widely adopted by young people and are always carried with them, giving a wide reach and an "always on" aspect to such programmes. Future research will test these findings in different settings, further assess long-term quit rates, and examine uses of advances in mobile phone technology.

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SYM4E
PRENATAL SMOKING EFFECTS ON BEHAVIORAL DYSREGULATION: METHODOLOGICAL ISSUES AND NOVEL APPROACHES

Laurie Stroud, Ph.D.*, Brown Medical School; Stephen Buka, Sc.D., Harvard School of Public Health; Marie Cornelius, Ph.D., University of Pittsburgh; Kimberly Andrews Espy, Ph.D., University of Nebraska, Lincoln; Theodore Slotkin, Ph.D., Duke University; Raymond Niaura, Ph.D.*, Brown Medical School

Although consistent effects of maternal smoking during pregnancy have emerged for a variety of adverse offspring outcomes across domains and development (e.g., behavioral, cognitive, and health outcomes from infancy to adulthood), past research has been confounded by critical methodological limitations that make causality difficult to demonstrate. Most prior reports describe large, epidemiological studies not originally designed to examine prenatal smoking. Maternal smoking has typically been measured retrospectively in the context of exposure to other drugs of abuse or with single-item measures. Few studies have included biochemical verification of exposure status or levels; genetic and family factors have rarely been examined, and important covariates such as postnatal smoking exposure have not been rigorously controlled. Presenters in this symposium will discuss methodological limitations of previous studies, then present novel methodologies, approaches, and results. Dr. Stroud will open the symposium with an overview of the field and summary of methodological limitations of prior studies. Dr. Buka will present two new approaches for disentangling the influence of family factors and postnatal smoking—a discordant sibling pair design and propensity modeling approach—using data from the National Collaborative Perinatal Project. Dr. Cornelius will elucidate the unique effects of prenatal smoking in a rigorous model including a number of key proximal and maternal influences with data from two prospective studies. Dr. Espy will present new methods for examining behavioral dysregulation in infancy as well as gene X prenatal exposure interactions in predicting infant behavior. Finally, Dr. Slotkin will present state-of-the art animal models for examining effects of prenatal nicotine and environmental tobacco smoke exposure on brain development in rodents and primates. Dr. Niaura, the discussant, will integrate across presentations, discuss implications for treatment and public health, and identify key questions, methodologies and approaches for future research.

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SYM5A  ESTIMATING THE CAUSAL EFFECTS OF MATERNAL SMOKING DURING PREGNANCY: Discordant Sibling Pair and Propensity Score Analyses


This paper will address some of the methodological challenges in demonstrating a causal link between prenatal exposure to maternal smoking during pregnancy and behavioral and cognitive sequelae. While recent prospective designs with biologically-validated measures of maternal smoking, have reduced potential information bias, these and other investigations are also highly vulnerable to confounding due to both within- and between-family factors such as family socioeconomic status, maternal health and caregiving behaviors. Standard multivariable regression approaches which attempt to adjust for such covariates may be insufficient. We present two alternative methodological approaches: 1) a sibling design, with siblings highly discordant for maternal smoking during pregnancy; and 2) contemporary propensity score methodologies. In the first analysis, we report on childhood behavioral and cognitive functioning of 700 sibling sets where the mother smoked heavily during one pregnancy and did not smoke during a second pregnancy. While there was still a significant and dramatic reduction in birthweight for exposed siblings, differences in cognition and behavior were largely attenuated. In a second analysis, we report on lifetime nicotine dependence among 1600 offspring followed from the prenatal period through age 40. Propensity score methods, which simultaneously adjust for a large set of potential confounds, also resulted in attenuated effect sizes, which, however, remained highly significant and support a causal link between maternal smoking and elevated risk for offspring nicotine dependence. Results are consistent with recent animal and genetic studies, as will be demonstrated by other talks in this symposium.

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SYM5B  PRENATAL TOBACCO EXPOSURE AND BEHAVIORAL OUTCOMES IN OFFSPRING: METHODOLOGICAL ISSUES

Marie D. Cornelius, Ph.D.*, Lidush Goldschmidt, Ph.D., Nancy L. Day, Ph.D., University of Pittsburgh School of Medicine

Although prior reports have shown links between prenatal tobacco exposure (PTE) and behavior problems in offspring, many of these reports were retrospective or did not consider covariates such as other prenatal substance exposures, maternal psychological and home environment characteristics, and offspring exposure to environmental smoke (ETS). In this birth cohort study of 356 6-year-olds, we examine the relation between PTE and child behavior including a rich set of covariates not examined in prior studies. Outcomes include maternal report on the Child Behavior Checklist, Routh Activity Scale, SNAP, and EAS. Children's average age was 6.4 years (range: 5.8-9.9), 48% were females, 69% were African-Americans. Data on maternal tobacco and other substance use were collected prenatally and postnatally; 59% smoked during pregnancy, and 57% smoked at 8 years. Child urine cotinine levels were used to measure current ETS exposure. PTE was examined as average exposure across pregnancy and separately by trimesters. Multiple regressions were run in steps. First, PTE, other prenatal substances, and demographic variables on child behaviors were included. The second step added home environment and maternal psychological characteristics to the model. The final step added ETS. PTE significantly predicted offspring activity (Routh), social problems (EAS), increased aggression, externalizing, and internalizing behaviors (CBCL) in step one. PTE remained a significant predictor of increased activity and social problems in steps two and three. Results were similar when PTE was examined by trimester, although third trimester PTE significantly predicted the most behavioral outcomes. Other predictors of child behavior included: maternal anxiety, depression, hostility, and home environment. These findings underscore the importance of considering other factors that are related to both PTE and child behavior, particularly maternal psychological status, when examining links between PTE and offspring behavior.

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SYM5C  THE INFLUENCE OF PRENATAL TOBACCO EXPOSURE ON NEONATAL STRESS REACTIVITY, SOOTHTABILITY, AND ATTENTION: BEHAVIORAL EFFECTS AND GENE BY ENVIRONMENT INTERACTIONS

Kimberly A. Espy, Ph.D.*, University of Nebraska-Lincoln and Southern Illinois University of Medicine, Carbondale; Lynda Sagrestano, Ph.D., Peter Stewart, B.S., Jodi Huggenvik, Ph.D., Tom Bik, Ph.D., David G. Gilbert, Ph.D., and Sandra Wiebe, Ph.D., Southern Illinois University School of Medicine, Carbondale

Despite the well known consequences of smoking during pregnancy on infant birth weight and the neurobiological effects of tobacco on the central nervous system, there remains surprisingly few prospective studies on the impact of prenatal tobacco exposure on behavior. Of those, most include inadequate characterization of exposure status and focus on broad developmental outcomes that are not linked to the known neurobiology of tobacco. In this prospective study in a rural, at-risk sample, women were recruited during pregnancy, interviewed at 4 and 7 months, and at delivery to ascertain prenatal tobacco use. Urine samples also were collected to confirm self reported use. Prior to hospital discharge, and again at 2 and 4 weeks of age, infants were administered tasks designed to measure emergent attention, stress reactivity, and soothability. To date, 96 infants have been evaluated at all three time points. Preliminary results reveal differential effects of prenatal tobacco exposure on stress reactivity and soothability, but not on emergent attention skills. Furthermore, differential patterns of change in reactivity during the neonatal period were evident. Given links between genetic variation in dopaminergic systems that subserves behavioral regulation, risk for smoking, and also to infant behavior, we are exploring the genetic contribution (dopaminergic genes) to variation in neonatal outcome. These findings highlight a novel approach to examining multifactorial determinants of outcome in those prenatally exposed to tobacco.

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SYM5D  ANIMAL MODELS OF PRENATAL TOBACCO EXPOSURE: NICOTINE AND ENVIRONMENTAL TOBACCO SMOKE (ETS) IN RODENTS AND PRIMATES

Theodore Slotkin, Ph.D.*, Duke University Medical Center

The relationship between maternal smoking and adverse effects in the offspring is incontrovertible. Nevertheless, a mechanistic connection to specific components of tobacco smoke is important in ruling out contributory covariables as well as for considering the safety of nicotine replacement therapy in pregnancy. Over the past two decades, we developed animal models that simulate the steady-state levels of nicotine typical of occasional, light or heavy smokers and have demonstrated the ability of nicotine to interfere with neural replication and differentiation, axonogenesis and synaptogenesis, and long-term programming of synaptic function. We have expanded the scope of these studies to encompass comparative evaluations of nicotine and ETS exposure in both rodents and nonhuman primates. Like nicotine, ETS elicits neuronal cell damage in the fetal brain, resulting in reduced cell numbers in a variety of regions important for learning and memory, reward and mood. Fetuses and neonates exposed to ETS absorbed sufficient amounts of nicotine to evoke upregulation of nicotinic cholinergic receptors and activation of antioxidant mechanisms, indicating a much higher net exposure of the developing brain than usually assumed. Surprisingly, coadministration of potential neuroprotectants (Vitamin C or choline) worsened the effects of nicotine, due in part to pharmacokinetic interactions. These results have a number of ramifications. (1) The demonstration that nicotine and ETS have similar effects on brain development confirms a mechanistic connection between maternal smoking or ETS exposure and adverse neurobehavioral outcomes. Indeed, our results provide some of the first evidence to support a causative relationship between ETS exposure and developmental brain damage. (2) The parallel findings in nonhuman primates reinforce prior conclusions based on the wealth of information from rodent models of nicotine exposure in the fetus, neonate and adolescent. (3) Our results point to caution in smoking cessation or amelioration strategies in pregnant women, as recent evidence suggests nicotine replacement therapy in pregnancy. Over the past two decades, we developed animal models that simulate the steady-state levels of nicotine typical of occasional, light or heavy smokers and have demonstrated the ability of nicotine to interfere with neural replication and differentiation, axonogenesis and synaptogenesis, and long-term programming of synaptic function. We have expanded the scope of these studies to encompass comparative evaluations of nicotine and ETS exposure in both rodents and nonhuman primates. Like nicotine, ETS elicits neuronal cell damage in the fetal brain, resulting in reduced cell numbers in a variety of regions important for learning and memory, reward and mood. Fetuses and neonates exposed to ETS absorbed sufficient amounts of nicotine to evoke upregulation of nicotinic cholinergic receptors and activation of antioxidant mechanisms, indicating a much higher net exposure of the developing brain than usually assumed. Surprisingly, coadministration of potential neuroprotectants (Vitamin C or choline) worsened the effects of nicotine, due in part to pharmacokinetic interactions. These results have a number of ramifications. (1) The demonstration that nicotine and ETS have similar effects on brain development confirms a mechanistic connection between maternal smoking or ETS exposure and adverse neurobehavioral outcomes. Indeed, our results provide some of the first evidence to support a causative relationship between ETS exposure and developmental brain damage. (2) The parallel findings in nonhuman primates reinforce prior conclusions based on the wealth of information from rodent models of nicotine exposure in the fetus, neonate and adolescent. (3) Our results point to caution in smoking cessation or amelioration strategies in pregnant women, as recent evidence suggests nicotine replacement therapy in pregnancy.

This work was supported by NIH DA114247 and Philip Morris.

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SYM5E

DISCUSSION: IMPLICATIONS AND NEW DIRECTIONS

Raymond Niaura, Ph.D.*, Brown Medical School

Dr. Niaura will integrate across presentations and disciplines to describe the current state of the field. He will also discuss implications for treatment of pregnant and post-partum mothers and prevention and intervention efforts for at-risk offspring. He will also moderate questions and discussion from the audience. Finally, Dr. Niaura will conclude by highlighting key questions, methodologies and approaches for future research.

Funding: CA84719.

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SYM6

NIMH WORKGROUP REPORT ON TOBACCO USE AND CESSATION IN PSYCHIATRIC DISORDERS

William Riley*, NIMH; Douglas Ziedonis, UMDNJ; Richard Brown, Brown University; Jean Beckham, Duke University; Naomi Breslau*, Michigan State University

On September 19, 2005, the National Institute of Mental Health convened a workgroup on Tobacco Use and Cessation in Psychiatric Disorders. The purpose of this workgroup was to review the current state of the research in this area and consider tobacco research priorities for the NIMH Health Behavior Change program. The relationships of tobacco use and nicotine dependence among those with schizophrenia, major depression, and anxiety disorders were discussed, including evidence of possible mediating factors contributing to the disproportionately high rates of smoking in these psychiatric populations. The workgroup also focused on current smoking cessation interventions and how these interventions may need to be adapted for the cognitive, emotional, and motivational symptoms and associated features of these psychiatric disorders, as well as possible treatment interactions that may need to be considered. Potential commonalities and differences in tobacco use and cessation among the three psychiatric groups were also discussed. Based on these presentations and discussions, research directions and priorities were considered. The three presentations in this symposium summarize the presentations and discussions of these issues in the areas of smoking and schizophrenia (Ziedonis, George, & Adler), depression (Brown, Audrain-McGovern, & Hitsman) and anxiety (Beckham, Zvolensky, & Breslau).

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SYM6A

TOBACCO USE AND CESSATION IN SCHIZOPHRENIA

Douglas Ziedonis*, UMDNJ; Tony George, Yale University; Lawrence Adler, University of Colorado Health Sciences

This paper is the result of the NIMH workgroup on Tobacco Use and Cessation in Psychiatric Disorders and reviews the findings related to smoking and schizophrenia. Approximately 70 to 90 percent of those with schizophrenia are regular smokers, contributing to the disproportionate rates of medical morbidity and mortality in this population. Nicotine has a number of beneficial self-medication effects on schizophrenia symptoms, specifically via transient effects of alpha-7 nicotinic receptors on P50 sensory gating. Polycyclic aromatic hydrocarbons also affect CYP1A2 activity, leading to increased metabolism of some antipsychotic medications. NRTs and bupropion have shown limited short-term smoking cessation efficacy but long-term efficacy has not been shown. 5HT3 receptor antagonists may have effects both on schizophrenia symptoms and nicotine dependence. Motivational enhancement therapy also has shown promise to increase motivation to quit among schizophrenic smokers. Cognitive, emotional, and social deficits of schizophrenia, however, must be considered when adapting psychosocial cessation treatments to smokers with schizophrenia. Further research is required to more fully understand the mediating factors responsible for the high rates of tobacco use observed among schizophrenics, to learn how to best to adapt smoking cessation interventions for smokers with schizophrenia, and evaluate the efficacy of these interventions.

Funding: NIMH.

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SYM6B

TOBACCO USE AND CESSATION IN SMOKERS WITH COMORBID MAJOR DEPRESSION

Richard Brown*, Brown University; Janet Audrain-McGovern, University of Pennsylvania; Brian Hitsman, Brown University

This paper is the result of the NIMH workgroup on Tobacco Use and Cessation in Psychiatric Disorders and reviews the findings related to smoking and depression. Approximately 50 of those with Major Depression (MDD) are nicotine dependent. MDD is a risk factor for nicotine dependence in young adults. In addition to direct causal models such as self-medication hypothesis, the relationship of smoking and MDD may share common genetic and environmental factors. DRD4 alleles may be of particular interest in understanding the smoking and MDD relationship. Recent meta-analysis reveals that history of MDD is not associated with smoking cessation outcome although history of MDD does appear to affect long-term efficacy, particularly when treated with lower intensity interventions. Despite considerable data on the relationship of MDD history and cessation outcome, little is known about the effects of current MDD on cessation outcome. Significant percentages of currently depressed smokers appear ready to quit and, with assistance, will accept smoking cessation treatment. Cognitive behavioral mood management may have some benefit as a smoking cessation strategy for smokers with recurrent MDD, but additional research on cessation strategies of those with current MDD is needed. Smoking cessation treatments for MDD smokers will need to address a range of motivational, biological, and behavioral vulnerabilities to be effective. Further research is needed to understand the mediating factors for the relationship between MDD and smoking, and to explore cessation efforts for smokers with current MDD.

Funding: NIMH.

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SYM6C  TOBACCO USE AND ANXIETY DISORDERS

Jean Beckham*, Duke University; Michael Zvolensky, University of Vermont; Naomi Breslau, Michigan State University

This paper is the result of the NIMH workshop on Tobacco Use and Cessation in Psychiatric Disorders and reviews the findings related to smoking and anxiety disorders. Nearly half of those with any anxiety disorder in the National Comorbidity Study also were nicotine dependent, and odds ratios for nicotine dependence among the various anxiety disorders range from 2.6 to 5.2. Smoking rates are particularly high in Panic Disorder (PD) and limited data suggest that smoking may be a risk factor for PD although further longitudinal research is needed. Smoking and/or withdrawal may serve as a proximal trigger for panic attacks although the relationship between smoking and panic appears complex and multidirectional. PTSD is another anxiety disorder with disproportionate smoking rates. Smoking triggers appear to be different for PTSD smokers than for normals. Prepulse inhibition may be of interest as a mediating factor for smoking and PTSD. Little is known about the relationship of smoking and anxiety disorders and more research exploring possible mediators is needed. Smoking cessation approaches for those with comorbid anxiety disorders remain to be developed and studied.

Funding: NIMH.

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SYM7  PERSPECTIVES ON LIGHT AND INTERMITTENT SMOKING

Symposium Chair: Patricia L. Mabry, Ph.D., NC/SAIC-Frederick;* Speakers: Corinne Husten, M.D., M.P.H., CDC; Clark Presson, Ph.D., Arizona State University; Kolawole Okuyemi, M.D., M.P.H., University of Kansas Medical Center; John Tauras, Ph.D., University of Illinois at Chicago; Discussant: Saul Shiffman, Ph.D., University of Pittsburgh*

The National Cancer Institute and the American Legacy Foundation recently held a two-day meeting on light and intermittent smokers (LITS). The impetus of the meeting was to recognize and analyze a dramatic increase in the percentage of smokers who smoke at very low levels and/or smoke less than daily. The meeting of 30 experts summarized the state of existing knowledge regarding LITS and achieved consensus regarding recommendations for future research. This symposium will present these findings and conclusions, and stimulate discussion on this important, but understudied topic. The symposium will begin with a historical overview describing the recent growth of the LITS population and the importance of understanding this group of smokers in light of current models of smoking and addiction. The papers will cover: 1) Definitions of LITS: How do definitions of LITS vary across studies? What consensus exists on defining different subgroups of LITS (e.g., chippers, some day smokers, low level smokers); 2) Stability of LITS smoking patterns and transitions to and from light and intermittent smoking; How smokers become LITS and how often and why LITS smoking patterns change; 3) Quitting patterns among LITS smokers: What motivates LITS to quit, how successful they are at quitting, and what strategies are best for this group; 4) Policy and programmatic interventions that influence LITS: How do smoking restrictions and access to cessation interventions impact the smoking behavior of LITS? Following paper presentations, the moderator will present selected recommendations for future LITS research that came from the August 2005 meeting, and invite discussion and input from the audience.

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SYM7A  WHAT'S IN A NAME

Corinne Husten*, M.D., M.P.H., Centers for Disease Control and Prevention

This paper discusses the multiple definitions and heterogeneous smoking patterns that exist among LITS. An exhaustive search of the peer-reviewed literature on LITS was conducted using several databases. Papers published from 1980-2005 in the English language were included in the review. Definitions of LITS were collected from each primary paper and relevant secondary references. A variety of terms for light and intermittent smokers were found, including “light,” “very light,” “low rate,” “smoker,” “low level daily,” “occasional,” “some day,” “intermittent,” “non-daily,” “chopper,” and “never daily.” Definitions used for each of these terms was quite variable (e.g., for “light,” definitions range from <5 cpd to >20 cpd). Based on limited survey day, there does appear to be a difference between non-daily smokers, daily smokers who smoke 1-5 cpd, and daily smokers who smoke more than 5 cpd. Within the non-daily and 1-5 cpd groups, however, there is considerable heterogeneity; some are transitioning to initiating smoking, some are in the process of quitting or attempting to quit, and some are in a stable pattern (of variable duration). Only 8-9% of current smokers have never been daily smokers (with the proportion varying among demographic groups). An unanswered question is whether there is high concurrent use of other tobacco products among the intermittent or 1-5 cpd groups. The development of a good research agenda on light and intermittent smokers will require development of consistent terms and definitions, as well as attention to the transitional subgroups within each category. This developmental process will require a systematic review of existing data, as well as new studies to address the specific definitional issues identified.

No funding.

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SYM7B  STABILITY OF LIGHT AND INTERMITTENT SMOKING (LITS) PATTERNS AND TRANSITIONS TO AND FROM LITS: HOW SMOKEBECOME LITS AND HOW OFTEN AND WHY LITS SMOKING PATTERNS CHANGE

Clark C. Presson*, Ph.D., Arizona State University

The recognition that some smokers maintain light or intermittent patterns of smoking has led to a re-examination of some premises of the classic model of smoking onset and maintenance. Given that these LITS smoke at levels below that needed to regulate nicotine levels, some of the basic questions about what maintains and motivates this smoking need to be revisited. Some LITS maintain stable patterns for a relatively long time (e.g., "chippers," Shiffman, 1993), but there is relatively little known about the natural history of LITS. Although there are sizeable number of individuals report light or intermittent levels of smoking at any one time, there are limited prospective data to address questions of onset and stability among LITS. The current presentation will focus on major questions (both answered and unanswered) about the natural history of LITS, patterns of onset and stability, and the processes of transition in and out of LITS. Although most studies of LITS have needed to rely on retrospective data, there are some prospective data available (e.g., Presson et al., 2002; Zhu et al. 2003). The presentation will use these existing data and prospective, longitudinal data from the Indiana Smoking Survey on both chippers as well as other LITS who do not report such long-term stability, to examine patterns of smoking history (both in terms of stability and instability) and to identify adolescent prospective predictors and motives of LITS in adulthood compared to more classic, normative levels of regular smoking. The need for more complex, process model of the transitions and detailed study of the motives and dynamics of LITS behavior will be emphasized.

No funding.

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SYM7C  QUITTING PATTERNS AMONG LIGHT AND INTERMITTENT SMOKERS

Kolawole Okuyemi*, M.D., University of Kansas Medical Center

Because smoking cessation research has focused on heavy smokers little is known about smoking cessation among a growing population of smokers who smoke at very low levels (Light and Intermittent Smokers; LITS). The purpose of this presentation is to address important research issues on quitting patterns among LITS. Data from three studies will be discussed. The first is a cross-sectional study that assessed quitting experiences of 484 African American occasional (22%), light (36%), moderate (14%), and heavy (28%) smokers. Forty percent of occasional smokers were in the preparation stage for quitting, compared with 26.8%, 25.8%, and 17.5% of light, moderate, and heavy smokers respectively (p<0.05). Occasional smokers reported less difficulty in their most recent quit attempt compared to the three other groups. Occasional and light smokers were more likely to have used will-power/spirituality, and gradual reduction in past quit attempts. The second study examined the efficacy of 2 mg nicotine lozenge for smoking cessation. Quit rates at one year were similar for light (19.2%) and moderate/heavy (16.7%) smokers. The third study is a recently completed clinical trial that tested the effects of 2 mg nicotine gum and counseling for smoking cessation among African American light smokers. Although primary outcomes data from this study is yet to be published, 755 were successfully recruited and retention rates at 6 months follow-up was approximately 90%. These studies suggest that LITS are interested in smoking cessation. Research is needed to develop effective smoking cessation interventions for LITS.

No funding.

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SYM8 • SYMPOSIA

SYM8A  YOUNG ADULTS PERCEIVED EFFECTIVENESS OF TOBACCO COUNTER-MARKETING ADVERTISEMENTS

Rebecca Murphy-Hoefner, Ph.D., M.P.H., Centers for Disease Control and Prevention; Andrew Hyland, Ph.D., and Cheryl Higbee, M.P.H., Roswell Park Cancer Institute

Despite the fact that tobacco companies have increased tobacco marketing efforts to young adults, and that smoking prevalence is generally highest in this population subgroup, few studies have been conducted to determine what counter-marketing messages and execution styles most resonate with them. To compare the relative effectiveness of different types of tobacco counter-marketing advertisements among young adults (18-24 year olds), 1,020 college students from a northern and a southern US four-year arts and sciences college from public universities were surveyed before and after viewing four tobacco counter-marketing advertisements in one of the following categories: social norms, health consequences, and tobacco industry manipulation and all students were exposed to four execution styles: drama, testimonial, humor, and sarcasm. Persuasiveness of the different advertisement categories and execution styles was assessed using a multivariate mixed linear regression model where persuasiveness scale outcomes for each advertisement were nested within students while controlling for the sex, gender, smoking status, and city of each respondent. A statistically significant difference in persuasiveness among tobacco counter advertisement categories was found. The health consequences category and drama execution style were rated as being significantly more persuasive than all other advertisement categories and execution styles. These findings suggest that tobacco control programs should ensure this particular message and type of execution style is well-represented in counter-marketing efforts.

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SYM8 • SYMPOSIA

SYM8B  PHYSIOLOGY, COGNITION, AFFECT AND BEHAVIOR: EFFECTS OF ANTI-TOBACCO ADVERTISING ON YOUTH, YOUNG ADULTS AND ADULTS

Melanie Wakefield, Ph.D., Chair, The Cancer Council Victoria, Australia; David Nelson, M.D., M.P.H., Discussant, Centers for Disease Control and Prevention

There has been considerable debate about the kinds of anti-tobacco advertising that exert most benefit in preventing youth smoking uptake and promoting smoking cessation. Research on this subject is important because advertising is a relatively expensive tobacco control strategy, but with nonetheless great potential to influence population change. This symposium features four studies that use different methodologies and target groups to better understand the characteristics of advertising that most engage audiences and are associated with behavioural change. Murphy-Hoefner will present an experimental study of young adults aimed at disentangling message theme from executional features of ads, where outcomes are cognitive responses to advertisements. Strasser will present results from an experimental study of advertising message sensation value and argument strength on physiological and cognitive responses to ads among adult smokers. Biener will present a population-based study of the extent to which ads with high emotion lead to increased recall of anti-tobacco advertising among youth. Finally, Wakefield will present the results of a population-based study of tobacco company smoking prevention advertising on youth smoking attitudes and behavior. Discussion of the studies by Nelson will focus on their design strengths and weaknesses, consistency of findings, contrasting what can be learned from experimental and population-based studies, and implications for practice and further research.

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THE EFFECT OF SMOKING CESSATION PSAs ON COGNITIVE AND PHYSIOLOGICAL RESPONSES

Andrew Strasser, Ph.D.*; Joseph Cappella, Ph.D., William Shadel, Ph.D., Martin Fishbein, Ph.D., Caryn Lerman, Ph.D., University of Pennsylvania

Despite the widespread use of public service announcements (PSAs) to promote smoking cessation, there have been few investigations of the features that influence PSA effectiveness. Two features of PSAs that may be important are argument quality (ARG) and message sensation value (MSV), a measure of production editing and pacing. The goal of this experiment was to explore the effects of anti-smoking PSA characteristics on cognitive (attitudes, beliefs, intentions), physiological (arousal, attention, affective response), and behavioral (calling a quit line) outcomes among adult smokers who are not currently seeking treatment. The first phase of this study was to rate 99 PSAs for ARG and MSV. We used a new ARG measure delivered to 300 current smokers recruited nationwide in shopping malls. The ARG measure showed high internal consistency (alphas=.91, p<.01), and significant correlation with perceived vulnerability to the harmful effects of smoking (r=.51, p<.01) and intention to quit smoking (r=.52, p<.01). PSAs were coded for MSV by trained raters (Kendall’s Tau =.91, p<.01). The experiment was a 2 (ARG high/low) by 2 (MSV high/low) factorial design of 160 adult smokers. Participants completed demographic, smoking history and sensation-seeking questionnaires then view PSAs from 1 of 4 PSA conditions while sensors measured skin conductance (arousal), heart rate (attention), and facial muscle activity (affective responses). Participants completed cognitive outcome measures, and were provided with information to call a quit line to join a free smoking cessation program. Preliminary outcome data will be presented.

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THE RELATIVE EFFECT OF BROADCAST VOLUME AND EMOTIONAL INTENSITY ON YOUTH RECALL OF ANTI-TOBACCO ADVERTISING

Lois Biener, Ph.D.*, Cecilia Shiner, B.A., University of Massachusetts Boston; Michael Siegel, M.D., Boston University School of Public Health; Glen Szczypka, B.A., University of Illinois at Chicago; Melanie Wakefield, Ph.D., The Cancer Council, Victoria, Australia; wallace@cancervic.org.au.

Television anti-tobacco advertising has been shown to be an effective tool for discouraging smoking initiation among youth. Because of the enormous cost of paid advertising, public health agencies need guidelines regarding the optimal level of broadcast intensity. Recall is widely seen as a pre-requisite for advertising effectiveness. This study investigated the relative impact of broadcast volume and emotional intensity of an ad as predictors of recall. The data come from a random-digit-dialed survey of 3863 youth 12 to 17 years of age interviewed over an 18 month period. Confirmed recall of 9 specific TV ads was assessed. The volume of broadcasting (Target Rating Points (TRP)) was based on commercial television ratings data. The TRP score was based on the volume of broadcast around the time that the respondent was interviewed. The emotional intensity score of the ad was derived from the average rating of an independent panel of youth judges who viewed ads and then rated them on a series of scales. The Logit procedure in STATA was used to analyze the two predictors of recall controlling for youth demographics and clustered to account for correlated responses to the ads within a given youth. Results indicated that volume of advertising was a significant predictor of recall, but emotional intensity of the ad was an even stronger predictor. This result reinforces other research that highlights the importance of emotional arousal in anti-tobacco advertising.

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IMPROVE THE EFFECT OF TOBACCO INDUSTRY SMOKING PREVENTION ADVERTISING ON YOUTH SMOKING-RELATED ATTITUDES AND BEHAVIOUR

Melanie Wakefield, Ph.D.*; Dr. Terry McElrath, M.S.A., University of Michigan; Sherry Emery, Ph.D., Glen Szczypka, B.A., Frank Chaloupka, Ph.D., Brian Flay, Ph.D., Sandy Slater, M.S., University of Illinois at Chicago; Henry Saffer, Ph.D., Keung University; Patrick O’Malley, Ph.D., and Lloyd Johnston, Ph.D., University of Michigan.

One strategy used by tobacco companies to attempt to remake their public image has been to invest in public education campaigns promoting the message that youth should not smoke. From December 1998 to January 2003, Philip Morris ran a nationally televised media campaign with the slogan, “Think. Don’t Smoke” and communicated the primary message that youth do not need to smoke to fit in. From October 1999, Lorillard Tobacco Company also ran a televised youth smoking prevention campaign with the slogan, “Tobacco is Whacko if You’re a Teen”. From mid-1999, Philip Morris launched a television advertising campaign emphasizing parental responsibility for talking to children about smoking with the slogan “Talk. They’ll Listen”. Commercial television ratings data for the largest 75 media markets in the United States from 1999 to 2002 for mean exposure to tobacco company-sponsored advertising for youth smoking prevention (YSP) and parent-directed youth smoking prevention advertising (PYSP) were merged with nationally representative school-based youth survey data. Multivariate regression models analysed associations between advertising exposure and youth smoking related beliefs, intentions and behaviour, controlling for individual, geographic and tobacco policy factors usually associated with youth smoking, and other televised anti-tobacco advertising from state tobacco control and Legacy campaigns. There were few associations between exposure to YSP advertising and youth smoking beliefs, intentions or behaviour for either 8th or 10th/12th grade students. Higher exposure to PYSP advertising was unrelated to 8th grade smoking beliefs, intentions or behaviour, but among 10th/12th graders, higher exposure was associated with lower perceived harm of smoking, lower disapproval of smoking, less firm intention not to smoke in five years time, and higher rates of past month smoking. We conclude that exposure to YSP advertising has no impact on youth smoking attitude, intentions or behaviour. However, exposure to PYSP advertising may have harmful boomerang effects for 10th/12th grade youth.

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SYM8E  DISCUSSION OF: PHYSIOLOGY, COGNITION, AFFECT AND BEHAVIOR: EFFECTS OF ANTI-TABACCO ADVERTISING ON YOUTH, YOUNG ADULTS AND ADULTS

David Nelson M.D., M.P.H.*, Centers for Disease Control and Prevention

This presentation will compare and contrast the four innovative studies presented in the symposium. Consideration will be given to study design, in terms of the strengths and weaknesses of experimental audience studies where exposure is assured and outcome measures are immediately assessed, compared with population-based studies where exposure is more natural but less controlled and outcome measures are assessed more distantly from exposure. The choice of outcome measures will also be a subject of discussion, given that these range from physiological measures through to cognitive and affective responses, to recall of advertising, to behavioral outcomes. Given methodological caveats, discussion will turn to consistency of findings across these studies, drawing implications for tobacco control programs looking to invest in counter-marketing efforts, and finally, will identify issues requiring additional research.

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SYM9A  DOES NICOTINE INCREASE TEMPORAL DISCOUNTING EVIDENCE FROM IMPULSIVE AND RISKY CHOICE PROCEDURES IN THE ANIMAL LABORATORY

Matthew L. Locey* and Jesse Dallery, Ph.D., University of Florida

Impulsive choice, or preference for small immediate reinforcers over larger delayed reinforcers, has been associated with cigarette smoking. Three experiments examined whether nicotine was at least partly responsible for this association, and whether an increase in temporal discounting — or the rate at which reinforcers lose value with increasing delay — could account for changes in impulsive choice. In Experiment 1, rats (n=5) chose between a smaller, sooner reinforcer and a larger, later reinforcer. Nicotine dose-dependently increased impulsive choice (all experiments used vehicle, 0.03, 0.1, 0.3, and 1.0 mg/kg). Experiment 2 tested whether temporal discounting could account for these findings. We used a risky choice procedure in which rats (n=9) made discrete choices between a variable delay (short and long delays; the risky option) and a fixed, moderate delay to a single pellet. The options differed only in the relative delays to the reinforcer, not in the amount of the reinforcer. Thus, if nicotine increased temporal discounting, then nicotine should increase preference for the risky option because it provides more immediate reinforcers than the fixed option. Nicotine did not affect risky choice, however. The lack of effect in Experiment 2 suggested that nicotine may have decreased amount sensitivity rather than increased temporal discounting in Experiment 1. By amount sensitivity, we mean the degree to which increases in reinforcer amount increase reinforcer value (which is not the result of a simple anorectic effect). A decrease in sensitivity would mean that large reinforcers would seem more like smaller reinforcers. In Experiment 3, therefore, we modified the risky choice procedure so that rats (n=9) chose between a variable delay to a smaller reinforcer and a fixed delay to a larger reinforcer. Nicotine increased risky choice when differences in amount were involved, which parallels the finding of an increase in impulsive choice in Experiment 1. Overall, the results suggest that while nicotine does increase impulsive choice, this increase is better accounted for by a decrease in amount sensitivity rather than an increase in temporal discounting.

Funding: Department of Psychology, University of Florida.

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SYM9B  ACUTE NICOTINE EFFECTS ON MEASURES OF IMPULSIVE BEHAVIOR IN ADULT SMOKERS AND NONSMOKERS

Suzanne Mitchell, Ph.D.*, Department of Behavioral Neuroscience, Oregon Health and Science University

This presentation examines the impact of nicotine on an array of impulsivity measures in nicotine-deprived heavy adult cigarette smokers and in self-reported never-smokers. On one 10-hour session, subjects were exposed to nicotine via a skin patch (7 mg [never smokers] or 21 mg [smokers]), 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 a 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). Preliminary data replicate previous findings suggesting that smokers are more impulsive than non-smokers at baseline. Further, while acute nicotine does not appear to impact impulsivity in nonsmokers, each of the various measures were affected differently for smokers. These findings underscore the complexity of the impulsivity construct and suggest different neurological mechanisms are responsible for different manifestations of impulsivity.

Funding: NIH.

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COMPARING REAL-TIME AND HYPOTHETICAL MEASURES OF DISCOUNTING IN ADULT SMOKERS AND NONSMokers

Brady Reynolds, Ph.D.*, Michele Patak, The Ohio State University

This presentation will compare a newly developed real-time measure of delay discounting called the Experiential Discounting Task (EDT) to more frequently used hypothetical measures of delay and probability discounting in smokers and non-smokers. Discounting is often considered an index of impulsive choice, and several studies using hypothetical measures have shown smokers discount more by delay (i.e., perform more impulsively) than nonsmokers. This smoking-status effect has not been explored with real-time measures of discounting like the EDT. As a real-time procedure, the EDT differs from hypothetical measures in the timeframe of choice consequences, i.e., participants actually experience choice-relevant consequences (delays, probabilities and monetary rewards from a coin dispenser) during the assessment session. This real-time quality of the EDT may affect its comparability to hypothetical measures; but, despite noted procedural differences, the current findings suggest the EDT is comparable to hypothetical measures of delay discounting. Smokers performed more impulsively than nonsmokers on all three discounting measures (EDT and hypothetical measures of delay and probability discounting).

Additionally, after combining data for smokers and nonsmokers, scores on the EDT were positively and significantly correlated with those from the hypothetical measure of delay discounting but not probability discounting. These findings provide initial validation for the EDT as a measure of delay discounting among smokers and nonsmokers.

Funding: Research Institute on Addictions, SUNY at Buffalo.

SYM10A
GRADUAL CESSATION: PAST AND FUTURE

John Hughes*, University of Vermont

The opening remarks will describe the early studies of gradual cessation using behavioral techniques such as hierarchical reduction, brand fading, etc. Possible reasons for the paucity of studies on gradual cessation since will be discussed; e.g. a) adoption of nicotine dependence theory, b) negative press about controlled drug use, c) use of medications that require abrupt cessation, d) use of brief treatments and e) absence of mention in national guidelines. The current status of accommodating gradual cessation in quitlines, group programs, etc will be reviewed. The closing remarks will discuss A) whether the current evidence is sufficient such that all programs should accommodate gradual reduction, b) whether NRT should be approved for use with gradual cessation, c) possible mechanisms of action of gradual cessation (e.g. stimulus disruption, decreased dependence, increased self-efficacy), and d) what further studies are needed.

Funded by Senior Scientist Award DA-00490 from US NIDA.

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SYM9C
COMPARING REAL-TIME AND HYPOTHETICAL MEASURES OF DISCOUNTING IN ADULT SMOKERS AND NONSMOKERS

Brady Reynolds, Ph.D.*, Michele Patak, The Ohio State University

IMPULSIVITY AS A PREDICTOR OF SMOKING CESSATION OUTCOMES IN ADOLESCENT SMOKERS

Suchitra Krishnan-Sarin, Ph.D.*, Dana Cavallo, Amanda McFetridge, Thomas Liss, Tricia Dahl, Marc Potenza, M.D., Ph.D. (Yale University); Amy Duhig, Ph.D. (Indiana University-Purdue University in Indianapolis); Brady Reynolds, Ph.D. (The Ohio State University)

A rapidly growing literature suggests that drug dependent individuals are impulsive. Measures of delay or temporal discounting which assess the degree to which consequences lose value for an individual as a function of a delay to their occurrence provide an index of impulsivity that has been linked to addictive behaviors and may predict relapse to substance use in adults (Bickel & Marsh, 2003; Doran et al., 2004). The construct of impulsivity may be particularly relevant to adolescents who are known to engage in risky behaviors without considering future consequences (Kelley et al., 2004; Steinberg & Morris, 2001). The present study evaluated self-reported and behaviorally assessed impulsivity as predictors of smoking cessation outcome in adolescent smokers participating in a school-based treatment program. The one month treatment program consisted of a combination of Contingency Management of Abstinence and Cognitive Behavioral therapy (Krishnan-Sarin et al., 2005). Impulsivity was assessed prior to initiation of the program using self-reports (BIS-II; Barratt, 1993) and an experimental task (Experiential Discounting Task; EDT; Reynolds & Shiffbauer, 2004). 20 adolescent smokers (10 males, 10 females) smoking 15.1 ± 4.7 cigs/day participated. Of these 11 participants (55%) were abstinent at the end of treatment as determined by urine cotinine levels < 50 ng/ml and breath CO < 8 ppm. The abstinent and non-abstinent groups were not significantly different on BIS-II scores. On the EDT, the total area under the empirical discounting curve displayed a trend towards being lower [t(16)=1.70, p=0.054] in nonabstinent smokers compared with abstinent smokers, and the scores obtained for the quadrant associated with the longest delay periods were significantly lower [t(16)=1.98, p=0.033] in nonabstinent smokers. These results indicate that adolescent smokers who are unable to achieve tobacco abstinence may have diminished sensitivity to delayed outcomes and that behavioral assessments of impulsivity may be more sensitive than self-reports in predicting treatment outcome in this population.

Supported by P50 DA09421.

SYM10
NEW DATA ON GRADUAL CESSATION TREATMENTS

John Hughes*, Paul Cinciripini, Erica Peters, Saul Shiffman

Almost all cessation programs recommend abrupt rather than gradual cessation. This symposium presents a) recent surveys of smoker interest in gradual cessation, b) recent tests of behavioral methods for gradual cessation and c) a recent test of using NRT to aid in gradual cessation. The symposium will begin with a brief overview of the history of early trials on gradual cessation and possible reasons for the lack of research on this topic (JH). We present three surveys that indicate many smokers are interested in gradual cessation on their next quit attempt (EP). We review RCTs and programmatic development of a behavioral techniques to aid in gradual cessation (PC). These trials repeatedly indicated smoking the preferred behavioral method for reduction. We present results of the first RCT of using NRT for gradual cessation (SS). Active nicotine gum outperformed placebo gum in producing long-term abstinence. Finally, we discuss whether all programs should offer both gradual and abrupt cessation and whether NRT should be approved for use with gradual cessation (JH).

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SYM9D
IMPULSIVITY AS A PREDICTOR OF SMOKING CESSATION OUTCOMES IN ADOLESCENT SMOKERS

Suchitra Krishnan-Sarin, Ph.D.*, Dana Cavallo, Amanda McFetridge, Thomas Liss, Tricia Dahl, Marc Potenza, M.D., Ph.D. (Yale University); Amy Duhig, Ph.D. (Indiana University-Purdue University in Indianapolis); Brady Reynolds, Ph.D. (The Ohio State University)

A rapidly growing literature suggests that drug dependent individuals are impulsive. Measures of delay or temporal discounting which assess the degree to which consequences lose value for an individual as a function of a delay to their occurrence provide an index of impulsivity that has been linked to addictive behaviors and may predict relapse to substance use in adults (Bickel & Marsh, 2003; Doran et al., 2004). The construct of impulsivity may be particularly relevant to adolescents who are known to engage in risky behaviors without considering future consequences (Kelley et al., 2004; Steinberg & Morris, 2001). The present study evaluated self-reported and behaviorally assessed impulsivity as predictors of smoking cessation outcome in adolescent smokers participating in a school-based treatment program. The one month treatment program consisted of a combination of Contingency Management of Abstinence and Cognitive Behavioral therapy (Krishnan-Sarin et al., 2005). Impulsivity was assessed prior to initiation of the program using self-reports (BIS-II; Barratt, 1993) and an experimental task (Experiential Discounting Task; EDT; Reynolds & Shiffbauer, 2004). 20 adolescent smokers (10 males, 10 females) smoking 15.1 ± 4.7 cigs/day participated. Of these 11 participants (55%) were abstinent at the end of treatment as determined by urine cotinine levels < 50 ng/ml and breath CO < 8 ppm. The abstinent and non-abstinent groups were not significantly different on BIS-II scores. On the EDT, the total area under the empirical discounting curve displayed a trend towards being lower [t(16)=1.70, p=0.054] in nonabstinent smokers compared with abstinent smokers, and the scores obtained for the quadrant associated with the longest delay periods were significantly lower [t(16)=1.98, p=0.033] in nonabstinent smokers. These results indicate that adolescent smokers who are unable to achieve tobacco abstinence may have diminished sensitivity to delayed outcomes and that behavioral assessments of impulsivity may be more sensitive than self-reports in predicting treatment outcome in this population.

Supported by P50 DA09421.

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In prior surveys, many smokers report that they have tried to quit in the past via gradual reduction. We examined what percent of smokers are interested in quitting gradually in two surveys. In Survey 1, we asked 125 smokers to rate their interest in quitting smoking on a scale of 1 to 10 given two scenarios. In the first scenario in which nicotine replacement therapy (NRT) was not mentioned, the rating of interest in gradual cessation was greater than that for abrupt (6.9 vs 4.7, < .0001). In the other scenario, NRT was assumed to be able to be used for gradual or abrupt cessation. The mean rating of interest was similar for gradual and abrupt cessation (7.0 vs 7.1). In Survey 2, we asked smokers to report their actual plans for cessation, rather than just their interest. 480 tobacco smokers in 2 mid-Atlantic and 4 northeastern cities responded to an advertisement stating, “Cigarette smokers who plan to quit smoking wanted for University of Vermont research study. This study does not offer treatment.” The screening survey asked subjects whether their goal in the next 30 days was to “not change smoking, stop smoking abruptly, stop smoking by first gradually reducing, or reduce but not quit smoking.” 19 smokers stated they did not plan to change their smoking in the next 30 days and were excluded from analyses. Among those who planned to change in the next 30 days, 13% (95% C.I. = 10-17%) said they planned to stop smoking abruptly, while 66% (95% C.I. = 61-70%) said they planned to stop smoking by first gradually reducing, and 21% (95% C.I. = 17-25%) said they planned to reduce but not quit. Among the subset of smokers who planned to quit smoking, 17% (95% C.I. = 20-29%) said they planned to do so abruptly and 83% (95% C.I. = 79-87%) gradually. In both surveys, over 3/4 of smokers were as interested or more interested in gradual cessation than abrupt cessation. In summary, many smokers are not only interested in gradual cessation but also intend to use this method in order to quit; thus, treatment research and programs need to accommodate gradual cessation as an option.

The idea of scheduled smoking (or smoking on cue) had been explored in the early 1970's. However, only recently have attempts been made to formalize this strategy into a treatment approach. The scheduled reduced smoking procedure developed and tested in our laboratory takes a highly systematic approach to nicotine dependence prior to a quit date and involves a progressive reduction in the smoking rate. In this presentation, we will review the results of a series of studies conducted by our group in this area, and present results from our current clinical trial involving the combination of scheduled smoking and NRT. In this study a handheld computer (HPC) was used to implement the scheduled smoking program. The program signaled smoking at progressively increasing inter-cigarette intervals, provided cessation tips, and routines for making multiple quit attempts in the event of a relapse. The study compared the effects of scheduled smoking with concurrent transdermal nicotine replacement (SSNP), vs. that of scheduled smoking alone (SS) plus NRT on the quit date, vs. a usual care control (UCU), who were instructed to quit smoking within a few days of study entry and to begin using the nicotine patch on their quit date. They are provided no reduction instructions or pre-cessation nicotine replacement but self monitor their smoking behavior using the HPC. Over 700 smokers participated in the trial. Preliminary results suggest that smokers in the combined treatment group (SSNP) were abstinent more often at the 4 week post-quit assessment, than those in the SS or UCC groups. Final results including long term follow-will be presented and implications for combining gradual reduction and NRT methods discussed.

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SYM10C DOES SCHEDULED REDUCED SMOKE HAVE A PLACE AMONG SMOKING CESSATION TREATMENTS?

P.M. Cinciripini*, Cho Lam, J.A. Blalock, J. Robinson, D.E. Wetter, and W. Baile, UT M.D. Anderson Cancer Center

SYM10D USING NICOTINE GUM TO ASSIST QUITTING BY GRADUAL REDUCTION

Saul Shiffman*, Carolyn Dresler, Michele Norton, Kenneth Strahs

Nicotine replacement therapy (NRT) is effective in helping smokers quit, and is being used by increasing proportions of smokers. However, current uses of NRT require that the smoker quit abruptly. Yet, nearly half of smokers planning to quit want to do so by gradual reduction. Accordingly, we tested the use of nicotine gum for quitting via gradual reduction. In a multi-center study, 3,297 smokers wanting to quit gradually were randomized to active or placebo gum (2 or 4 mg; by smoking rate). Over the course of up to 8 weeks, they were to incrementally reduce their smoking while increasing their use of gum. Once they had achieved initial abstinence (24 hours), gum was to be used in accordance to the current directions for cessation. The study was run under over-the-counter (OTC) conditions, with absolutely no counseling or instruction provided outside of the product labeling. CO-verified continuous abstinence was assessed after 28 days and 6 months, and CO-verified smoking reduction was also assessed. Smokers on active gum were significantly more likely to achieve smoking reductions of ≥50% (19% vs 11%; OR=1.81) and initial cessation; i.e., 24 hours of abstinence (26% versus 18%; OR=1.60). Active gum also led to greater rates of CO-verified continuous abstinence at 28 days (10% vs 4%, OR=2.83) and at 6 months (6% vs 2%, OR=2.88). The long-term abstinence rates were consistent with those obtained in a comparable study using nicotine gum for abrupt cessation in an OTC setting. Higher abstinence rates were achieved by those who did in fact decrease their smoking and increase their gum use during the early phase of the program. The adverse events observed were comparable to those observed in the use of nicotine gum for abrupt quitting. There was no systematic increase in adverse events among those who engaged in high gum use along with high rates of smoking. The study suggests that NRT can be used safely and effectively to enable quitting through gradual reduction.

Study supported by GlaxoSmithKline Consumer Healthcare. Dr. Shiffman consults to GlaxoSmithKline Consumer Healthcare and also has an interest in a new smoking cessation product.

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SYM11 TOBACCO CONTROL IN A COMPLEX ADAPTIVE ENVIRONMENT: MODELING TO IMPROVE STRATEGIC PLANNING

Chair: Scott J. Leischow*, Department of Health and Human Services; David Mendez, University of Michigan; John Billimek, University of California, Irvine; David Levy, University of Baltimore; James Shaw, Thomas Jefferson University; Discussant: Kenneth Warner*, University of Michigan

Tobacco use and tobacco control exists within a highly complex and adaptive system that will not be understood through randomized clinical trials, epidemiologic studies or other reductionist approaches. While reductionist science is a necessary foundation to clinical, community and policy decision-making, the analysis and modeling of complex and transdisciplinary relationships inherent in expansionist science is also needed. Recent events provide an analogy: An understanding of hurricanes as a complex phenomena is only possible by linking many types of data from many different sources and disciplines over time via complex mathematical modeling so that the nature and trajectory of the event can be projected (which allows for action to be taken to prevent human suffering and death). Similarly, improvements in informatics infrastructure, social network analyses, and modeling methodologies (e.g. econometric, statistical, geographic, and dynamic), plus knowledge gained from outside the health science disciplines (e.g. engineering, management, and physics) have the potential to significantly improve our tobacco control efforts. This symposium will explore several approaches to modeling that have the potential to identify critical research, practice and policy priorities and practices in the future.

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SYM11A  FROM CALIFORNIA TO KENTUCKY: BEST-CASE AND WORST-CASE SCENARIOS FOR FUTURE ADULT SMOKING PREVALENCE IN THE UNITED STATES

David Mendez*, Ph.D., and Kenneth E. Warner, Ph.D., The University of Michigan, School of Public Health

Government targets for national smoking prevalence have been set without reliance on strong empirical evidence. Goals: The goals of this analysis were to assess whether effective nationwide implementation of best-practice tobacco control could achieve the 2010 government’s target, provide the analytic means to compute challenging yet feasible targets for future years based on empirical evidence of the impacts of best-practice tobacco control programming, and explore the consequences of a worst-case scenario on future smoking prevalence. Methods: We employed California’s and Kentucky’s smoking initiation and cessation rates to project a best-case and a worst-case scenario for US adult smoking prevalence through the first half of the century. We estimate California and Kentucky rates with data from the Behavioral Risk Factor Surveillance System. These rates are supplied to a well established population dynamics model of national smoking prevalence. Main Outcome Measures. Adult smoking prevalence and number of smokers in the US for the period 2005-2050. Results: If initiation and cessation rates for the nation as a whole do not change, smoking prevalence in 2010 will be 18.1%. In 2020 it will be 16.8%. Under the most pessimistic circumstances (applying California’s rates), adult smoking prevalence will be 18.1% at best in 2010. In 2020 it will be 14.4%. Under the most pessimistic circumstances (applying Kentucky’s rates) adult smoking prevalence will be 20.4% in 2010 and 22.6% in 2020. In 2050 the number of smokers will vary from 25.7 million, assuming California’s rates, to 65 million, using Kentucky’s rates. Conclusions: Even with best practice tobacco control, the national target of 12% prevalence for 2010 is unattainable. Our analysis indicates that a national goal of 14% for 2020 would be challenging but feasible. Failure to maintain and enhance national tobacco control efforts could lead to an increase in smoking in the future, disastrous for Public Health. This work was commissioned by the Institute of Medicine (IOM) of the National Academies for the Institute’s project on Reducing Tobacco Use: Strategies, Barriers, and Consequences.

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SYM11B  DERIVING A RISK-THRESHOLD MATRIX OF ESTIMATED HEALTH IMPACTS OF TOBACCO HARM REDUCTION POLICIES: A SIMULATION MODELING APPROACH

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BACKGROUND: With adult smoking prevalence rates declining too slowly to reach national objectives, opinion leaders are considering policies to improve smoking cessation outcomes by regulating the composition of cigarettes to be (1) less harmful and/or (2) less addictive. Because harm reduction efforts may actually encourage higher cigarette consumption by promoting a safer image and addictiveness reduction may increase the harmfulness of cigarettes by encouraging compensatory smoking behaviors, policy makers must consider the tradeoffs between these two approaches when proposing legislation to control cigarette content.

METHODS: To estimate health impacts, we developed a dynamic computer model simulating changes in the age and gender-specific smoking behaviors of the U.S. population over time. Secondary data for model parameters were obtained from publicly available sources. Population health impacts were measured as change in smoking prevalence and the change in cumulative quality-adjusted life-years (QALYs) in the U.S. population over 75 years.

RESULTS: According to the risk-use threshold matrix generated by the simulation, modifying cigarettes to reduce their harmfulness and/or addictiveness could result in important gains to the nation’s health. Addictiveness reduction efforts producing a 60% improvement in smoking behavior change probabilities would produce a net gain in population health at every plausible level of increase of smoking-related harm that was modeled. A 40% reduction in smoking-related harm would produce a net QALY gain at every level of behavior change considered.

CONCLUSIONS: This research should prove useful to policy makers as they contemplate giving the FDA the authority to regulate the composition of cigarettes.

Funding: NIDA.

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SYM11C  THE USE OF SIMULATION MODELS IN UNDERSTANDING COMPLEX SYSTEMS: THE SIMSMOKE MODEL

David T. Levy*, University of Baltimore

While previous empirical studies have shown that tobacco control policies are effective at reducing smoking rates, the ability to isolate the effects of different policies has been limited. In particular, the effect of a policy may depend on its initial level, how it was implemented, other policies in effect, and characteristics of the population. Understanding these nuances is important for creating more robust tobacco control policies. An alternative, but complementary approach to purely statistical modeling is simulation modeling. This talk describes the SimSmoke model and how it has been applied to assess tobacco control policy. SimSmoke has been applied to the US, states within the US and a number of different countries. A specific case-study will be described to provide context and to help visualize the possibilities of a simulation modeling approach. Specifically, we will show how the model considers the effects on different age and other demographic groups, how the effects of policies often must reach a certain level to have noticeable effects and the effects then taper off, and the benefits of multiple policies. Finally, we discuss limitations of the model and how simulation models might be used in the future. While we focus on the use of the SimSmoke model for prediction and planning, an equally important goal is its use to gain a better understanding of public health policies within a complex, dynamic social system.

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SYM11D  NEW STATE-LEVEL ESTIMATES OF DYNAMIC CIGARETTE DEMAND

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BACKGROUND: The World Health Organization has projected that tobacco-related deaths will increase from 5 million in 2005 to 10 million by 2020. In order to better understand and address this global epidemic, the National Cancer Institute is funding the Initiative on the Study and Implementation of Systems to better understand the inter-related systems that sustain tobacco use. It is particularly important to understand the relationship between cigarette prices and demand. In the United States, prices are influenced to a large degree by state and federal excise taxes, and tax increases have been a staple of US tobacco control policies since the 1960s. A number of studies have investigated the relationship between cigarette prices and demand in the US using pooled time-series data for states.

METHOD: A common feature of these studies has been the presumption that current cigarette consumption depends on cigarette consumption at some previous point in time, i.e., that consumption is dynamic. Most of the relevant studies have used the fixed effects two-stage least squares (FE2LS) estimator, which is downward biased when applied to short time series. The authors of the current paper estimate dynamic models for cigarette prices and sales using panel data for the 48 contiguous states and District of Columbia over the period 1989-2001. Demand and price are modeled as second-order autoregressive processes. Ordinary least squares and fixed effects estimates are compared with those derived from generalized method of moments estimators.

RESULTS: The authors find cigarette demand to be highly persistent over time and estimate the long-run price elasticity of demand to be -3.27. This is greater than previous estimates and indicates that, in the long run, the demand for cigarettes is price elastic. Discussion: The authors hypothesize that the long-run price elasticity has been historically underestimated due to use of fixed effects estimators. Their results also suggest that earlier studies have misspecified the lag structure of the cigarette demand model.

Funding: NCI.

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SYM12

SCIENCE AND THE BUILDING BLOCKS FOR TOBACCO PRODUCT REGULATION

Thomas Eissenberg, Ph.D., Virginia Commonwealth University; Stephen S. Hecht, Ph.D., University of Minnesota Cancer Center; Dorothy Hatsukami*, Ph.D., University of Minnesota; Mitchell Zeller, J.D., Pinney Associates.

Tobacco product regulation will only succeed if it is evidence-based and grounded in science. The purpose of this panel is to highlight the central role science must play (and is playing) in the global movement toward regulation of tobacco products (along with their associated marketing, sales and promotion). This panel brings together individuals from several disciplines, including basic science and clinical research, to describe and frame for the audience how their work is or should be used in the development of regulations for tobacco products. Drs. Thomas Eissenberg and Stephen Hecht will discuss, respectively, the appropriate role(s) for clinical research methodologies and basic research approaches in the design, implementation, and evaluation of the effectiveness of tobacco product regulations. Dr. Dorothy Hatsukami will serve as the discussant for this panel and will offer her insights into how science can support tobacco product laws and regulations in the United States and globally. Mr. Mitchell Zeller, an expert in tobacco product regulation and policy development, will serve as the chair of this panel and will provide a broad overview of the key issues for the panel, including some of the unintended consequences when policy is created on incomplete or inadequate science. He will also discuss the importance of this topic in light of movements domestically in the U.S. (toward Food and Drug Administration regulation of tobacco products) and globally with the ratification of the Framework Convention on Tobacco Control.

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SYM12A

CLINICAL TRIAL METHODOLOGIES FOR REGULATING TOBACCO PRODUCTS

Thomas Eissenberg, Ph.D., Virginia Commonwealth University

Dr. Eissenberg will discuss several aspects of how a clinical trials/research methodology can be used in the context of tobacco product regulation. These approaches include: 1. Using a clinical trials methodology to regulate existing product marketing as well as the release of new products. 2. Complementing basic lab science (animals) and smoke machine testing with human exposure testing, and favoring the results of the latter over those of the former. 3. Using clinical trial methods to incentivize and drive harm reduction approaches. 4. Using post-marketing surveillance to refine marketing and products toward increased truthfulness of health claims and information available to consumers and toward increased health. 5. Developing methods whereby the tobacco industry funds the regulatory enterprise.

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SYM12B

THE ROLE OF BASIC SCIENCE IN THE REGULATION OF TOBACCO PRODUCTS

Stephen S. Hecht, Ph.D., University of Minnesota Cancer Center

This presentation will discuss the role of basic science in regulation, using tobacco and cancer as an example. While nicotine is not a carcinogen, each puff of each cigarette contains a mixture of over 60 carcinogens which have been extensively characterized, with respect to their levels in smoke and biological activity. Decreasing and eliminating carcinogens and toxins from cigarette smoke and other tobacco products is one approach that is currently being explored in new products. Biomarkers for carcinogen uptake and cellular damage in smokers, such as urinary metabolites, hemoglobin adducts, and DNA adducts are now available. Highly sensitive and specific methods have been developed to quantify these biomarkers. These methods could be applied in clinical studies to evaluate and regulate new products.

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SYM12C

HOW SCIENCE CAN INFORM THE DEVELOPMENT OF TOBACCO PRODUCT REGULATIONS

Dorothy Hatsukami*, Ph.D., University of Minnesota

Dr. Hatsukami, serving as a discussant to the panel, will offer her perspectives on how science influences and sometimes is driven by tobacco product regulation (the absence, formulation, and/or presence of it). She will describe how her own work studying tobacco harm reduction products has the potential to inform and shape the debate and future design of tobacco product regulations, domestically and globally, in particular in defining for regulators the bounds of current knowledge and the limitations of science in answering various questions about tobacco products and their impact on the public health, individuals, and tobacco and non-tobacco users.

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EFFECTS OF NICOTINE VARY ACROSS TWO AUDITORY EVOKED POTENTIALS IN THE MOUSE

Steven J. Siegel1,2, Kayla L. Metzger, Christina R. Maxwell, Yuling Liang1, Stanley Center for Experimental Therapeutics in Psychiatry, Department of Psychiatry, University of Pennsylvania; 2Division of Neuropsychiatry, Department of Psychiatry, University of Pennsylvania

BACKGROUND: Schizophrenia patients display sensory processing deficits, reduced alpha 7-nicotine receptor expression and increased incidence of smoking, prompting investigation of nicotine receptor agonists as possible treatments. We evaluate the effects of acute and chronic nicotine using an animal model that incorporates genetic variation for sensory processing and nicotine sensitivity.

METHODS: C57BL/6J and DBA/2Hsd mice received 2 weeks of 4.2 mg/kg chronic nicotine or saline. Auditory evoked potentials were recorded prior to and following acute nicotine injection of 1.05 mg/kg on day 14 using a paired-click paradigm (S1/S2). Amplitude and gating of the P20 and N40 were compared between conditions.

RESULTS: Acute nicotine increased the amplitude and gating of the P20 and decreased the amplitude and gating of the N40 across all groups, primarily by acting on S1. Chronic nicotine attenuated the effects of acute nicotine on the N40.

CONCLUSIONS: Our data support the notion that the mouse P20 shares pharmacological response properties with the human P50. Additionally, findings suggest that nicotine may increase the initial sensory response (S1) with a resulting improvement in gating of some components.

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NEUROPSYCHOLOGICAL DIFFERENCES IN SCHIZOPHRENIA AND CONTROLS AS A FUNCTION OF SMOKING STATUS

Kristi A. Sacco, Psy.D.*,1,2, Angelo Termine, B.S.1, Taryn M. Allen, B.S.1, Erin Reutenauer, B.S.1, Andrea Weinberger, Ph.D.1,1, Jennifer C. Vessicchio, L.C.S.W.1, Bruce E. Wexler, M.D.1, and Tony P. George, M.D.1,2;1Program for Research in Smokers with Mental Illness; 2Division of Substance Abuse, Department of Psychiatry, Yale University School of Medicine, New Haven, CT

There are numerous deficits in neurocognitive function in schizophrenia. Furthermore, patients with schizophrenia have high rates of cigarette smoking (88% compared to the general population (~23%), and greater difficulty quitting smoking. To better understand the relationship between smoking status and cognitive function, assessment of group differences in neuropsychological performance across current, former (abstinent at least six months) and never smokers (< 100 cigarettes lifetime) in clinically-stable outpatients with schizophrenia and non-psychiatric controls were performed. Subjects included: current smokers with schizophrenia (n=27), never-smokers with schizophrenia (n=7), former smokers with schizophrenia (n=7), control smokers (n=26), control never-smokers (n=12), and control former smokers (n=3). All subjects were assessed using a comprehensive (2.5 hour) neuropsychological battery, and smokers were studied under non-deprivation conditions. Results demonstrated overall group differences in baseline performance across tests of attention, visuospatial working memory, verbal working memory, processing speed and response inhibition, and executive functioning. Post-hoc analyses revealed that never-smokers with schizophrenia performed more poorly on tasks of attentional function (p<0.01), processing speed (p<0.001), response inhibition (p<0.05), and executive functioning (p<0.05) when compared with each of the other schizophrenia and control subgroups. Smoking status did not alter neuropsychological performance in controls. Our data suggest that the more severe cognitive deficits in never smoking schizophrenia patients may relate to this subgroup of patients being a distinct schizophrenia subtype, independent of cigarette smoking effects. Implications of this data for treatment of nicotine dependence and cognitive deficits in schizophrenia will be discussed.

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EFFECTS OF SMOKING CUES, ACUTE ABSTINENCE AND BUPROPION IN SMOKERS WITH SCHIZOPHRENIA AND NON-PSYCHIATRIC CONTROLS.

Jennifer W. Tidey, Ph.D.*, Brown University; Damaris J. Rohsenow, Ph.D., Providence VAMC and Brown University; Gary B. Kaplan, M.D., Brockton VAMC; Robert M. Swift, M.D., Ph.D., Providence VAMC; and Elizabeth B. Cutters, B.A., Brown University

There is a high prevalence of smoking among people with schizophrenia (70-90%), and little is known about biological and environmental mechanisms that maintain smoking in these patients. In this controlled laboratory study, we are comparing the subjective and physiological responses of smokers with schizophrenia (SCZ) and smokers without this disorder (CON) to smoking-related cues, short-term abstinence, and bupropion. Each participant undergoes 4 test sessions: one session while non-abstinent and 3 sessions while 5-h abstinent and after taking bupropion (0, 150 and 300 mg; randomized order) for one week prior to each session. Test sessions consist of an in vivo cue-reactivity assessment followed by a smoking choice assessment (20 choices between 2 puffs versus $0.10). Current results from 8 SCZ and 16 CON participants indicate that these groups are matched on gender (75% male), age (47 ± 2.5 years), daily smoking rate (28.5 ± 3.2 cpd, years of daily smoking (30.7 ± 2.8 years) and FTND score (7.5 ± 0.3). The groups have similar baseline smoking urge (SUQ-brief) levels (SCZ: 3.2 ± 1.7; CON: 3.9 ± 2.0), nicotine withdrawal symp- tom (MNWS measured on 100mm VAS) levels (SCZ: 19.0 ± 6.0; CON: 14.1 ± 4.7) and number of smoking choices (SCZ: 7.3 ± 2.2; CON: 9.6 ± 1.8). In both groups, exposure to smoking cues significantly increases SUQ urge levels and MNWS scores over baseline levels (p < .05). Cue-elicited urge levels and number of smoking choices are significantly correlated in both groups (SCZ r = .82; CON: r = .56). SCZ smokers appear to be more sensitive than CON smokers to the effects of acute abstinence on urge levels (p < .05 for the interaction). Unlike our previous study of transdermal nicotine using this model, current results do not indicate that bupropion decreases urge levels, MNWS levels or smoking choices in either group.

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PA1-4 IMPACT OF MENTHOL AND OTHER BRAND CHARACTERISTICS ON BLOOD NICOTINE LEVELS IN SMOKERS WITH SCHIZOPHRENIA VS CONTROLS

Jill M. Williams*, M.D., Kunal K. Gandhi, M.B.B.S., M.P.H., Marc L. Steinberg, Ph.D., Jonathan Foulds, Ph.D., Douglas M. Ziedonis, M.D., M.P.H., and Neal Benowitz, M.D., UMDNJ-Robert Wood Johnson Medical School, UMDNJ-School of Public Health and University of California San Francisco

It is important to characterize cigarette brand use, including menthol brands, among smokers with schizophrenia in order to examine their impact on nicotine levels and to identify trends, which could be related to socio-economic factors. In a previous study we found that individuals with schizophrenia achieve higher blood nicotine and cotinine levels per cigarette smoked than matched healthy controls. We now examine the hypothesis that smokers with schizophrenia achieve higher blood nicotine levels not only by smoking cigarettes more intensively, but also by choosing mentholated brands or brands with high FTC nicotine yields which would facilitate higher levels of nicotine intake. This study examined blood nicotine levels in 142 smokers (89 with schizophrenia/schizoaffective disorder and 53 controls). FTC delivery of tar, nicotine and carbon monoxide yields for each brand were recorded. Individuals with schizophrenia/schizoaffective disorder smoked more generic or discount/value brands than control smokers (χ² =26; df 19; p=0.002) but did not smoke cigarettes with higher FTC nicotine yields. After controlling for cigarettes per day, pair wise comparisons indicated that menthol smokers with schizophrenia had significantly higher blood nicotine levels compared to menthol smokers without schizophrenia (p = .013), non-menthol smokers with schizophrenia (p = .009), or non-menthol smokers without schizophrenia (p < .001). These results provide novel information on cigarette brand preference in smokers with schizophrenia and support previous findings of some studies that menthol smokers have higher blood nicotine levels, most likely due to an inhalation effect and/or menthol-mediated inhibition of nicotine metabolism.

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PA1-5 SMOKING CESSION IN PERSONS WITH SCHIZOPHRENIA AND OTHER SERIOUS MENTAL ILLNESS

Sandra M. Gallagher, Ph.D.*, La Frontera Center, Inc.; Patricia E. Penn, Ph.D., La Frontera Center, Inc.; Eric Schindler, Ph.D., Child and Family Resources

Our study compares two interventions designed to promote smoking cessation in persons with schizophrenia and other serious mental illness (PSMI). We focused on PSMI because national data suggests that: (1) their smoking rate is 2-3 times higher than in the general population; (2) cessation interventions for this population are understudied; (3) most cessation studies exclude PSMI; (4) cessation would mean health care savings; and (5) this population can spend up to 40% of their generally low disability income on cigarettes (Glassman, 1993, Ziedonis and George, 1997; Ziedonis, et al. 1994). Furthermore, adults with any DSM-IV diagnosed mental illness smoke nearly half of the cigarettes in the U.S. (Lasser, et al. 2000). PSMI (N = 180) were recruited from three sites within a large community behavioral health center and randomly assigned to one of the three groups. The active interventions were contingent reinforcement (CR), and contingent reinforcement plus free nicotine replacement therapy by 21 mg patch (CR+HRT) for 16 weeks with follow-up over 9 months. CR was accomplished with escalating financial compensation for achieving and maintaining abstinence. The efficacy of each of these interventions was compared to each other and to a minimal intervention or ‘self-quit’ control group. Results suggest that intervention group participants had a significantly higher quit rate than control participants (58% vs. 18%; χ² =12.84, p<0.00) as measured by breath CO. Breath CO and self-report outcomes were discordant with saliva cotinine outcomes, which yielded far lower quit rates and a nonsignificant difference between intervention and control participants (11.6% vs. 10.7%; χ² =0.15, p=0.901). Suggested reasons for this discrepancy will be presented along with outcomes on other measures such as craving, assessment of psychological symptoms and wellbeing, and quality of life.

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PA1-6 PSYCHOLOGICAL AND PERSONALITY DIFFERENCES AMONG SMOKERS WITH RECURRENT VERSUS SINGLE TYPE OF MAJOR DEPRESSION

Lirio S. Covey, Alexander H. Glassman, New York State Psychiatric Institute and Columbia University; Rene Laje, Social Work Department, Hebrew Home of Greater Washington; Sally Woodring, Catherine LoDuca, Jenny Masmela, New York State Psychiatric Institute

BACKGROUND: Differences in smoking cessation outcome according to a history of recurrent or single major depression have been reported (Brown 2001; Covey 1994, 2005; Haas 2004). The nature and the extent of the differences between recurrent and the single type of major depression, however, have not been adequately investigated. This study compared smokers with past single major depression (SMD) and those with past recurrent major depression (RMD) on psychological, personality, smoking history and demographic variables.

SUBJECTS: Data were obtained from 103 participants with past major depression in a smoking cessation trial (SMD=71, RMD=32).

RESULTS: Compared to smokers with SMD, those with RMD showed higher scores on Spielberger trait anxiety (p<0.02), the POMS negative symptoms (depressed mood, restlessness, tension, confusion, fatigue) (p<0.02), and neuroticism (as measured by the Eysenck Personality Questionnaire) (p=0.006); and lower scores on the POMS positive symptoms factor (vigor, friendliness)(p=0.05). Age of first onset of major depression, a possible index of genetic load, was lower among smokers with RMD (23 yrs vs. 33 yrs, p<0.001). No differences were observed on demographic characteristics (age, gender, educational status, marital status, and race), history of alcohol dependence, nicotine dependence level, number of cigarettes smoked daily, or age of smoking onset.

CONCLUSION: Higher ratings on measures of psychopathology and younger age of major depression onset observed among smokers with past RMD may indicate mediating mechanisms that underlie a stronger adverse influence of this more severe form of major depression compared to SMD on the ability to stop smoking.

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PA1-7

INFLUENCE OF NICOTINE DEPENDENCE ON THE ASSOCIATION BETWEEN MAJOR DEPRESSION AND OTHER PSYCHIATRIC DISORDERS

Melinda J. Manley, M.A.*, Marc N. Potenza, M.D., Ph.D., and Rani A. Desai, M.P.H., Ph.D., Yale University School of Medicine, Departments of Psychiatry and Epidemiology & Public Health

BACKGROUND: Nicotine dependence frequently co-occurs with major depression. Major depression also co-occurs frequently with other psychiatric disorders. Despite the public health problems associated with nicotine dependence, major depression, and other mental illnesses, the relationship between these disorders remains poorly understood. To elucidate these associations, this study examined the influence of co-occurring nicotine dependence on the association between major depression and other DSM-IV diagnoses.

METHODS: The 2001-2002 National Epidemiologic Survey of Alcohol and Related Conditions (NESARC) surveyed a nationally representative sample of 43,093 U.S. adults. Lifetime and past 12-month DSM-IV diagnoses for a number of disorders, including nicotine dependence and major depression were determined using the Alcohol Use Disorder and Associated Disability Interview Schedule DSM-IV version (AUDADIS-IV). Cross-tabulation analyses underwent Chi-square analyses and odds ratios were derived from logistic regression analyses. Results: The associations of major depression with other Axis I and II disorders are present among both nicotine dependent and non-nicotin dependent respondents. Among non-nicotin dependent persons there is a lower prevalence of psychopathology, as compared to those who are nicotine dependent. The associations between major depression and other psychiatric disorders are stronger among those who are not nicotine dependent. Models examining the interactions between gender and nicotine dependence on the associations between major depression and other psychopathology identify similar findings across gender groups. Discussion: Nicotine dependence influences the association between major depression and other psychiatric disorders. The findings suggest that major depression represents a greater risk factor for psychopathology in non-nicotin dependent people than in those who are nicotine dependent. These findings have implications for the prevention and treatment of nicotine dependence, major depression, and other psychiatric disorders.

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PA1-8

DEPRESSION HISTORY AND CESSATION: RESULTS FROM THE WISCONSIN BEHAVIORAL HEALTH SURVEY

Steven S. Smith, Ph.D.*, Mark Zehner, M.S., Michael C. Fiore, M.D., M.P.H., and Timothy B. Baker, Ph.D., University of Wisconsin Medical School

Research on the relationship between current or prior clinical depression and smoking cessation attempts and success has yielded mixed findings. Most studies examining depression and cessation have utilized smokers enrolled in cessation clinical trials. Clinical trial participants may not be representative of the smoker population and, in addition, study inclusion-exclusion criteria may further bias samples of trial participants. The current study utilizes smokers who were initially identified in a population-based sample of adults who were willing to enroll in a subsequent longitudinal study, the Wisconsin Behavioral Health Survey (WBHS). A total of 1542 smokers were originally identified in the 2003 Wisconsin Tobacco Survey (WTS) and 1053 of these smokers agreed to be re-contacted about the WBHS. 452 smokers enrolled in the WBHS and completed an in-depth phone interview approximately one year after the WTS. Demographic information (gender, age, race/ethnicity, and education), smoking variables (FTND, intention to quit in the next 6 months), and depression history were collected during the WTS interview. Depression history was based on a WTS participant’s report of ever having been told by a health care provider that he or she had depression. During the Year 1 WBHS interview, self-reported smoking status (abstinent versus smoking) was assessed as well as information about whether or not a quit attempt was made during the year after the WTS. Separate hierarchical logistic regression (LR) analyses were computed for each dichotomous dependent variable (abstinent versus smoking; quit attempt made or not). The relationship between depression history and Year 1 smoking status and quit attempts was examined with gender, age, race, education, FTND score, and intention to quit used as control variables. Results of the LR analyses showed that history of depression predicted smoking status (odds ratio=2.7; p<0.05) and quit attempts (OR=1.7; p<0.05) after controlling for demographic and smoking variables. Compared to never-depressed smokers, smokers with history of depression were less likely to be abstinent but were more likely to make a quit attempt.

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PA2-1


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According to national data, US physicians missed many opportunities to intervene with smokers at office visits in 1991-95. We hypothesized that changes over the past decade, including the release of national smoking cessation guidelines and the availability of new pharmacotherapy, may have increased US physicians’ rates of addressing smoking at office visits. To determine whether physician practices have changed, we analyzed data from the National Ambulatory Care Survey, an annual survey of US office-based physicians. After each patient visit, physicians completed a form describing smoking status, smoking counseling, demographic, and diagnoses. We compared identification of smoking status and counseling about smoking at office visits to physicians in 2001-03 (N= 58,991 visits) to rates in 1994-96 (N= 84,104 visits). We analyzed data from 2001-2003 to assess recent trends in physician behavior. All comparisons were analyzed with weighted multiple logistic regression. Physicians identified patients’ smoking status at 68% of all visits in 2001-03 vs. 66% in 1994-96 (OR=1.16, 95% CI 1.04-1.30). Physicians counseled about smoking at 20% of smokers’ visits in 2001-03 vs. 21% in 1994-96 (OR=0.84, 95%CI 0.71-0.99). Between 2001 and 2003, identification of smoking status increased from 64% to 71% of all visits (p for trend=0.02) and smoking counseling increased from 18% to 21% of smokers’ visits (p for trend=0.47). The identification of smoking status at office visits to US physicians has improved over the past decade, but there has not been a significant change in smoking counseling despite substantial national efforts to improve physicians’ treatment of smoking. These results likely reflect barriers in the current practice environment, including lack of time to provide adequate counseling and lack of systems in place to support physicians’ efforts.

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PA2-2  INDIVIDUAL, PROFESSIONAL, AND ENVIRONMENTAL FACTORS IN TOBACCO-RELATED PRACTICE OF CANADIAN FAMILY PHYSICIANS AND PEDIATRICIANS

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Exposure to second-hand smoke (SHS) in homes has well-established health consequences for children; pediatricians and family practitioners are ideally positioned to reduce the exposure of children to smoke from parents and other family members. Advice from physicians can be effective in reducing smoking in homes, but there is little research on factors that are related to their actual practice. A detailed questionnaire on tobacco-related practice, practice environment, role perceptions, attitudes, and demographic factors was mailed to 1600 Canadian family physicians and pediatricians; the corrected response rate was 65 percent. Data were analyzed using a behavioral model including elements from the Health Belief Model, Social Cognitive Theory, and Diffusion of Innovation. While a great majority of physicians agreed that they have a major role in identifying parents who smoke, when patients are children, only about half report that they advise all or most parents to cut down or quit smoking. Less than one quarter give specific assistance in quitting. Respiratory disease in children is a strong stimulus for advising patients to quit smoking. Specialty is also strongly related to practice, with pediatricians more likely to discuss the effects of SHS and to advise parents to cut down or quit, while family practitioners are more likely to give specific help with quitting. Those who have taken tobacco-related continuing education are more likely to give all types of advice, and physicians who practice in smoke-free communities are more likely to help parents to quit smoking when their children have respiratory disease. A model of psychological behavior helps in understanding factors related to physician practice and points to educational and other changes that will facilitate physicians’ counseling of parents who smoke when children are their patients.

This study was funded by the SickKids Foundation, Toronto, Ontario.

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PA2-3  A RANDOMIZED TRIAL OF ACADEMIC PROFILING INCREASES PROVIDER TOBACCO INTERVENTION

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OBJECTIVE: To test academic profiling, or office-based education and comparative data feedback, to improve practice performance in assisting smokers with quitting.

METHODS: 50 primary care practices were randomized to receive either 2 tobacco education sessions and data feedback, or information by mail. Practice profiling data included frequency of tobacco documentation, and prescription rates for nicotine therapy or buproprion for adult patients enrolled in Medicaid and a single HMO. Enrolled patients identified as current smokers at baseline were surveyed by telephone 12 to 18 months post-intervention, and queried about care delivered in the preceding year. Logistic regression examined intervention effects on patient-report ed assistance with quitting. Results: A total of 1,239 smoking patients were surveyed at follow-up, of which 812 had 1 or more visits. Smokers seen by an experimental practice were more likely than smokers in control practices to receive information about counseling programs (OR = 1.43, 95% CI = 1.02-2.0), or use bupropion during a quit attempt (OR=1.73, CI=1.4-2.62). A total of 67.6% of smokers reported their advice from physicians can be effective in reducing smoking in homes, but there is little research on factors that are related to their actual practice. A detailed questionnaire on tobacco-related practice, practice environment, role perceptions, attitudes, and demographic factors was mailed to 1600 Canadian family physicians and pediatricians; the corrected response rate was 65 percent. Data were analyzed using a behavioral model including elements from the Health Belief Model, Social Cognitive Theory, and Diffusion of Innovation. While a great majority of physicians agreed that they have a major role in identifying parents who smoke, when patients are children, only about half report that they advise all or most parents to cut down or quit smoking. Less than one quarter give specific assistance in quitting. Respiratory disease in children is a strong stimulus for advising patients to quit smoking. Specialty is also strongly related to practice, with pediatricians more likely to discuss the effects of SHS and to advise parents to cut down or quit, while family practitioners are more likely to give specific help with quitting. Those who have taken tobacco-related continuing education are more likely to give all types of advice, and physicians who practice in smoke-free communities are more likely to help parents to quit smoking when their children have respiratory disease. A model of psychological behavior helps in understanding factors related to physician practice and points to educational and other changes that will facilitate physicians’ counseling of parents who smoke when children are their patients.

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PA2-4  TOBACCO TRAINING IN MEDICAL SCHOOLS: PRELIMINARY OUTCOMES OF THE GENERALIZABLE CURRICULUM INITIATIVE

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We produced a model for standardizing tobacco treatment instruction within established curricula across multiple medical schools while maintaining the flexibility to meet idiosyncratic needs. The model targets tobacco-related knowledge, attitudes, and behaviors derived from USPHS guidelines. We report our preliminary experience of the educational impact of the model. A 65-item instrument designed to measure knowledge and attitude objectives was administered prior to and one-month following tobacco training. Students also tracked clinical encounter details using handheld computers modified to capture Ask and Advise indicators. Finally, 10 tobacco history and counseling checklist items were embedded into 4 standardized patient cases in the year-end Clinical Skills Exam (CSE). Complete data were available for 201 of 208 students who participated. Factor analysis of the instrument yielded 8 factors; the first (eigenvalue 8.1, 31% of variance) included four items related to beliefs that smoking is a patient’s personal decision. Analysis of variance by intervention group showed significant change from pre to posttest with an overall increase of 1.4 points (p<0.001). The students reported 41,200 patient encounters across six clerkships during the academic year. 15,517 included tobacco counseling. Analysis of events by time revealed a 10% increase in history taking, sustained for at least 3 months following the training (p<0.001). The CSE was completed by 223 students at the end of their third year providing a measure of long-term retention. Virtually all of the students (99%) asked about tobacco use, and over 60% assessed willingness to quit. Standardized tobacco training curricula in medical schools are feasible and produce significant changes in short, intermediate, and long-term outcomes.

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PA2-5  MEDICAL STUDENTS COMPLIANCE WITH TOBACCO DEPENDENCE INTERVIEWING AND COUNSELING SKILLS USING HANDHELD COMPUTERS (PDA)

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BACKGROUND: A review of the literature indicates that handheld computers (PDA) are used in medical schools, but not designed for tobacco dependence treatment skills. In August 2005, Loma Linda University School of Medicine (LLUSM) required all 160 junior students to electronically document all patient encounters prospectively with ICD9/CPT codes to tabulate their longitudinal clinical experiences using a handheld computer (Pocket PC or Palm Pilot). After reviewing existing computerized clinician training software, we identified two programs based on the USPHS guidelines or the "5As Checklist" (tested originally as paper-based, but they did not provide 1) a basic interview format for a beginning medical student level, nor 2) were they designed to store all the patient responses from a handheld computer to document compliance. We produced a model for standardizing tobacco treatment instruction within established curricula across multiple medical schools while maintaining the flexibility to meet idiosyncratic needs. The model targets tobacco-related knowledge, attitudes, and behaviors derived from USPHS guidelines. We report our preliminary experience of the educational impact of the model. A 65-item instrument designed to measure knowledge and attitude objectives was administered prior to and one-month following tobacco training. Students also tracked clinical encounter details using handheld computers modified to capture Ask and Advise indicators. Finally, 10 tobacco history and counseling checklist items were embedded into 4 standardized patient cases in the year-end Clinical Skills Exam (CSE). Complete data were available for 201 of 208 students who participated. Factor analysis of the instrument yielded 8 factors; the first (eigenvalue 8.1, 31% of variance) included four items related to beliefs that smoking is a patient’s personal decision. Analysis of variance by intervention group showed significant change from pre to posttest with an overall increase of 1.4 points (p<0.001). The students reported 41,200 patient encounters across six clerkships during the academic year. 15,517 included tobacco counseling. Analysis of events by time revealed a 10% increase in history taking, sustained for at least 3 months following the training (p<0.001). The CSE was completed by 223 students at the end of their third year providing a measure of long-term retention. Virtually all of the students (99%) asked about tobacco use, and over 60% assessed willingness to quit. Standardized tobacco training curricula in medical schools are feasible and produce significant changes in short, intermediate, and long-term outcomes.

METHODS: We transferred the "5As Checklist" software to 150/160 juniors' PDAs the week before starting their clinical rotations during a 2-hour workshop. They were told they would receive a newly-developed PDA program (17 items) on their family medicine rotation to document interviewing and counseling skills as demonstrated in the workshop. We used the HandBase software designed for the LLUSM clinical PDA database to modify the required interviews from a paper-based system (used in 2004-5) to a digitized record (2005-6) of 10 tobacco users/students. FINDINGS: Students and faculty (n=20) who pilot-tested the PDA format took 2-3 minutes longer to complete interviews and found it easy to use. Evaluation of the effectiveness of PDAs as a new educational tool for reinforcing interviewing skills will be determined by 80 students’ perception of the PDAs usability, compliance with the required 10 interviews, and an Objective Structured Clinical Exam (OSCE) compared to the Class of 2006.

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PA2-6
ARE NURSES ADEQUATELY INFORMED ABOUT THE RISKS OF REDUCED TAR AND NICOTINE CIGARETTES, AND OTHER HARM REDUCTION STRATEGIES?
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Light and Ultra Light (L/UL) cigarettes evidence little or no risk reduction, but the majority of smokers believe that they are safer (Cummings et al., 2004; Kozlowski et al., 1998). We evaluated whether nurses (N=178; 93% female, 90% Caucasian, M age = 41; M years in nursing = 14.9; 10% current smokers; 46% former smokers) believe that certain products (L/UL, reduced tar, and no-additive cigarettes) and smoking behavior (lower tar, lower nicotine, reduced tobacco usage) can reduce harm. Nurses completed an anonymous questionnaire before mandatory hospital-based training on smoking cessation counseling. 25% believed that L/UL cigarettes were equal in tar to regular cigarettes; 55% believed that 2 Light cigarettes were equal in tar to one regular cigarette, and 51% believed that >= 3 UL cigarettes were equal in tar to one regular cigarette. 40% believed that L/UL cigarettes were less dangerous; younger nurses (< 41 years old) were more likely to believe this than older nurses (p<0.05). 14% of nurses said they recommend L/UL cigarettes to help patients reduce health risks. Regarding other harm reduction strategies, 15% said that cigars are less harmful than cigarettes; 41% said that cigarettes without additives are less dangerous; and 81% said that cutting down to 5 cigarettes per day improves health. Nurses had misperceptions about nicotine replacement: 60% believed that nicotine causes cancer, 72% believed that nicotine patches could cause heart attacks and 40% and 15% believed that a prescription was needed for the nicotine patch and gum respectively. No analyses differed by smoking status, except current smokers were more likely to believe that smoking risks were exaggerated (p<0.05). Nurse misinformation could lead to iatrogenic medical recommendations and failure to fully capitalize on the teachable moment in the medical encounter.

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PA2-7
USE OF ELECTRONIC CONTINUING EDUCATION IN DENTAL OFFICES FOR TOBACCO CESSATION

This study evaluated the effectiveness of a CD-ROM intervention combined with academic detailing email messages, and reimbursement for dentists to increase tobacco cessation activities in the dental practices within a dental managed care organization. The grant also evaluated dentists’ knowledge, attitudes, and behaviors towards tobacco cessation services within their practice, as well as patient cessation behaviors. 184 dentists from 29 states were randomized into intervention or control conditions. At follow-up intervention offices reported more patient education materials were available in the reception room(p<0.05). In intervention offices, lack of reimbursement and concerns over tobacco cessation effectiveness were less of a barrier to conducting tobacco cessation activities(p<0.05). Changes in dentist behavior approached significance for asking and advising behavior(p<0.10). At follow-up, approximately half of the dentists reported using the CD-ROM. Of the dentists who loaded the program, 62% rated the CD-ROM as useful or very useful, and 32% shared the program with other clinicians in the office. Intervention dentists who used the CD-ROM and electronic e-mail messages believed that nicotine replacement therapy (gum) was effective for tobacco cessation with dental patients(p<0.01). There was an association between time spent using electronic tobacco cessation education and tobacco cessation knowledge(p<0.01), and for activities such as advising(p<0.01). Patients in the intervention group were encouraged to set a quit date and received written materials and information on gum or patch more frequently than patients in the control condition(p<0.05), and made more quit attempts than patients in the control condition(p<0.05). There was significant reduction in the number of cigarettes smoked per week in the intervention than in the control condition (p<0.01). The study found that an intervention delivered via CD-ROM and e-mail resulted in increased time spent using the program, increased dentist shared the program with other clinicians in the office, and increased patient cessation behaviors.

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PA2-8
RECRUITMENT STRATEGIES FOR COMMUNITY-BASED TOBACCO CESSATION TRAINING
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Despite its vital role in research and dissemination studies, methods for effective recruitment are rarely prospectively studied or reported in the literature. We present findings from a comparative analysis of recruitment strategies employed in Project Reach, a community based trial of brief tobacco cessation intervention trainings for non-medical health influencers. Recruitment was completed over eleven months through multiple venues: community college course listings, in-person community outreach presentations, television and print advertising, on-screen postings (e.g. movie theaters and hospital monitors) and email list-serves. Methods were implemented incrementally based on recruitment flow and success of each venue. Audiences of interest included public health and social service workers, educators, behavioral and allied health professionals, fitness staff, and others interested in helping someone quit tobacco. 1819 individuals were screened and 898 randomized. The top three recruitment channels were community outreach presentations(53%), television(22%) and print advertising(10%). Each of the other methods, including community college listings, email list-serves, and movie theater postings, resulted in fewer than 5% of completed screening interviews. Community outreach presentations yielded, overall, the highest proportion of participants and were significantly more effective in recruiting Hispanic participants compared to other sources. Age differences also emerged. Outreach presentations were more effective among 20-24 year olds compared to other age groups. Gender differences were not documented. Findings support the effectiveness of having a strong “on the ground” recruitment presence with a large number of outreach activities. Ancillary reports revealed the strength of emotionally-driven messages and provided evidence of a cumulative effect of multiple exposures to different types of advertising and outreach. Ultimately, a combination of recruitment methods may contribute to successful enrolment of community-based research investigations in tobacco control and other health promotion areas. Specific recommendations for recruitment are presented.

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PA3-1
EFFECTS OF IN UTERO EXPOSURE TO THE CONSTITUENTS OF CIGARETTE SMOKE ON SENSORY GATING DURING PUBERTY
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In the rat the vertex-recorded N40 midlatency auditory evoked potential is a negative waveform that occurs ~40 msec after appropriate stimulation. This waveform has been localized to the hippocampus, can be modulated by cholinergic and noradrenergic agents and is affected by nicotinic agonists. It also habituates rapidly when animals receive repetitive stimuli. Habituation of the N40 potential has been used as a measure of higher level (hippocampal) sensory gating and has been proposed as a model to study human conditions characterized by deficits in sensory gating (e.g. schizophrenia). Pregnant rats were exposed to 350 ml of cigarette smoke from a 13RF experimental cigarette for 15 min, 3 times per day, from day E4 until birth. The pups were allowed to mature normally. Pups from exposed and unexposed mothers (controls) were implanted with skull electrodes on about PND 25. After a 3 day recovery period, responses (N40 evoked potentials) elicited by an auditory click stimulus were recorded. To measure habituation of these responses a paired stimulus paradigm (interstimulus interval 500 msec) was used. Comparison of amplitude of the N40 response of pups exposed in utero to that of unexposed pups showed no difference in amplitude of the response to the 1st stimulus. A similiar comparison of habituation of the N40 response showed that pups born to dams that were exposed to cigarette smoke during pregnancy exhibited a 51 ±10% (mean ± SEM) reduction in habituation of the response. This reduction was present at the beginning of puberty (PND 30-35) and tended to increase during puberty so that by PND 56-60 habituation was reduced by 70%. These results show that in utero exposure to the constituents of cigarette smoke produces a deficit in sensory gating that persists at least throughout puberty. Because a deficit in sensory gating can contribute to attentional and cognitive defects as well as disturbances in perception, in utero exposure-induced changes in the habitation of this response could partially explain the effects of maternal smoking.

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**PA3-2** PRENATAL SMOKING INFLUENCES NEWBORN NEUROBEHAVIOR: THE NEW ENGLAND FAMILY STUDY

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Relative to studies of other drugs of abuse, only a small number of studies have examined effects of prenatal smoking on newborn behavior. Through data available to us from the New England Cohort of the National Collaborative Perinatal Project (NCPP), we found the opportunity to study the effects of prenatal smoking during pregnancy on newborn neurobehavior. Based on our previous studies, we predicted specific effects of smoking on infant arousal, excitability and hyper-tonicity. Participants were 1235 mother and full-term infant pairs from the NCPP. Infants exposed to other drugs of abuse were excluded. The sample was 42% low-socio-economic status and 23% African American. Because data were collected during the 1960's, more than half of the sample reported smoking during pregnancy (61% of mothers). Levels of maternal smoking were measured at each prenatal visit and summed over pregnancy. Infant neurobehavior was assessed using the Graham-Freund Behavioral Examination, one of the first clinician-rated assessments of infant behavioral responses to structured handling. As predicted, infants exposed to prenatal smoking showed significant increases in fussiness (measure of infant crying throughout the exam; F = 3.87, p < .05), and number of measures of increased muscle tone (F's > 3.88, p's < .05). Smoking exposed infants also showed more spontaneous movements (F = 4.50, p < .05), suggestive of increased arousal and excitability. Results remained significant when low birthweight infants were excluded, and after controlling for significant covariates, including maternal socioeconomic status, age, and race, and infant gestational age. Significant dose response relationships emerged between prenatal smoking levels and several measures of muscle tone (rs > .09, ps < .01). Results extend specific effects of prenatal smoking on infant arousal, hyper-tonicity, and self-regulation found in small studies to a large community sample. Given proposed associations between early behavioral regulation and later externalizing behavior, results have important implications for early identification of at-risk offspring.

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**PA3-3** EVALUATING THE NATIONAL PARTNERSHIP TO HELP PREGNANT SMOKERS QUIT: 2006 UPDATES

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The purpose of this study was to evaluate the initiatives of the National Partnership to Help Pregnant Smokers Quit (QUIT) (National in May 2002, the National Partnership is a diverse coalition of over 60 leading philanthropic, health, business and government organizations dedicated to achieving the Healthy People 2010 goal of reducing smoking during pregnancy to less than 2%. The National Partnership adopted an Action Plan to provide proven clinical and community-based interventions to every pregnant smoker in the U.S. Evidence-based interventions in the areas of health-care, media, policy, research, communities/worksites, and state outreach are implemented by working groups of representatives from partner organizations. Working group members identified a core set of objectives for each focus area and review and modify these objectives annually. Benchmarks were established to gauge the progress towards these objectives. Activities for achieving these benchmarks are planned through monthly teleconferences, emails, and in-person meetings. The session will include a discussion of the progress and accomplishments of the National Partnership, the products generated by the member organizations, and the database developed to track and record elements of the national coalition. These elements include communications, strategies, decisions, and actions. Detailed information from all teleconferences, emails, and meetings are entered into the database, and results from Access queries provide descriptive statistics on the work of the National Partnership. Data on selected benchmarks will illustrate a range of activities designed to increase the accessibility of prenatal smoking cessation services. These activities include reaching employees through new webpage links with Wal-Mart; developing an Action Plan for providers who work with Native American populations; and assisting states in establishing Medicaid coverage for pregnant smokers. These results demonstrate how partners from health service and community organizations can successfully work together to accomplish shared goals.

Project funded by The Robert Wood Johnson Foundation.

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**PA3-4** EFFICACY OF PROACTIVE TELEPHONE COUNSELING FOR PREGNANT Smokers: A RANDOMIZED TRIAL

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Reducing pregnant women’s tobacco use is a public health priority. Brief smoking counseling done at prenatal visits is effective but cessation rates are low. More intensive smoking counseling might improve success. Proactive telephone counseling, an effective smoking cessation method, could offer pregnant women convenient access to more intensive smoking counseling, but the efficacy of this approach has not been demonstrated. We tested the efficacy of proactive pregnancy-tailored telephone-delivered smoking counseling (INT) vs a brief counseling control (CTL) in a randomized controlled trial of 442 pregnant smokers referred by Massachusetts prenatal providers and a managed care plan. INT patients (pts) received cognitive-behavioral counseling in a motivational interviewing style by trained counselors throughout pregnancy and for 2 mo postpartum (mean: 5 calls, 73 min of contact). CTL pts received a 5-min call. INT and CTL groups were similar at baseline (mean age, 28 yrs; 46% nulliparous; 87% white; 74% married; 73% privately insured). Cotinine-validated 7-day tobacco abstinence in INT vs CTL groups was 10.0% vs 7.5% at end-of-pregnancy (OR 1.37, 95% CI: 0.69-2.70, p=.39) and 6.7% vs 7.1% at 3 mo postpartum (OR 0.93, 95% CI: 0.44-1.99; p=1.0). However, the INT improved validated cessation rates at end-of-pregnancy in the 211 light smokers (<10 cig/day): 19.1% (INT) vs 8.4% (CTL) (OR 2.58, 95% CI 1.1-6.1, p=.037). In this large randomized trial, proactive telephone-delivered counseling did not improve smoking cessation rates over a brief ‘best practice’ intervention. However, telephone counseling was effective for the 50% of subjects who were light smokers at baseline, and it may have benefit for this group of pregnant smokers.

Funding: Robert Wood Johnson Foundation SmokeFree Families Program.

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**PA3-5** TESTING A COMBINED HEALTH BELIEF AND TRANSTHEORETICAL MODEL ON SMOKING CESSATION IN A RURAL PREGNANT POPULATION

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Despite the implementation of smoking cessation programs tailored to the pregnant woman, women continue to smoke during pregnancy. Most programs employ concepts from the Health Belief (HB) and Transtheoretical (TM) Models. Therefore, one of the purposes of this study was to test the effectiveness of a nurse-managed perinatal smoking cessation program that was integrated into routine care was to test a Combined HBTM Model. The setting included private offices and medical center in a rural area in western New York State. Data were collected from 101 women who stated that they were smokers at the onset of their pregnancies and who were enrolled in the experimental arm of the trial. Assessment of Stage of Change and Readiness to Quit was part of the Make Yours A Fresh Start Family intervention protocol. Stepwise logistic regressions analyzed the associations of perceived susceptibility (gravidity and parity), barriers (number of smokers in the household, number of cigarettes per day as reported at the first prenatal visit and at 16 weeks), demographic factors (age, highest grade completed, type of health insurance, marital status, place of residence, practice setting), Stages of Change and Readiness to Quit (3 categories) as they related to the likelihood of action (change of self-reported smoker status and urinary cotinine assays from the first prenatal visit to those at 28 weeks gestation and at postpartum). Multiple combinations of covariates were tested. Results found that those who were in the ready to quit category at the baseline first prenatal visit (RR = .081, CI = .020-.332, p < .001) and at 16 weeks gestation (RR=.037, CI = .004-.370, p=.005) were more likely to have positive urinary cotinine assays (>200ng/ml) at 28 weeks. In addition, the baseline number of cigarettes per day (RR = .495, CI = .272-.895, p = .020) and baseline ready to quit category (RR = .045, CI = .004-.453, p = .009) were significant predictors of positive urinary cotinine results at postpartum. The results indicate that for this rural pregnant population these parameters of behavioral change established the lower bar of smoking continuance, not the higher bar of smoking cessation.

This study was supported in part by Quest Diagnostics, Ross Laboratories, and the Southern Tier Tobacco Awareness Coalition.

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PA3-6  FACTORS PREDICTING SMOKING CESATION DURING PREGNANCY: RESULTS FROM A RURAL COHORT WITH A HIGH SMOKING PREVALENCE
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BACKGROUND: While smoking cessation programs for pregnant women have been developed, most of the research on their effectiveness has been conducted with urban women. Little is known about the factors that may influence the success of quitting during pregnancy of rural women with high rates of smoking and limited access to cessation assistance. Purpose: The aim of this project was to identify the sociodemographic, medical, and substance use factors associated with smoking cessation during pregnancy in a rural, high smoking prevalence population.

METHODS: Participants were women presenting for prenatal care at a family practice center during a two year period. Of 221 such women, 148 were identified as prepregnancy smokers and included in the sample. Sociodemographic and medical data were extracted from prenatal and newborn medical records through systematic chart review.

RESULTS: Participant age ranged from 14 to 43 (mean=22), with 96% Caucasian, 70% single, 51% with < a high school degree, and 56% with household incomes < $10,000/year. Prior quitting attempts ranged from none to 44. Fewer prior quit attempts was associated with increased smoking cessation during pregnancy. Women who quit smoking during pregnancy had significantly higher incomes, fewer prior pregnancy cessations, had smoked fewer cigarettes per day and for fewer years, and were more likely to have adequate prenatal care utilization, than those who continued to smoke. Additionally, women who reduced but did not quit smoking were significantly more likely to have used alcohol prior to pregnancy than those who quit smoking or continued smoking at the same rate. Pregnancy smoking cessation status was unrelated to age, marital status, education, history of depression, and use of marijuana or other illicit drugs.

CONCLUSIONS: Several background and prenatal care factors predicted pregnancy smoking cessation in this lower SES Appalachian sample. Results suggest ways to more effectively target pregnant women for successful smoking cessation.

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PA3-7  PROACTIVE VS REACTIVE RECRUITMENT OF PREGNANT EXSMOKERS
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A common challenge in research on pregnant smokers has been in achieving the target sample size, with even greater difficulty in accrual of prepregnant exsmokers for relapse-prevention studies. Two broad-based recruitment strategies have been used in different studies. One strategy involves the traditional reactive method in which women respond to public advertisements. The other strategy is more proactive, with researchers directly contacting potential participants. It is important to evaluate the equivalence of the samples accrued via the two strategies. At least one study that compared these strategies in the same sample of minority women found notable differences between participants recruited in these two ways (Harris et al., 2003). We examined if similar differences would be found among pregnant exsmokers. In our ongoing study on relapse prevention for pregnant exsmokers, we have used numerous accrual techniques, which can be classified into the two broad-based strategies. Specifically, the reactive methods included newspaper, TV, magazine, and radio advertising; flyers and business cards; direct mailings; and screeners in OB/Gyn offices. The proactive method involved purchasing commercial lists of pregnant women and telephoning them directly. To date, we have recruited 113 pregnant exsmokers (52 reactive, 61 proactive) who are between their 4th and 8th month of pregnancy. We have found no statistical differences between the two groups of women on demographic variables (i.e., age, race, marital status, education, SES), with the exception of employment, with women recruited proactively more likely to have adequate prenatal care utilization, than those who continued to smoke.

CONCLUSION: Several background and prenatal care factors predicted pregnancy smoking cessation in this lower SES Appalachian sample. Results suggest ways to more effectively target pregnant women for successful smoking cessation.

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PA3-8  A CLINICAL COLLABORATIVE IMPROVES THE TOBACCO INTERVENTIONS WITH PREGNANT SMOKERS
Susan Swartz, M.D.*, Judy Soper, Tim Cowan, M.S.P.H., Cindy Tworek, Ph.D., Center for Tobacco Independence, ME

Prenatal practices were recruited for a 9-month Collaborative modeled after Institute of Healthcare Improvement programs. A total of 21 practice teams (14 Ob/Gyn, 7 Family Practice) were asked to attend three all-day Learning Sessions, test rapid-cycle office changes, and report tobacco assessment and treatment data monthly. Teams were surveyed 1 year after the project began.

RESULTS: Of 15 practices that continued participation, 13 implemented office system improvements and saw an improvement in at least one quality measure, including identifying spontaneous quitters, advising to quit, assessing interest in quitting, and/or providing assistance. Quit line fax referrals increased from n=12 in the 9 months prior to n=82 after the project began. Among 69 team members eligible for follow-up, 62 (90%) completed the survey. Citing reasons for participation, 81% reported improving patient care as very important, and 64% felt improved communication with pregnant smokers was very important. As a result of participation, 88% reported greater ability to identify women quitting before the first visit, 85% more frequently ordered medications or referred, 27% had greater satisfaction with caring for pregnant smokers, and 59% felt less judgmental about smokers. When asked about comparing the use of medications for pregnant smokers before and after the Collaborative, frequent use of nicotine therapy was reported by 15.2% respondents before and 41.3% after participation; bupropion was reportedly used frequently by 53.5% prior to and 81.8% after beginning the project. While most team members faced challenges performing tasks and completing data entry and reporting, 98% felt the practice would continue efforts in tobacco-related office improvements.

CONCLUSION: For practices motivated to use a team-based approach to implement office changes, a Collaborative can lead to practice performance improvement for tobacco interventions during pregnancy.

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PA4-1  REINFORCEMENT ENHANCING EFFECT OF NICOTINE AND ITS ATTENUATION BY NICOTINIC AND DOPAMINERGIC ANTAGONISTS.
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Recent studies have demonstrated that nicotine can function as both a primary reinforcer and an enhancer of the reinforcing effects of non-nicotine stimuli through a non-associative mechanism. The present study used response-independent nicotine administration in male Sprague-Dawley rats to characterize the dose-dependency of this reinforcement enhancing effect of nicotine and examine its sensitivity to pharmacological antagonism of nicotinic and dopaminergic neurotransmission. A compound visual stimulus (VS, 1 s lever light on and 60 s house light off) maintained a stable level of operant responding (lever-pressing) on an FR5 schedule, and response-independent infusions of intravenous nicotine increased responding for the VS in a dose-dependent manner. The non-competitive nicotinic antagonist mecamylamine (0.5, 1, 2 mg/kg) substantially attenuated the nicotine-enhanced responding for the VS but not responding for the VS alone (i.e. with saline infusions). A dopamine D1 antagonist, Ro20-1724 (2.5, 10, 30 micro g/kg) and a D2 antagonist eticlopride (5, 10, 30 micro g/kg) significantly decreased responding for the VS in both nicotine-infused and saline control rats. These results demonstrate dose-dependence of the reinforcement enhancing effect of nicotine and suggest that nicotinic receptor activation mediates this effect. The results also suggest that antagonism of dopaminergic neurotransmission mediated by D1 and D2 receptor antagonists decreases the reinforcing value of the VS and probably thereby decreases the enhancing effect of nicotine. Further experiments are needed to verify whether dopaminergic neurotransmission directly mediates the reinforcement enhancing effect of nicotine.

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PA4-2
CHARACTERIZATION AND RECEPTOR MECHANISMS OF THE REWARDING PROPERTIES OF NICOTINE IN THE CONDITIONED PLACE PREFERENCE IN MICE

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Given that nicotine is the addictive component of tobacco, determining the nicotinic neuronal mechanisms involved in nicotine reward is of utmost importance in understanding how nicotine addiction progresses. Although not easily demonstrated, establishment of nicotine conditioned place preference (CPP) in mice would eventually allow for the examination of the roles of various receptor types in nicotine reward (i.e., through the use of transgenic mice). The present study was designed to investigate nicotinic receptor subtypes involvement and to assess the genetic influences on nicotine reward. Here we demonstrate in an unbiased CPP procedure that nicotine produced dose-dependent place preferences in CS7/BL6 mice after s.c. administration. Mecamylamine and dihydro-b-erythroidine, but not MLA, attenuated the place preference, demonstrating that specific nAChR subtypes mediate nicotine reward. In addition, we show that mice lacking the beta2 subunit of the nAChR do not find nicotine rewarding while alpha7 knock-out mice do. Taken together, these data suggest that the beta2 nAChR subunit is critically involved in nicotine reward as measured by CPP. Furthermore, assessing nicotine CPP in five mouse inbred strains revealed that the strains showed significant dose effects. The rewarding effects of nicotine in DBA mice were significantly lower that all other strains. These results suggest that genetic factors influence the responsiveness of mice to the rewarding effects of nicotine using the CPP procedure.

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PA4-3
ORAL NICOTINE SELF-ADMINISTRATION IS LESS IN NICOTINIC ALPHA-7 KNOCKOUT MICE THAN WILD-TYPE CONTROLS

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Nicotine self-administration has been classically considered to depend on nicotinic actions at high affinity nicotinic receptors. Low affinity alpha7 nicotinic receptors have not been considered to play a prominent role in the neural basis of nicotine self-administration. To test this possibility that alpha7 nicotinic receptors may be important in regulating nicotine self-administration, we measured the nicotine drinking in mice with knockout of alpha7 nicotinic receptors vs. wildtype controls (N=10 per genotype). Two bottles were available so that the mice had a free choice of saccharin sweetened water (20 mg/ml) or the same solution with added nicotine (50 ug/ml). Mice of each genotype were given free access to the two bottles for 60 days. The alpha7 knockout mice drank significantly (p<0.05) less proportion of their total fluid from the nicotine solution (34.1±3.3%) than the wildtype controls (43.9±3.1%). The alpha7 knockout mice showed a slight decline in nicotine drinking from 36.9 to 31.9% from the first third to the last third of the experiment, while the controls maintained a level between 43.1 and 43.7%. This result suggests a role for neuronal nicotinic alpha7 receptors in nicotine self-administration. There are a variety of possible mechanisms underlying this effect. Nicotinic alpha7 receptors may be important for the reinforcing value of nicotine. Nicotinic alpha7 receptors may be important for decreasing the aversive effects of nicotine. There may have been alterations in the neural circuitry underlying neural development without alpha7 nicotinic receptors, which influenced nicotine preference. These results may be important for explaining the high rates of tobacco addiction in conditions of abnormal alpha7 response such as schizophrenia. These results also point to the possible use of nicotinic alpha7 receptor acting drugs in the treatment of tobacco addiction.

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PA4-4
GENETIC VARIATION IN Cyph2a5-MEDIATED NICOTINE METABOLISM CORRELATES WITH DIFFERENTIAL ORAL NICOTINE CONSUMPTION IN MALE MICE

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Cyp2a5 is the mouse homologue of human cyp2a6; these enzymes are responsible for the primary metabolic inactivation of nicotine (NIC) to cotinine. Variation in human CYP2A6 activity can alter the amount smoked; both numbers of cigarettes smoked per day and smoking topography can be affected. Various mouse strains self-administer different amounts of oral NIC. Quantitative trait loci analysis of the second generation (F2) mice propagated from high (C57Bl6) and low (StuNi) NIC consuming mouse strains suggested that Cyp2a5 may be involved in the differential NIC consumption. We developed an in vitro NIC metabolism assay and a Western blotting assay and compared F2 high and low NIC consumers. We found that in F2 male mice high (n=8; 25.1±1.2ug NIC/day) consumers have ±56% higher CYP2A5 protein compared to low (n=11; 3.8±1.4ug NIC/day) consumers (22±4 vs. 14±2ug, P=0.03). In vivo hepatic NIC metabolism indicated that high consumers metabolize NIC ~39% faster (at Km [30μM]) compared to the low consumers (0.36±0.02 vs. 0.25±0.04ng/min/mg, P = 0.03). In contrast, female high (25.1±1.2ug NIC/day) and low (4.7±1.4ug NIC/day) consumers did not show pronounced differences in nicotine metabolism (0.43±0.05 vs. 0.39±0.09ng/min/mg) or CYP2A4/5 protein levels (306±28 vs. 299±33 units); this is consistent with some other studies of sex differences in response to nicotine. These data suggest that among the male F2 mice, increased nicotine self-administration is associated with increased nicotine metabolism, most likely as a result of greater CYP2A5 protein levels.

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PA4-5
INDUCTION OF CYP2E1, AN ENZYME ASSOCIATED WITH ALCOHOL AND NICOTINE DEPENDENCE, IN RAT BRAIN

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We found that CYP2E1 increases following nicotine treatment in rat brain in a time-dependent, region-specific manner. CYP2E1, the primary ethanol-metabolizing CYP in rats and humans also metabolizes endogenous substrates (arachidonic acid), other drugs (acetoephone, chloroxazone) and proactivates procarcinogens (tobacco-specific nitratosmes) and neurotoxins. Nicotine, in tobacco smoke, may contribute to enhanced CYP2E1 activity seen in smokers, as we have shown that it can increase CYP2E1 in rat liver and brain. Induction of rat hepatic CYP2E1 is short-lived with a maximal induction at 4 h after last drug injection, however the time course and mechanism of induction in rat brain is unknown. Induction of brain CYP2E1 was assessed following acute or chronic treatment with saline or nicotine (1mg/kg s.c.) and sacrificed at different times after the last injection. CYP2E1 mRNA levels were unchanged with nicotine treatment suggesting non-transcriptional regulation. Chronic nicotine treatment induced CYP2E1 maximally at 12 h post-treatment in frontal cortex (1.4-fold, p<0.01) versus at 8 h in hippocampus (1.5-fold, p<0.01) and cerebellum (1.4-fold, p<0.05), returning to basal levels by 24 h. In contrast, acute nicotine treatment increased CYP2E1 in the cerebellum 8 h post-treatment (1.6-fold, p<0.01) but no induction was observed in the frontal cortex and hippocampus. These results reveal a difference in CYP2E1 induction between acute and chronic treatment and brain areas. This suggests that humans exposed to nicotine acutely or chronically may have altered metabolism of centrally acting drugs and altered toxicity due to oxidative stress caused by CYP2E1. Those potentially affected include current smokers, passive smokers and people treated with nicotine such as smokers, and patients with Alzheimer’s or Parkinson’s disease or ulcerative colitis.

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PA4-6

RISK OF ACQUERING NICOTINE DEPENDENCE AMONG ADOLESCENT CAUCASIANS: INFLUENCE OF CYP2A6 GENETIC VARIATION

Nael Al Koudsi*, Daniel Rodriguez, Ph.D., Janet Audrain-McGovern, Ph.D., and Rachel F. Tyndale, Ph.D., Universities of Toronto and Pennsylvania

CYP2A6 is the human hepatic enzyme responsible for ~90% of nicotine's inactivation to cotinine. Recently, genetic variation in CYP2A6 has been associated with a differential risk for acquiring nicotine dependence (measured by ICD-10) among young (age 12-15) adolescents (O’Loughlin et al, 2004). We investigated this among older adolescents (age 14-18) using a measure, the modified Fagerstrom Tolernance Questionnaire for adolescents (mFTQ), which emphasizes physical aspects of dependence. A subset (N=249 Caucasians who smoked at least one cigarette) of a large cohort (N=1,151) followed for four years, were genotyped for decreased and inactive CYP2A6 alleles (CYP2A6*2, *4, *9, *12). A Latent Growth Curve model of progression to nicotine dependence fit the data well with a linear trend (chi square[21,325]=22.79, p=.35, CFI=.99, SRMR=.06, & RMSEA=.016 (CI=0.03)). The results indicated that adolescents with normal nicotine metabolism had significantly higher baseline nicotine dependence (beta=.825, z=2.258, p=.0239), but slower increases in nicotine dependence over time (beta=-.300, z=-.2.005, p=.045), perhaps due to their already higher levels of dependence at baseline. In contrast slow metabolizers (individuals with at least one CYP2A6 variant) show an acceleration in the level of nicotine dependence. In addition, baseline levels of lifetime marijuan use, smoking, and pleasant initial experience had significant positive effects on baseline nicotine dependence. These results suggest that CYP2A6 genetic variation alters the risk for nicotine dependence. Further examination of two protective haplotypes, G-G-T in AAs and T-G-T in EAs, indicated that the polymorphism rs740603-rs4680-rs174699 in the AA sample (minimum Z = -3.35; P = .0005 for FTND), a major protective T-G-T haplotype (frequency 15.2%; minimum Z = 1.6; P = .002 for SQ) in the AA sample for rs933271-rs4680-rs174699. Furthermore, we found that the significant haplotypes within COMT were gender-specific and the significantly associated G-G-T is protective in AA females only, whereas T-G-T is protective in EA males only. Moreover, we found a major high-risk T-A-T haplotype (frequency 56.7%) that showed significant association with the three ND measures in the pooled and EA samples and with FTND in the AA sample. Haplotype analysis revealed a major protective G-G-T haplotype (frequency 16.9%; minimum Z = 3.16; P = 0.002 for SQ) in the AA sample for rs933271-rs4680-rs174699. Furthermore, we found that the significant haplotypes within COMT were gender-specific and the significantly associated G-G-T is protective in AA females only, whereas T-G-T is protective in EA males only. Moreover, we found a major high-risk T-A-T haplotype (frequency 56.7%) that showed significant association with the three ND measures in EA males. Further examination of two protective haplotypes, G-G-T in AAs and T-G-T in EAs, indicated that the low COMT enzyme activity Met allele is protective to become nicotine dependent. In summary, our results provide evidence for a role of COMT in the susceptibility to ND and further confirm that its effect is ethnic and gender specific.

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PA4-7

SIGNIFICANT ASSOCIATION OF CATECHOL-O-METHYL-
TRANSFERASE (COMT) HAPLOTYPES WITH NICOTINE DEPENDENCE IN MALE AND FEMALE SMOKERS OF TWO ETHNIC POPULATIONS

Ming D. Li*, Joke Beuten, Jennie Z. Ma, Department of Psychiatric Medicine, University of Virginia; Thomas J. Payne, The ACT Center, University of Mississippi Medical Center

The catechol-O-methyltransferase (COMT) gene plays a prominent role in dopaminergic circuits central to drug reward. Allelic variants within the COMT gene are therefore potential candidates for examining inter-individual differences in vulnerability to nicotine dependence (ND). We analyzed five single nucleotide polymorphisms (SNPs), including the Val/Met variant (rs4680), which results in a 3- to 4-fold difference in enzyme activity within COMT, for association with the three ND measures in the pooled and EA samples and with FTND in the AA sample. Significant differences in withdrawal were found between 30 minutes and 180 minutes postcessation on the various subscales of the WSWS, within 30 minutes on the Stroop task. Statistically significant differences in withdrawal were found between 30 minutes and 180 minutes postcessation on the various subscales of the WSWS, within 30 minutes on the Stroop task. These findings provide the first evidence of the early time course of tobacco withdrawal symptoms. Limitations of the study design will be discussed, as well as potential implications for understanding the maintenance of daily smoking, and for the treatment of tobacco dependence.

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PA4-8

THE INFLUENCE OF MOOD, NICOTINE, AND DOSE INSTRUCTIONS ON THE SUBJECTIVE AND REINFORCING EFFECTS OF SMOKING

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The subjective and reinforcing effects of cigarette smoking are influenced by both actual nicotine and instructions regarding nicotine dose. These effects may be enhanced when smokers are experiencing negative affect. Smokers (n=172) abstained from smoking overnight prior to two sessions, during which negative and positive mood were induced (counter-balanced order between sessions) using music, smell, and modified IAPS + music procedure. Subjects were randomized to one of five groups. Four groups comprised a 2 x 2 balanced-placebo design, varying actual nicotine dose (0.6 mg vs. 0.05 mg [denicotinized]) and dose instructions (‘told nicotine’ vs ‘told no nicotine’). A fifth group was a no smoking control. The same smoking and instruction conditions were in effect during both sessions. Self-reported negative affect (NA) was assessed at baseline and after initial mood induction (negative or positive). Subjects in the smoking groups were then given dose instructions, smoked 4 puffs from the designated cigarette, and rated affect and cigarette ‘liking’. They then smoked that brand ad lib over the next 14 mins as the mood induction continued. NA was greater under negative vs positive mood induction, as expected, especially in women. Contrary to expectation, NA did not decline following smoking exposure, and cigarette ‘liking’ was not influenced by mood condition. However, ‘liking’ was greater due to nicotine, especially in men, and was greater in those ‘told nicotine’, especially among those given the descending instruction. During the ad lib smoking period, latency to smoke was quicker and number of puffs greater under negative vs positive mood induction. Latency was also quicker in those ‘told nicotine’ vs ‘told no nicotine’. Consistent with other research, these findings show that although negative mood induction does not alter subjective responses to smoking, it does quicen latency and increase ad lib smoking. Dose instructions also can influence smoking behavior and ‘liking’. Supported by NIDA Grants DA12655 and DA16483.

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PA5-1

THE EARLY TIME COURSE OF SMOKING WITHDRAWAL SYMPTOMS

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Despite the large volume of research on tobacco withdrawal, the vast majority of studies have focused on the onset and remission of symptoms over the course of several days and weeks, with the earliest assessment periods occurring the day after cessation. To our knowledge, there has been no systematic study of the very early time course of the tobacco withdrawal syndrome, despite its obvious relevance to the maintenance of both smoking and postcessation abstinence. The published literature contains a range of estimates about the early appearance of withdrawal symptoms, but without reference to empirical data. The main objective of the current study was to conduct a comprehensive, multimodal assessment of the early time course of the symptoms associated with tobacco withdrawal among cigarette smokers. Participants were 50 smokers randomly assigned to either be abstinent or smoke at their own pace during four hours in the laboratory. Dependent measures included self-report (the Wisconsin Smoking Withdrawal Scales; WSWS); sustained attention to conduct a comprehensive, multimodal assessment of the early time course of the symptoms associated with tobacco withdrawal among cigarette smokers. Participants were 50 smokers randomly assigned to either be abstinent or smoke at their own pace during four hours in the laboratory. Dependent measures included self-report (the Wisconsin Smoking Withdrawal Scales; WSWS); sustained attention to smoking stimuli (an emotional Stroop task); and a physiological measure (resting heart rate). After baseline assessment, participants were assigned to the two conditions and the dependent measures were collected every 30 minutes. Generalized Estimating Equations (GEEs) revealed that abstinent participants displayed greater withdrawal than continuing smokers on all measures with the exception of the Stroop task. Statistically significant differences in withdrawal were found between 30 minutes and 180 minutes postcessation on the various subscales of the WSWS, within 30 minutes on the RVIP, and within 60 minutes on the heart rate. These findings provide the first evidence of the early time course of tobacco withdrawal symptoms. Limitations of the study design will be discussed, as well as potential implications for understanding the maintenance of daily smoking, and for the treatment of tobacco dependence.

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PA5-2

COGNITIVE-MOTIVATIONAL EFFECTS OF NICOTINE: INDIVIDUAL DIFFERENCES IN RESPONSE, AND PREDICTORS OF SUCCESSFUL SMOKING CESSATION

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The incentive-sensitisation model of addiction implicates dopaminergic reward pathways in the development of, and relapse to, smoking. The present experimental prospective study tested the hypotheses that in smokers: (a) cognitive and motivational processes unmediated by these pathways would show impairments during acute abstinence and would be reversed by nicotine consumption; and (b) that early relapse, within 7 days of commencement of a quit attempt, would be predicted by the severity of these impairments during acute abstinence and by individual differences variables (personality, genotypes) indicative of hypo-functioning reward mechanisms. 198 smokers were assessed on a number of cognitive and behavioural measures following overnight abstinence on two occasions, immediately after consuming a lozenge containing either 4mg or 0mg nicotine (in counterbalanced order). 143 participants then commenced a quit attempt, and their success in remaining abstinent to 7 days was confirmed by biological measures at regular intervals. In the first few weeks of abstinence, the nicotine withdrawal symptom severity was higher in those who subsequently relapsed than in those who remained abstinent. The nicotine-related craving was not predictive of relapse. One Sample T-test was used for group comparisons. At 22-30 days of smoking abstinence they participated in a second scan. They were assisted in their efforts to quit smoking with contingency management techniques. Smokers were abstinent as indicated by urinary cotinine levels < 100 ng/mL and carbon monoxide levels < 10 ppm on both scan days. 5-A was administered intra-n venously as a bolus to constant infusion for 8 h and subjects were scanned between 6-8 h. Results demonstrate that 5-IA uptake decreased throughout cortical and subcortical regions over time. These findings confirm that the high affinity nicotinic agonist binding site is upregulated in recently abstinent smokers, compared to a previously acquired group of control nonsmokers, and that approximately 30 days of abstinence may be required to detect the normalization of beta2-nAChRs.

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PA5-3

BRAIN SIGNATURE OF CIGARETTE CUE-INDUCED CRAVING IS GREATEST IN FEMALES


Depleted brain/blood nicotine and conditioned cigarette reminders contribute to continued smoking and/or relapse. Data suggest that brain nicotine levels influence male smoking behavior more while female smoking behavior is influenced more by sensory cues associated with cigarette use. NRT and bupropion reduce withdrawal-induced craving (incurred by smokers) and are partial effective early, but not later, while nicotine-induced craving (incurred by smokers) is more severe and may persist much longer. To understand brain mechanisms underlying CIC we have developed a neuroimaging paradigm that minimizes WIC, revealing brain activation specific to cues. Results from two fMRI pilot studies, one BOLD and the other PASL perfusion, have been replicated and extended in our 

PA5-4

SPECT IMAGING OF BETA2 NICOTINIC ACETYLCHOLINE RECEPTORS IN TOBACCO SMOKERS DURING ACUTE AND PROLONGED WITHDRAWAL

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Nicotine, the principal addictive chemical in tobacco smoke, initiates its actions in brain through nicotinic acetylcholine receptors (nAChRs). In postmortem brain from human tobacco smokers, high affinity nicotinic agonist binding is elevated throughout the brain compared to nonsmokers and normalized to control levels in smokers who quit smoking at least 2 months before death. Animal studies also demonstrated that nicotine induced nAChR upregulation is reversible; however, the exact time course is unknown. We recently demonstrated that in human tobacco smokers, beta2-nAChRs were significantly elevated throughout the brain (25-35% in cortical and 9-26% in subcortical regions) compared to nonsmokers as measured with the high affinity nicotinic agonist [123I]-IA-85380 (5-I-A) and SPECT. The purpose of the present study is to image human tobacco smokers during both acute and prolonged withdrawal using 5-I-A and SPECT to examine the time course of the normalization of the beta2-nAChR during tobacco cessation. To date, 5 subjects have been studied. At the time of admission into the study, tobacco smokers smoked on average 20.8 ± 3.7 cigarettes /day and had a mean Fagerstrom Test for Nicotine Dependence (FTND) score of 6.3 ± 2.2. Tobacco smokers abstained from smoking for an average of 7-9 days prior to the first scan and were scanned for two time periods: for residual nicotine to clear from the brain. At 22-30 days of smoking abstinence they participated in a second scan. They were scanned twice in efforts to quit smoking with contingency management techniques. Smokers were abstinent as indicated by urinary cotinine levels < 100 ng/mL and carbon monoxide levels < 10 ppm on both scan days. 5-I-A was administered intravenously as a bolus to constant infusion for 8 h and subjects were scanned between 6-8 h. Results demonstrate that 5-I-A uptake decreased throughout cortical and subcortical regions over time. These findings confirm that the high affinity nicotinic agonist binding site is upregulated in recently abstinent smokers, compared to a previously acquired group of control nonsmokers, and that approximately 30 days of abstinence may be required to detect the normalization of beta2-nAChRs.

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PA5-5

EFFECTS OF HYDROXYMETABOLITES OF BUPROPION ON NICOTINE REWARD AND WITHDRAWAL IN MICE

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Bupropion, an atypical antidepressant, is also an effective aid to smoking cessation (ZYBAN®). Bupropion is extensively metabolized to several metabolites with hydroxybupropion being the major one. We recently reported that remarkable enantioselectivity was observed with the (2S,3S)-hydroxbupropion being more potent than the (2R,3R)-hydroxbupropion in blocking various neuronal nicotinic receptors and nicotine’s effects (Damaj et al., 2004). However, little is known about the effects of bupropion and its metabolites on nicotine reward and withdrawal. Studies were conducted to investigate the effects of hydroxybupropion enantiomers on nicotine reward (using the conditioned place preference or CPP) and withdrawal (using a spontaneous withdrawal model) in the mouse and compared to that of bupropion. (2S)-hydroxybupropion was found to block nicotine CPP with a potency higher that of the R-isomer or that of bupropion after s.c. administration. In contrast both enantiomers reversed the spontaneous somatic and affective withdrawal signs in nicotine receiving chronic nicotine (24 mg/kg/day for 14 days) with a similar potency. Our results suggest that the effects of bupropion’s major metabolite may be critical to its anti-smoking effects.

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PA5-6 MEDIATORS OF BUPROPION TREATMENT EFFECTS

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608 adult smokers (52% women; mean age = 42) participated in a randomized double-blind placebo-controlled study that examined the efficacy of bupropion SR (150 mg., b.i.d.) alone and bupropion SR with 4-mg nicotine gum. Individuals who received active bupropion (n = 453) were compared with those who received only placebo medication (n = 155). Ecological momentary assessment (EMA) and daily diary data were used in a structural equation model to test potential mediators of bupropion’s effect on outcome. 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. Results revealed that bupropion had three significant mechanisms of action: it reduced the overall withdrawal symptomatology experienced on the quit day, it accelerated the reduction of cravings in the first week post-quit, and it increased the experience of positive affect during the first week post-quit. These mediators accounted for between 6% and 40% of the variance in outcome due to treatment effects. These results support negative reinforcement models of tobacco dependence that emphasize the importance of withdrawal alleviation as a motivation for drug use.

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PA6-1 OPIATE MODULATION OF PAIN AND HYPOTHALAMIC-PITUITARY HORMONES IN SMOKING MEN AND WOMEN

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Endogenous opiates play an important role in regulating mood, pain sensitivity, and hypothalamic-pituitary-adrenocortical (HPA) functions. They may also be involved in the reinforcement of cigarette smoking. This study was conducted to examine opiate modulation of pain sensitivity and HPA hormones in smoking men and women. Smokers and nonsmokers completed two sessions during which placebo or 50 mg of naltrexone was administered, using a double-blind, counterbalanced design. Blood and saliva samples, cardiovascular and mood measures were obtained throughout the sessions. Thermal pain threshold and heat tolerance were assessed, and participants also rated pain during a 90-sec cold pressor test (CPT). They also completed the McGill Pain Questionnaire (MPQ) after each pain challenge. Endogenous opioid blockade increased plasma cortisol, adrenocorticotropin, and salivary cortisol levels, but this increase was attenuated in smokers. Smokers reported less pain than nonsmokers. Women reported more pain during both pain procedures, but these differences were significant only among nonsmokers. Smokers exhibited increased diastolic BP response to CPT. In response to naltrexone, smokers exhibited attenuated HPA responses relative to nonsmokers. Results also showed that nonsmoking women showed reduced thermal pain tolerance, increased affective pain, and reduced diastolic and systolic BP responses to CPT after opioid blockade. The attenuated HPA response to the opioid blockade among smokers and the reduced pain sensitivity in this group suggest dysregulated opioid modulation that may be involved in maintaining smoking behavior. The diminished gender differences among smokers are an indication that smoking-related pain alteration is more profound in women.

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PA6-2 PEAK CORTISOL REACTIVITY AND ANXIETY SENSITIVITY AS PREDICTORS OF SMOKING CESSATION FAILURE

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In the current study, we examined the biologically-based variables of peak cortisol reactivity after a stressful task and anxiety sensitivity in the prediction of time to first lapse in a sample of 60 African American smokers receiving standard smoking cessation treatment. Univariate analyses indicated a relationship between peak cortisol reactivity and anxiety sensitivity (p < .05), with both variables related to latency to first lapse up to 30 days of abstinence (both p’s < .01). Using demographics and current depressive symptomatology as covariates, both peak cortisol reactivity and anxiety sensitivity contributed uniquely to the prediction of latency to first lapse in a regression analysis (p < .01, sr2 = 5.1, p < .01, sr2 = 9.6, respectively). Together, these results indicate that peak cortisol reactivity and anxiety sensitivity may a) tap into a single biologically-based construct, and b) may be key in understanding smoking cessation failure.

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PA6-3 ANXIETY-BASED AFFECT INTOLERANCE AND EARLY SMOKING RELAPSE

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The present study examined cigarette smoking behavior, negative affectivity, and anxiety-based affect intolerance in relation to quit attempt duration among a young adult sample (N = 500; mean age = 21.8 years, SD = 2.2 years) from Mexico. Among the sub-sample of current smokers who attempted to quit but relapsed (n = 130), higher levels of anxiety-relevant affect intolerance demonstrated a unique incremental association with early relapse (Beta = -.231, p < .05, Level 2 R2 = .042) above and beyond the variance accounted for by average rate of daily cigarette use (Beta = -.418, p < .05) and levels of negative affectivity (Beta = -.065, n.s.; Level 1 R2 = .197, p < .05). These findings will be discussed within the context of anxiety-relevant affect intolerance and smoking relapse patterns more specifically.

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PA6-4  PERSISTENCE, STRESS REACTIVITY, AND OUTCOME: A PROSPECTIVE ANALYSIS OF THE RELATIONSHIP BETWEEN DISTRESS TOLERANCE AND SMOKING RELAPSE

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Recent findings have suggested that distress tolerance predicts success or failure in smoking cessation. Individuals with a history of early relapse seem to be more reactive to stress and less persistent on physical and psychological tasks; those able to remain abstinent for longer periods are less reactive and more persistent. We analyzed the effects of baseline persistence and stress reactivity on relapse in a community-based sample (N = 136) of smokers who received nicotine replacement and individual cognitive behavioral counseling as they attempted to quit smoking. Survival analysis indicated no significant effect of persistence (p = .74) or stress reactivity (p = .78) on outcome for participants followed 60 days. Logistic regressions performed for one day, one week, two months, and two months post-quit also showed no significant effects for persistence or stress reactivity (p values ranged from .23 to .96). Overall, only 40% of participants relapsed by the end of the first two months. Participants who reported poorer physical health (p < .01) at baseline and shorter length of abstinence on prior quit attempts (p < .01) were significantly more likely to return to smoking. Our prospective results do not support a relationship between distress tolerance and early relapse, but do reinforce other recent findings that baseline physical distress is related to early relapse.

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PA6-5  THE ROLE OF COMMITMENT IN CESSION OUTCOMES IN BOTH AIDED AND UNAIDED QUIT ATTEMPTS

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The construct of commitment has become central to researchers examining motivational processes and substance use outcomes as well as those applying principles of Acceptance and Commitment Therapy to the addictions. However, measurement of this construct and examination of its role in smoking cessation outcomes has been absent. We developed an 8-item measure of commitment to smoking cessation, conceptualized as a self-reported willingness to persist in quitting smoking in the face of difficulty and discomfort, e.g. ‘No matter how difficult it may be, I won’t let myself smoke once I quit.’ The psychometric properties and predictive validity of the measure were tested in two samples: 81 smokers making an unaided quit attempt and 145 heavy drinking smokers enrolled in a randomized smoking cessation trial. The measure showed good internal consistency in both samples and was moderately stable over time. Overall, only 39% of participants relapsed by the end of the first two months. Participants who reported poorer physical health (p < .01) at baseline and shorter length of abstinence on prior quit attempts (p < .01) were significantly more likely to return to smoking. Our prospective results do not support a relationship between distress tolerance and early relapse, but do reinforce other recent findings that baseline physical distress is related to early relapse.

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PA6-6  THE ROLE OF DEPRESSION AND AFFECT REGULATION IN TOBACCO SMOKING AMONG COLLEGE STUDENTS

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Previous research has revealed a strong link between depression and smoking. To account for this relationship, researchers have suggested that smokers may use nicotine to self-medicate depressive symptoms or manage mood. However, few studies have investigated the self-medication hypothesis among college students. This study examined the relationships among depression, affect regulation expectations, and smoking behavior within a college population. 315 undergraduate smokers at a Midwestern university completed a 296-item survey. Cross-sectional analyses revealed that the number of cigarettes smoked in the past month was correlated with both a higher number of depressive symptoms (p<.0001) and a greater expectancy that smoking would regulate negative affect (p<.0001). Furthermore, the relationship between depressive symptoms and smoking was fully mediated by negative affect regulation expectations. Specifically, a higher level of depressive symptoms was associated with smoking more cigarettes (p<.001), but this relationship became nonsignificant once negative affect regulation expectations was entered into the model (p=.13, compared to p<.001). Additionally, affect regulation expectations completely mediated the relationship between a probable history of depression and smoking behavior (p=.97, compared to p=.008). These findings suggest that although depressive symptoms and a history of depression are associated with smoking, these relationships are accounted for by the expectation that smoking will reduce negative emotions. The results of this study have important clinical implications. It is recommended that tobacco smoking interventions teach college students healthy ways to cope with negative emotions.

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PA7-1  USING TOBACCO CESSION STORIES FROM LOW-INCOME PATIENT TO DEVELOP TARGETED INTERVENTIONS: THE ACCE PROJECT

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BACKGROUND: Understanding the unique experiences of low-income and minority smokers is potentially important in planning interventions. OBJECTIVE: To explore smokers’ personal stories using a mixed-methods semi-quantitative approach. METHODS: FIFTY CURRENT OR PREVIOUS SMOKERS WERE RECRUITED FROM THE INPATIENT GENERAL medical service and follow-up clinic at an urban, indigent-care hospital in Alabama. Using an open-ended interview guide, interviewers asked participants to tell the story of their experiences with tobacco. Four independent reviewers coded transcribed interview statements into categories (risks, rewards of quitting, personal relevance of quitting, self-efficacy, and strategies for success), and then rated the strength of each statement (low, medium or high). RESULTS: Of the 50 patients, 66% were current smokers, with 70% African-American, 44% female, 48% inpatients and mean age was 49 (SD 11). All 33 current smokers were in the contemplation stage. Of note, 21 interviews contained no statements rated high. The most frequently identified statements rated high were: smoking risks (30% of interviews) and personal relevance (24%) (eg: “When I walked into the emergency room, I couldn’t breathe, & the main, primary reason was smoking cigs”). High statements of self-efficacy were present in 22% of interviews. Behavioral strategies for quitting were present in 20% (eg: “Keeping myself occupied, finding things to do around the house”). Specific comments related to other strategies were rare (talking to family (8%), with doctor (6%), and use of pharmaceuticals (6%), as were high-rated rewards of quitting were rare (8%). CONCLUSIONS: Patients did have unique Stories, although the yield per interview was low. Understanding the content of what is said, and not said, will help target interventions.

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Numerous studies have demonstrated that patients’ belief that they are taking active drug is associated with desired outcomes. This analysis describes the effect of perceived and actual drug assignment among African American (AA) smokers enrolled in a clinical trial of bupropion vs. placebo. 600 AAs were randomly assigned to either 150mg bupropion SR (n=300) or placebo (n=300). At 26 weeks follow-up, participants were asked, “Do you think you were given the actual medication Zyban or the sugar pill (placebo)?” For this analysis, “believers” were those who reported that they received active bupropion. “Non-believers” were those reporting having received “placebo” or “some Zyban and some placebo” or “don’t know.” 7-day cotinine-verified quit rates at 26 weeks were 25.4% for believers and 16.5% for non-believers. To determine the effect of belief about drug assignment on cessation, while controlling for actual treatment received, logistic regression analyses were performed. Believers’ odds of quitting were 1.61 (p=0.04) times as high as non-believers. Results indicate that participants who believed they received active bupropion, regardless of the actual drug they received, were statistically more likely to quit smoking than non-believers. These results support previous research that perceived treatment is a powerful predictor of outcome and confirms this relationship in smoking cessation trials. Funded by NIH R01 CA77856.

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PA7-5 RACE DIFFERENCES IN SHORT-TERM SMOKING CESSATION AND RELAPSE

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BACKGROUND: The efficacy of several pharmacological treatments for smokers has been demonstrated. This evidence has been based mostly on Whites. Short-term cessation and relapse rates by race were examined in this study.

METHODS: Subjects (n=588, African-American - 21%, Hispanic - 12%, Asian - 5%, and White - 61%) were aged 21 to 76, smoked 10+ cigarettes daily, and had made a previous quit attempt. Participants received bupropion, nicotine patch, and individual counseling (B/NP/IC) openly for 8 weeks (Phase 1). Short-term cessation was defined as 4-week sustained abstinence at the end Phase 1. Abstainers entered a 16-week maintenance phase and randomly assigned to receive: bupropion+nicotine gum; bupropion + placebo gum; nicotine gum + placebo pill; or placebo pill + placebo gum (Phase 2). Relapse was defined as first episode consecutive 7-day smoking during Phase 2.

RESULTS: I. Short-term cessation. Rates in response to B/NP/IC were White - 61%; Asian-55%; Hispanic-40%; African-American-39% (p<0.001). II. Relapse. Of 312 successful abstainers in the open-label period, 294 (African-American-15%, Hispanic-9%, Asian-5%, White-70%) entered Phase 2. Overall relapse rates by treatment in Phase 2 were: bupropion+nicotine gum=57%, bupropion+placebo gum=46%, placebo pill+nicotine gum=55%, and double placebo=64%. Kaplan-Meier pair-wise comparison test, only the difference in survival curves between bupropion+placebo gum versus double placebo was significant (p<0.04). Further analysis of maintenance treatment response, limited to African-American and White samples because of limited sample size, showed that none (0/7) of the African-Americans assigned to the bupropion+placebo gum arm relapsed; by contrast, 50% (29/58) of Whites assigned to the same treatment (p<0.01) and 42% (5/12) of the African-Americans assigned to double-placebo relapsed. Although response to short-term open treatment bupropion and nicotine delivered with counseling was lower among African-Americans than Whites, response to maintenance treatment with bupropion among the African-Americans who were able to abstain initially was highly salutary.

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PA7-6
THE EFFECTS OF NICOTINE GUM AND COUNSELING AMONG AFRICAN AMERICAN LIGHT SMOKERS
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The prevalence of light smoking in the U.S. is increasing yet there have been no smoking cessation clinical trials targeting light smokers. Approximately 50% of African American (AA) smokers are light smokers (smoke - 10 cigarettes a day). The purpose of this 2 x 2 factorial, randomized clinical trial was to evaluate the efficacy of 2mg nicotine gum and counseling for AA light smokers. Participants were randomly assigned to one of four study arms: 2 mg nicotine gum plus health education (HE); 2 mg nicotine gum plus motivational interviewing (MI); placebo gum plus HE; and placebo gum plus MI. 755 AA light smokers (66% female, mean age = 45) were enrolled at a community health center over a 16-month period. Participants received nicotine gum for 8 weeks and 6 counseling sessions over 26 weeks. Biochemical measures included expired carbon monoxide (CO) and serum and salivary cotinine. Quit rates for nicotine gum did not differ from placebo (14.2% vs. 11.1%, p = 0.232). However, a counseling effect emerged, with HE performing significantly better than MI (16.7% vs. 8.5%, p < 0.001). Results highlight the potential positive impact of directive information and advice-oriented counseling on smoking cessation. Studies are needed to assess other interventions that may further improve quit rates among AA light smokers who are motivated to quit.

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PA8-2
STRUCTURAL EQUIVALENCE MODELING OF STATE-LEVEL TOBACCO CONTROL ORGANIZATIONAL ACTIVITIES
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State tobacco control programs have been built on the coalition model. In this model, the organizations share responsibility for the various required activities. It is not known what degree of redundancy of efforts is occurring, or even what degree is appropriate. Non-metric multidimensional scaling, typically used to assess structural equivalence in social network analysis, was used to infer system structural equivalence based on common organizational activity patterns among 372 organizations in the 50 states and Washington, DC in 1998-1999. Most of the organizations tended to congregate around a common set of activities, with a great deal of redundancy of efforts. The American Cancer Society and American Lung Association showed particular overlap in activity patterns. The American Heart Association appeared distinct from these and showed greater variability in activity patterns across the states. The state health departments showed moderate homogeneity in activities. The technique illustrated here can be used to investigate the most parsimonious use of increasingly scarce tobacco control resources.

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PA8-1
TOBACCO CONTROL IN ONTARIO: STRATEGIC SUCCESS OR SECULAR SLIDE?
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Ontario, Canada’s largest province, initiated a comprehensive tobacco-control strategy in 1994. Objectives (prevention, protection, cessation) and strategic priorities (public education, cessation support, infrastructure development) were set by the Ministry of Health, while programs were designed and delivered by voluntary agencies. The Ontario Tobacco Research Unit monitors and evaluates the Strategy and publishes annual reports on progress. Between 1999 and 2003, 22% fewer cigarettes were sold, falling to 1631 per capita; daily smoking by students dropped from 21% to 13%; daily smoking among 15-19 year-olds declined from 19% to 9%; smoking by age 18+ dropped from 25% to 23%; complete restrictions on smoking at work increased from 70% to 81% of employed persons; regular smoking in homes with children under age 12 declined from 23% to 10% of homes; and 80% of the population lived in municipalities with effective bans on public smoking, including in restaurants. On the input side, funding was increased in 1999 to CAD 1.16 per capita (then the highest in Canada), and again in 2004. Tobacco taxes have tripled the price of cigarettes since the 1994 cut that prompted the Strategy. There was thus much progress in tobacco control in Ontario, especially in protection from ETS. This improvement coincides with the period of the Strategy, especially its second five years. However, declines in prevalence and consumption have only kept pace with those in other provinces and states, most of which had no comprehensive strategy. Despite increases in tobacco taxes, Ontario is still the North American bargain center for smokers, while tobacco-control funding lagged well behind recommended levels until a year ago. We conclude that, with the important exception of protection, Ontario’s gains in tobacco control through 2004 have been largely secular trends that would have occurred regardless. The new Smoke-free Ontario Strategy will provide an important test of the effectiveness of expanded funding, policies and programs.

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PA8-3
CANADIAN APPROACHES TO BUILDING RESEARCH CAPACITY IN TOBACCO CONTROL
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BACKGROUND: Tobacco control can benefit from greater integration of research, practice and policy. However, achieving integration depends upon having sufficient research capacity and receptivity for generating new knowledge and testing innovative interventions. At present, research capacity is limited, inequitably distributed across and within countries, poorly integrated across disciplines, and often conducted independent of the needs of program providers and policy makers.

METHODS: In 2004, the partners of the Canadian Tobacco Control Research Initiative funded three investigator teams to enhance tobacco control research capacity in Canada. One team is using strategic recruitment and training, the development of productivity tools, and the creation of ‘Communities of Research and Practice’ to enhance the number, size and distribution of trans-disciplinary, multi-sectoral, applied research teams. A second team brings university-based researchers together with program planners and policy makers from the Institut Santé Publique du Québec, an organization that has direct links to a provincial ministry of health. The third team is pursuing a more traditional approach by funding a multi-disciplinary team of scientists to pursue research in the neurobiological and psychological mechanisms of nicotine addiction and vulnerability to nicotine dependence.

RESULTS AND DISCUSSION: We will describe and compare the approaches taken by the teams, and a preliminary report of their progress, and barriers. Progress has been slow but steady. Engagement of researchers and decision makers has been a challenge. Sharing proprietary data to facilitate team building and secondary data analyses is more difficult than expected. Leaders from each of the interdiscipliary capacity enhancement teams meet to improve efficiency and enhance knowledge across the projects.

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PA8-4  THE IMPACT OF STATE TOBACCO CONTROL PROGRAMS ON PREVALENCE AND INDIVIDUAL RISK OF BEING A HARDCORE SMOKER

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Hardcore Smokers (HC) have been defined as those individuals who are established, heavy smokers with no history of quit attempts and no reported intent to quit. Research has attempted to better characterize HC based on demographics, smoking, and environmental variables. One set of environmental factors of particular interest is contact with sources of support for cessation attempts. It has been found that contact with such factors differentiates HC from other groups of smokers with HC consistently having less contact with potentially important resources such as smoking restrictions, interactions with healthcare providers, and advice from healthcare providers. Another important source of environmental influence on HC may be population-level interventions, such as state tobacco control programs. Using data from the 1998/1999 TUS-CPS, we compared prevalence rates of HC at the state level to a measure of strength of state tobacco control (SOTC) derived from the ASSIST evaluation that was conducted in the same timeframe. We also included SOTC in logistic regression analyses of individual-level factors comparing HC to other smokers. Results of logistic regression analyses demonstrated that stronger SOTC was predictive of lower HC prevalence (P=0.0002). In addition, SOCT was a significant predictor of risk of being a HC even after controlling for factors previously shown to predict HC prevalence (P=0.0002). These results lend further support to the idea that contact with contextual factors that support cessation efforts is a predictor of risk of being HC even after controlling for factors previously shown to predict lower HC prevalence (P=0.0002). In addition, population-level interventions impact the prevalence of HC at a state level. These findings also have implications for the hardening debate.

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PA8-5  REVERSING THE MACHINE SMOKING REGIME FOR CIGARETTE YIELDS: IMPLICATIONS FOR TOBACCO CONTROL POLICY

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The issue of how to test and regulate conventional cigarettes represents a critical challenge for the tobacco control community. Article 9 of the Framework Convention on Tobacco Control (FCTC) includes provisions for testing the contents and emissions of tobacco products, as well as for regulating these contents and emissions. However, the current international standard for testing cigarette emissions, the ISO/FTC smoking regimes, are widely recognized to be flawed and biased in favor of certain product designs. As a consequence, an ISO working group that includes participants from the tobacco industry, the World Health Organization, and government regulators is in the process of developing a new machine smoking regime that is more representative of human smoking behavior. We review the smoking regimes under consideration, and present data that examines the implications of these protocols. For example, will the yields from more intensive smoking regimes serve as better predictors of exposure? To what extent will the yields serve as more effective regulatory limits, particularly in jurisdictions such as the European Union where limits are already in place? Will the new yields be any less susceptible to industry exploitation than the current ISO yields? The implications for consumer information will also be discussed, along with the how cigarette yields fit within the broader context of tobacco testing, including smoking topography, biomarkers of exposure, and product design.

The research was funded by grants from the U.S. National Cancer Institute/NIH (from the Roswell Park Transdisciplinary Tobacco Use Research Center (TTURC), P50 CA111236, and from R01 CA103362), the Canadian Institutes for Health Research, the Australian National Health and Medical Research Council, the Australian Commonwealth Department of Health and Aging, Cancer Research UK, the Centre for Behavioural Research and Program Evaluation of the National Cancer Institute of Canada/Cancer Research UK, and the Canadian Tobacco Control Research Initiative.

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PA8-6  INDOOR AIR QUALITY IN HOSPITALITY VENUES BEFORE AND AFTER PASSAGE OF A CLEAN INDOOR AIR LAW

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This study compared indoor air quality in Atlanta restaurants and bars prior to and after passage of the Georgia Smokefree Air Act of 2005. The Georgia law is the first state-wide smoking ban passed in a tobacco producing state. It took effect on July 1, 2005. The law prohibits smoking in all public places. Bars and restaurants that deny access to patrons under the age of 18 and that do not employ anyone under 18 are exempt. Respirable suspended particles 2.5 microns and smaller (PM2.5) were measured using personal aerosol monitors in a purposive sample of 50 Atlanta bars and restaurants prior to enactment of the new law and at one month following enactment of the law. All study establishments allowed smoking prior to July 1, 2005. Field staff entered the restaurant or bar and remained for at least 30 minutes. The personal aerosol monitor sampled the air continuously at one minute intervals. Observations were also made on the number of patrons, the number of burning cigarettes, and signature. Follow-up measurements of air quality were made in all venues. The follow-up measurements were taken on the same day of the week and at approximately the same time of day as the baseline measurements. At follow-up, we observed some dramatic reductions in secondhand smoke exposure. However, there was no reduction in the average PM2.5 level over the 50 venues and compliance with the new law was low. Some restaurants and bars ignored the law. Others allowed smoking during some time periods, typically evenings. A few establishments posted signs announcing they were smoking venues. This paper discusses the reasons for noncompliance and the lack of reduction in secondhand smoke exposure. Data from this study will help shape public policy in Georgia (where the law has not yet been fully implemented) and other states that have not yet passed or implemented comprehensive smoke-free laws.

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PA9-1  MESSAGE FRAMING FOR SMOKING CESSATION WITH BUPROPION: A RANDOMIZED CONTROLLED TRIAL

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Prospect theory suggests that because smoking cessation is a prevention behavior with a fairly certain outcome (i.e., quitting is clearly linked to preventing health problems), it is likely that gain-framed messages would be more persuasive than loss-framed messages when attempting to encourage smoking cessation. The present study is the first to test this notion in a smoking cessation clinical trial. This investigation was a prospectively randomized study of two framed messages for smoking cessation in combination with open label bupropion SR. Participants (N = 258) were randomly assigned to receive factually equivalent video and print messages encouraging smoking cessation that emphasized either the benefits of quitting (gain-framed) or the costs of not quitting (loss-framed), respectively. All participants received open label bupropion SR (300 mg/day) for 7 weeks. The primary outcome measures were biologically verified continuous abstinence from the targeted quit date and abstinence in the last 4 weeks of treatment. Results revealed a trend showing that participants in the gain-framed condition were more likely to report continuous abstinence than those in the loss-framed condition. After adjusting for medication compliance using pill bottle openings, this effect favoring gain-framing was statistically significant. These findings offer initial evidence that gain-framed messages should be provided to individuals trying to quit smoking with bupropion.

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PA9-2
A POOLED-ANALYSIS OF VARENICLINE, AN ALPHA 4 BETA 2 NICOTINIC RECEPTOR PARTIAL AGONIST VS. BUPROPION, AN, FOR SMOKING CESSATION

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Varenicline, a selective partial agonist of the alpha 4 beta 2 nicotinic receptor, is the first non-nicotine agent developed specifically for smoking cessation. Varenicline has the potential to reduce nicotine craving and withdrawal symptoms during abstinence. During smoking, varenicline blocks nicotine binding to the alpha 4 beta 2 receptor, theoretically reducing the reinforcing effects of smoking. In two identically designed, randomized, double-blind studies, treatment with varenicline 1 mg bid was compared with bupropion 150 mg bid and placebo, each for 12 weeks, and a 40-week non-treatment follow-up period. For both studies, the primary end point was the carbon monoxide-confirmed 4-week continuous quit rate (CQR) during weeks 9-12. The continuous abstinence (CA) rate for weeks 9-52 was also measured. The pooled data for the CQR and CA binary end points were modeled using a logistic regression with treatment group and study as the main effects. Response rates with corresponding odds ratios, 95% confidence intervals, and p values comparing treatment groups were obtained. A total of 2045 smokers, who were randomized and received at least 1 dose (intent-to-treat population), are included (varenicline, n=692; bupropion, n=669; and placebo, n=684). The odds ratios for the 4-week CQR at weeks 9-12 were 1.87 (95% CI, 1.50-2.34) for varenicline compared with bupropion (p<0.0001) and 3.69 (95% CI, 2.88-4.72) for varenicline compared with placebo (p<0.0001) with the following response rates: varenicline 44.2%, bupropion 29.7%, and placebo 17.7%. The odds ratios for CA over weeks 9-52 were 1.56 (95% CI, 1.19-2.06) for varenicline vs. bupropion (p<0.0013) and 2.82 (95% CI, 2.06-3.86) for varenicline vs. placebo (p<0.0001; response rates: varenicline 22.5%, bupropion 15.7%, and placebo 9.4%). Nausea was mild to moderate in intensity (discontinuation rate due to nausea was 2.5%). Overall discontinuations from treatment due to adverse events were lower with varenicline than with bupropion and similar to placebo rates in both studies. Results suggest that varenicline will provide a significant advance over currently available drug treatments for smoking cessation.

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PA9-3
EFFECT OF VARENICLINE ON CRAVING AND WITHDRAWAL SYMPTOMS

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The alpha 4 beta 2 nicotinic acetylcholine receptor mediates nicotine’s effects on dependence and craving. Varenicline, a novel, selective alpha 4 beta 2 nicotinic receptor partial agonist, was developed specifically for smoking cessation. Partial activation of the alpha 4 beta 2 receptor by varenicline is hypothesized to provide sufficient pharmacologic activity to diminish craving and nicotine withdrawal symptoms. In two identically designed, randomized, double-blind, 12-week studies, treatment with varenicline 1 mg bid or bupropion 150 mg bid was compared with placebo. Craving was assessed using the Urge to Smoke item of the Minnesota Nicotine Withdrawal Scale (MNWS) and the 10-item Brief Questionnaire of Smoking Urges (QSU-Brief). Withdrawal was assessed using the remaining eight items of the MNWS. Data were analyzed using a repeated measures model. For craving, MNWS Urge to Smoke and QSU-Brief Total Craving Score were prespecified as relevant; for withdrawal, Negative Affect and Restlessness subscales were prespecified. Results from both studies showed consistent and statistically significant benefit of varenicline versus placebo on craving over both measurements (p<0.0001) and withdrawal characterized by Negative Affect (depressed mood, irritability, frustration, or anger, anxiety, difficulty concentrating; p<0.001), but Restlessness was significant in only one of the two studies. Standardized effect sizes (ES; in absolute value) were over 0.30 for MNWS Urge to Smoke, QSU-Brief Total Craving Score, and the two QSU-Brief subscales, and over 0.20 on the MNWS Negative Affect subscale, and at least 0.11 for Restlessness. Standardized ES were 0.67 and 0.63, respectively, on Urge to Smoke (MNWS); 0.33 in both studies on the Total Craving Score (QSU-Brief); and 0.30 and 0.22 on Negative Affect (MNWS). The effect of bupropion was noticeably smaller on Urge to Smoke (MNWS; ES=0.30, 0.50) and the Total Craving Score (QSU-Brief; ES=0.15, 0.26) versus placebo in both studies, and was consistent on withdrawal. The data suggest that varenicline reduces craving and key symptoms of withdrawal and appears to provide greater benefit than bupropion in mitigating craving.

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PA9-4
INDIVIDUALIZING NICOTINE PATCH DOSE TO MATCH SMOKERS’ USUAL NICOTINE INTAKE LEVELS


Nicotine replacement products have been moderately successful in treating addicted smokers, but they typically replace only 50% of the nicotine that smokers receive from their cigarettes. We conducted a prospective, randomized, clinical trial involving 391 adult smokers (Mean age = 43 (SD=11)) to test the hypothesis that those who replace 100% of their normal nicotine intake will be more likely to quit successfully. Subjects were moderate to heavily-dependent smokers (mean cigarettes per day = 25 (SD = 11); mean baseline saliva cotinine = 424 ng/ml (SD = 222)). They were randomly assigned to one of 5 nicotine-patch treatment conditions: 100% replacement, 50% replacement, 21 mg, 42 mg, or placebo, and followed for 1 year. To reach target replacement levels, patch dose was adjusted if necessary during the first 2 weeks post-cessation for subjects assigned to 100% or 50% replacement. Relapse was rapid for all treatment groups, with more than 50% relapsed in the first week post-quit. Survival analyses indicated that those assigned to the active-patch conditions had significantly better outcomes than those assigned to placebo patches after 1-year of follow-up (14% quit vs. 6% quit; p = .0001). However, 100% replacement was not superior to other active-patch conditions. We conclude that nicotine-patch treatment continues to be effective for adult smokers, but that individualizing 100% replacement of nicotine is not more efficacious than standard patch treatment in the population of moderate to heavily-dependent smokers.

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PA9-5

WILL MAINTENANCE PHARMACOTHERAPY REDUCE RELAPSE TO SMOKING?

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BACKGROUND: More than 20% of US adults are cigarette smokers, the vast majority of whom would like to stop smoking. Treatments that enable many of these smokers to quit in the short-term have been developed. However, whether stopping on their own or with the help of formal programs, the majority of initial successes will return to smoking. This study examined the efficacy of maintenance pharmacotherapy for reducing relapse to smoking.

METHODS: 588 smokers received combination bupropion, nicotine patch, and counseling during an initial 8-week period. 312 participants (53.1%) achieved 4-week continuous abstinence (CO<8 ppm); 294 of them entered a 16-week maintenance treatment phase where they were randomized, in a 2 x 2 factorial design (bupropion or placebo and nicotine gum or placebo gum), to one of four treatment arms. A 24-week treatment-free period followed.

RESULTS: Survival analysis through Week 48 (40 weeks from Day 1 of the maintenance phase) showed a significant difference indicating longer time to relapse (first episode of 7 consecutive days smoking) with bupropion+placebo gum treatment than the placebo/placebo condition (P=0.02). Bupropion+nicotine gum and nicotine gum+placebo bupropion also appeared to reduce time to relapse relative to placebo/placebo, but the differences were not significant (P>0.05). Other predictors of time to relapse were older age, higher education status, higher occupation status, no history of major depression, having been a smoker for longer, smoking more cigarettes, smoked fewer cigarettes daily, and higher body mass index (all P's<0.05).

CONCLUSION: Among smokers able to achieve sustained abstinence during an initial 8-week treatment with bupropion, nicotine, and counseling, extended use of bupropion reduced the relapse rate.

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PA9-6

THE IMPACT OF SOURCE OF FUNDING ON RESULTS OF RANDOMIZED TRIALS OF NICOTINE REPLACEMENT THERAPY FOR SMOKING CESSATION: A META-ANALYSIS

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OBJECTIVE: To assess whether funding source was associated with results of trials of nicotine replacement therapy for smoking cessation.

DATA SOURCES AND STUDY SELECTION: We conducted a meta-analysis of all randomized, controlled trials included in the Cochrane review of nicotine replacement therapy for smoking cessation. We relied on disclosure of financial support as reported in published articles.

DATA SYNTHESIS: There were 105 trials with at least 6 months of follow-up (pooled odds ratio=1.77, 95% confidence interval: 1.66 to 1.88). For the 37 trials exclusively funded by pharmaceutical companies, the pooled odds ratio was 1.85 (1.66 to 2.05). For the 25 studies with mixed funding (industry and non-profit or government agencies), the odds ratio was 1.82 (1.62 to 2.04). For the 31 studies exclusively funded by non-profit or government agencies, the odds ratio was 1.66 (1.46 to 1.89). Twelve studies did not indicate their source of funding (odds ratio=1.57, 1.26 to 1.95). A funnel plot of trials funded by the industry was asymmetrical, suggesting that publication bias occurred, with about 9 small trials missing (rank test, z=3.35, P<0.001). Nineteen of the 37 industry-sponsored studies reported statistically significant results, compared with 7 of 31 studies funded by non-profit or government agencies (91% vs. 23%, odds ratio=3.62, P=0.015). Industry sponsored studies had a larger sample size (median=240) than studies funded by non-profit or government agencies (median=201). After adjustment for sample size, the latter odds ratio decreased to 3.43 (P=0.031). For the 3 patch studies funded only by non-profit or government agencies, the pooled odds ratio was not statistically significant (odds ratio=1.36, 0.86 to 2.15).

CONCLUSIONS: Industry-funded studies reported larger effects and were more likely to report statistically significant results. These results were explained both by differences in sample size and by publication bias.

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PA10-1

WOMEN'S TOBACCO USE IN EGYPT: CHANGES IN ATTITUDES AND PRACTICES

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Women in traditional societies are often under-represented in tobacco use surveys, due to social norms that discourage women from smoking. Surveys often are conducted in homes while relatives are present, which may inhibit women from freely discussing tobacco use. Concurrently, the global social and economic liberation of women has led to working outside home, increased disposable incomes, and exposure to Western culture and advertising. To overcome problems associated with household interviews, we conducted a survey of 630 adult women recruited in cafes in Cairo, Egypt. Half of the participants (49%) smoked only cigarettes, 23% smoked cigarettes and water pipes, and 28% were exclusive water pipe smokers. The median age was 32.5 years; exclusive water pipe smokers were younger than cigarette smokers (29 vs. 37 yrs, P<0.001). Marital status was strongly associated with use: 63% of the unmarried subjects used water pipes, compared to 41% of married, divorced, or widowed women (P=0.01). Being unmarried was associated with the belief that water pipe smoking is less harmful than cigarettes (44% vs. 38% of married women, and 27% of divorced/widowed). Younger, unmarried smokers were of relatively high SES but used tobacco away from the home, whereas older married or divorced smokers tended to own their water pipes and smoke in their homes, often in defiance of social norms. Cafes have become a place where women can smoke openly. Results of this study suggest surveys of women's tobacco use in traditional societies may obtain more realistic data by interviewing women in non-residential settings. Future tobacco control efforts in Egypt will need to address the rapidly increasing use of tobacco products by women.

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PA10-2

SMOKERS' CHOICE: WHAT EXPLAINS THE STEADY GROWTH OF CIGAR USE IN THE US?

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PROBLEM/OBJECTIVE: Some tobacco survey data suggest that the cigar boom, specifically the dramatic increase in prevalence, may be over. However, the most recent USDA data suggest the contrary—cigar consumption in the United States has demonstrated small but steady increases every year. The purpose of this paper is to explore recent trends in cigar prevalence and consumption.

METHODS: Data from three unique sources are reported. 1. The National Survey on Drug Use and Health (NSDUH) is utilized to generate cigar use prevalence estimates. 2. Data from the US Department of Agriculture (USDA) are used to examine trends in overall US consumption. 3. Data from ACNielsen Market Scanner summarize tobacco sales using universal product codes and have great utility to highlight trends in specific products.

RESULTS: The NSDUH shows that past month cigar use has significantly increased in the United States between 2000 and 2004 among adults from 4.8% to 5.8% and among young adults from 10.4% to 12.7%. The highest rates of past month cigar use were reported among male young adults, ages 18 to 25 (19.7% in 2004). The most recent USDA data indicate that small cigars have become the fastest growing segment of the market, increasing in consumption by 76% between 1998 and 2004 vs. large cigars which increased by 34%. The data from ACNielsen highlight an increasing phenomenon in the use of flavors in cigars, reflecting a parallel trend in the cigarette industry. Indeed, 55% of the cigars sold in convenience stores in 2004 represented new flavored cigars.

CONCLUSIONS: In contrast to cigarettes, cigar consumption and prevalence is rising. Young adults constitute an increasingly greater proportion of the number of new cigar smokers. The new flavored cigars, undoubtedly appeal to the youth and young adult market. Given declines in cigarette consumption, steady growth in cigar consumption, innovative cigar marketing, and the expansion of available cigar products, the threat posed by cigars is real and deserves renewed attention.

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PA10-3
HARM PERCEPTION OF NICOTINE PRODUCTS IN COLLEGE FRESHMEN
Stephanie Y. Smith*, Barbara Curbow, Fran Stillman

OBJECTIVES: To explore the association of sociodemographic factors and behavioral experience (i.e., cigarette, cigar, and waterpipe smoking) with nicotine product harm perception in college freshmen. Students were asked to compare the perceived harmfulness of three FDA-regulated and eight unregulated nicotine products to the perceived harmfulness of a regular conventional cigarette.

DESIGN: The data are from Phase II of a cross-sectional Internet survey entitled The College Freshman Nicotine Study (CFNS), N=411. The CFNS was a one-year two-phase qualitative and quantitative study that assessed knowledge, attitudes, beliefs, and use of nicotine products among a sample of college freshmen attending a private university during the 2003-2004 academic year. Methods: Binomial logistic regression was used to determine the association between sociodemographic and behavioral experience with nicotine product harm perception. The outcome measure was less or as or more harmful than a regular cigarette.

RESULTS: Freshmen perceived the harmfulness of regulated and unregulated nicotine products differently. Among the FDA-regulated products, three were perceived to be as or more harmful than cigarettes: nicotine patch (20%), nicotine gum (23%), and nicotine inhaler (52%). Among the unregulated nicotine delivery products, seven were perceived to be less harmful than cigarettes: dip/ chew (11%), cigars and cigarillos (17%), liquid (36%), waterpipe (20%), ultra light cigarettes (40%), nicotine lollipops (64%), and nicotine water (65%). The sociodemographic factors of sex, race, weekly spent income, and citizenship were associated with nicotine product harm perception (p<.05). Current cigarette smokers were less likely to perceive the three FDA-regulated products such as waterpipe smoking, even ever, and ever and current waterpipe smoking were associated with nicotine product harm perception (p<.01). Conclusions: Misperceptions about the harmfulness of regulated and unregulated nicotine products relative to regular cigarettes exist in this sample of college freshmen. These findings underscore the importance of developing a science base to inform policies and educate consumers about these products.

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PA10-4
PERCEIVED RISK OF HARM FROM CIGARETTES OR SMOKELESS TOBACCO AMONG U.S. HIGH SCHOOL SENIORS
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OBJECTIVE: Some advocates call for increased promotion of smokeless tobacco (ST) as a potentially reduced exposure tobacco product. This study examined perceived risk of harm from smoking or ST use in a U.S. nationally representative sample of high school seniors and examined its association with current smoking status.

DESIGN: Data were from the Monitoring the Future Project. Trend analysis included data for 1992-2003 and detailed analyses included data for 1999 through 2003 (n=11,093). Main outcome measures: Prevalence of perceived great risk of harm from smoking or using ST, and association between perceived risks and current smoking.

RESULTS: Perceived great risk for harm from smoking or using ST increased between 1992 and 2003 while prevalence of using either product declined since the mid-1990s. In 1999-2003, 74.0% of high school seniors perceived great risk of harm from smoking and 44.9% perceived great risk from using ST. Perceived risk varied by smoking intensity: 80.3% of non-smokers perceived great risk of harm from smoking, compared to 49.7% of students who smoked about one-half pack per day and 36.1% of pack-a-day smokers. Overall, 52.7% perceived equal risk of harm from using either product, 41.3% perceived greater risk from cigarettes, and 6.1% perceived a greater risk from using ST. Students who perceived an equal risk for harm from using cigarettes or ST were less likely than those perceiving a greater risk for smoking to be current smokers (OR=0.62; 95% CI: 0.55, 0.69).

CONCLUSIONS: Young smokers underestimate smoking’s risks and perceived lower risk for ST use was associated with greater probability of current smoking. Effective methods for communicating accurate health risks to young people are needed, but it is unclear whether changing risk perceptions would influence their behavior.

Funding: CDC ORIE Fellowship.

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PA10-5
SMOKELESS TOBACCO REDUCTION: USE OF TOBACCO FREE SNUFF
Dorothy K. Hatsukami, Ph.D.*, Admanda J.Edmonds, Sharon E. Murphy, Ph.D., Xiaoyan Li, and Stephen S. Hecht, Ph.D., University of Minnesota

Not all smokeless tobacco (ST) users are ready to quit when advice for cessation is given, however they may be receptive to reducing their smokeless tobacco intake. Yet, no study has been conducted examining the most efficacious method to facilitate the reduction of ST use. This study examined the effects of using tobacco free snuff compared to a control condition of no tobacco free snuff in reducing ST use among users uninterested in quitting. ST users assigned to tobacco free snuff were given the product for 8 weeks and both groups received behavioral instructions for reduction during this time. All participants were required to reduce their intake by 50% by week 4 and 75% by week 8. Follow-up occurred at 12 weeks. No differences in demographics and tobacco use history were observed for those assigned to the tobacco free snuff (N=52) or control (N=54) conditions. The mean (SD) age was 33 years (7.9), tins per week was 4.2 (1.8), and cotinine level was 10,500 ng/mL (4,960). Significant reductions in amount used (tins per week and dips per day, p < 0.001), cotinine levels (p<0.001) and levels of total NNAL, a measure of uptake of NNK, a potent carcinogen (p=0.03) were found. Mean percent reductions at the end of treatment (week 8) were 80% for tins per week, 77% for dips per day, 48% for cotinine, and 26% for total NNAL and similar reductions were observed at Week 12. Only total NNAL showed treatment effects, with the greatest reductions occurring in the tobacco free snuff compared to the control condition (p=0.05). The abstinence rate (no use of tobacco snuff for the past 7 days) was 39% for the tobacco free snuff and 15% for the control condition (p=0.02). Significant differences between the two treatment conditions (p=0.006). In summary, significant reductions in ST use were achieved in ST users not interested in quitting. ST users assigned to the tobacco free snuff experienced greater reductions in toxin exposure and were significantly more likely to achieve point prevalence abstinence. Supported by NIH grant DA14404.

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PA10-6
EVALUATING MOTIVATIONAL INTERVIEW PHONE SUPPORT FOR SMOKELESS TOBACCO CESSATION WITH MILITARY PERSONNEL
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While national surveys have indicated that cigarette smoking has declined both in prevalence and on a per capita basis, smokeless tobacco (ST) use has remained stable. It is estimated that 17 percent of young male active duty military personnel use ST products and the use has been increasing with further restrictions on smoking on base. The purpose of the present study was to evaluate a population health approach to reducing ST use employing pro-active recruitment and a minimum contact treatment as compared to usual preventive health care. Subjects were recruited from 24 base/post dental clinics where active duty military personnel attended their annual dental examination and indicated they were ST users. Subjects assigned to treatment condition were contacted via telephone by trained cessation counselors and offered assistance in making a quit attempt. Those expressing interest were mailed a free videotape and manual specifically developed for this population of ST users. Two additional counseling calls were scheduled to coincide with receipt of the materials and the subject’s quit date. Follow-up measures are being obtained at the 3-month and 6-month points via written surveys sent by mail. To date, 785 subjects have enrolled in the study. Examination of the 3-month outcomes available from 341 subjects found that those assigned to the treatment condition reported close to triple the quit rate of subjects receiving usual care (45% versus 15%, 7-day point prevalence). Significant treatment effects were shown for pro-quit prevalence (23% versus 8%, no use in past 60 days). Complete three and six month follow-up results will be presented. These preliminary findings support the pro-active use of a minimal-contact intervention using motivational phone support within a military population can significantly reduce ST use.

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PA11-1

ACUTE EFFECTS OF A BRIEF COMPUTERIZED INTERVENTION ON MOTIVATION TO QUIT AND SMOKING BEHAVIOR

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Most current smokers are not highly motivated to quit at a given point in time. Based on a positive relationship between motivation to quit and cessation, it is imperative to increase motivation among this majority of the smoking population. We previously reported on the initial development of a brief computerized intervention directed at low-motivated smokers. In the present study, we extended this evaluation by randomly assigning fifty low-motivated smokers (10 or more cigarettes/day) to one of three intervention conditions: Smoking-Related (SR), Nutrition-Related (NR), or No Intervention (NI). All three conditions involved watching a computer monitor for approximately 12 minutes. The two active interventions provided tailored messages based partly on tenets of Motivational Interviewing (Miller & Rollnick, 2002). Analyses focused on intervention effects on Stage of Change and Contemplation Ladder indices of motivation to quit, as well as smoking behavior during an unobtrusive cigarette rating task. Chi-square analysis indicated a significant Group difference on Stage of Change movement (p < .01), with 50% of Group SR participants moving from the precontemplation to the contemplation stage. There was also a significant Group x Time interaction in Contemplation Ladder scores (p < .01), with only Group SR showing a significant increase in CL score from pre to post intervention. These changes were less pronounced than observed in our pilot study, possibly due to the competing influence of urge to smoke as this lengthier session progressed. Nonetheless, increases in self-reported motivation to quit were accompanied by decreases in smoking behavior in Group SR, including a longer time to first puff and decreased total number of puffs (p < .05). In conclusion, it appears that a brief computerized intervention can produce desirable short-term changes in motivation and smoking behavior. Further work is necessary to determine if this intervention, or some variant, can lead to sustained changes in motivation and/or behavior.

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PA11-2

SMOKING CESSATION VIA THE INTERNET: TWO RANDOMIZED CLINICAL TRIALS OF AN INTERNET INTERVENTION FOR SMOKING CESSATION

Sandra J. Japuntich*, Mark E. Zehner, Stevens S. Smith, Douglas E. Jorenby, Jose E. Alvez, Michael C. Fiore, Timothy B. Baker, and David H. Gustafson, University of Wisconsin-Madison

Internet interventions for smoking cessation are ubiquitous. Yet, to date, there are no randomized clinical trials that gauge their efficacy. The first study is a randomized clinical trial (n = 265, 58% female, 77% Caucasian) of an internet smoking cessation intervention. Smokers were randomly selected to receive either bupropion alone, or bupropion in addition to 12 weeks of access to the Comprehensive Health Enhancement Support System (CHESS) for smoking cessation and relapse prevention (a website, which provided information on smoking cessation as well as support). We found that access to CHESS was not significantly related to abstinence at the end of the treatment period (OR = 1.37, 95% CI = 0.79-2.38) or at 6 months post-quit (OR = 1.48, 95% CI = 0.74-2.97). However, the number of times participants used CHESS per week was related to abstinence at both end of treatment (OR = 1.832, 95% CI = 1.31-2.57) and at the 6 month follow-up (OR = 1.83, 95% CI = 1.09-2.43), with higher rates of use during the middle and end of the use period being particularly related to success. Participants with access to CHESS logged in an average of 33.64 times (SD = 30.76) over the 90 day period of access. CHESS use did not differ by ethnicity, level of education or gender (p > .05). Results of a second clinical trial will also be presented. In sum, results suggest that participants used CHESS frequently, CHESS use was related to success, but the effects in general were too modest to yield inter-group effects.

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PA11-3

WEB-BASED SUPPORT AS AN ADJUNCT TO GROUP-BASED SMOKING CESSATION FOR ADOLESCENTS

Lindsey Turner* and Robin Mermelon, Institute for Health Research and Policy, UIC

Although group-based programs remain the most common treatment approach for adolescent smoking cessation, success rates for these programs have been relatively modest, and their reach may be limited. Web-based adjuncts may be one way to boost the efficacy and reach of group-based approaches. The purpose of this study was to evaluate the efficacy of enhancing the American Lung Association’s Not on Tobacco Program (NOT) with a web-based adjunct (NOT Plus). Twenty-nine high schools were randomly assigned to either the NOT program alone or to the NOT Plus condition, which included access to a specially designed website for teens, along with proactive phone calls from the group facilitator to the participant. Self-reported smoking behavior was obtained at end-of-program and at a 3-month follow-up. In a multivariate model controlling for student gender, race, grade, and baseline smoking rate, there was a significant condition effect at end-of-treatment (OR = 2.74, 95% CI = 1.06-6.84) and at 3-month follow-up (OR = 2.17, 95% CI = 1.15-4.08). Approximately 57% of adolescents reported visiting the website, and among the NOT Plus condition, use of the website was associated with cessation significantly at end-of-program (p < .05). Adolescents in urban schools were more likely to access the website than those in rural schools. Participants who visited the website rated it positively on several dimensions. Reasons for not using the website will be discussed, as well as its value as an adjunct.

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PA11-4

ORGANIZATION, FINANCING AND PROMOTION OF QUITLINES IN THE UNITED STATES - 2004

Paula A. Keller, M.P.H.*, University of Wisconsin Center for Tobacco Research and Intervention; Linda A. Bailey, J.D., M.H.S., North American Quitline Consortium, a special program of the American Legacy Foundation; Shu-Hong Zhu, Ph.D., University of California-San Diego; Michael C. Fiore, M.D., M.P.H., University of Wisconsin Center for Tobacco Research and Intervention

Quitlines are an evidence-based method for delivering smoking cessation services on a population-wide basis. In 2004, the North American Quitline Consortium (NAQC) surveyed the 50 states and D.C. to obtain baseline information about the organization, financing and promotion of quitlines (one non-responder). This abstract summarizes the results of the 2004 NAQC survey. As of May 31, 2004, 38 respondents reported having a quitline. Subsequent analyses were limited to this subset of respondents. 65.8% reported that the quitline’s primary aim was to provide counseling and 28.9% reported that the primary aim was to provide comprehensive services including both counseling and medications (medications were often limited). Median state quitline operating budgets in 2004 were $505,000 (range $150,000-$3,800,000), with a comparable amount spent for promotion. Quitline services varied, with 97.4% of respondents providing mailed information or self-help resources, 89.5% providing proactive counseling, 89.2% providing referrals to other cessation services, and 62.2% providing reactive counseling. Smoking cessation medication is provided to some callers by 21.1% of respondents at no cost and by 16.2% of respondents at low cost. Services are provided in multiple languages, with Spanish (57.2%) or having multiple language services available through a language line (28.9%) reported most frequently. Eligibility criteria have been implemented by some states, with 31.2% reporting that callers must be ready to quit in the next 30 days and 13.2% reporting that the caller must be ready to quit and/or set a quit date in order to receive counseling. Promotional strategies also varied. The three most commonly reported promotional methods were brochures and fact sheets (97.4%), posters or flyers (94.7%), and radio advertising (94.6%). These findings provide a baseline description of U.S. quitlines; limitations include lack of standardized data collection and reporting. Further research is required to monitor changes in state quitlines and to determine how external factors such as CDC and NCI support of a National Network of Tobacco Cessation Quitlines affect state quitlines.

The survey was funded by the American Legacy Foundation. Analyses were funded by grant #52570, Partners with Tobacco Use Research Centers: Advancing Transdisciplinary Science and Policy Studies, The Robert Wood Johnson Foundation, and grant #5 P30 CA023100-22 from the National Cancer Institute.

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WHO CALLS WHEN FREE NRT IS OFFERED: THE OREGON PATCH INITIATIVE?


This paper describes characteristics of callers seeking services from the Oregon Tobacco Quit Line (ORQL) before and after the ‘Oregon Patch Initiative,’ (an initiative providing free NRT to eligible callers) and reviews the effects of different recruitment efforts, especially earned media. Data for the study come from all callers to the ORQL who enrolled for services 3 months prior (March-May, 2004) and 3 months after (October 2004-December 2004) the availability of free nicotine patches through a special state sponsored initiative. For the time period of March to May 2004, 1013 Oregonians called the quit line. After the initiative began, 6678 smokers called the ORQL for smoking cessation treatment. From March to May, callers were offered one telephone counseling call with a cessation specialist. Those enrolled after October 1st, 2004 also were offered 2 weeks of patches mailed to their home, and were encouraged to obtain additional patches. Promotion was through earned media and word-of-mouth, including an initial press release and press conference, as well as communications to health plans and providers. Analyses included chi-square and T-tests of the demographic characteristics and tobacco use between pre- and post-initiative ORQL enrollees. Analysis of Co-Variance (ANCOVA) will be used for additional comparisons controlling for covariates. Enrollment in the ORQL averaged 481/month before and 2,064/month after promotion of the free NRT. The first week of the initiative the volume of calls increased 10 times and consistently stayed at higher than average volumes. Those enrolling after the Oregon Initiative were older (mean age of 44.3 vs. 40.7; p-value= .0001) and more likely to be uninsured (34.7% vs. 19.8%). Gender, ethnicity and education level were similar. Motivation, stage and confidence level of quitting will be reviewed. The Oregon Patch Initiative markedly increased participation in older and uninsured populations. Through ongoing efforts to improve reach and effectiveness, the ORQL program continues to prove that a state population can easily and affordably access treatment for the single most preventable cause of death and disease.

Funding: Oregon Department of Human Services.

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HELPING OLDER SMOKERS QUIT: THE MEDICARE STOP SMOKING PROGRAM

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OBJECTIVE: To determine whether structured benefits, including reimbursement for physician counseling, pharmacotherapies, and a telephone quitline, would increase smoking cessation among Medicare recipients. Design: The Medicare Stop Smoking Program was designed to test the effectiveness of three variations of a Medicare smoking cessation benefit against usual care. Medicare beneficiaries enrolled between October 2002-2003, and were each followed for another year.

SETTING: Seven states were chosen to enroll a sample of beneficiaries that would best represent the national population in terms of the proportion of those >= 65 years of age and smoking rate. States were divided into four regions corresponding with the four study arms. Enrollees were assigned to arms based on residence. Participants: Medicare beneficiaries (fee-for-service, Part B); current smokers; age >= 65 years; interest in quitting; anticipated stable residence >= 9 months; provider located in regions assigned to providing counseling. Of 13,577 beneficiaries who completed a qualification survey, 7,354 enrolled. Intervention(s): (1) provider counseling reimbursement (n=829); (2) provider counseling reimbursement with pharmacotherapy (nicotine patch or bupropion; n=2605); (3) telephone counseling quitline with nicotine patch (n=1690); (4) Usual care (n=2230). Pharmacotherapy was available for a $5 co-pay.

RESULTS: Follow-up rates were 67.5% and 60.6% at 6 and 12 months. Unadjusted quit rates (seven-day point prevalence) assuming missing data=smoking was 9.9% (95% CI: 8.7-11.2), 11.9% (9.7-14.2), 15.8% (14.4-17.2) and 21.2% (19.2-23.1) at 6-months, and 10.2% (9.0-11.5), 14.1% (11.7-16.5), 15.8% (14.4-17.2), and 19.3% (17.4- 21.2) at 12 months for the usual care, provider counseling, provider counseling + pharmacotherapy, and quitline arms, respectively. Results were unchanged when adjusted for sociodemographic factors, smoking history, motivation, health status, state, and time of enrollment.

CONCLUSIONS: Provision of a benefit structured around low-cost pharmacotherapy, possibly in conjunction with available quitline services, should be explored.

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PSYCHOSOCIAL VARIABLES AND CHANGES IN ADOLESCENT AND YOUNG ADULT SMOKING STATUS OVER TIME: RESULTS FROM A 10-YEAR COHORT STUDY

Linda L. Pederson, Paul Mowery, CDC/OSH John Koval, University of Western Ontario

This paper presents results from a large (1,614 respondent) prospective study of adolescents followed for ten years, with approximately 85% of the original group participating in the follow-up. Psychosocial factors and smoking status (current, former, experimenter, and never smoker) were measured at each of four points in time: grade 6, grade 8, grade 11, and young adults aged 21 and 22. Our study demonstrates that changes in psychosocial variables predict smoking uptake and, among young adults, smoking cessation. Social/environmental variables measured include social involvement, social support, parental education, occupation, family and peer smoking. Psychological variables measured include self-esteem, stress, coping, mastery, social conformity, and rebelliousness. We used longitudinal models and structural equation modeling to investigate the relative strength of each psychosocial variable on subsequent smoking uptake and smoking cessation. Both hypothesis testing and best fit models were developed over the 10 and 8 year periods. Models for males and females differed. Implications for prevention and cessation programs are discussed.

Funding: National Cancer Institute of Canada.

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MILESTONES IN THE NATURAL COURSE OF CIGARETTE USE ONSET IN ADOLESCENTS

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OBJECTIVE: To describe the sequence and timing of milestones in the natural course of cigarette use onset.

METHODS: Grade 7 students in ten secondary schools in Montreal (N=1293) were followed prospectively every 3-4 months for five years. The cumulative probability of attaining 12 smoking onset milestones according to time (in months) after first puff was computed using Kaplan-Meier analysis, among 311 participants who initiated cigarette smoking during follow-up.

RESULTS: Inhalation occurred rapidly after first puff, followed sequentially by smoking a whole cigarette, self-reported mental addiction, cravings, self-reported physical addiction, monthly smoking, withdrawal symptoms and tolerance. These milestones typically occurred prior to a lifetime total of 100 cigarettes, weekly and daily smoking, and conversion to tobacco dependence. Once cravings were reported, the probability of daily smoking and conversion to tobacco dependence increased markedly.

CONCLUSIONS: Symptoms of nicotine dependence develop soon after first puff and can precede monthly, weekly and daily smoking. Cessation interventions that manage symptoms of nicotine dependence may be needed soon after first puff.

This research was funded by the National Cancer Institute of Canada, with funds from the Canadian Cancer Society. J. O’Loughlin is a Canada Research Chair in the Childhood Determinants of Adult Chronic Disease. C. Banci held a Doctoral Fellowship from the Canadian Institutes for Health Research (CIHR) at the time this study was undertaken.

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PSYCHOSOCIAL VARIABLES AND CHANGES IN ADOLESCENT AND YOUNG ADULT SMOKING STATUS OVER TIME: RESULTS FROM A 10-YEAR COHORT STUDY

Linda L. Pederson, Paul Mowery, CDC/OSH John Koval, University of Western Ontario

This paper presents results from a large (1,614 respondent) prospective study of adolescents followed for ten years, with approximately 85% of the original group participating in the last follow-up. Psychosocial factors and smoking status (current, former, experimenter, and never smoker) were measured at each of four points in time: grade 6, grade 8, grade 11, and young adults aged 21 and 22. Our study demonstrates that changes in psychosocial variables predict smoking uptake and, among young adults, smoking cessation. Social/environmental variables measured include social involvement, social support, parental education, occupation, family and peer smoking. Psychological variables measured include self-esteem, stress, coping, mastery, social conformity, and rebelliousness. We used longitudinal models and structural equation modeling to investigate the relative strength of each psychosocial variable on subsequent smoking uptake and smoking cessation. Both hypothesis testing and best fit models were developed over the 10 and 8 year periods. Models for males and females differed. Implications for prevention and cessation programs are discussed.

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PA12-3  

CIGARETTE SMOKING FROM ADOLESCENCE TO YOUNG ADULTHOOD: WOMEN'S DEVELOPMENTAL TRAJECTORIES AND ASSOCIATED OUTCOMES

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It is well-established that adolescent smokers are more likely than non-smokers to exhibit problem behaviors including academic difficulties, drug and alcohol use, and delinquent behavior. Recent research on developmental trajectories of substance use has allowed a glimpse of the long-term outcomes associated with certain patterns of use over time, although it has not focused specifically on women. This is an important oversight in that problem behaviors associated with youth smoking (e.g., early sex, parenthood) may have a differential impact for women in terms of transitions into conventional adult roles, education, employment, and other key outcomes. Using data from 1,424 women followed from age 13-29 (9 waves), we compared women with distinct developmental trajectories of smoking in terms of young adult outcomes at age 29, including: income, welfare status, and employment problems; college graduation; mental and physical health; substance abuse; arrest history; early sex (age <15); and early marriage and parenthood (age <20). In addition to Abstainers (30% of women), latent growth mixture modeling identified 5 smoking trajectories from age 13-23: Stable Highs (26%), Early Increasers (9%), Steady Increasers (11%), Decreasers (6%), and Triers (40%). Tiers and Abstainers had similar profiles at age 29, except Tiers had higher rates of alcohol abuse and arrests. Both groups tended to have better profiles than Stable Highs and Early Increasers on most outcomes. Further, Abstainers (and, in a few cases, Tiers) were less likely to report: alcohol abuse compared to Decreasers and Late Increasers; arrests and not graduating from college compared to Late Increasers; and early sex and parenthood compared to Decreasers. Stable Highs and Early Increasers were more likely than Late Increasers to report early sex and parenthood. Being a Decreaser appeared protective in terms of college graduation and arrest history. Results indicate several pathways to high- and low-frequency smoking by young adulthood and suggest that these distinct pathways have different implications for the wellbeing and functioning of women during this important developmental period.

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PA12-4  

THE TIMING OF THE EXPERIENCE OF SYMPTOMS OF NICOTINE DEPENDENCE

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OBJECTIVE: To identify the time lag from onset of tobacco use to onset of nicotine dependence symptoms and the factors that affect the rates of transition.

METHODS: The data are from the first three waves of a cohort of adolescents (mean age 14.1 years) interviewed at six-month intervals. The analytical sample of 323 new tobacco users started to use tobacco within 12 months preceding Wave 1 or between Waves 1 & 3. At each interview, detailed monthly histories of DSM-IV dependence symptoms were ascertained. Follow up histories were available for up to 24 months. Times to the events of interest were estimated with survival analysis. The effects of race/ethnicity, gender and age of onset of tobacco use on rates of transition were estimated with Cox's proportional hazard models.

RESULTS: Descriptive analysis indicates that 35% of those with symptoms experienced a first symptom within the month of tobacco use onset, whereas survival analysis estimates that 49% will do within 20 months of onset. Progression to the second symptom was associated with age of onset and race/ethnicity, with children starting to use tobacco after age 13 compared with those who started using earlier. Differences in the timing of the first symptom are inversely related to rate of transition to the second symptom. Withdrawal, tolerance and impaired control are the three most commonly experienced symptoms; withdrawal is experienced first. The first dependence symptom is experienced faster by African Americans than whites or Hispanics, and by those who started to use tobacco after age 13 compared with those who started using earlier. There are no gender differences in the timing of the first symptom.

CONCLUSION: This is the first report in the literature of the timing of the development of symptoms of nicotine dependence. Survival analysis, which takes censoring into account, provides more accurate estimates of the timing of the occurrence of symptoms than descriptive statistics. The physiological symptoms are experienced more frequently and faster than other symptoms. The rate at which the first symptom is experienced influences the rate at which subsequent symptoms develop. Our goal is to investigate the impact of the timing of the first symptom on the experience of full nicotine dependence.

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PA12-5  

THE INFLUENCE OF SENSATION SEEKING, RACE/ETHNICITY AND POPULATION DENSITY ON ADOLESCENT SMOKING AND RECEPTIVITY TO AN ANTI-TOBACCO CAMPAIGN

Donna Vallone, Ph.D.*, Jennifer Duke, Ph.D., Elia Watson-Stryker, B.A., Hailun Xiao, M.S., Jane Allen, M.A., American Legacy Foundation

This study explores the relationships among three factors known to influence youth smoking: sensation seeking, race/ethnicity and population density. Previous research shows that youth who are classified as high sensation seekers are more likely to smoke, as are youth who are white. Smoking is inversely related to population density, so that smoking rates are higher in rural rather than urban areas. Although each of these variables has been considered separately as a risk factor for adolescent smoking, no prior study has focused on the potential interaction of these variables as they impact smoking and receptivity to an anti-tobacco media campaign, truth. This research is based on pooled data from three waves of the Legacy Media Tracking Survey. The LMTS data used in this study were collected between October 2002 and January 2004. The total sample size for this study is approximately 15,000, with response rates of 53%, 43% and 30% for the respective data collections. Sensation seeking, race/ethnicity and population density are interconnected risk factors for adolescent smoking, but do not influence receptivity to the anti-tobacco campaign, truth. It is important for individuals who are developing programs to prevent youth smoking to understand the relationships among these variables.

Funding for this research came from American Legacy Foundation.

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There is much to be learned about why some adolescents progress to a regular smoking habit while others do not. The objective of this study was to evaluate whether physical activity via team sport participation buffered the effect of having two smoking risk genotypes, dopamine re-uptake transporter (SLC6A3) and the dopamine D2 receptor (DRD2), or one smoking risk genotype versus having none on adolescent smoking progression. Participants were 361 Caucasian adolescents of European ancestry who participated in a longitudinal cohort study of the bio-behavioral determinants of adolescent smoking adoption from grade 9 to the end of grade 12. Data were analyzed using a two-group Latent Growth Model. The results indicated that for adolescents participating in at least one team sport, but not for adolescents with no team sport participation, physical activity had a significant negative effect on smoking progression ($z = -3.847$, $p=.0001$; chi square(1, N=361) = 6.73, $p = .009$). In addition, having one ($z=2.692$, $p=.007$) and two ($z=2.218$, $p=.0266$) smoking risk genotypes had a positive effect on physical activity. These represented significant between groups effects, chi-square(1, N=361) = 6.29, $p = .012$ and chi square(1, N=361) = 3.81, $p = .05$, respectively. Thus, having one or more smoking risk genotypes is related to higher levels of physical activity, which in turn, is related to lower levels of smoking progression by the end of 12th grade for adolescents participating in at least one team sport, but not for adolescents with no team sport participation. This study provides the first evidence of an interaction between environmental influences and specific genes on adolescent smoking. The present study may also promote an understanding of the biology of smoking behavior and important protective relationships within the environment. The results provide more support for the role of physical activity through team sport participation in adolescent smoking prevention and intervention efforts.

This study was supported by a Transdisciplinary Tobacco Use Research Center grant (NCI, NIDA, NIAAA) P50 CA84718 and NCI R01 CA109250.
NI-1

CLINICAL IMPLICATIONS OF THE NEUROMODULATORY EFFECTS OF DOPAMINE: BEHAVIORAL REACTIVITY AND SMOKING CESSATION TREATMENT OUTCOMES

Elizabeth V. Gifford, Ph.D.*, Jodie A. Trafton, Ph.D., Center for Health Care Evaluation

Considering the effects of dopamine on neuropsychology and neuromodulation may lead to better understanding of processes responsible for smoking cessation treatment outcomes. Based on recent research on the neuromodulatory effects of dopamine in the nucleus accumbens (NACC), we present a model of behavioral reactivity (BR) and data on an initial test of the model as a predictor of cessation outcomes in behavioral and bupropion smoking treatment. The data are from a randomized controlled trial of combined bupropion and behavioral treatment in comparison with bupropion alone (N = 306). Changes in self-reported behavioral reactivity during treatment were strongly related to treatment outcomes (p < .01, OR = .893, CI = .865-.921). The ability to predict smoking outcomes was particularly strong for those participants with large changes in BR, with over 81% of those individuals abstinent at the post measurement compared to 30% of those who had moderate changes and only 7% of those who had no change or worsened. Approximately twice as many participants in the combined condition reported large changes. Within treatment changes in BR were also highly predictive of smoking status six months after treatment (p < .01, OR = .913, CI = .856-.970). Potential relationships of behavioral reactivity to reward availability and changes in gene transcription in the NACC are discussed.

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NI-2

HAS THE CALIFORNIA TOBACCO CONTROL PROGRAM CLOSED THE ACCULTURATION GAP IN SMOKING AMONG HISPANIC WOMEN?

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Research has shown that more acculturated (MA) Hispanic women smoke at higher rates than those less acculturated (LA). It is unknown whether differences in smoking by acculturation level among adult Hispanic women in California have decreased in recent years. We compared current daily (100+ cigarettes, now smokes daily) and current non-daily (100+ cigarettes, now smokes some days) smoking prevalence for adult Hispanic women by language-based acculturation from population-based, random-digit-dialed California Tobacco Surveys (CTS) in 1996, 1999, 2002 (n=3,000/year, ~66% response rate/year). Current smoking prevalence was at least twice as high among MA Hispanic women compared to LA in every survey year (1996: 14.7% vs. 6.1%; 1999: 14.6 vs. 6.1%; 2002: 11.7% vs. 4.9%) with the ratio staying constant (2:4:1). There was a substantial decline in current non-daily smoking among MA women by 2002 (1996 & 1999 prevalence: ~6%, 2002: ~4%), but not in current daily smoking (~8% each year). Regardless of acculturation level, there was a constant twofold difference in current daily versus current non-daily smoking rates from 1996 to 2002. There has been no reduction in the acculturation gap in smoking among Hispanic women in California. While there has been a significant decline in overall current smoking prevalence among Hispanic women, the proportion of daily smokers among MA women actually increased over time because of no significant reduction in current daily smoking among MA women. Increased efforts to prevent smoking and increase cessation among MA Hispanic women are warranted.


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NI-3

THE MAINE TOBACCO MEDICATION PROGRAM: ASSESSING PATTERNS OF USE AND SHORT-TERM OUTCOMES

Cindy Tworek*, Ph.D., M.P.H.; Susan Swartz, M.D., M.P.H.; Tim Cowan, M.S.P.H.; Center for Tobacco Independence, Portland, ME

BACKGROUND: As part of a comprehensive program, the Maine Tobacco HelpLine has offered free NRT to uninsured adults, or those without NRT benefits, since 2002. Information is electronically submitted to a pharmacy benefit management company and up to 8 weeks of nicotine patch or gum can be obtained at any Maine pharmacy.

METHODS: To assess patterns of NRT use, a survey was conducted with HelpLine callers who were authorized for NRT between February-March 2005. Of 609 callers, a total of 546 were eligible and contacted for the survey via telephone in June and July 2005. Interviews were completed with 398 subjects, for a 73% response rate.

RESULTS: Mean respondent age was 47 years, while 54% were female, 52% were married, and 52% had a high school education or less. Free availability of NRT influenced over 90% to call the HelpLine, and about half were prompted to call by friends or family. Results showed 99% of subjects picked up NRT (89% patches, 10% gum) and 91% had no problems obtaining it. Almost all (96%) used NRT to help quit, and 91% quit for at least 24 hours since calling the HelpLine. Mean duration of NRT use was 38 days; however, a third reported stopping and starting NRT use. A total of 40% reported side effects, commonly skin reactions or abnormal dreams. Chi-square tests did not detect significant differences in patterns of NRT use by gender or age. At the time of the survey, 50% reported no smoking in the past 7 days. A total of 88% of respondents were very satisfied with getting medication through the HelpLine, and over two-thirds of those surveyed were very likely to try NRT and very likely to contact the HelpLine in the future. Conclusions: This state-supported NRT program encourages smokers to contact the Maine Tobacco HelpLine, demonstrating a valuable opportunity for quit lines to increase demand and provide NRT access for use during serious quit attempts.

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TARGETING CONDITIONING PROCESSES TO REDUCE TOBACCO SMOKING

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This year’s annual SRNT meeting is the first to include a presentation by the recipient of the SRNT Young Investigator Award (formerly the SRNT New Investigator Award). Dr. Le Foll, the 2006 award recipient will deliver a 25-minute presentation on his emerging program of research. Dr. Le Foll’s award will be presented to him at the Awards Presentation Session, which will be held on Friday, February 17, 2006, from 2:00 p.m. to 3:30 p.m.
POS1-1  TRENDS IN PUBLIC SUPPORT FOR SMOKE FREE WORKPLACES, RESTAURANTS AND BARS IN ONTARIO: 1998-2004
Bo Zhang*, M.P.H.1,2; Roberta Ferrence, Ph.D.1,2,3, “Ontario Tobacco Research Unit, University of Toronto; 1Department of Public Health Sciences, University of Toronto, Canada; 2Centre for Addiction and Mental Health, Toronto, Ontario, Canada

BACKGROUND: Second hand smoke (SHS) is of great public health concern. Yet, exposure to indoor SHS continues to be widespread. Measuring and reporting public support for restrictions on smoking and disseminating the findings to policy makers may foster the political will to enact tobacco control policies that will benefit the community as a whole. The objective of this study is to report trends in public support for smoking restrictions in Ontario, Canada between 1998 and 2004.

METHODS: Six population-based, cross-sectional surveys were used. The main outcome variables were public support for total smoking bans and smoking bans with designated smoking rooms (DSRs) in workplaces, restaurants and bars. Responses were tabulated as weighted percentages, and corresponding 95% confidence intervals (CIs) were calculated using standard errors estimated according to the complex survey design. Multivariable logistic regression was used to identify which factors predicted support for smoking restrictions.

RESULTS: Support for smoking restrictions increased significantly from 1998 to 2004. Support for total smoking bans in workplaces increased from 46% to 59%, in restaurants from 24% to 57%, and in bars from 10% to 33%. Current smokers expressed significantly lower levels of support than non-smokers, but the increase in support over time was much greater in current smokers. Females and respondents with university education expressed significantly higher support for smoking restrictions than males and those with lower education. Support for total smoking bans was significantly lower than for smoking bans with DSRs. In 2004, support for smoking bans with DSRs in workplaces, restaurants and bars was 87%, 87% and 72%, respectively.

CONCLUSIONS: Support for restrictions and bans on smoking in public places is increasing substantially over time. Jurisdictions considering smoking bans should be reassured that public support is growing rapidly and will provide a firm basis for increased regulation.

No funding.

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POS1-2  CREATING A COMMUNITY OF PRACTICE WITHIN TOBACCO CONTROL: A CASE STUDY
Cameron D. Norman, Ph.D.*, University of British Columbia and Tim Huerta, Ph.D., Texas Tech University

Tobacco control’s success relies in large part on the effective exchange of knowledge and resources within a network of committed researchers, health practitioners, and policy makers, yet relatively few avenues exist to facilitate this process. One method of creating such opportunities is through the development of a community of practice (CoP); a voluntary, self-organizing, group of individuals and organizations that are tied together by common practices and interests. This paper will describe the process of creating a community of practice within the web-assisted tobacco intervention (WATI) community. Drawing upon networks and systems theory, the process will be discussed with reference to data collected initially at a meeting of WATI investigators, practitioners and policy makers and further followed up over the course of 6 months. The use of social network data, combined with community development activities supported by information technology is described with reference to specific knowledge exchange and capacity-building outcomes. The implications of using the CoP approach and social network methods to enhance knowledge integration in tobacco control will be discussed.

This research was made possible through a CTRH Strategic Training Program in Tobacco Research Post-Doctoral Fellowship (C.Norman) and a travel grant from the Centre for Addiction and Mental Health, Toronto, ON.

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POS1-3  MAPPING U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES TOBACCO LEADERSHIP
Doug Luke*, St. Louis University; Jenine Harris, St. Louis University; Nancy Mueller, St. Louis University; Scott Leischow, Department of Health and Human Services

The United States Department of Health and Human Services (DHHS) funds, through its various operational divisions (OPDIVS) such as NIH, CDC, CMS, SAMHSA and AHRQ, much of the tobacco-related research to practice (clinical and community) infrastructure in the US—and has considerable global impact as well. Because DHHS is a very large organization, and given the need for organizations to work together to effectively address the complex problem of tobacco use in society, a social network analysis was conducted in 2005 to examine the communication, partnership, and knowledge relationships between key individuals and agencies involved in tobacco activities within DHHS. Findings include: 1) There is a high degree of awareness of tobacco work across all agencies in DHHS; 2) Both the communication and partnership networks suggest that there might be gaps in terms of inter-agency communication and cooperation; 3) CDC and NCI have important leadership roles in terms of network membership; 4) The Office of the Secretary plays an important brokering role in the network; 5) The contact, integration, and influence networks appear to have a core-periphery structure, where the core is made up of CDC, NCI, and OS, with the other organizations on the periphery, connected to the network through one of the three core agencies. Analytic network maps and implications will be presented.

Funding: National Cancer Institute.

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POS1-4  TRANSDICIBILITY IN A NETWORK OF TOBACCO HARM REDUCTION RESEARCHERS

Keith Provan*, University of Arizona; Pamela Clark, Battelle Centers for Public Health; Tim Huerta, Texas Tech University

Social network analysis was used to assess multidisciplinarity, interdisciplinarity and transdisciplinarity among members of an informal network of tobacco control researchers. Potential members of NCI's Tobacco Harm Reduction Network were identified through reputational sampling and asked to complete a membership application. Respondents indicated the field in which they earned their highest degree, their expertise (none, some, strong) in 17 areas related to tobacco control research (e.g., smoke emissions testing, clinical trials of new products, population surveillance), and the nature of their relationships with other members of the latent network. Analyses will be presented to demonstrate the relatively dense nature of the network, and its several key isolates. A novel method of quantifying transdisciplinarity of a network will be demonstrated, resulting in recommendations for building a network infrastructure and strengthening collaborations.

Funding: National Cancer Institute.

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POS1-5  WORLD HEALTH ORGANIZATION TOBACCO LABORATORY NETWORK (WHO TobLabNet)

Jack Henningfield*, The Johns Hopkins University School of Medicine, Department of Psychiatry and Behavioral Sciences, and Pinney Associates; Mirjana Djordjevic*, National Cancer Institute, Tobacco Control Research Branch; Erik Dybing, Norwegian Institute of Public Health, Division of Environmental Medicine; Douglas Bettcher, World Health Organization, Tobacco Free Initiative

The WHO Framework Convention on Tobacco Control (WHO FCTC) was developed with a primary goal of protecting public health through the reduction of the demand for and use of tobacco in present and future generations (http://www.who.int/tobacco/framework/fctc_en.pdf). As of September 2005, this legally binding international treaty had more than 80 Parties (e.g., countries) bound to its provisions. The treaty includes specific articles concerning prevention and cessation (Articles 12-16). To support these goals it contains three articles pertaining to the science-based regulation of the contents and emissions and labeling of tobacco product packages (Articles 9-11). This will necessitate substantial development of competence and capacity on testing, research and evaluation on a global level. The treaty recognizes that generating such competence and capacity would require a level of international scientific and technical cooperation and communication of information and formalized this in Article 20. WHO has now taken a major step to facilitate implementation of Article 20 through the establishment of the WHO Tobacco Laboratory Network (TobLabNet) in 2005, which was guided in part by the WHO Study Group on Tobacco Product Regulation (TobReg). The TobLabNet was developed with support by the WHO Tobacco Free Initiative, U.S. National Cancer Institute, the U.S. Centers for Disease Control, the Dutch National Institute for Public Health and the Environment (RIVM), and the European Network of Government Laboratories on Tobacco and Tobacco Products (ENGL). Once capacity is established, TobLabNet will be positioned as a primary source of laboratory support, methods development, and scientific information in the areas of tobacco testing and research for national governments to fulfill their requirements and needs related to the treaty. This poster will provide an overview of the rationale, activities and goals of TobLabNet, so as to encourage and facilitate participation by SRNT members.


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POS1-6  TREATMENT OF HUMAN SUBJECTS IN TOBACCO INDUSTRY RESEARCH

Jenny White*, M.Sc., M.P.H., Lisa Bero, Ph.D., University of California, San Francisco; Mark Parascandola, Ph.D., M.P.H., National Cancer Institute

Companies that conduct research are under no obligation to follow guidelines regarding treatment of human subjects in clinical trials—whereas clinical researchers funded by federal agencies or under FDA authority are required to follow federal regulations, and academics must adhere to their institutions' standards. We examine how one private industry, the tobacco industry, treated human subjects in internal research during 1985-2000; we then compare this treatment with standards of the time. We focus on R.J. Reynolds Tobacco Company because they conducted a significant amount of research using human subjects. Tobacco industry documents were retrieved from the UCSF/Legacy Tobacco Documents Library and from industry websites. Materials from 73 research projects, including informed consent forms, were analyzed. The U.S. Code of Federal Regulations, Title 45 Part 46, Protection of Human Subjects (the Common Rule) was the primary source for human subjects research guidelines/standards. R.J. Reynolds formed a human subjects review committee in 1985. The committee's structure and procedures did not meet generally accepted practices of the time regarding community representation, written procedures for adverse events, and other factors. In all 73 studies, consent procedures failed to meet five or more human subjects research standards. Policymakers should consider expanding the scope of federal human subjects research regulations (45 CFR 46) to cover research undertaken by private firms such as tobacco companies. Peer-reviewed scientific journals should consider retracting or not publishing studies which do not provide adequate protection of human subjects.

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POS1-7  PRACTICE 'BUSINESS' AND PATIENT RECEIPT OF TOBACCO USE SCREENING IN DENTAL PRACTICES


BACKGROUND: Few research studies have assessed rates in dental practice or assessed organizational barriers to implementing tobacco control.

PURPOSE: To evaluate the association of dentist-reported practice busyness and patient receipt of tobacco screening and cessation advice in dental practices.

METHODS: Tobacco screening rates were assessed using patient surveys completed immediately at the end of each visit at 45 dental practices. The practices reported organizational characteristics including practice busyness, assessed through a previously validated question. Association of patient receipt of tobacco screening with the main independent variable, being 'too busy to treat all patients requesting appointments' was assessed using logistic regression analysis adjusted for patient age, sex, and smoking status, size of practice (n of dentists and hygienists), and practice-level case-mix (total number of smokers, proportion of patients who were self-pay, or public assistance), and performance of general oral cancer screening exams. We accounted for patient clustering within practices using generalized estimating equations.

RESULTS: Among the 3,906 patients responding (87% response rate), most were female (61%), with mean age 46 (SD 16). Of the 45 practices, most were solo dentist practices (82%), and 10% responded that they were "too busy." Patients seen by "too busy" practices less frequently received tobacco screening (23% versus 33%, p < 0.01). After adjustment, patients seen by 'too busy' practices were again less frequently screened (odds ratio 0.54 (95% CI 0.29-0.98)) compared with other practices.

CONCLUSIONS: Practice busyness was the strongest negative factor, and was independent of other effects.

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POS1-8  STOP SMOKING AMONG PHYSICIANS IN BANGLADESH: AGENDA FOR ACTION

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BACKGROUND: Smoking by physicians, a common phenomenon in many developing countries, is an obstacle to promote smoking cessation in these countries. Besides their unwillingness to tobacco control-related policy formulation, it also encourages smoking among the public as many consider physicians as role model. Understanding of physicians’ attitudes towards smoking cessation would be useful to design any smoking cessation program. In this study we examined physicians smoking behavior and attitudes towards quitting smoking. Design: Cross sectional survey using a structured questionnaire. Subject: 500 doctors registered with Bangladesh Medical & Dental Council in 2005. Result: Although the initial response was poor, we were able to get a response rate of 57.6% (288/500) after repeated reminder. Of the respondents (n=288), 53% were current smokers; 99% were aware of the ill effect of tobacco use and 78% agreed that tobacco control policies should be strengthened in Bangladesh. Of the smoker respondents (n=152), 35% did not agree that tobacco use is addictive; 1% were in the preparation/action stage, 5% were in the contemplation stage and 94% were in the pre-contemplation stage. 72% of the respondents knew that pharmaceutical help is available to support quitting, but they did not know its existence in Bangladesh. 70% said that they would not ask their patient to quit as it might affect their rapport. Conclusion: The findings indicate the need to target physicians with smoking cessation services. To achieve the goals of WHO’s framework convention of tobacco control, urgent attention is needed to develop programs that will train physicians with smoking cessation skills and encourage them to quit smoking.

Funding: Bangladesh Cancer Foundation and GlaxoSmithKline.

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POS1-9  HEALTH PROFESSIONALS’ ROLE IN SMOKING CESSATION IN RUSSIA

Nikolay S. Antonov*, M.D., Ph.D., D. Sc., Galina M. Sakhrovara, M.D., Ph.D., D. Sc., Research Pulmonology Institute, Moscow, Russia

In Russia many physicians are not convinced of the importance of their role in promoting smoking cessation. To recognize the knowledge, attitude and skills of doctors their experience in tobacco control was examined. 120 pulmonologists completed questionnaires including 24 items about their own smoking habits, attitude to tobacco smoking and etc. The summarized results are presented below: 1. Where do the personnel of your hospital smoke? Everywhere? 70%; 2. Who smoke in your hospital? Physicians? 93%; Patients? 71%; Students and Interns? 76%; Nurses? 86%; Visitors? 72%; 3. Do you consider the passive smoke to be the serious risk factor? Yes? 90%; 4. Was tobacco smoking discussed during your education as a cause of disease? Yes, systematically? 95%, Yes, but not systematically? 5%, No? 36%; 5. What methods do you use in your practice or recommend to patients? Patients will- 60%, Group therapy-0%, NRT-40%, Educational literature-47%, Acupuncture-20%, Hypnosis-7%; 6. Would you like to learn more about treating tobacco dependence? Yes? 90%; 7. Do you smoke? Yes-47% Thus, high level smoking in Russian physicians and their low awareness of tobacco dependence treatment results in low effectiveness of smoking cessation. Though a lot of studies have shown a large increase in quit rates when physicians advise and support their patients to quit smoking. The Ministry of Health is planning the special activities in this field. It has been developed the Clinical Guideline on Smoking Cessation for physicians and 2- Days training course that held regularly in different cities of Russia for all health professionals. No funding.

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POS1-10  TRENDS IN PHYSICIAN ADVICE TO QUIT SMOKING: ONTARIO, CANADA 2000-2004

J. Charles Victor*, M.Sc., Joan M. Brewster, Ph.D., Homa Kameh, M.Sc., Roberta Ferrence, Ph.D.; Ontario Tobacco Research Unit, Department of Public Health Sciences, University of Toronto

Physicians are viewed as the predominant source of professional advice on smoking cessation. Much effort has been devoted to identifying patients at risk for persistent smoking. However, few studies have examined whether physicians have responded to these patients. Data from the CAMH Monitor, an annual cross-sectional RDD telephone survey of Ontario residents 18 years and older, were compiled from 2000 to 2004 (response rate=80%). During this period, 3,076 smokers were surveyed about their smoking behavior, quit attempts and experiences with physicians. Logistic regression was used to compare characteristics of those receiving physician advice and those who did not. Advice to quit smoking remained low throughout the five-year period, reaching a maximum of 53% [95% CI: 47.5%, 58.4%] in 2004. Respondents who smoked daily, and those intending to quit were significantly more likely to report having been advised to quit by a physician (p<0.001). Of those advised to quit, these groups of respondents were more likely to have been recommended NRT and bupropion, and to have been asked to set a quit date (p<0.001). Among daily smokers, higher dependence was an indicator of being recommended bupropion (p<0.001). However, none of these relationships changed significantly over time, with fewer than half of respondents reporting being recommended each quit aid or method. Over the five years, patients with less than high school were increasingly more likely to be advised to stop smoking than those with university degrees (p=0.016). Females were increasingly more likely to be recommended counselling, and older patients were more likely to be recommended pharmacotherapy (p<0.001). While physicians are more likely to advise daily smokers and patients intending to quit, quitting advice remains low and has not increased over the past five years. As the physician remains the most likely health professional from whom smokers seek advice, an increased emphasis needs to be placed on physician training in smoking cessation.

No funding.

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POS1-11  SMOKING CESSATION TRAINING FOR RURAL FAMILY PHYSICIANS AND RURAL MEDICINE CLERKSHIP STUDENTS

Lesa L. Woodby, Ph.D., M.P.H.*, Tamela J. Turner, Ph.D., Myra A. Crawford, Ph.D., University of Alabama at Birmingham; Billie S. Anderson, University of Alabama

INTRODUCTION: The overall goal of the project was to increase the rate of smoking assessment and counseling delivered by Alabama rural family physicians and student physicians, thereby reducing the smoking prevalence rate and ETS exposure among their patients burdened by the epidemic of tobacco use.

AIMS: Specific aims were to: (1) plan and implement a smoking cessation brief intervention training program; (2) recruit and train 60+ AL rural family practice physicians and their staff; (3) train 300 UASOM Rural Medicine Clerkship students; and (4) evaluate the dissemination process and effectiveness of the project.

METHODS: Following national guidelines for tobacco use cessation, this project used a standardized methodology to train health care providers to deliver a brief smoking cessation intervention to their patients who smoked and prepared providers to adopt smoking assessment as a routine vital sign.

RESULTS: Evaluations showed 100% of the physicians and their staff, and 99.4% of the medical students agreeing the training objectives were met and reflected a curriculum that will train physicians with smoking cessation skills and encourage them to quit smoking.

No funding.

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POS1-12  INAPPROPRIATE CONCERNS ABOUT THE DANGERS OF NRT COMPARED TO CIGARETTES AMONG HEALTH CARE PROFESSIONALS

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National interviews were conducted in 2005 on a small sample of clinical professionals (10 physicians), 10 nurses/nurse practitioners/physician assistants, and 10 counselors) on practices and beliefs about Nicotine Replacement Therapy (NRT) for smoking treatment. A random sample was not possible due to high refusal rates, especially among physicians; volunteers likely had a particular interest in smoking treatment. Efforts were made to get respondents from a broad range of practice settings in 11 states throughout the U.S. Most participants were identified through online professional directories and contacted via faxes with follow-up telephone calls. Remarkably, when asked if they agreed that “Nicotine patches are less likely than cigarettes to cause someone to have a heart attack,” 1 in 5 professionals “disagreed” (3 of 10 MDs) and two more (both counselors) indicated that they “did not know.” Overall, nearly 1 in 4 clinicians did not appreciate that cigarettes carry a much larger heart attack risk than does the nicotine patch. Results on beliefs about nicotine causing cancer, the “potential for addiction to NRT when used as directed” and the use of NRT while smoking a cigarette or two or during pregnancy, indicate that, while the majority have an appropriate sense of the much larger relative dangers of cigarettes, there is a noteworthy minority who may be excessively concerned about the risks of NRT relative to smoking. Comparisons will be made to recent consumer surveys and policy implications will be discussed.

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POS1-13  HEALTH PROS: A POSITIVE INFLUENCE FOR CHANGING SMOKERS’ HABITS

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The Canadian Tobacco Use Monitoring Survey (CTUMS) is an ongoing random digit dialling survey of over 20,000 Canadians 15 years of age and older, with half the sample consisting of 15-24 year olds. Many current smokers report having seen or spoken to a health professional in the past year (73% doctors, 59% dentists, 32% pharmacists and 14% nurses). Each contact provides the health professional an opportunity to change smokers’ behaviour but many opportunities may be missed. Of smokers reporting contact with a health professional, 52% received advice to reduce or quit smoking from a doctor compared to 28% from a dentist, 17% from a pharmacist and 29% from a nurse. More pharmacists offered information on quit aids (83%) than any other health professional (54% doctors, 23% dentists and 44% nurses). The majority of smokers who saw a health professional reported considering quitting in the next six months (range 64% to 84%) higher than the overall average of 58%, however, this did not translate into quit attempts lasting 24 hours. Almost half of smokers who were advised by a doctor or dentist to reduce or quit smoking made no quit attempts in the past year about the same as the national average. If provided with quit aid information, smokers were more likely to try the nicotine patch (doctors: 58%, pharmacist: 58% and nurses: 52%). Regardless of being advised by a health professional to reduce or quit, two-thirds reported reducing the number of cigarettes smoked to quit. Health practitioners need to be front line to help smokers quit. Continued research is needed to continue to develop and disseminate tools to further assist health professionals in carrying out these practices.

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POS1-14  A SURVEY OF DOMINICAN REPUBLIC HEALTH CARE PROVIDERS


Little empirical data are available on tobacco use in the Dominican Republic (DR) and there has been no infrastructure to address tobacco control. This paper presents data from health care provider (HCP) surveys in 6 marginalized DR communities as part of a project to build tobacco control capacity in low and middle income countries. 143 providers (the majority of local HCPs) were surveyed for knowledge, attitudes, and practices: 46 doctors, 8 licensed nurses, 60 unlicensed nurses, and 29 pharmacy workers. Tobacco was currently used by 0-8.5%; 0-12.0% were ex-users across professions. Most believed tobacco is harmful (87.5-97.8%) and quitting is beneficial (87.5-100%). Variability was found in knowledge of specific diseases, with most recognizing lung cancer (93.1-100%), low birth weight (89.3-100%), persistent cough (87.5-100%), and asthma (85.2-100%); fewer recognized heart problems (53.6%-100%); even fewer identified other cancers, osteoporosis, spontaneous abortion.

Providers varied in whether they thought their advice would help (50.0-91.7%); fewer thought patients wanted their help (33.3-68.3%). In contrast, in earlier smoker surveys, 80.6% wanted help from HCPs. Variability was found in % providers reporting advising patients to quit (48.3-93.5%). Counseling (53.3-80.4%) and talks (27.6-62.5%) were most often used, with little reported use of traditional remedies, print materials, and medications. 51.1-75.5% felt they had sufficient knowledge to intervene, only 28.8-75% had formal training, and 30.0-62.5% received training through conferences or talks. Differences across types of HCPs will be presented. Survey results are used to develop HCP training programs as part of DR infrastructure building for tobacco control.

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POS1-15  DOMINICAN REPUBLIC TOBACCO CONTROL: UNDERSTANDING THE ROLE OF HEALTH CARE PROVIDERS


Published research on Dominican Republic (DR) tobacco use is limited, as are tobacco control and intervention programs. To guide program development for health care providers (HCP), a qualitative Rapid Assessment Procedure (RAP) was conducted. During a 1-week period, 6 communities were targeted (2 urban, 2 peri-urban, 2 rural) for 1-2 days each. Two interdisciplinary teams (mixed gender, nationalities and disciplines) conducted participant observations and interviews with over 80 key HCPs. Despite differences in communities, HCPs had some similar perceptions: HCPs perceived tobacco use among patients to be influenced by parent’s tobacco use, lifestyles, fashion trends and maturity status. HCPs noted myriad health effects from smoking ranging from respiratory problems (emphysema, COPD, pneumonia but not asthma), cancer, gastro-intestinal difficulties, cardiovascular effects (hyper-tension, stroke) and other chronic conditions as diabetes. Most HCPs noted the physician as having the main role in interacting with patients about smoking although one nurse indicated being the principal communicator to the patient. There was a general lack of proactiveness on the HCP’s behalf to address tobacco use among their patients, unless they perceived the behavior to worsen a pre-existing illness. Tobacco intervention with patients was limited, and many attributed this to such obstacles as lack of education on the topic and resources to assist their patients with cessation. The results of this RAP were used to develop HCP training programs to further explore HCP issues and develop interventions. Both training and resources must be provided to the health care community to begin a collaborative effort in tobacco control in the Dominican Republic.

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POS1-16  SMOKING CESSION EDUCATION IN MEDICAL SCHOOLS
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Currently, efforts from an NCI-sponsored consortium of 12 medical schools are underway to examine medical school curricula related to tobacco cessation and prevention, and ultimately to increase the number of hours available for students in U.S. medical schools via a proposed national model for curriculum development (Powers, et al., 2004). As part of this consortium’s efforts, and through an innovative, required community health improvement clerkship for 4th year medical students, The University of Rochester has successfully increased the number of educational hours (both required and elective opportunities) for competence in nicotine dependence counseling and implementation of community-based interventions during the 4-year medical school experience. This paper/poster describes current activities, partnerships, and course development strategies. Data are provided from surveys with pre- and 4th year medical students and with community partners. The paper/poster highlights innovative strategies such as an “Advocacy Module”, which educates future physicians on their role in advocacy and policy change, using tobacco control examples. Also described is an online intensive elective for nicotine dependence counseling, specifically designed to complement the main clerkship program materials for medical students such as carbon monoxide screening with disparate populations, community education and referral projects, web-assisted tobacco interventions (WATI), and partnership-building with local, regional, state, and national cessation resources. Ref: Powers C.A., Zapka J.G., Bognar B., Dube C., Hyder F.L., Ferguson K.J., O’Donnell J.F., Rigotti N., Conley Thomson C., White M., Wilkinson L., Geller A.C., and McIntosh S. (2004). Evaluation of Current Tobacco Curriculum at 12 US Medical Schools. Journal of Cancer Education, 19(4): 212-219. Supported in part by grants from the National Cancer Institute and the New York State Department of Health.

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POS1-17  FACTORS INFLUENCING ANTICIPATED ADOPTION OF A TOBACCO CURRICULUM FOR HEALTH PROFESSIONAL STUDENTS
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BACKGROUND: The process by which educational programs are disseminated is understudied. Through careful assessments of potential adopters’ perceptions of a program and implementation of that program, one can identify factors that are predictive of successful dissemination.

OBJECTIVE: To apply Rogers’ Diffusion of Innovations Theory (DIT) in examining the relationship between faculty perceptions of the Rx for Change tobacco cessation program, perceived adoption of the program, and eventual implementation in the medical curriculum.  

METHODS: 159 faculty representing 85 schools of pharmacy attended a train-the-trainer conference and completed a post-training survey assessing key DIT factors hypothesized to be associated with program adoption.

RESULTS: Half of participants lacked prior formal training for treating tobacco use and dependence, and we observed a significant increase in self-reported pre- versus post-training teaching abilities for tobacco cessation (p<0.001). Sixty-seven percent indicated high likelihood of program adoption at their school; 31% indicated moderate likelihood. The DIT perceived attributes of the innovation most closely associated (p<0.001) with anticipated adoption were perceived compatibility of the program for integration (r=0.47) and acceptability of the complexity associated with implementation (r=0.31). Of 54 schools that had implemented the program during the 2003-2004 academic year, a median of 300 minutes of Rx for Change materials was presented (median, 310 minutes of tobacco education total). Nearly 6,000 students were exposed to all or portions of the program, and 89% of implementing schools integrated the program materials into the core (required) curriculum.

CONCLUSION: Participation in a train-the-trainer program increased faculty confidence in presenting tobacco cessation education, and post-training, the majority of participants perceived high adoptability of the Rx for Change curriculum at their school. Ongoing implementation data, collected over a study period of 3 years, will enable further examination of the various DIT theoretical elements with respect to program adoption as well as sustainability of adoption.

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POS1-18  STUDY OF HEALTHCARE PROFESSIONALS PARTICIPATING IN A WORKSITE TOBACCO DEPENDENCE PROGRAM
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PURPOSE: Healthcare professionals are expected to be role models. Addressing tobacco dependence is a healthcare imperative. Healthcare workers who themselves smoke are reluctant to address tobacco dependence with patients. We studied the impact of an employer-provided, on-site, free tobacco cessation initiative for healthcare providers.

METHODS: All smoking healthcare professionals (MD, RN, PA, RT, Social Workers, etc.) were offered free FDA approved pharmacotherapy and confidential counseling in groups(individually). Maximum flexibility/support was provided. Exhaled CO was used to biochemically validate status. Follow-up was done over 1 year, non-responders were considered to have relapsed back to smoking.

RESULTS: 217 healthcare professionals mostly RN’s (54% females) attended a medint 28% of 23 (pack years= #cigarettes per day X # of years smoked). Mean age of 1st cigarette = 16. Mean number of previous quit attempts=2.7. Mean CO level on day 1= 18.5ppm. Mean Fagerstrom score =6 (a valid instrument used to assess nicotine addiction with highest possible score of 10). 71 people (%) refused to answer the questionnaire. Mean age was 37, of 35% more males (p<0.001). Reasons cited for this readiness for change were: 85% general health concerns, 43% pressure from family/friends, 11% pressure from their physician, a recent change in health status, 59% women, 37% cigarette control my life. All others quit rate at 30-days = 60%. Perceived benefits of quitting were: 69% less coughing, 59% better breathing, 49% increased sense of taste, 44% saved money, 43% increased self esteem, 73% less tobacco odor, 30% increased exercise tolerance, 26% better oral health. Quitters who relapsed by year one =18%.

CONCLUSIONS: Providing comprehensive convenient treatment for employees to quit smoking, promotes health benefits that will ultimately reduce the risk of tobacco-related morbidity. In addition, healthcare professionals who quit smoking themselves can be more effective counselors and positively impact patient outcomes.

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POS1-19  THE PREVALENCE OF SMOKING AMONG MENTAL HEALTH WORKERS IN ARGENTINA
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BACKGROUND: Previous studies have already shown that tobacco addiction is common on the Argentinean health workers. The smoking status of the health workers could influence the way they advise to smoking patients. WHO has emphasized how important is this fact and encouraged its control. Besides, the known association between smoking and psychiatric co morbidity make the nicotine addiction among mental health workers particularly relevant.

OBJECTIVES: To determine the prevalence of smoking among health psychologists and psychiatrists in Argentina. To look at their beliefs, attitude and knowledge on the nicotine addiction Material and Methods: Transversal survey study. The used questionnaire had been previously validated. The WHO Methodology guidelines were followed. A trained team obtained the samples during the XXI Annual Conference of the Argentinean Psychiatry association. One thousand samples were obtained during rush hours at the mentioned meeting. This number of subjects doubled the estimated necessary one.

RESULTS: 1003 attendents were surveyed (6600 people attended to the meeting). 31 people (%) refused to answer the question. Of 31% were women and 69% men. Men who smoked aged 44, 3 years and women accounted for 60, 4% of the sample. Among the surveyed, there were 258 (25%) were psychologist and 675 (65.3%) were psychiatrists. 34% of the psychologists and 24.8% of the psychiatrists were found to be current regular smokers. There was predominance on the female population (females 36% and males 30.5%) which were found to be significant, being even higher among the psychologists. Although there was recognition of there addiction (92%), 55% of the smokers would not consider an attempt to quit. 97% of them stressed that they knew the risks of passive smoking.

CONCLUSIONS: A high prevalence of smoking among mental health professionals was found. The female psychologists showed some predominance. It is worth mentioning the high percentage of smokers on precontemplation stage of change. These findings should elicit urgent intervention.

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POS1-20 CHARACTERISTICS OF A SAMPLE OF HEALTH INFLUENCERS PARTICIPATING IN BRIEF CESSATION INTERVENTION TRAINING

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Cessation training strategies have focused on healthcare providers, overlooking the much broader range of human services professionals or “Health Influencers” (HI). Despite this healthcare provider focus, rates of cessation assistance remain low. Non-medical, community-based HIs could significantly advance tobacco control efforts at the community level. We present characteristics of a baseline sample of HIs (n=911), following completion of telephone interview and pre-test survey and prior to randomization into web, in-person, or usual practice brief intervention cessation training. Individuals were recruited using the message “help others quit tobacco” in two Arizona metropolitan areas using multiple outreach approaches including paid advertising and community presentations. The sample consisted of primarily non-Hispanic whites (89%), females (77%), college graduates (46%), median age 44 years. Unique features of this cohort of HIs include current non-smoking status (93%), Internet access (79%), and substantial experience in behavioral health, counseling, or social work (35%). Most individuals identified personal relationships (89%) rather than work contexts (24%) as a predominant motivator for participation; however, 80% wanted to improve their general intervention skills. Assessment of behaviors, attitudes, confidence, and knowledge included a mean knowledge score of 55% correct (SD=13%) but a relatively high level of confidence. Ninety-three percent of participants were confident about their ability to be empathetic and respectful when intervening with a tobacco user, however, only 51% were confident in their ability to provide information about pharmacotherapy. This baseline sample is highly motivated and confident regarding empathy and general counseling but relatively lacking in knowledge and confidence for providing specific cessation assistance. Findings suggest that HIs likely to promote and engage in cessation activities would benefit from broader access to brief intervention tobacco.

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POS1-21 AN EXAMINATION OF SMOKING RATES OF NURSING STAFF IN LONG-TERM CARE SETTINGS

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The inverse relationship between education and smoking status and the higher smoking rate of nurses compared to other professions is well established. Among nurses, educational level (e.g., LPN, RN) and practice setting (e.g., psychiatric, critical care, etc.) have been linked to varying smoking rates, ranging from 14% to 32%. However, previous studies have not examined CNAs nor healthcare professionals in long-term care settings. This study examined smoking and quit rates among nursing staff, including CNAs, working in long-term care facilities nationwide, of which 96% allowed smoking in designated areas. The overall smoking rate across all nursing licenses was 26.2%. RNs (19.9%, n=181) smoked significantly less than LPNs (32.8%, n=554), however there was no significant difference between CNAs (26.8%, n=365) and other nursing licenses. Identifying the prevalence of smoking is the first step to understanding nurses’ attitudes and behaviors towards resident smoking and identifying the impact of nurses’ smoking on residents of long-term care.

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POS1-22 PSYCHOLOGICAL CORRELATES OF MATERNAL SMOKING DURING PREGNANCY

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This study examined psychosocial functioning in women who smoke cigarettes during pregnancy. The psychosocial functioning of 44 light pregnancy smokers, 18 moderate pregnancy smokers and 49 women who did not smoke during or in the month prior to pregnancy was assessed using the Brief Symptom Inventory (BSI) and the Buss-Perry Aggression Questionnaire (BPA) administered at 2-4 weeks postpartum. Smoking was measured using the Timeline Follow-back Interview. Two multivariate analyses of covariance (MANCOVA) with maternal education and socioeconomic status as covariates were conducted to examine group differences in BSI and BPA subscale scores. The MANCOVA for the BSI subscales yielded a significant multivariate effect of group status on maternal functioning. F(9, 99) = 2.14, p < .05. Univariate analyses indicated that women who were either light or moderate smokers during pregnancy had higher scores on the Paranoid Ideation subscale. Women who were moderate smokers during pregnancy had higher scores on the Anxiety and Hostility subscales than both lighter smokers and nonsmokers and lighter smokers had higher scores on these subscales than nonsmokers. The MANCOVA for the BPA subscales yielded a significant multivariate effect of group status on aggression, F(4,101) = 2.3, p < .05. Univariate analyses indicated that women who were either light or moderate smokers during pregnancy had higher scores on the Physical Aggression and Anger subscales than nonsmokers. In addition, moderate smokers had higher scores on the Hostility subscale than either light or nonsmokers. These findings suggest there are important maternal characteristics that differentiate pregnancy smokers from non-smokers. Since these aspects of psychosocial functioning have consistently been linked to negative developmental outcomes in children and may serve as barriers to smoking cessation, interventions that include strategies for regulating affect such as reducing depression and/or anxiety levels and managing anger and hostility may be more effective at reducing smoking rates among pregnant women while at the same time ensuring more positive behavioral outcomes for the children.

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POS1-23 PSYCHOLOGICAL CORRELATES OF MATERNAL CIGARETTE SMOKING DURING PREGNANCY

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The purpose of this study was to examine group differences in childhood trauma, psychiatric symptoms, and current experiences with physical violence between women who smoked cigarettes during pregnancy and those who did not. We hypothesized that women who smoked during pregnancy would have experienced greater childhood trauma, and would report higher number of psychiatric symptoms and greater current experiences with physical violence. Women were recruited from two city hospitals after delivery as part of an ongoing study of maternal substance use and infant regulation. Maternal substance use during and after pregnancy and all other measures were assessed during a detailed interview at 1 month of infant age. The sample consisted of 25 women smokers and 50 non-smokers. There were no group differences on use of alcohol or marijuana, and women who used other illicit substances were excluded from these analyses. About 88% of mothers who smoked during pregnancy continued to smoke postnatally. The number of cigarettes smoked per day declined over the three trimesters of pregnancy from about 10 cigarettes per day in the first trimester to 4 cigarettes per day by the third trimester. Results indicated that women who smoked cigarettes during pregnancy had lower education compared to non-smokers. Thus, all follow-up analyses were conducted after using maternal education as a covariate. Results of multivariate analyses of covariance indicated that women smokers experienced higher rates of sexual abuse during childhood and had higher psychiatric symptoms including higher depression, anxiety, hostility, interpersonal sensitivity, and paranoid ideation. Women smokers also experienced and perpetrated higher physical violence during pregnancy compared to non-smokers. Infants prenatally exposed to cigarettes had lower birthweight and gestational age compared to those not exposed to cigarettes. Results highlight the importance of evaluating and treating comorbid psychiatric symptoms and violence exposure that may either be etiological or impede treatment success among pregnant women smokers.

Funding: National Institute on Drug Abuse.

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POS1-24
HAIR COTININE AS A BIOMARKER OF ACTIVE AND PASSIVE SMOKING IN WOMEN OF REPRODUCTIVE AGE, PREGNANT WOMEN, CHILDREN AND NEONATES
Ana Florescu*, Tom Einarbon, Roberta Ferrence, Gideon Koren, University of Toronto, Ontario, Canada

Measurement of environmental tobacco smoke (ETS) exposure has largely relied on reports from respondents. Biomarkers, such as cotinine, can provide accurate information on exposure to ETS without relying on self-reports. One underused method involves the analysis of cotinine in hair. To date, no reference range of hair cotinine exists to distinguish among active, passive and unexposed non-smokers. Active smokers and exposed smokers were matched in the hair of women, children and neonates. Hair cotinine cutoff values were evaluated for their potential to discriminate between different levels of exposure. A total of 1746 cases were available for analysis. For active smokers, mean hair cotinine concentrations (95% CI) were: 2.3-3.1 ng/mg for non-pregnant women, and 1.5-1.9 ng/mg for pregnant women. Among passive smokers, mean hair cotinine concentrations were: 0.5-0.7 ng/mg for non-pregnant women; 0.04-0.09 ng/mg for pregnant women; 0.9-1.1 for children; 1.2-1.7 for neonates. Among unexposed non-smokers, mean hair cotinine concentrations were: 0.2-0.4 ng/mg in non-pregnant women; 0.06-0.09 ng/mg in pregnant women; 0.3-0.4 ng/mg in children. A cutoff value between 0.5 and 0.8 ng/mg of hair can accurately discriminate between non-pregnant active smokers and either passively exposed mothers or unexposed mothers. A cut-off between 0.1 - 0.2 ng/mg hair cotinine can be used in the group of pregnant women to discriminate between active and passively exposed or unexposed women.


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POS1-25
MATERNAL ALCOHOLISM, SMOKING DURING PREGNANCY, AND CHILD EXTERNALIZING BEHAVIOR: DIS-ENTANGLING GENETIC AND ENVIRONMENTAL EFFECTS VIA A CHILDREN-OF-TWINS DESIGN.
Valerie S. Knopik, Ph.D., Brown University, Center for Alcohol and Addiction Studies; Mary Waldron, Ph.D., Andrew C. Heath, D.PHIL., Midwest Alcoholism Research Center, Washington University School of Medicine; Theodore Jacob, Ph.D., Palo Alto Veterans Affairs Health Care System; Wendy S. Slutske, Ph.D., University of Missouri, Columbia, Midwest Alcoholism Research Center; Kathleen K. Bucholz, Ph.D., Pamela A.F. Madden, Ph.D., Midwest Alcoholism Research Center, Washington University School of Medicine; Nicholas G. Martin, Ph.D., Genetic Epidemiology Unit, Queensland Institute of Medical Research, Brisbane, Australia

In order to disentangle genetic and environmental effects involved in the association between maternal alcoholism and offspring externalizing behavior [specifically ADHD and Conduct Disorder (CD)], diagnostic telephone interview data on a sample of 202 adolescents and young adults and their 440 children from 536 Australian female monozygotic (MZ) and dizygotic (DZ) twins concordant or discordant for alcoholism and control pairs were analyzed using logistic regression techniques. Initial results for ADHD and CD indicate that offspring of MZ and DZ twins with a history of alcoholism were significantly more likely to exhibit these behaviors than were offspring of nonalcoholic mothers. Moreover, offspring of nonalcoholic MZ twins whose co-twin was alcoholic were also significantly more likely to exhibit externalizing behaviors than were offspring of nonalcoholic twins. This pattern is consistent with a genetic explanation for the association between maternal alcoholism and increased risk of externalizing behavior. Maternal smoking during pregnancy was somewhat confounded with maternal genetic risk of alcoholism, so that controlling for maternal genetic risk reduced but did not entirely explain the association between maternal heavy smoking throughout pregnancy (15 or more cigarettes per day) and child ADHD risk (unadjusted Odds Ratio: 9.47, 95% CI 4.74-18.95; adjusted Odds Ratio 3.83, 1.09-13.45). In contrast to the findings for the relationship between maternal smoking and child ADHD, however, we find that any maternal smoking during pregnancy beyond the 1st trimester (which, in these data, in the vast majority of cases meant smoking throughout the pregnancy), and especially maternal heavy smoking beyond the 1st trimester (more than 15 cigarettes per day) remained a strong predictor of risk of child conduct problems even after control for maternal genetic risk of alcohol use disorder (unadjusted OR =2.83, 95%CI 1.29-6.19; adjusted OR = 5.12, 95% CI 2.12-12.37).

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POS1-26
PHYSIOLOGICAL REACTIVITY AND REGULATION AMONG 7-MONTH-OLD INFANTS PRENATALLY EXPOSED TO CIGARETTE SMOKE
Pamela Schuetze*, State University of New York at Buffalo and Research Institute on Addictions and Department of Pediatrics, University at Buffalo; Rina D. Eiden, Research Institute on Addictions and Department of Pediatrics, University at Buffalo; Francisco A. Lopez, State University of New York at Buffalo

This study examined the relation between prenatal cigarette exposure and reactivity/regulation in a frustration paradigm, as measured by cortisol. Reactivity refers to the infant's emotional response to stress, while regulatory ability refers to the ability to inhibit these stress responses. Mothers and their 7-month-old infants (N=42) were assessed on a second arm restraint trial and 40 minutes after arm restraint. We examined the association between cortisol level and cigarette exposure. Results from an repeated-measures ANCOVA controlling for time of day indicated a significant group by sex interaction effect, F(6, 132) = 2.31, p < .05. Analysis of simple effects indicated that, among infants who were prenatally exposed to moderate levels of cigarettes, boys had higher cortisol during the two baseline samples compared to girls. These findings mirror a pattern of findings in the general developmental literature that suggests boys are more developmentally vulnerable particularly under conditions of prenatal substance exposure.

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POS1-27
MATERNAL SMOKING IN UTERO: COGNITIVE EFFECTS IN THE EARLY SCHOOL YEARS
Kerry Grohman, Ph.D.*, Eilen Edwards, Ph.D., Rina Eiden, Ph.D., and Kenneth Leonard Ph.D., The University at Buffalo, State University of New York, The Research Institute on Addictions

This study examined the association between maternal smoking during pregnancy and early childhood cognitive development in their offspring. SAMPLE AND METHODS: 172 families were drawn from a community based longitudinal study of child development. Families were matched for gender, maternal education, number of children, income, and ethnicity. Exclusion factors included in utero use of alcohol or drugs, and psychiatric comorbidity. Extensive interviews and observations were made between the ages of 1 and 6 years. In this study, we used the WPSSI-R to assess children's cognitive during the latter part of the children's kindergarten year.

FINDINGS: Children in the smoking group performed more poorly than children of controls on multiple measures in the Performance domain including Object Assembly (M = 9.97 vs M = 11.11), F (1, 171) = 4.74, p < .05, Geometric Design (M = 9.79 vs M = 10.96), F (1, 171) = 3.57, p = .06, and Animal Shapes (M = 11.52) F (1, 135) = 3.60, p = .05. Interactions were also found for smoking and gender on Comprehension, with females in the smoking group performing more poorly than control females, and males in the smoking group and control group, and on Geometric Design, with females in the smoking group performing more poorly than female controls, and males in the smoking group and control group. IMPLICATIONS: In this sample, vulnerabilities in children of mothers who smoke during pregnancy appear to fall primarily in visual-spatial skills, which is consistent with previous literature. Daughters of women who smoked in utero demonstrated specific vulnerabilities. Scores for all groups of children in this study fell within the normal range of functioning, however, the lower scores for daughters in the smoking group reveal a concerning developmental vulnerability that may contribute to difficulties in later school.

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POS1-28
ETHNIC DIFFERENCES IN COTININE LEVELS AMONG MOTHER-INFANT DYADS

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Cotinine, a nicotine metabolite can be used to measure exposure to tobacco smoke. It can be measured in saliva. This study assayed cotinine in the saliva of 442 ethnically diverse mother-infant dyads. The infants were 6 months of age (M=7.24 months), 28.1% were African American, 71.5% were Caucasian. Two hundred and fifty-seven mothers self-reported smoking at least 1 cigarette in the previous 48 hours (17.5 cigarettes); 78% of these mothers had self-reported smoking levels that were <10 ng/ml (M=0.84 ng/ml). With regard to infants (M=7.24 months), infants of smoking mothers had higher cotinine levels (M=10.86 ng/ml) than those with non-smoking mothers (M=2.15 ng/ml). Maternal cotinine levels (r=0.69, p<0.001) were positively associated with infant salivary cotinine levels. African American infants of smoking mothers had higher cotinine levels (M=14.24 ng/ml) than did their Caucasian counterparts (M=10.02 ng/ml). As previously reported (Wagenknecht et al., 1990) African American mothers had higher salivary cotinine levels (M=322.69 ng/ml) than did Caucasian mothers (M=288.04 ng/ml) despite smoking significantly fewer cigarettes (M=2.26 vs. 18.35 cigarettes). These findings document possible links between ethnic status and second hand nicotine exposure of infants during early childhood.

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POS1-29
MATERNAL BEHAVIOR DURING MOTHER-INFANT FEEDING INTERACTIONS AMONG 2-4 WEEKS OLD CIGARETTE-EXPOSED INFANTS

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This study examined the association between pregnancy smoking and maternal behavior during mother-infant interactions at 2-4 weeks of infant age. 62 infants who were prenatally exposed to cigarettes, 42 non-exposed infants and their mothers were recruited after birth and assessed at 2-4 weeks of infant age. Group status was determined by self reported smoking (Timeline Followback Interview) and infant saliva cotinine. Mothers were asked to feed their infants as they normally would at home. The first 10 minutes of these interactions were coded by research assistants blind to group status using the Mother-Infant Feeding Scale (Chattoor, 1985). Maternal aggression and hostility was also assessed using the Buss Perry Aggression Questionnaire (BPA). Factor analysis identified two subscales which were subsequently identified as Maternal Warmth and Maternal Insensitivity. Results of ANCOVAs with maternal education and alcohol use during pregnancy as the covariates indicated that women who smoked during pregnancy had higher levels of maternal insensitivity and lower levels of maternal warmth than comparison women. These analyses were then repeated with scores on the BPA Anger and Physical Aggression subscales as covariate to see if maternal anger/hostility explained the association between pregnancy smoking and maternal behavior during feeding interactions. Even after controlling for maternal anger/hostility, women who smoked during pregnancy had higher levels of maternal insensitivity during feeding interactions than nonsmokers, F(1,98) = 3.79, p < .05. For maternal warmth, after controlling for maternal anger/hostility, there was no longer a group difference for maternal warmth during feeding, F(1,79) = 2.44, p = .11. These findings suggest that maternal cigarette smoking during pregnancy is associated with a higher risk for negative mother-infant interactions and highlight the importance of examining maternal behavior as a measure of parenting among mothers who smoked during pregnancy. Furthermore, these results suggest that maternal psychological functioning should be examined as a possible predictor of parenting in this high risk population.

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POS1-30
EVALUATION OF A PROGRAMME OF INTENSIVE SUPPORT TO HELP PREGNANT WOMEN STOP SMOKING

Catherine Ann Fitchett, Jane Beach

The West Midlands region has one of the highest perinatal death rates in the United Kingdom. Smoking during pregnancy has been linked with major adverse consequences for both the mother and baby. The risk of pre-term birth, low birth weight, perinatal death and sudden infant death are reduced if women stop smoking in pregnancy (Lumley et al. 2003). Furthermore, ectopic pregnancy and miscarriage can also be reduced by cessation (Lawrence et al. 2003). Consequently, reducing rates of smoking in pregnancy is high on the public health agenda. Many pregnant women are already aware of the risks of smoking during early pregnancy and around 40% will attempt to quit, with a varying degree of success. (Lumley et al. 2005). However, those with the most success tend to be women in the higher socio-economic groups. Women in the lower socio-economic groups who tend to be young, single and on a low income are much less successful (Lumley et al. 2005). Typically, smoking cessation models aimed at reducing smoking in pregnancy are based on a 7-week treatment programme, but with minimal ongoing support. These programmes have reported quit rates of 18-24% (United Kingdom). Birmingham PCT specialist pregnancy service implemented a programme of intensive support involving weekly home visits from a trained advisor for 8-10 weeks, followed by monthly home visits until the birth of the baby. Nicotine replacement therapy was issued free and carbon monoxide monitoring was used to provide additional motivation for continued abstinence. After twelve months the programme was evaluated using descriptive statistics. In total 63 women accessed the service and 27 (43%) were point prevalent abstinent at four weeks. A programme of continuing support provided by a stop smoking specialist, together with nicotine replacement therapy results in a higher quit rate among pregnant women when compared to less intensive approaches. No funding.

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POS1-31
EFFECTIVE RECRUITMENT STRATEGIES FOR SECONĐHANCED SMOKE EXPOSURE STUDIES


The pursuit of successful recruitment strategies may be one of the most fundamental parts of any clinical trial. Recruitment methods that have been employed in previous studies, as well as the present Project Sirocco study, include proactive (face-to-face methods) and reactive (mass media methods). Project Sirocco, a Secondhand Smoke (SHS) Exposure study designed to determine if preteen exposure to tobacco smoke by a household member can be reduced by counseling, plus cotinine feedback, plus incentives to the preteen, has found that face-to-face recruitment is the most effective strategy for recruiting low-income, preteen/parent pairs. Of the 698 pairs screened for enrollment into Project Sirocco, 59 (8.3%) pairs have been enrolled in the study (inclusion criteria; non-smoking preteen 8-13 years of age, living in the home with a smoker, exposure to at least two cigarettes per day, and resident of San Diego County). Thirty (51%) of enrolled preteens are male, 21 (36%) are Black, 19 (32%) are Latino, 17 (29%) are White, and 2 (3%) are Other. Of the 59 successfully recruited and enrolled, 31 (52%) were from face-to-face collaborative agency staff; 17 (29%) were from face-to-face project staff in person, and 6 (10%) were from mass media sources. Interestingly, face-to-face collaborative agency staff recruitment, face-to-face project staff recruitment and mass media recruitment all had similar ratios of enrolled pairs to screened pairs (9.5%, 7.9%, and 7.8%, respectively; X2 (2, n = 698) = 0.51, p = 0.77). However, the ability to get a large number of potential participants screened required using face-to-face recruitment strategies. Of the 698 screened pairs, only 77 (11%) came from mass media recruitment. Face-to-face collaborative agency staff and face-to-face project staff, generating 390 (56%) and 231 (33%) of screened pairs, respectively. The reactive (mass media) approach did not generate as much interest by potential preteen/parent pairs. Recommendations for future SHS studies with this population would be to use financial resources for face-to-face recruitment and not mass media. Supported by National Heart, Lung and Blood Institute (NHLBI), National Institutes of Health (NIH), grant # R01 HL066307.

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POS1-32 BEHAVIORAL COUNSELING INTERVENTION FOR PASSIVE SMOKING AND SMOKING CESSATION WITH LOW-INCOME FAMILIES WITH YOUNG CHILDREN

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The purpose of this study was to test a behavioral counseling intervention designed to reduce environmental secondhand smoke exposure (SHS) and parents' smoking among 150 low-income families with children younger than four years. Families were randomized to an experimental condition that received up to 10 in-home and 4 telephone counseling sessions over 6 months, and free nicotine patches and gum for all adults' quit attempts. Controls received measures only. Parent reports, children's urine cotinine, and environmental nicotine measures were obtained at baseline, 3, 6, 12, and 18 months (86.7% participant retention at 18 months). Preliminary results found that children's SHS exposure (from mothers in the home and total) and mothers' smoking rate (overall and indoors) declined in both groups through 6 months, with significant group by time interactions and the counseling group decreasing more than controls (p<.05). During follow-up, group differences remained significant and mothers' overall smoking rate increased in both groups. Fifteen mothers who completed counseling reported 7-day smoking cessation at one or more study measures, versus five controls (p=.019). SHS counseling combined with smoking cessation counseling was effective in helping families reduce children's SHS exposure, and in increasing mothers' point prevalence quits.

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POS1-33 URINE COTININE FEEDBACK TO PROMPT SECONDHAND SMOKE EXPOSURE COUNSELING BY PEDIATRIC CLINICIANS


Despite the documented health effects of secondhand smoke (SHS) in children, only 1.5% of pediatric ambulatory care visits incorporate tobacco cessation counseling. The purpose of this project is to evaluate the feasibility of obtaining urine cotinine results on pediatric patients, and to determine the effects of these results on anti-tobacco counseling by providers to parents. One hundred and two participating families, with a child under 5 and at least one smoking parent, were randomized to intervention or control conditions. Urine cotinine, a biomarker for SHS exposure, was obtained from each child. Cotinine results were delivered to pediatric care providers for intervention families. The providers were surveyed to verify that cotinine results were received, and to assess whether the providers counseled the parents about SHS. Of the 21 providers for intervention group families, 6 received cotinine results and 15 did not see the results. The 6 that received the cotinine feedback recommended smoking cessation and bans in the home; 5 recommended car bans, as well. Of the 15 providers who did not see the cotinine feedback, 10 recommended cessation and home bans. In the control group (n=11), only 6 were aware of patient exposure and provided anti-tobacco advice and home bans. Urine cotinine is well accepted by parents and providers as a tangible marker for SHS exposure. Cotinine biofeedback prompted anti-tobacco counseling by providers.

This study was conducted while the first author was at the University of California, San Diego. Supported by the American Heart Association, grant #0770023N.

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POS1-34 WHAT'S HAPPENING WITH NICOTINE LEVELS IN 2004?

Doris M. Cullen*, Thomas G. Land, Lois Keithly, Massachusetts Department of Public Health

The national standard for testing tar and nicotine in mainstream smoke was developed by the Federal Trade Commission (FTC) almost 40 years ago (1967). The FTC admits, however, that their tar and nicotine ratings are not intended to reflect what an individual consumer would get from any particular cigarette. In fact, the FTC issued a Consumer Alert to the public which states the amount of tar and nicotine smokers actually get depends on how deep and how often they puff on the cigarette and whether they block the vent holes. The Massachusetts Department of Public Health implemented testing standards to more accurately imitate the way smokers actually smoke. The Massachusetts standards reflect compensation techniques such as vent blocking, puffing more frequently and inhaling more deeply. These standards requires tobacco manufacturers to file an annual report concerning nicotine yields with the Massachusetts Department of Public Health (MDPH) for each brand of tobacco product sold in the Commonwealth. Since 1997, the tobacco companies have reported data to the MDPH. The data for 2004 is the latest available. Over 150 brands were evaluated. Based on the nicotine level, each brand/sub-brand combination was categorized as either High (>1.2mg), Moderate (0.2mg - 1.2mg), Low (<0.2mg), or Nicotine Free (0.0mg). In 2004, not a single brand had nicotine levels low enough to be classified as either Low Nicotine or Nicotine Free. In addition, less than 13% could be classified as Moderate Nicotine cigarettes, while the remaining 87% were rated as High Nicotine. In contrast, the cigarette manufacturers classify cigarettes as Full Flavor, Light, or UltraLight. The distribution among these categories is much less lopsided. 43% of the brands were labeled as Full Flavor. 39% were light cigarettes. The remaining 18% were ultra-light. In 2004, the average nicotine delivered for each of these categories was in excess of 1.0 milligram. On average, Full Flavor cigarettes had 2.15 milligrams of nicotine. Light cigarettes had 1.68 milligrams of nicotine. UltraLights had 1.17 milligrams of nicotine.

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POS1-35 WHAT MAKES A LIGHT CIGARETTE LIGHT? EXAMINING PHYSICAL PROPERTIES

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Since the 1960s, the sales weighted average tar yield of American cigarettes has dropped significantly, yet little progress has been seen in reducing tobacco-caused mortality. This is likely because the design features used to achieve yield reductions can be defeated by smoker behaviors. We wanted to examine what design features and cigarette physical characteristics distinguish cigarettes described as Light or Ultra Light from Regular or Full Flavor Cigarettes. We examined 10 parameters on 17 major brand families available in at least two yield bands in New York State in August 2005. Tar and nicotine yields were obtained from manufacturers' websites and FTC reports. Half of the brands self-described as 'Full Flavor' would qualify as 'low tar' by the traditional categorization (<15 mg tar). Filter ventilation was highly correlated with tar yield (r=0.89), while tobacco weight (r=0.45) and filter length (r=0.62) were less so. Ultra Light cigarettes tended to have denser filters, and both Lights and Ultra Lights tended to have longer overwraps. Stepwise discriminant analysis showed that filter ventilation, tobacco weight, and pressure drop best classified cigarettes as Regular (>15mg tar), Light (7-15mg tar), or Ultra Light (<6 mg tar). We find that descriptors such as Light and Ultra Light are misleading to consumers. Funding: Roswell Park Cancer Institute Transdisciplinary Tobacco Use Research Center (1 P50 CA111236).

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SRNT • Poster Session 1
**POS1-36**

**PUFF COUNTS IN STANDARD FTC CIGARETTE TESTING: DOCUMENTS, DATA, AND IMPLICATIONS**

Lynn T. Kozlowski*, Ph.D., and Courtney A. Whetzel, B.S., Penn State University

U.S. Federal Trade Commission (FTC) testing of cigarettes for tar yields began in 1967, requiring a 2-sec, 35ml puff be taken once per minute until a fixed butt length. We reviewed industry documents on the birth of the FTC test and found issues on the varying number of puffs taken in testing. The majority of the industry argued for "dual reporting" of yield--both per cigarette and per puff. After testing began, the President of the Tobacco Institute sent a memo to the FTC, asking that puff number information, a by-product of the testing machine, at least be preserved as part of the record. Documents and recent communications with the FTC indicate that puff number information was never preserved by the government, yet it was a fundamental and routine part of industry testing and cigarette design. In recent years, the FTC closed its laboratory and contracted with the Tobacco Institute Testing Laboratory (TITL), which does record puff count data and releases it to the tobacco industry, but not the FTC. A sample of puff counts for popular cigarettes tested in 1993 by TITL will be reported and issues related to reporting tar, per puff, and puff counts will be discussed. On average 100s have 18% more puffs taken on them than do 85s in standard tests (P < .01): King Size cigarettes have an average of 7.66 puffs (SEM = 0.5) (N = 235) and 100 mm cigarettes have an average of 9.03 puffs (SEM = 0.5) (N = 232). The 10th percentile puff count is 6.8 and the 90th percentile is 8.8 for King Size; the 10th percentile puff count is 8.2 and the 90th percentile is 100.0 for 100 mm cigarettes, indicating that puff counts can vary substantially among brands. The government declines to seek puff-count information that the industry demands. Policy implications will be discussed.

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**POS1-38**

**SMOKE INHALATION ESTIMATES OF SMOKE EXPOSURE**

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Smoking machine data and measures of smoke exposure are typically indexed by measures of puff topography (puff volume, puff velocity, inter-puff interval, puff duration). However, it is known that smoke intake (mouth exposure) is greater than smoke uptake by the lungs. Measuring inhalation of components of tobacco smoke into lung tissue is critical because most nicotine and CO absorption occurs in the lung. Previous attempts to measure exposure to tobacco smoke by plottysmography have been hampered by expensive and cumbersome equipment. Recently respiratory inductance plethysmography has been accomplished using a fitted vest (LifeShirt, Vivometrics, Ventura CA). Using this vest, we compared inhalation parameters and heart rate (beats/min) during two rest periods and two smoking periods in 8 subjects. Each subject smoked their own brand of cigarettes. Inhalation parameters examined were inspiratory volume (ViVol; ml), expiratory volume (VeVol; ml), inspiratory time (Ti); sec), expiratory time (Te; sec), and inspiratory flow (VITI; ml/sec). During smoking, ViVol (636 ml) and VeVol (634 ml) were significantly greater than ViVol (423 ml) and VeVol (425 ml) during resting. Ti was significantly more prolonged during smoking as compared to baseline (2.1 sec, 1.3 sec) although there was no significant difference in Te. VITI was significantly greater during smoking (458 ml/sec) than during resting (382 ml/sec). There was evidence that heart rate was faster during smoking period smoking (80.4 beats/min) relative to the baseline period (72.6 beats/min); yet the difference was not significant (p = .06). It appears that breathing parameters intensify during periods of smoking. These data suggest that the record- ing of inhalation while smoking is a practical and assessable means to measure smoke exposure and may offer a new technological approach to index exposure to nicotine, CO and other components of tobacco.

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**POS1-37**

**EFFECTS OF REDUCED NICOTINE CIGARETTE PRODUCTS ON SMOKING TOPOGRAPHY AND HARM EXPOSURE**

Andrew Strasser*, Paul Sanborn, Caryn Lerman, Transdisciplinary Tobacco Use Research Center, University of Pennsylvania

Quest® cigarettes are marketed as a means to become nicotine-free and are commercially available in three nicotine levels (0.6mg, 0.3mg, and 0.05mg). Tar levels are constant (10mg) across the three levels. Previous research on other cigarettes has examined the effect of nicotine level on smoking topography, a quantifiable measure of smoking behavior, and on harm exposure. Fifty participants smoked ad lib one cigarette of each Quest® level cigarette using a smoking topography device. Participants were blinded to nicotine level. All cigarettes were smoked 30 minutes apart. Carbon monoxide (CO) levels before and after each cigarette determined CO boost. Mean total puff volume was 571ml (SD=156), 520ml (SD=145), and 540ml (SD=145) for the 0.05mg, 0.3mg, and 0.6mg nicotine level cigarettes respectively [F(2, 49)=5.49, p<.01]. Mean CO boost was 520ml (SD=145), 520ml (SD=145), and 540ml (SD=145) for the 0.05mg, 0.3mg, and 0.6mg nicotine level cigarettes respectively [F(2, 49)=5.49, p<.01]. Mean CO boost was 156, 156, and 156 for the 0.05mg, 0.3mg, and 0.6mg nicotine level cigarettes respectively [F(2, 49)=5.49, p<.01].

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**POS1-39**

**INTER-INDIVIDUAL VARIABILITY OF EXPOSURE TO CIGARETTE SMOKE TOXINS DUE TO DIFFERENCES IN SMOKING BEHAVIOR AND METABOLISM**

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POS1-40
REAL-TIME MEASUREMENT OF PARTICLES AND VOCs IN SMOKERS: EXHALED BREATH
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Mainstream cigarette smoke is a complex mixture consisting of a vapor phase and an aerosol particle phase. The VOCs in tobacco smoke, several of which are important carcinogens, occur almost exclusively in the vapor phase, while the more potent semi-volatile organic chemical (SVOC) carcinogens are largely confined to the particle phase. Biomarkers are suitable surrogates for assessing exposure to specific smoke constituents, potentially providing a powerful means of elucidating associations with adverse health outcomes. We are evaluating the effectiveness of non-invasive, real-time methods based on exhaled breath for measuring tobacco-related particle size distributions and for monitoring specific tobacco-related VOCs in breath as a means of objectively assessing exposure to and uptake of these constituents by active smokers. We measured the particle size distribution and concentration of the fine and ultrafine (<0.1 µm) particles in the exhaled breath of active smokers using a novel real-time particle analyzer, to determine their deposition in the respiratory tract. Preliminary measurements showed a preponderance of ultrafine particles, which have largely been ignored in previous work, with the number of particles in the lowest measurable range (>0.007 µm) at least an order of magnitude greater than that measured for the next five larger cutpoints (range 0.03 – 0.26 µm). Currently under way is an investigation of what smoke-related chemicals are attached to such ultrafine particles during actual human smoking of commercial cigarettes. Given the complex dynamics associated with particle deposition in the lung, this ultrafine particle dominance has potential health implications. We also measured the uptake, distribution, and elimination of some tobacco-related VOCs in smokers’ exhaled breath using two different mass spectrometry-based real-time techniques. The utility of the technology for providing unique exposure data in smokers was demonstrated by estimating body concentrations and residence times for the carcinogens benzene and 1,3-butadiene, along with the smoke biomarkers 2,5-dimethylfuran and acetonitrile.

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POS1-41
ESTIMATION OF EFFECTIVE CIGARETTE DELIVERY AND FILTER VENTILATION USING DIGITAL IMAGING
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Examination of tar stain patterns deposited in a cigarette filter has long been postulated as a means to estimate whether blockage of filter ventilation holes in light or ultra-light cigarettes has occurred. inadvertent or deliberate blockage of filter vent holes in cigarettes designated as low delivery when smoked under FTC conditions may cause the tar and nicotine deliveries to dramatically increase approaching that of high-delivery full-flavored cigarette brands. We have evaluated using comparative digital image analysis of the filter stain patterns to estimate the effective filter ventilation, tar deliveries, and nicotine deliveries for selected full-flavor, light, and ultra-light cigarettes. The digital image analysis approach looks promising and provides comparable results to measuring chemical markers deposited in the filter during smoking.

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POS1-42
THE RELIABILITY AND PREDICTIVE VALIDITY OF DIGITAL IMAGE ANALYSIS OF CIGARETTE FILTER STAINING FOR ESTIMATING SMOKE EXPOSURE
Richard J. O’Connor1*, David Hammond2, Lynn T. Kozlowski1, Joseph P. Stitt1, Andrew Hyland1, K. Michael Cummings1, Geoffrey T. Fong1, Roswell Park Cancer Institute; University of Waterloo; Pennsylvania State University

There is sufficient variation in how people smoke each cigarette that the number of cigarettes smoked daily and the years of smoking represent only crude measures of exposure to the toxins in tobacco smoke. There is an urgent need for better, non-invasive measures of smoke exposure. Previous research has shown that spent cigarette filters can provide information about how individuals smoke cigarettes. Digital image analysis has previously been used to identify filter vent blocking, and may also provide an inexpensive, unobtrusive index of smoke exposure. In the current study, a total of 3740 cigarette butts smoked by 59 participants in a smoking topography study were imaged and analyzed. Imaging showed test-retest reliability of over 90%. Mean color scores (CIELAB system) showed acceptable stability (>0.60) across three waves of data collection, consistent with the stability observed among measures of smoking topography across waves. Average score correlations correlated highly (>0.70) with total smoke volumes (puff volume * number of puffs) drawn from cigarettes. These data suggest that digital image analysis of spent cigarette butts can serve as a reliable proxy measure of total smoke volume.

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POS1-43
CHEMILUMINESCENCE ANALYSIS OF HERBICIDES IN TOBACCO SMOKE
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Chemical analysis of herbicides in tobacco smoke has been studied using a gas chromatography mass spectrometer (GC-MS), a sulfur and nitrogen chemiluminescence detectors which are interfaced to a gas chromatography (GC). A CH technologies smoking machine was used to smoke reference research cigarettes-2R4F- and generic cigarettes, following the FTC parameters. The mainstream smoke was collected in Cambridge Filter pads. After smoking the pads contents were extracted using methanol. The resultant were manually and simultaneously injected into the GC port for chemiluminescence detection (NCD & SCD), which is a process of oxidation and reduction of the sulfur and nitrogen compounds. An auto sampler was used for analysis using the GC-MS, where the Nist 98 database was used for identification of the different peaks fragments. Based on the retention times, the results obtained by the GC-NCD-SCD were compared and identified to those obtained by the GC-MS. Accordingly, 4 herbicides residues were identified in the smoke samples.

Funding: Arkansas Biosciences Institute.

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POS1-44  
**A COMPARISON OF SMOKING-ATTRIBUTABLE MORTALITY AND MORBIDITY IN 1992 AND 2002: TRUTH OR ARTIFACT?**

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The 1st Canadian Study on the Costs of Substance Abuse estimated the mortality and morbidity attributable to smoking for 1992. Since that time, the prevalence of smoking in Canada has decreased, the list of diseases determined to be causally linked to smoking has increased, and new relative risks (RRs) for various diseases are available. Thus, new estimates were necessary. The 2nd Canadian Study on the Costs of Substance Abuse has produced estimates of the mortality and morbidity attributable to smoking for the year 2002. RRs for each disease category were taken from current meta-analyses. Mortality data in for the year 2002 were obtained from Statistics Canada. Hospital separations for the fiscal year 2002-2003 were obtained from the Canadian Institute for Health Information. Smoking prevalence by age and sex was obtained from the Canadian Community Health Survey 2003 (cycle 2.1). Smoking-attributable fractions (SAFs) were calculated and applied to the mortality and morbidity data to estimate the smoking-attributable mortality and morbidity by age and sex. These were compared with 1992 estimates and reasons for differences were explored. For Canada in 2002, 37,212 deaths were attributable to smoking. This constituted 16.6% of all deaths in Canada. In the fiscal year 2002-2003, 339,180 hospital separations were attributable to smoking. There were 33,498 deaths and 208,095 hospitalizations attributed to smoking in 1992; smoking accounted for 17% of total mortality and 6% of hospitalizations. There are several real and artifactual reasons that may explain these differences. Real reasons include a change in prevalence of exposure, total number of deaths and distribution of causes of death. Artifactual reasons include different RRs used and diseases included. Prevalence of smoking decreased over this time period. Total deaths increased from 196,968 to 223,603, but ischemic heart disease deaths increased from 18.2% of all deaths to 22.1%, while chronic obstructive pulmonary disorder decreased from 4.2% to 3.8% and lung cancer decreased from 7.7% to 7.3%. The effects of these changes are presented for smoking-attributable mortality and morbidity.

This analysis was performed under the umbrella of the Second Canadian Study on Social Costs of Substance Abuse, funded by the Canadian Centre on Substance Abuse and Health Canada.

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POS1-45  
**META-ANALYSES OF THE EFFECT OF SMOKING INTENSITY ON DISEASE MORBIDITY**

Lisa Mucha*, and J. Stephenson, Thomson Medstat; Riad Dirani, Pfizer Global Pharmaceuticals.

**INTRODUCTION:** The purpose of the meta-analyses was to assess morbidity and mortality associated with intensity of smoking.

**METHODS:** Data from 61 English-language published studies with point estimates and confidence intervals were extracted. Three sets of meta-analyses were performed: current smokers, low level of use and high level of use. Low level of use was defined as 1-20/21 cigarettes per day and high level was greater than 20/21 per day. Pooled estimates and forest diagrams are reported.

**RESULTS:** The meta-analysis of current smokers showed a highly significant pooled risk estimate of 1.83 (1.44, 2.31) across the 18 studies that reported estimates. The estimates of risk when stratified by gender were similar, with 1.98 (1.43, 2.74) for men and 1.84 (1.05, 3.24) for women. The overall estimate for the 57 studies reporting risk associated with low levels of smoking was 1.70 (1.52, 1.90) which was lower than the overall estimate reported in the analysis of current smokers. The analysis of the risk associated with high levels of smoking showed all point estimates, including both the pooled 2.09 (1.87, 2.34) <p<0.0001> and gender-stratified, were highly significant. The risk estimates for each gender at high levels exceeded those found for low levels. The increase in risk from low to high level of smoking was generally greater for females than for males.

**CONCLUSIONS:** Low and high level of smoking showed that intensity is indeed a factor in the risk of disease. Risk increased as intensity level increased for males and for females. The overall ratio of all persons smoking at a high level was over twice that of persons who never smoked. Risk of disease among current smokers was substantially and was worsened by increasing intensity of smoking. Smoking cessation therapy, aids and programs are of paramount importance to smoking rates.

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POS1-46  
**MORBIDITY AND MORTALITY TRENDS IN CIGARETTE SMOKING: POTENTIAL REDUCTIONS BY ALTERNATE NICOTINE DELIVERY SYSTEMS**


Cigarettes are the most deadly of all commonly used tobacco products due to their design, ingredients and typical patterns of use. Specifically, most cigarette smokers smoke many cigarettes per day for decades, inhaling the highly toxic smoke deep into their lung, with each of the 10 or more puffs from every cigarette. A broad range of diseases attributable to smoke inhalation include heart and lung diseases and risks are substantially and was worsened by increasing intensity of smoking. Although combusted products such as pipes and cigars may contain comparable types of toxins and in even greater quantities than cigarette, they are typically used less frequently per day and the smoke is not as regularly inhaled into the lung. Oral tobacco forms can also be toxic and cause cancer although the risk appears to vary across product types with American and Indian products clearly producing head and neck cancer, and modern Swedish snus products producing oral diseases but apparently low cancer risk. Medicinal nicotine products approved by regulatory agencies carry a very low risk of life-threatening disease. The potential for disease reduction in the near and long term by alternate forms of nicotine maintenance will be summarized.

*International Agency for Research on Cancer Robert Wood Johnson Foundation Innovators Awards Program at Johns Hopkins Medical School and Pinney Associates*

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POS1-47  
**KNOWLEDGE, BELIEFS AND ATTITUDES REGARDING SMOKING AMONG AFRICAN AMERICAN SMOKERS WITH DIABETES: FOCUS GROUP RESULTS**

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Persons with diabetes are at elevated risk for cardiovascular disease and these risks are substantially increased in those who smoke cigarettes. Few investigators have examined smoking cessation among persons with diabetes. Low-income, African American smokers with diabetes (N=25, M=48.48 years (SD=10.23), 60% female) completed a brief survey before being assigned to one of four focus groups. Quantitative survey results indicate that participants had been diagnosed with diabetes for 12.2 years and 44% used insulin to manage their diabetes. Participants smoked 20.92 (SD=12.54) cpd and had an average of 3.16 (SD=6.12) quit attempts in the past year. 68% were seriously considering quitting smoking in the next 6 months and 66% had decreased cpd to lower health risks. Most participants had tried ‘cold turkey’ in their previous quit attempts and few used NRT (patch [32%], gum [28%], nasal spray [4%], lozenge [4%]) or bupropion (4%). Most said they relied on ‘willpower’ (76%), spirituality (36%) and support from family/friends (32%) to help them quit. Focus group results indicate that participants smoked to control health-related stress, keep their appetite down and to control their glucose. Most acknowledged their elevated risk for cardiovascular problems and were aware that smoking increased risk. Key components wanted in a cessation program included stress management, diabetic education, nutrition advice, support and both group and individual sessions. Results suggest that persons diagnosed with diabetes are interested in quitting and may be an appropriate group to target in smoking cessation trials.

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POS1-49  VALIDITY AND RELIABILITY OF SURVEY ITEMS ON TOBACCO USE AMONG CAMBODIAN ADULTS

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BACKGROUND: There is currently a paucity of national prevalence data on tobacco and health in most nations of Southeast Asia. In Cambodia, no nationwide survey of tobacco and health had been conducted until our recent survey of 13,988 adults (Tobacco Control Leadership Training Program (Fogarty-NIH)) that was completed in September 2005. In preparation for this national prevalence survey we conducted validity and reliability studies of the survey items and pictograms on tobacco use.

METHODS: For the validity study we used census data to randomly sample 201 adults (ages 21 to 84) from a rural province. Of these 201 adults, 197 (98% response rate) provided interviewer-administered survey data on tobacco use, saliva samples, and informed consent. The saliva samples were tested for cotinine using the NicAlert test. For the reliability study, we randomly sampled 30 subjects who had completed the national prevalence survey and 2 to 3 weeks later completed a re-interview using the identical survey and a different interviewer.

RESULTS: In the validity study, 47% of the sample could be classified as tobacco users based on the results from saliva cotinine tests. Survey items and pictograms of tobacco use had a sensitivity of 86%, specificity of 94%, and positive predictive value of 93% in the detection of tobacco use measured by cotinine levels. We classed current smokers into low and high cotinine groups and found that the mean number of cigarettes (smoked per month) reported by these groups in the survey was 124, 216, and 359 respectively. We found excellent reliability for current smoking (kappa=0.93), a commercial cigarette pictogram of common brands (kappa=1), hand-rolled cigarettes (kappa=0.80), a chewing tobacco pictogram (kappa=0.83), and a pipe use pictogram (kappa=1). Reliability of the second hand smoke (kappa = 0.57) and intention to quit items (kappa=0.37) was somewhat lower. Age at initiation of tobacco use was not significantly different upon re-test (p=0.20).

CONCLUSIONS: Survey items and pictograms of tobacco products can provide a valid and reliable estimate of tobacco use in a national prevalence survey of Cambodian adults.

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POS1-50  PERCEIVED RISK AND SMOKING BEHAVIOUR: FINDINGS FROM THE ITC FOUR COUNTRY SURVEY

Mary-Jean Costello*, Geoffrey T. Fong, Mark Zanna, Paul W. McDonald, University of Waterloo

BACKGROUND: Although perceived risk is a key predictor in most conceptual models of health behaviour, the evidence has been inconsistent. We examined whether two more specific measures of perceived risk improved prediction of future quit intentions, quit attempts, and successful quitting and whether the risk difference measure would yield even greater predictability.

METHODS: We analyzed data from the International Tobacco Control Survey, a cohort telephone survey of smokers across four countries: Australia, Canada, U.K., and U.S. Measures of perceived risk obtained from individuals at Wave 2 (N=6784) were used to predict quitting intentions and behaviour at an 8-12 month follow (Wave 3).

RESULTS: Specific perceived risk (i.e. risk if one continues to smoke), significantly predicted intentions to quit and quitting behaviour at follow-up [intentions: OR=1.39, CI: 1.30-1.48, p<.0001; quit attempts: OR=1.20, CI: 1.13-1.27, p<.001; smoking status: OR=1.17, CI: 1.10-1.28, p<.01]. The difference between the specific perceived risk and if one were to quit was a slightly stronger predictor of future quit intentions [OR=1.52, CI: 1.30-1.77, p<.0001], quit attempts [OR=1.28, CI: 1.10-1.44, p<.001], and smoking status [OR=1.24, CI: 1.15-1.32, p<.01]. Similar results were found for these two refined measures of perceived risk for heart disease.

CONCLUSIONS: Making perceived risk measures more specific in studies of tobacco use and quitting improves utility.

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POS1-51  ATTITUDES TOWARDS SMOKING AMONG HIV+ INDIVIDUALS

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Although smoking is highly prevalent among HIV+ individuals, there is very little research on this topic. This study’s aim was to investigate current attitudes and beliefs towards smoking among HIV+ individuals. Surveys were distributed to patients (n=44) attending scheduled appointments at an HIV clinic. Patients completed the surveys on their own time and mailed it to the researchers. There were 11 never smokers, 15 former smokers and 18 current smokers. Patients were, on average, 42.9 (S.D. ± 8.62) years old and 87% were male. On average, the current smokers smoked 19.5 (S.D. ± 13.6) cigarettes per day and had an average Fagerstrom score of 5.7 (S.D. ± 1.9). There were no significant demographic differences between never, former and current smokers. Of all respondents, 53% thought an HIV+ individual’s health would benefit more from quitting smoking than an HIV- individual and 48% were unsure if the use of nicotine replacement therapy would have a negative impact the health of an HIV+ individual. The majority of respondents cited HIV status (58%), physical symptoms associated with HIV infection (59%), and increased anxiety (81%) as deterrents for quitting smoking. More current than never smokers agreed that an HIV+ individual would have more motivation to quit than an HIV- individual (29 % v. 0%, p=0.024). Current smokers rated their confidence level for quitting smoking an average of 4.7 (S.D. ± 2.8) and their skills to quit smoking an average of 4.6 (S.D. ± 2.5) on a 10-point Likert scale. These data suggest there may be a need for skills-based education within the HIV-infected community to promote quitting smoking.

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POS1-52  CHARACTERIZATION OF SMOKERS WITH RESPECT TO REASONS FOR SMOKING AND PERSONALITY MEASURES

Jennie Z. Ma, University of Texas Health Science Center at San Antonio; Ming D. Li, University of Virginia; Thomas J. Payne and Karen M. Creus, University of Mississippi School of Dentistry

To examine the relationship between smoking motivations and personality characteristics, we studied 1,186 smokers who completed the Russell Motives for Smoking Questionnaire (RMSQ) and the NEO Five-Factor Inventory (NEO-FFI) as part of a larger study on the genetics of nicotine dependence. The average age was 39.3 ± 13.5 (years) with 65% female and 59% African-American. The relationship between smoking and the seven subscales of RMSQ and five subscales of NEO-FFI was examined using exploratory and confirmatory factor analysis. We found the subscale scores of RMSQ (stimulation, indulgent, psychosocial, sensorimotor, addictive, automatic, sedative) to be either positively or negatively correlated with those of the NEO-FFI (neuroticism, extraversion, openness, agreeableness, and conscientiousness). Further, latent variable analysis revealed that smokers can be broadly classified into low and high motivation classes. The low class consists of 64% of smokers with low scores on the seven RMSQ subscales and the neuroticism subscale of NEO-FFI, and high scores on extraversion, openness, agreeableness, and conscientiousness of NEO-FFI. In contrast, high motivation class smokers have high scores on all seven RMSQ subscales but lower scores on all NEO-FFI subscales except for neuroticism. These two classes differ in several important respects, including level of nicotine dependence as measured by FTND scale, education, and likelihood of attempting to quit smoking. These findings provide supportive evidence for the differential association of smoking motivations with personality characteristics, and suggest latent classes underlie characteristic differences among smokers.

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POS1-53  CHARACTERISTICS OF LESBIAN, GAY, BISEXUAL, AND TRANSGENDER (LGBT) SMOKERS SEEKING INTERNET-BASED TREATMENT

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Data indicate that lesbian, gay, bisexual, and transgender (LGBT) populations have higher smoking rates compared to the general population and may be at increased risk for psychosocial issues that predict smoking treatment failure. However, little data are available describing LGBT smokers and how they may be similar to or different from other smokers. We are currently completing a study that examines the efficacy of Internet-based smoking treatment for LGBT smokers and examines variables that may predict smoking treatment success. 794 LGBT smokers were randomly assigned to one of two Internet-based treatments: 1) a LGBT-targeted self-help intervention plus social support, or 2) a self-help control condition. Participants were assessed at baseline on smoking, nicotine dependence, depression diagnosis, demographics, mood, motivation to change, and alcohol use. Preliminary analyses have been conducted on baseline variables with the full sample. Fifty-eight percent of the sample is male, 35% female and 7% transgender. Approximately 81% of the sample is Caucasian. Sixty-seven percent of the sample lives in urban areas, 17% in suburban areas, and 16% lives in small town or rural areas. Eighty-seven percent of the sample identify as gay/lesbian, 9% as bisexual, 2% as heterosexual, and 2% as other. Regarding stages of change, 41% of the sample was in the contemplation stage, 56% was in the preparation stage and 3% was in the action stage. Mean daily cigarettes was 19.1 and the mean FTND score was 4.4. The current sample scored significantly higher on measures of poor mood (anger and depression) than comparable standardization samples. 72% reported a history of a major depressive episode while 27% reported a current episode at study entry. Forty-six percent reported alcohol use one or more times weekly while 20% of the sample reported typically having 5 or more drinks per drinking occasion. Preliminary findings suggest that LGBT smokers are at high risk for experiencing variables known to predict smoking treatment failure. During the conference, we will compare these results with findings from research with the general population of smokers.

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POS1-54  COVARIATES OF SMOKING STATUS FOR LESBIANS, GAY MEN, BISEXUALS, AND TRANSGENDER PERSONS (LGBT)

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A national priority is reducing health disparities based on diverse factors, including sexual orientation (Healthy People 2010). Tobacco use among LGBT is substantially higher than in the general population, but little is known about variables influencing smoking status for LGBT persons. In collaboration with the New York City LGBT Community Center (LGBTCC) and a large cancer center, we randomly surveyed LGBTCC users about tobacco use and related health behaviors and perceptions. Of 234 LGBT adults responding, 37% identified as female and 62% male, and mean age was 47. Most were gay men (59%) or lesbian (32%), and 7% bisexual, 4% transgender. Most (78%) were White; 10% Black. Of these also Hispanic, Most (86%) were college educated and median income was 31.3%. Covariates of smoking status were selected through univariate logistic regressions, followed by a two-step multivariate logistic regression model with current smoking status (Y/N) as outcome. Model covariates were age, education, and ethnicity entered as one block, then perceived stress, perceived stigma for being LGBT, level of participation in LGBT community, and alcohol/drug use as the second block. The final model was significant (p<.0001), with younger age (OR=.95, CI=.91-.99) lower education (OR=.16, CI=.05-.55), greater perceived stress (OR=1.28, CI=1.03-1.60), and greater perceived stigma (1.16, CI=1.04-1.29) associated with current smoking. Depressive symptom score (CES-D) was equivalent in the model to perceived stress, as the two were strongly correlated (r=.70). These preliminary data suggest that smoking cessation interventions for LGBT smokers should address stigma, stress and depressed mood as potential barriers to abstinence.

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POS1-55  CORRELATES OF SELF-EFFICACY AMONG RURAL SMOKERS

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Smoking abstinence self-efficacy (SE) has been related to intent to stop smoking, abstinence success, and risk for smoking relapse. Because limited attention has been given to SE among rural smokers or smokers with comorbid illnesses, the current study examined correlates of SE among a rural primary care sample. Medical students recruited patients smoking more than 10 cigarettes per day. Participants completed a telephone survey assessing demographics, smoking and medical history, personality, SE, nicotine dependence, depression, and motivation for quitting. Among the 639 participants, higher SE was correlated with older age (p = .001), being male (p = .04), lower nicotine dependence (p = .005), fewer cigarettes per day (p = .02), longer previous quit attempts (p < .0001), readiness to quit in the next 30 days (p < .01), fewer friends that smoke (p < .005), no other smokers in the home (p = .04), higher ratings of confidence in being able to quit (p < .0001), and higher autonomous motivation (i.e., due to willingness/choice; p = .0001). Those with a diagnosis of diabetes had higher SE (p = .02); those with higher levels of depression had lower SE (p = .0001). By identifying patients at risk for low SE (e.g., heavy smokers, females) and by capitalizing on characteristics associated with high SE (e.g., social support), health care providers may be able to better enhance SE in their efforts to help smokers quit. Supported by NCI, R01 1102390.

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POS1-56 RELIGION'S INFLUENCE ON QUITTING SMOKING: COMPARISON BETWEEN THAI BUDDHISTS AND MALAYSIAN MUSLIMS

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Religion is a major influence in the “behavioral ecology” of many Asian countries. Yet, there has been little systematic study of the influence of religion in South East Asia. Thailand is predominantly Buddhist and Malaysia predominantly Muslim, providing opportunity for investigating religious influences in the same region. Several questions on religiosity were included in a large face to face survey of 2,000 adults conducted both in Buddhist Thailand and Muslim Malaysia. The survey included representative cluster samples in multiple regions in both Malaysia and Thailand. Survey instruments were developed, translated, and back-translated for accuracy. Surveys were pretested, adjusted/corrected, retested and then administered in both countries over the same six-week period in early 2005. Household enumeration was checked, data cleaned and then analyzed using both bivariate and multivariate methods. About 58% of Muslims versus 24% of Buddhists said religious beliefs affected their actions all the time. Though a slightly higher percentage of Thais said their religion discouraged smoking (67% vs. 80%), a higher percentage of Malaysians said they would quit if their religious leader said to do so (63 vs. 56%) and that their religious leader would influence them a lot to quit (28 vs. 25%). Overall bivariate results of attitudes and intentions were stronger among Muslims. Multivariate analysis relating four personal and institutional commitment variables to religious influences in quit attempts and future intentions to quit adjusted for age, sex, income, education and locality also showed significant odds ratios for Malaysian Muslims (95% CIs varying between 2.32 and 3.71). These results suggest that Muslim religious commitment affects present smoking behavior and can possibly be of future importance for quit attempts in Malaysia. At present, Thai Buddhist religiosity clearly has less effect on quitting behavior.

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POS1-57 EXPOSURE TO SOCIAL SMOKING TEMPTATIONS INCREASES THE SALIENCE OF THE GOAL TO ABSTAIN AMONG SMOKERS WHO ARE MOTIVATED TO QUIT

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Smokers with close others who smoke face additional challenges to quitting. Having smokers in one’s social network is associated with increased risk of relapse, especially during later stages of a quit attempt. Understanding how quitters might resist the urge to smoke in temptation situations such as socializing with other smokers is important for understanding relapse dynamics and for informing interventions to prolong abstinence. Recent basic social cognitive research indicates that people who are highly committed to a goal may have efficient cognitive self-regulatory strategies for switching their attention away from temptation and toward their goal, thereby decreasing the likelihood of giving into a temptation. The present work investigated whether smokers who are highly motivated to quit might have a similar self-regulatory reflex. A guided imagery procedure was used to experimentally manipulate cognitive activation of positive social outcome expectations for smoking. This was followed by administration of a lexical decision task to assess cognitive accessibility of abstinence and smoke goals. Results confirmed that among smokers committed to quitting in the near future and who experienced high urge to smoke, exposure to the social temptation prime increased the cognitive salience of their goals to abstain compared to their goals to smoke as assessed via the speed with which they identified representative words (p < .01, eta-squared = .67). No differences in goal salience were found among high commitment, high urge individuals who had not been primed with the social smoking temptation. In addition, no differences in abstinence and smoke goal salience as a function of priming were observed among smokers low in commitment to quitting. Results suggest that at the outset of a quit attempt, when commitment to quitting is high, quitters may benefit from an efficient cognitive self-regulatory process. Given that increased cognitive salience of the goal to abstain was detected with an implicit measure of cognitive accessibility (lexical decision task), self-regulatory attention switching may be relatively effortless.

Funding: Department of Psychology University of Illinois at Chicago.

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POS1-58 EMOTIONAL AND PHYSIOLOGICAL FACTORS RELATIONSHIP WITH MENSTRUAL CYCLE PHASE DURING SMOKING CESSATION

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Numerous studies have shown gender differences in smoking cessation but it is still unclear why this difference exists. To find a possible explanation, this study examined the relationship between emotional and physiological factors with menstrual cycle phase and smoking relapse. Forty-four women ages 18-40 were given behavioral counseling and randomly assigned a quit date in either the follicular (N=21) or late luteal (N=23) phase. The mean age was 30.8 years (+/- 5.9), average number of cigarettes smoked daily was 15.2 (+/- 4.4), and average Fagerstrom score was 3.6 (+/- 1.9). Six women did not reach quit day (follicular phase = 3, late luteal phase = 3). Thirteen women relapsed (follicular=7, late luteal=6) and 25 remained abstinent (follicular=10, late luteal=15) three days post-quit. One day before and three days following quit day, each subject filled out the Subjective State Scale which measures distress, positive affect, withdrawal, craving, and physical symptoms on a 7-point Likert scale. On the day before quitting, women in the follicular phase had more craving than those quitting in late luteal phase (2.67 +/- 1.68 vs. 1.11 +/- 1.71, p=0.007) and those who relapsed experienced more physical symptoms than those who ended up quitting (6.80 +/- 5.57 vs. 3.19 +/- 4.24, p=0.054). When looking at change from day before quit day to three days after, women quitting in follicular phase had an increase in physical change (1.81 +/- 5.68 vs. -1.73 +/- 3.90, p=0.053) and showed a trend for increase in distress (3.93 +/- 4.83 vs. 0.08 +/- 6.10, p=0.085) compared to those quitting in late luteal phase. On the third day after quit, those who relapsed experienced more change (4.92 +/- 5.25 vs. 2.15, p=0.001) compared to those who quit, and those quitting in follicular phase showed a trend for more craving compared to those quitting in late luteal phase (2.74 +/- 2.42 vs. 1.50 +/- 1.82, p=0.089). This data may suggest that emotional and physiological factors as well as menstrual cycle phase may play a role in smoking cessation outcome.

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POS1-59 ENHANCING TOBACCO ABstinence FOLLOWING HOSPITALIZATION

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Enhancing tobacco abstinence initiated during a medical/surgical hospital admission has potential to reduce health risks and costs in smoking patients with acute or chronic conditions.

OBJECTIVE: This pilot study, driven by Self-efficacy Theory, used a randomized two-group with intention-to-treat design (n = 40) to test the efficacy of a 12-week nurse-delivered telephone intervention program to promote smoking abstinence and prevent relapse following hospital discharge.

METHODS: All subjects received enhanced usual care during hospitalization, which included relapse risk identification using the ‘Relapse Situation Efficacy Questionnaire’. Treatment (SI and control) UC groups (n = 40/group) were similar with respect to age (mean of 51 yrs.), gender (60% female), race (79% White), tobacco use (mean = 19 cigarettes/day), and complaints of nicotine withdrawal symptoms during hospitalization (95%). Outcome measures (point-prevalence self-reported smoking status validated by CO) were obtained 12 and 24 weeks following discharge.

RESULTS: At 12 weeks, 20% (n = 8) UC and 40% (n = 16) SI subjects were abstinent (unadjusted Logistic regression LR Chi Square = 3.6, df = 1, p = .06). At 24 weeks, 15% (n = 6) UC and 42% (n=16) SI subjects were abstinent (unadjusted LR Chi Square = 6.92, df = 1, p = .009). When confounding variables (current employment and length of hospital stay) were controlled, adjusted LR Chi Square was 4.87 (df = 1, p = .03) at 12 weeks and 7.69 (df = 1, p = .008) at 24 weeks. The two groups did not differ in time to first smoking lapse (log rank = 1.78, df = 1, p = .181). Retention rates at 24 weeks only differed with respect to 12-week smoking status.

CONCLUSIONS: There were significant differences in abstinence rates between the SI and UC groups when current employment and hospital length of stay were controlled. More research is needed to identify successful strategies and/or combinations of strategies to improve tobacco abstinence following hospital discharge in the hospitalized smoker population, particularly with the hardcore smoking population.


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POS1-60 WHAT THE ITC PROJECT TELLS US ABOUT QUITTING AND RELAPSE

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The International Tobacco Control (ITC) four-country study follows a cohort of smokers in four countries (USA, Canada, UK, Australia). We continue to follow smokers who quit. The study is designed to assess the impact of policies, but includes measures of variables postulated to mediate the relationship between policies and cessation, among other potential determinants of cessation. This provides an opportunity to better understand the process of cessation and factors that affect relapse. We report data on various cohorts of size between 6882 (smokers at Wave 1 recontacted at Wave2) and 320 (quit at Wave 2 and recontacted at Wave 3). Hyland et al (Tobacco Control, in press) looked at quitting between the first two waves of the cohort found that a mix of dependence-related and motivational (including intention) variables predicted quit attempts, while only dependence-related variables independently predicted success among those who tried. In this paper we extend these analyses and replicate on Waves 2 to 3, and also consider predictors of staying quit among those stopped at Wave 2. While the exact set of predictors varied, we found the same basic pattern of dependence being the main predictor of relapse, while dependence and motivational variables, including intention, predicted attempts. Relapse among ex-smokers was best predicted by length of time quit. The results highlight the importance of dependence early in quit attempts, but suggest that its effects are less important once the person has quit for a while.

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POS1-64 IMPACT OF USE OF SUDDEN VERSUS GRADUAL QUITTING ON QUIT SUCCESS: FINDINGS FROM THE ITC COLLABORATION

Hua-Hie Yong*, Yoo-Seock Cheong and Ron Borland for the ITC Research Team

Two recommended quit methods in standard cessation program involve either a gradual reduction of smoking prior to complete abstinence ("Cut Down") or sudden abstinence from cigarettes ("Cold Turkey"). However, little is known about both the prevalence of use of these two methods and the effects they have on quit success especially among smokers who are quitting on their own accord. This study examined the reported use, characteristics of users and impact of self-selected strategy choice on quit success at quitting, in the first two waves of the International Tobacco Control Policy Evaluation 4-Country Survey (ITC-4). The ITC-4 is a random digit dialed telephone survey of a cohort of over 8,000 adult smokers from UK, US, Canada, and Australia, with follow-up rate = 75%. The results indicated that 68% of the smokers who had made a quit attempt between waves reported using the Cold Turkey method for quitting. Of those who used the Cold Turkey method to quit, 29% succeeded as compared to 15% who tried Cut Down. Multivariate analyses revealed that Cold Turkey users were more likely to be aged 25 to 39 years, male, from the UK, and have lower perceived difficulty of going without cigarettes for a whole day. Controlling for socio-demographic and known predictors of quitting including NRT use, smokers who employed the Cold Turkey method to quit were twice as likely to succeed in their attempt. The reduced relapse among those who quit cold turkey may indicate that these quitters are intrinsically more motivated. That said, caution suggests that quit advice should recommend Cold Turkey for smokers who want to quit on their own.

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POS1-61 THE ROLE OF PRIOR QUITTING EXPERIENCE IN PREDICTING SMOKING CESSATION OUTCOME

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OBJECTIVE: The Transtheoretical Model (TTM) defines preparation as planning to quit for at least 24 hours in the last year. A common criticism is that smokers who are planning to quit but who have not made a quit attempt in the last year (cognitive preparers) are classified into contemplation instead of preparation. This study of smokers planning to quit in the next 30 days examines whether predictors of making a quit attempt and staying quit (eg self-efficacy, temptations to smoke, decisional balance, processes of change and level of addiction) differ according to whether or not the smoker has made a quit attempt in the last year (ie, for cognitive preparers vs TTM-classified preparers).

METHODS: 1046 participants in a randomised trial of the effectiveness of a computer-generated tailored cessation advice program and a callback counselling service were followed up at 3 months.

RESULTS: In a multivariate model, the predictive capacity of the measures for the outcome of making a quit attempt was greater overall (8.4%) than when the sample was divided into subsets defined according to level of quitting experience (5.4% and 7.9% for cognitive and TTM preparers respectively). Nonetheless, specific variables differed in their predictive capacity in each subset; self-efficacy had greater predictive power among cognitive preparers whereas level of addiction was the strongest predictor of making a quit attempt among TTM preparers.

CONCLUSIONS: The results call into question the validity of the current TTM definition of the preparation stage. Smokers who are intending to quit within the next 30 days should not be downgraded to the contemplation stage simply because they have not made a quit attempt in the previous year. Nonetheless, the results indicate that prior quitting experience should be assessed among preparers, as it may influence the specific factors that need to be targeted within an intervention.

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POS1-65 PREDICTORS OF SMOKING REDUCTION AMONG SMOKERS ATTENDED A SMOKING CESSATION HEALTH CENTER: IMPLICATIONS FOR TOBACCO HARM REDUCTION

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RATIONALE: There are over 300 million Chinese smokers but many are unable or unwilling to quit smoking. There is some evidence suggesting that reduction on smoking can help promote quitting smoking. However, data on the factors associated with reduction on smoking is scarce globally.

OBJECTIVES: To describe the factors associated with reduction on smoking among Chinese smokers in Hong Kong. Methods: 1203 smokers who attended the Smoking Cessation Health Centre from August 2000 through January 2002 were studied. Trained counselors provided individual counseling and carried out follow up interviews. We used structured questionnaires at baseline and at 12 months and an intention-to-treat approach for analysis.

RESULTS: Of the Chinese attendees (n=1186), 325 were successful quitters and were excluded from analysis. Of the 861 subjects, 79% were male, 84% attained education to secondary school or above level and 56% were married/cohabiting. Most were daily smokers (98%) and the mean number of cigarettes smoked per day was 18.4 (SD=10.2). By using intention-to-treat analysis, the reduction rate at 12 month follow up (defined as a reduction of the amount smoked by at least 50% from the baseline level at 12 month follow up) was 20% (95% CI 17-23%). Stepwise logistic regression model showed that being male, having a higher personal income, being severely dependent on nicotine and having more confidence in quitting were significant predictors of reduction on smoking.

CONCLUSIONS: This study identified several predictors of smoking reduction, indicating that smokers who reduce smoking differ significantly than those who continue to smoke. These predictors should be taken into account when designing smoking reduction intervention for smokers who are unwilling to quit.

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American smokers. Findings support the inclusion of African Americans within genetic consent for genetic analysis for smoking-related investigation among African Americans. This study examined correlates of consent for genetic testing among African American smokers enrolled in a smoking cessation clinical trial. African American light smokers (< 10 cigarettes per day) enrolled in a smoking cessation study met with study counselors to review consent forms for an adjunct study and responded to a request for genetic analysis related to smoking. Participants completed assessment of demographic, psychosocial, and tobacco-related variables. Of 755 clinical trial participants, 745 (99%) responded to the genetic consent form and 83% provided consent for blood collection for genetic analysis. No correlates were identified between individuals who consented to genetic analysis and those who denied consent. This study demonstrates the feasibility of obtaining consent for genetic analysis for smoking-related investigation among African American smokers. Findings support the inclusion of African Americans within genetic investigation of tobacco use and treatment.

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**POS1-67** IMPACT OF A CELL PHONE INTERVENTION ON POTENTIAL MECHANISMS OF CHANGE IN SMOKERS LIVING WITH HIV/AIDS

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Mounting evidence suggests that individuals living with HIV/AIDS who smoke have a significantly increased risk of numerous adverse health outcomes (both AIDS- and non-AIDS-related) compared to nonsmoking individuals with HIV/AIDS. Thus, efforts to design and implement effective cessation treatments for this growing patient population are warranted. In the present study, we assessed the effects of a cell phone intervention on changes in psychosocial variables (i.e., depression, anxiety, and self-efficacy) demonstrated to affect cessation outcomes in other trials. Ninety-five participants from an inner-city AIDS clinic were randomized to receive either a cell phone intervention (CPI) or usual care (UC) smoking cessation treatment. Participants in the UC group (n=47) received brief physician advice to quit smoking, a 10-week supply of nicotine patches, and self-help materials. Participants in the CPI group (n=48) received all UC components plus a series of 8 proactive counseling sessions delivered via cell phones. Baseline levels of depression, anxiety, and self-efficacy did not significantly differ between the two treatment groups, but at the 3-month follow-up assessment the difference scores (follow-up-baseline) for depression and self-efficacy did significantly differ. Specifically, participants in the CPI group experienced a significantly (p=0.011) greater decrease in depressive symptoms; a significant (p=0.009) increase in self-efficacy; and a marginally significant (p=0.076) decrease in anxiety symptoms compared to participants randomized to the UC group. In addition, each of these difference scores was significantly associated with biochemical confirmed point prevalence abstinence at the 3-month follow-up assessment. Future interventions that capitalize on these mechanisms may be especially efficacious for this special population.

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**POS1-66** CORRELATES OF CONSENTING TO GENETIC TESTING AMONG AFRICAN AMERICAN SMOKERS

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Genetic factors play an important role in smoking behavior. Although African Americans are at disproportionately increased risk for tobacco-related morbidity and mortality, limited attention has been given to genetic investigation of tobacco use among African Americans. This study examined correlates of consent for genetic testing among African American smokers enrolled in a smoking cessation clinical trial. African American light smokers (< 10 cigarettes per day) enrolled in a smoking cessation study met with study counselors to review consent forms for an adjunct study and responded to a request for genetic analysis related to smoking. Participants completed assessment of demographic, psychosocial, and tobacco-related variables. Of 755 clinical trial participants, 745 (99%) responded to the genetic consent form and 83% provided consent for blood collection for genetic analysis. No correlates were identified between individuals who consented to genetic analysis and those who denied consent. This study demonstrates the feasibility of obtaining consent for genetic analysis for smoking-related investigation among African American smokers. Findings support the inclusion of African Americans within genetic investigation of tobacco use and treatment.

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**POS1-68** WILL QUITLINE CALLERS ACCEPT ADDITIONAL CALLS AT SIX MONTHS?

Timothy A. McAfee*, M.D., M.P.H., Free & Clear and University of Washington; Kathy A. Edris, M.S., Anne Perez, B.A., Susan Zbikowski, Ph.D., Free & Clear

Recruiting smokers from state, health plan and employer populations to use evidence-based tobacco treatment is challenging, complex and expensive. Once recruited, participation usually follows an acute-care model of delivery, with little or no effort to re-enroll or extend treatment beyond a prescribed set of contacts. There is evidence that current and recently quit smokers may benefit from additional contact, but little information is available on acceptance rates for extended intervention. This paper reports data from a recruitment trial for smokers enrolled in a proactive phone-based cessation program through one state quitline, two health plans and an employer. Three recruitment call attempts were made to 265 participants within 30 days after receiving their final call in a 4- or 5-call program. 154 (58%) participants were successfully contacted. All participants were offered 3 additional counseling calls, regardless of their quit status. The offer was made using a ‘soft sell’ approach, in which the service was described objectively. 65% (100) of those reached accepted the offer. Acceptance rates were analyzed by stage. 72% (52) of current smokers and 56% (48) of current non-smokers accepted the additional calls (p<0.08). Timing of the additional calls was customized, based on quit status at time of offer: 86% (66) of those accepting additional calls completed the first call, with 1/3 unreachable after 3 attempts. Other calls are still in process. Presentation data include detailed characteristics of acceptors and decliners including quit status based on stage and source of entry (healthplan, state, or employer), as well as data from participants recruited who did not complete the final call of the program.

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**POS1-69** INTEREST IN AND PERCEIVED USEFULNESS OF INTERNET-BASED CESSATION TREATMENT


An estimated 7% of Internet users have sought online assistance quitting smoking. However, interest in online treatment among current smokers is not clear and little is known about smokers’ perceptions of Internet-based treatment. We anonymously surveyed a convenience sample of current smokers (n = 60). The sample was racially diverse (47% White, 38% Black, 5% Asian, 5% Native American, 7% other or mixed), half female (53%), with a mean age of 42 years. Participants averaged 12 cigarettes/day and 77% had tried to quit in the past year. Eighty-three percent used the Internet and 28% had looked for quit information online. When asked what cessation treatments they would be willing to try, 18% were willing to try an Internet-based program, 58% were interested in NRT, 28% in Zyban, 22% in a phone-support program, and 18% in an in-person support program. Twenty-nine percent generally agreed that the Internet was a good tool for providing quit support; 43% clearly disagreed. Perceived usefulness of Internet-based treatment was comparable to Zyban and phone support, but more people believed NRT and group counseling would increase their odds of quitting. Among Internet users, 22% were willing to use an online cessation program. These smokers were more likely to agree that the Internet was a good way to provide support and assistance to quitters, less wary of the Internet, more comfortable with the Internet and sharing personal information online, and used the Internet more frequently than smokers not interested in online assistance. Internet-based treatment appeals to a subset of smokers, but currently may not be as appealing or perceived to be as effective as other forms of treatment.

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POS1-70 RECRUITING SMOKERS FOR PROJECT QUIT, AN ONLINE CESSATION PROGRAM

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We examined smokers’ interest in participating in an online smoking cessation program and compared the success of several different recruitment strategies. Members from two large, regional health maintenance organizations were invited to participate in the Project Quit, an online cognitive-behavioral support program with free NRT patches. Recruitment efforts included targeted invitation letters to likely smokers, recruitment ads in each organization’s member newsletter, and other referral strategies. Over three thousand people (n=3,266) visited the Project Quit website, 2,000 were eligible, and 1,863 enrolled (57% of website visitors). Proactive invitation letters were superior to other recruitment strategies, by site and overall, and accounted for 68% of enrollees. Twenty-two percent of enrollees responded to newsletter ads and 10% to all other sources combined. Seven percent of invitation letter recipients visited the website (n=2,265) and 3.7% were eligible and enrolled. This enrollment rate reflects strict exclusion criteria for NRT use. Nevertheless, it is comparable to follow-up rates seen after referrals to other forms of cessation counseling. The enrolled sample was 59% female, 79% white, and 76% employed. They smoked an average of 22 cigarettes per day. There were no differences in baseline demographic characteristics of participants recruited by letter or newsletter. Additional comparisons by recruitment strategy and site will be presented. The results demonstrate the utility of using proactive, targeted mailings to promote use of cessation services among likely smokers. Additionally, we found that smokers are interested in an Internet-based cessation program, even when they have access to alternative forms of treatment through their health insurance.

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POS1-71 CHEWFREE.COM: RESULTS OF A WEB-DELIVERED SMOKELESS TOBACCO CESSATION PROGRAM

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BACKGROUND: An estimated 12 million Americans currently use smokeless tobacco (ST). Most are in small towns and rural areas with few cessation resources for ST users. Approximately 94 million Americans use the Internet for health-related information, and online access is growing among lower-income and less-educated groups.

PURPOSE: This RCT compared a linear, text-based website presenting ST cessation information (Basic Condition) vs. an interactive, tailored Web-based ST cessation program (Enhanced Condition).

METHODS: Participants were recruited primarily through thematic promotional mailings to media outlets in 31 states with high ST prevalence of ST users. Other recruitment tools included paid online advertising and targeted mailings to state tobacco control organizations and professionals. Participants completed consent and enrollment online, and were randomized to one of the two conditions. Follow up was collected at 6 weeks, 3 months, and 6 months post enrollment via online surveys or by phone for non-respondents.

RESULTS: More than 2,400 participants were enrolled over a 15-month period. Point prevalence of self-reported tobacco use among participants in the Enhanced Condition was significantly higher than for those in the Basic Condition at all time points (intent to treat: 22% vs. 15% at 6 weeks, p < .001; 22% vs. 17% at 3 months, p < .05, and 20% vs. 16% at 6 months, n.s.). Repeated-point-prevalence outcomes will also be presented, and alternative methods for dealing with missing data will be explored. Predictors of cessation and measures of website use and participant engagement will also be presented. Implications for broadening access to cessation assistance via the Web, and the unique properties of web data collection systems will be discussed. Conclusions: Results of this study indicate that our Web-delivered cessation programs for smokeless tobacco users are effective, and that the Enhanced site was significantly more effective than the Basic site.

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POS1-72 HEALTHCARE PROVIDER ATTITUDES, BELIEFS AND PERCEIVED EFFECTIVENESS TOWARD TOBACCO TREATMENT

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Despite the fact that effective tobacco cessation treatments exist, a recent survey of healthcare providers revealed that providers’ attitudes toward tobacco treatment may hinder their willingness to refer patients to successful treatment programs that are included in their insurance benefit. We assessed attitudes and behaviors towards tobacco treatment among 250 network providers affiliated with a staff-model HMO in Washington State. Among the 105 (42%) providers (70% Family Practice, 18% Internal Medicine) who returned the survey, over 95% discussed smoking with their patients. Furthermore, an equal percent (95%) of providers reported they ask smoking status, determine interest in quitting, advise tobacco users to quit, and help patients quit. However, fewer take further action; only 70% refer tobacco users to the Health Plan’s covered cessation program or offer to schedule follow-up. In fact, referrals to and registration in the covered cessation program have been declining since 2003. This trend could be a result of providers’ attitudes about cessation. For example, over 60% of providers believe patients are not interested in quitting and say there is not enough time to counsel smokers; nearly 40% believe that cessation treatments are not effective; additionally, 40% believe that cessation treatment is not a covered benefit. About half lack confidence in their ability to motivate smokers to consider quitting. This belief may transfer to patients and decrease motivation to quit among tobacco users who are in need of consistent and encouraging messages about quitting. This presentation will present detailed survey results and describe providers’ preferred method of receiving information on tobacco treatment options. Results will inform the development of effective provider communication to improve utilization of treatment services.

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POS1-74 OUTCOMES FROM SYRIA’S FIRST SMOKING CESSATION TRIAL

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Many developing countries lack culturally appropriate and effective smoking cessation interventions. In Syria, smoking rates are double and quit rates half of what is observed in the U.S., but cessation services are not available. To determine the feasibility of implementing clinical trials of smoking cessation interventions in Syria, we randomized 50 smokers to either a single session (‘Brief’) or moderately intensive (‘Intensive’; 4 sessions plus 6 phone contacts) free, hospital-based, behavioral counseling intervention delivered by trained physicians. Participants were followed for 3 months post-cessation. Mean age of enrollees was 34.8±11 years, 86% were men, and 64% smoked >20 cigarettes/day. At baseline, treatment conditions were comparable on all demographic and smoking history variables, but readiness to quit was higher in Brief. Only 40% completed treatment in Intensive. Using intent-to-treat analysis, CO-verified quit rates at 3 months for Brief and Intensive were 16% and 4%, respectively (odds ratio, 95% CI = 0.22, 0.02-2.11). Adjusting for readiness to quit, quit rates did not differ between conditions but favored Intensive (OR= 1.49, 0.06-36.33). Lower nicotine dependence, assessed by FTND, was associated with quitting (OR= 0.53, 0.30-0.96). In process evaluation interviews, perceived barriers to quitting included lack of pharmacotherapy (currently unavailable in Syria), poor social support, and difficulty implementing some behavioral strategies (e.g., self-monitoring, scheduled reduction, social support enhancement). Despite excellent implementation and retention efforts, treatment completion and short term quit rates were low. Nicotine dependence and lack of access to pharmacotherapy are important barriers to cessation in Syria, and behavioral interventions developed from developed countries need to be adapted to the Syrian setting.

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POS1-75 SELF-HYPNOSIS FOR SMOKING CESSATION: A RANDOMIZED CONTROLLED TRIAL


Recent studies suggest that self-hypnosis may be a promising approach to smoking cessation. We conducted a randomized clinical trial in which 286 adult smokers were randomly assigned to receive either self-hypnosis training or standard counseling. Both self-hypnosis and standard counseling treatments were conducted in two 45-minute sessions. All participants received two months of nicotine patches. Of the 286 participants enrolled, 39% were women, 31% were non-white, 34% were veterans, and 25% were married or partnered. Their mean age was 45 years and 73% were educated beyond high school. They smoked an average of one pack of cigarettes per day upon entering the study. A total of 145 participants were assigned to self-hypnosis and 141 were assigned to standard counseling. There were no significant differences between the groups in demographic or smoking characteristics at baseline. At six months, the self-reported point-prevalence quit rate was 29% for the self-hypnosis group and 25% for the standard counseling group; and their validated point-prevalence quit rates were 24% and 19%, respectively. At one year, the self-reported point-prevalence quit rate was 26% for the self-hypnosis group and 21% for the standard counseling group; and their validated quit rates were 19% and 14%, respectively. At one year, the validated quit rates favored the hypnosis group, but were not significantly different. Self-hypnosis compared favorably with standard counseling and may be a useful addition to conventional smoking cessation approaches.

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POS1-76 COMPENSATORY SMOKING IN A STUDY OF SCHEDULED SMOKING REDUCTION

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Compensatory smoking (CS) primarily refers to changes in smoking behavior in order to adjust for changes in nicotine levels of a tobacco product. Little is known about CS in the context of smoking reduction with nicotine replacement therapy (NRT). The current poster has three goals: (1) to describe the effect of CS on multiple biomarkers of tobacco exposure, using three formulations of CS; (2) to compare relative rates of compensation across biomarkers; and (3) to evaluate predictors of both smoking reduction and compensatory smoking. In a study of scheduled smoking reduction using NRT, levels of tobacco-associated or tobacco-specific chemicals were repeatedly measured to estimate degree of compensatory smoking. Compensation indexes were calculated for carbon monoxide (CO), 4-(methylnitrosoamo)-3-(pyriyld)nitrobutanol (NNAL), 1-hydroxypyrene (1-HOP), and anatabine. Wide variability in compensation scores was observed, with the majority of smokers showing compensation. Relative to CO, compensation for NNAL, 1-HOP, and anatabine were greater. Apart from use of medicinal nicotine, few consistent predictors of smoking reduction or compensation were seen. CS limits the harm-reduction potential of decreased smoking of conventional cigarettes.

This research was supported by the NIDA grant P50-DA13333. GlaxoSmithKline provided the nicotine gum and patches.

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POS1-77 EFFECTIVENESS OF A BEDSIDE TOBACCO CONTROL INTERVENTION ON HOSPITALIZED SMOKERS IN NEW YORK

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PURPOSE: Smoking cessation is a healthcare imperative. We hypothesized that a hospital-based bedside tobacco control intervention involving pharmacotherapy and behavior modification would provide an effective intervention during a hospital stay. We studied the effectiveness of a bedside counseling intervention, and a follow-up questionnaire, provided to all hospitalized smokers upon admission.

METHODS: Hospital staff identified smokers upon admission then a bedside consultation was done by tobacco control advanced practice nurses. All patients were counseled, assessed for withdrawal, offered nicotine replacement therapy (NRT) if eligible and invited to attend a tobacco cessation program. Follow-up questionnaires were mailed 1 month after discharge. RESULTS: Over 15 months a total 3,140 smokers with mean age 54 years [56% male, 44% female] were evaluated. 39% cardiac diagnoses, 18% surgical, 5% other. After discharge, and excluding those too ill and those evaluated in error, 82% were mailed a follow up questionnaire. 120 were returned (10%) with the following results reported: 80% quit smoking; 79% found cessation counseling helpful; 93% did not smoke during hospitalization; 63% were offered nicotine replacement during hospital stay.

CONCLUSIONS: Hospitalization provides a unique and effective opportunity to counsel smokers. Screening for withdrawal and providing comfort with NRT allows the hospital stay to be an impetus for initiating and sustaining a quit attempt. Providing comprehensive treatment for tobacco dependence can effectively reduce tobacco-related morbidity, known to be a tremendous economic burden. No funding.

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POS1-78 EVALUATION OF TELEPHONE BOOSTER SESSIONS AFTER INTENSIVE IN-PATIENT TREATMENT – A RANDOMIZED TREATMENT CONTROL TRIAL

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BACKGROUND: Smokers suffering from smoking-related diseases, who are hospitalised in rehabilitation centres seem to be a highly change-resistant group of smokers, who should be offered smoking cessation. Until now there is no study evaluating whether telephone booster sessions after intensive in-patient treatment are an effective strategy.

METHODS: The study is conducted in 13 rehabilitation centres for somatic disorders as a prospective multi-centre study with a randomised quasi-experimental treatment control group design. A group program on smoking cessation during in-patient treatment with (treatment group; TG) and without telephone booster sessions (control group; CG) after discharge are compared. Data of 290 smokers are analysed.

RESULTS: After six and twelve months TG achieved an abstinence rate twice as high as CG. Men profited more from telephone booster sessions than women.

CONCLUSIONS: This study indicates that telephone booster sessions are highly effective (even) after an intensive group program during a hospital stay. Further research should focus on the special needs of women according to telephone counselling.

This paper has been prepared in the context of the project F5 “Intensified Smoking Cessation for Smokers resistant to Change” (PI: Christoph Kroeger) of the Addiction Research Network ASAT (Allocating Substance Abuse Treatments to Patient Heterogeneity) (www.asat-verbund.de). ASAT is sponsored by a federal grant of the Federal Ministry of Education and Research (01 EB 0441, 01 EB 0142).

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POS1-79 OUTPATIENT CESSATION CLINICS ALSO PROMOTE QUIT ATTEMPTS IN NON-PARTICIPANTS LIVING IN THE SOCIAL ENVIRONMENT OF PARTICIPANTS


INTRODUCTION: Our outpatient smoking cessation program (4 weeks, 5 appointments per patient) includes personal counselling and supporting medication. 1,037 patients participated the program till June 2004. The question was if the patient’s social environment is influenced, also.

METHODS: People were interviewed via the phone. Questions dealt with the patients’ satisfaction with the program and whether they could motivate people in their surroundings to quit smoking.

RESULTS: So far, 250 of our patients have been evaluated. The response rate was 71.2%. 95.5% stated that they were satisfied with the team in the waiting area and 86.5% were content with the medical counselling. 23.7% stated that they could motivate other persons to quit smoking.

DISCUSSION: The results show that people are very content with the counselling we offer. The data supports our assumption that we do not only motivate people in our program, but that the outpatient clinic has also an impact on the motivation of the social environment of our patients: 23.7% stated that relatives, colleagues or friends tried to stop smoking after their participation in our program. In conclusion the existence of an outpatient clinic reveals the issue of smoking to a broader community than expected.

The authors receive funds from the General Sick Fund of Lower Austria (1.1 million clients) for implementing and running outpatient smoking cessation clinics in Lower Austria.

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POS1-80 A REALISTIC EVALUATION OF AN OPEN ACCESS STOP SMOKING CLINIC

Jane Beach*, Stop Smoking Service

The UK has a network of smoking cessation services, typically providing group support lasting an hour per week over seven consecutive weeks. Around 70% of participants are quit at the end of the course, but groups have limited population reach. In March 2004, South Birmingham Stop Smoking Service developed an alternative model in the form of an open access Drop In clinic. Instead of struggling to fill groups, smokers were queuing out of the door. The stop smoking advisors provided carbon monoxide monitoring, advice, lasting typically 5 minutes, and one weeks supply of NRT free. Participants were followed up for four weeks and more than half remained quit. The Drop In proved to be a popular format in comparison to groups. This qualitative study used a realistic evaluation model to explain why. A focus group with six stop smoking advisors and interviews with eleven participants identified the mechanisms and contexts of the Drop In considered to be involved in enabling smokers to change their behaviour. The principles of grounded theory were used to formulate the Context, Mechanism, Outcome (CMO) configurations, which provided propositions stating what it was about the Drop In that worked, for whom and in what circumstances. Ten CMO configurations were identified. Two of the most important being: One Stop Shop and Innovative Service. It was considered that as many people live life at a fast pace, the streamlined service provided suited those who subscribe to this ethos, which facilitated them to attend and quit. Furthermore, the CPT had a target for the number of smokers it was expected to support and required a large throughput of smokers. Therefore, service developments were encouraged and funded. The innovative nature of the clinic attracted large numbers into treatment, many of whom quit, boosting the target. This study suggests that in order to attract smokers and facilitate them to quit, services need to be configured that are convenient, innovative, supportive and include free NRT. The importance of working in partnership with primary healthcare was also highlighted as an effective way of increasing throughput, whilst maintaining quality.

Funding: South Birmingham Primary Care Trust.

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POS1-81 ENHANCING FEASIBILITY OF CONTINGENCY MANAGEMENT FOR SMOKING CESSATION THROUGH USE OF IMMUNOASSAY TEST STRIPS MEASURING COTININE

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Contingency management (CM) is a powerful behavioral intervention shown to reduce the use of several substances including tobacco. CM for smoking cessation has traditionally utilized multiple daily breath Carbon Monoxide (CO) levels as an objective means to determine abstinence (Stitzer et al, 1985; Roll et al, 1996), which has limited the use of CM for smoking cessation. Cotinine, with a longer half-life (12-20 hrs), may be a better marker. We evaluated the use of once daily semiquantitative cotinine immunoassay test strips (ITS; Jant Corp.) and quantitative urine cotinine levels (QUC; GCHPLC) as abstinence indicators for treatment seeking adult and adolescent smokers in a CM-based intervention program. This involved an escalating magnitude schedule of abstinence reinforcement with a reset contingency and a frequent brief behavioral intervention (Cooney, 2000). Abstinence (ITS <2 and QUC levels <100ng/ml) was compared with existing standards of multiple daily CO levels (<8ppm). The results indicate both techniques of determining urine cotinine were moderately sensitive (adult =50% for ITS & 56% for QUC; adolescent =51% for NIS & 47% for QUC) and highly specific (adult = 87.6% for NIS & 92% for QUC; adolescent = 86% for NIS & 100% for QUC) at detecting abstinence and were highly concordant. Sensitivity was low during the first few days of abstinence and improved over time. The results suggest during the first days of a quit attempt, it would be advisable to use daily multiple CO measurements to verify abstinence. However, when abstinence is achieved, once daily urine cotinine (using ITS levels) could be used for continued monitoring. Thus, the use of cotinine as an abstinence indicator, with fewer appointments daily, could significantly enhance the feasibility/utility of CM-based interventions for smoking cessation.

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**POS1-82** GUIDED IMAGERY FOR SMOKING CESSATION: A PILOT RANDOMIZED TRIAL

Hilary Tindle,* Nancy Rigotti, Elizabeth Barbeau, Roger Davis, Elyse Park, David Eisenberg, Russell Phillips

**BACKGROUND:** Smokers often seek alternative therapies for smoking cessation, but little is known about the efficacy of these methods.

**METHODS:** We conducted a pilot randomized controlled trial of guided imagery for adults seeking to quit smoking. Thirty smokers not using pharmacotherapy were assigned to guided imagery (6 weekly instructional group sessions + a CD-based home program) or a waiting list control group (offered guided imagery at 12 weeks). Guided imagery was expected to reduce stress and assist in cessation. At enrollment, all participants received physician advice to quit and set a quit date. Outcome (cotinine-validated 7-day point prevalence abstinence) was assessed at 6 weeks, (end of treatment), 12 weeks, and 1 year. Subjects lost to follow-up were counted as smokers, and analyses were intended to treat.

**RESULTS:** At end of treatment, verified 7-day abstinence rates in intervention (INT) vs. control (CTL) groups were 36% (6/17) vs. 18% (3/17) (p=.43). At 12-weeks and 1 year, verified 7-day abstinence rates in INT vs. CTL groups were 30% (5/17) vs. 12% (2/17) (p = .40) and 24% (4/17) vs. 6% (1/17) (p = .34), respectively. At 6 weeks, INT subjects had greater readiness to quit (p <.05) and lower state anxiety ( Spielberger Index, 32 vs. 38, p <.05), effects that did not persist after treatment. At 12 weeks INT subjects had lower trait anxiety (Spielberger Index, 33 vs. 44, p=0.04) and a trend toward higher self efficacy (Temptation Score 22 vs. 30, p=.06).

**CONCLUSION:** A guided imagery program for smoking cessation was feasible and may improve factors integral to the cessation process. Abstinence rates were not statistically different between groups, likely due to small sample size in this pilot trial, but the encouraging results provide a rationale for conducting a larger long-term study to test the efficacy of guided imagery, which may offer an alternative non-pharmacologic treatment for smoking cessation.

_Funding:_ American Legacy Foundation, NCCAM.

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**POS1-83** ADDRESSING SMOKING CESSATION AMONG NATIVE AMERICANS

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**BACKGROUND:** Few studies have identified how culture and acculturation affect smoking among Native Americans. Because of the emergence of tobacco and its deep roots in Native American culture, conventional tobacco control messages which portray tobacco as entirely negative may be ineffective and culturally insensitive. The heterogeneity of the Native American population may be a barrier to developing a culturally-sensitive smoking cessation program. This qualitative study explored issues related to smoking and cessation as a prelude to the development of a culturally appropriate smoking cessation program.

**METHODS:** Six focus groups were conducted with smokers at the Haskell Health Center, a Service Unit of the Indian Health Service. Participants were asked to comment on the role of tobacco in their culture and which aspects would be important to include in a cessation program.

**RESULTS:** Focus group participants [n=41; 63% female, mean age=41 years, 10 cigarettes per day (median)] reported that any smoking cessation program should include a familial component and commented on the importance of the “Talking circle” format since storytelling is an important part of their culture, although not everyone was familiar with this format. They also reported using tobacco for prayer, protection, and medicinal purposes. Those who used tobacco for both traditional and recreational purposes reported they were able to separate the two practices.

**CONCLUSIONS:** Not everyone participated in ceremonies or used tobacco for non-recreational purposes. The “Talking circle” format was preferred because of the storytelling nature of the group setting. This collaborative project presented unique challenges related to recruitment, assessment, and other aspects of conducting a research project among Native Americans.

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**POS1-84** SMOKING CESSATION AND ITS DETERMINANTS AMONG OLDER AMERICAN INDIANS: THE STRONG HEART STUDY

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**OBJECTIVE:** The study examined the relation between sociodemographic, clinical and smoking history factors and smoking cessation among older American Indians.

**METHODS:** Data were obtained from the Strong Heart Study, a longitudinal study of cardiovascular disease among American Indian tribes. The sample included 995 American Indians, aged 45-74, who identified themselves as smokers at the initial Strong Heart Study examination. Smoking status was ascertained at baseline and four years later.

**RESULTS:** Twenty-one percent of smokers quit during the 4 year follow-up period. Factors associated with smoking cessation include age 65-74 years old, Arizona regional, daily cigarette consumption of less than a pack, fewer years of smoking cigarettes, older age of smoking initiation (17 years or older), and history of diabetes. Factors not associated with smoking cessation include sex, level of education, childhood exposure to tobacco smoking, and a history of cardiovascular diseases, cancer, or respiratory diseases.

**CONCLUSION:** Several determinants of smoking cessation among older American Indians identified in this study may have important implications for future research in cessation and designing appropriate interventions in this special population.

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**POS1-85** INFLUENCE OF TRANSDERMAL NICOTINE ON WITHDRAWAL AND SMOKING EFFECTS: A GENDER COMPARISON

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Transdermal nicotine (TN) is a smoking cessation pharmacotherapy thought to work by suppressing tobacco/nicotine withdrawal and reducing the effects of cigarettes, though clinical trials suggest that it may be less efficacious for women. The purpose of this acute, laboratory study is to determine if gender influences TN-induced withdrawal suppression and/or reduction of smoking effects. Overnight abstinent smokers (N = 25 women and 70 men) completed four, double-blind, randomized, 6.5-hour sessions in which 0, 7, 14, or 21 mg TN was administered, followed 4 hours later by an opportunity to smoke an own-brand cigarette. Women participated during menstrual cycle days 2-16 to control for the influence of premenstrual symptoms. Outcome measures included heart rate (HR), expired air carbon monoxide (CO), self-reported withdrawal and the direct effects of nicotine and smoking, cognitive performance, and puff topography. TN increased HR, suppressed craving and difficulty concentrating, produced direct effects (e.g., nausea), and altered puff topography. Smoking increased HR and CO, suppressed many withdrawal symptoms, and enhanced cognitive performance (e.g., working memory accuracy increased from 60 to 65%). Smoking-induced tachycardia, suppression of urge to smoke and irritability, and reductions in task response time were attenuated by some active doses (e.g., mean smoking-induced irritability reduction was 10.9 for 0 mg but 4.3 for 14 mg). Virtually all of the 137 possible gender interactions were not significant. TN-induced suppression with reduction of smoking’s rewarding effects are not influenced by smokers’ gender.

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POS1-86  EFFECT OF BUPROPION ON PHYSIOLOGICAL MEASURES OF STRESS IN SMOKERS DURING NICOTINE WITHDRAWAL

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Studies suggest that among cigarette smokers trying to quit, stress undermines abstinence. Little research has assessed if therapies that increase smoking cessation rates impact physiological measures of stress response. Forty-three subjects completed this repeated-measures study in which a laboratory assessment was completed at baseline and after 17 days of treatment with either placebo (n=15), bupropion sustained release (150 mg twice daily) (n=14) or bupropion with stress reduction counseling (n=14). All subjects quit smoking 3 days prior to the second laboratory assessment. At each laboratory assessment physiological measures of stress (i.e. blood pressure, heart rate, plasma epinephrine, norepinephrine and cortisol concentrations) were measured during rest periods and in response to a speech, a math and a cold pressor task. Among subjects taking placebo, physiological measures of stress were generally lower at rest and during the stressors after smoking cessation. In those taking bupropion these measures were equivalent at the two assessments. Additionally, compared to placebo, those on bupropion had a greater diastolic blood pressure response to the speech stressor and greater systolic blood pressure response to the math stressor during the second laboratory session. This study suggests that bupropion may be stabilizing physiological measures of stress during the nicotine withdrawal period.

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POS1-87  BUPROPION AND PREDICTORS OF SMOKING WITHDRAWAL IN WOMEN SMOKERS CONCERNED ABOUT POSTCESSION WEIGHT GAIN: A MULTILEVEL GROWTH MODELING ANALYSIS

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Clinical data indicate that antidepressant medications for smoking cessation may be particularly effective for women quitters because postcessation withdrawal is more severe and more likely to precipitate relapse in women than in men. Yet few studies have examined the effects of antidepressant pharmacotherapy on the way smoking withdrawal symptoms change over time in women quitters. In the present study, random coefficient growth modeling was used to investigate predictors of DSM-IV smoking withdrawal symptoms among weight-concerned women quitters participating in a randomized placebo-controlled clinical trial of bupropion (Zyban) for smoking cessation. Only those who achieved initial point-prevalence abstinence were included in the analyses. Overall, findings indicate that smokers who were more dependent on nicotine reported more severe withdrawal symptoms. Controlling for nicotine dependence, baseline measures of depression and anxiety predicted the intercept, but not the slope of withdrawal trajectories over time, indicating that those high in high negative affect prior to quitting experienced more severe withdrawal symptoms throughout the course of treatment. Across all participants, bupropion treatment reduced both the overall severity and time course of smoking withdrawal relative to placebo. These findings provide support for the notion that bupropion facilitates cessation by partially relieving the severity of withdrawal. Understanding trajectories of withdrawal experience may improve our ability to identify persons who are particularly vulnerable to relapse.

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POS1-88  CORRELATES OF ADOLESCENT TOBACCO WITHDRAWAL: MEASURES OF DEPENDENCE, NICOTINE AND SMOKE EXPOSURE

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Dependent smokers experience some degree of withdrawal even outside of attempted quitting. Our aim was to examine withdrawal at baseline (Prequit) and one week after quitting in relation to level of dependence, nicotine and smoke exposure among adolescent smokers participating in a randomized controlled cessation trial using nicotine replacement therapy. One hundred and twenty teenagers smokers [mean +/- SD, 15.2 +/- 1.33 yrs, 70% female; mean reported number of cigarettes per day (CPD) 18.8 +/- 5.56] were recruited. Pearson product-moment correlations showed that baseline (Prequit) Minnesota Nicotine Withdrawal Scale (MNWS) scores were significantly associated with several scales of dependence scores including the Fagerstrom Test of Nicotine Dependence (FTND) (p=0.046, r=0.20) and the modified Fagerstrom Tolerance Questionnaire (mFTQ) (Killen) (p=0.033, r=0.22) but not CPD, exhaled carbon monoxide (CO) or plasma cotinine (COT). Logistic regression controlling for treatment group and smoking status showed that Post-Quit MNWS was significantly associated with baseline CPD (p=0.005) and FTND (p=0.011) but not mFTQ (Killen), COT or CO. These preliminary findings suggest that in heavy adolescent smokers, level of dependence rather than consumption might influence degree of tobacco withdrawal during ad lib smoking. Previous consumption and Fagerstrom-defined dependence, but not nicotine and smoke exposure, might portend degree of withdrawal during a quit attempt. Further analysis will examine the relationship of individual Fagerstrom scale items with withdrawal.

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POS1-89  IMPACT OF WITHDRAWAL ON NICOTINE EXPECTANCY AND RESPONSE: AN FMRI INVESTIGATION OF REGIONAL BRAIN ACTIVITY

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Research indicates that drug motivational systems are instantiated in structures of the dopaminergic reward/incentive circuitry that reflect attention allocation to salient stimuli. There is evidence that presentation of drug cues elicits activity in these regions, yet research has not linked brain activity to anticipation of drug or response to drug receipt. The present research tests the hypothesis that activity in such structures will be powerfully affected by the combination of nicotine anticipation and withdrawal. Thus, consistent with theories of drug motivation that stress the role of withdrawal, our hypothesis was that the greatest level of activity in dopaminergic forebrain regions would be observed during anticipation of nicotine in withdrawn smokers and that this activity would decrease following receipt of a nicotine infusion. Event-related functional magnetic resonance imaging (fMRI) was used to examine activation in response to a pre-infusion warning cue and following an injection of 1.25 mg of a nicotine solution in two experimental sessions that manipulated withdrawal status (24-hour withdrawal and ad lib smoking). Pre-imaging exposure to this nicotine infusion established its incentive value. In response to the warning cue, significantly greater MR signal change was observed in the withdrawn vs. ad lib smoking condition in the anterior cingulate, insula, nucleus accumbens, amygdala, and sensorimotor cortex. The results show that the reward/incentive neural circuitry is activated by nicotine anticipation and that this effect is powerfully moderated by withdrawal status.

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PASSIVE IMMUNIZATION WITH NICOTINE-SPECIFIC MONOCLONAL ANTIBODIES AS AN ALTERNATIVE TO VACCINATION: PHARMACOKINETIC EVALUATION IN RATS.

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Vaccination of rats against nicotine reduces nicotine distribution to brain, and attenuates a variety of nicotine-induced behaviors relevant to addiction. Efficacy is limited by the amount of antibody that can be produced and, possibly, by affinity. Passive immunization with monoclonal antibodies can potentially circumvent these limitations by allowing control of antibody dose and affinity. In this study, the influence of antibody dose and affinity on nicotine distribution to brain was studied using a monoclonal antibody (NICmAb311, Kd 60 nM) and higher affinity polyclonal rabbit nicotine-specific IgG (Nic-IgG, Kd 1.6 nM). Nicotine was administered to rats as multiple i.v. bolus doses over 2 days (2 mg/kg/d total) to simulate chronic nicotine exposure from smoking. Antibody was administered as a single i.p. dose of 10-240 mg/kg one day after the start of nicotine dosing. Immunization with either NICmAb311 or Nic-IgG only minimally reduced the chronic accumulation of nicotine in brain, measured 1 day after antibody administration. However, both NICmAb311 and Nic-IgG substantially reduced the peak brain nicotine levels measured 5 min after each nicotine dose. The extent of reduced nicotine distribution to brain was closely related to the antibody dose, with a 75% reduction at the highest NICmAb311 dose. There was no consistent difference between the efficacy of NICmAb311 and Nic-IgG for reducing nicotine distribution to brain. Serum protein binding of nicotine mirrored the brain distribution data, with little effect of antibodies on the unbound concentration of chronically administered nicotine. These data suggest that the efficacy of passive immunization for reducing nicotine distribution to brain is dose-related, and that it may be possible to achieve greater efficacy with passive immunization than with vaccination by administering a sufficient dose of nicotine-specific monoclonal antibody.

There was no clear advantage to using the higher affinity antibody.

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NICOTINE WITHDRAWAL IN ADOLESCENT MALE RATS

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Adolescent smoking is a serious health concern with about 40% of 10th graders reporting smoking in the past 30 days (Monitoring the Future Study, 2004). Yet we know little about nicotine dependence and withdrawal in adolescents (Kassel, 2000). The present experiment used an animal model based on Malin et al. (1992) to examine nicotine withdrawal in male adolescent rats. Subjects were 24 Sprague-Dawley male rats that were 21 days old at the beginning of the experiment. Adolescence in rats includes 21 - 42 days old (Spear & Brake, 1983). Rats received 7 days of continuous SC infusion via Alzet osmotic minipumps of saline or 3.16 mg/kg of nicotine hydrogen tartrate (expressed as base), identical to Malin et al. (1992), O’Dell et al. (2004), and Phillips et al. (2004). Behavioral observations were made at baseline, during nicotine infusion, 20 hours post minipump removal (optimal time to detect withdrawal behaviors in adult male rats), and 44 hours post minipump removal. Rats that had received nicotine displayed significantly more withdrawal behaviors compared with saline rats 20 hours after pump removal (F[1,22]= 11.78, p< 0.05). Rats in the nicotine condition continued to display significantly more withdrawal behaviors than saline rats 44 hours after pump removal (F[1,22]= 12.69, p< 0.05). The extent of withdrawal behaviors 20 hours after pump removal for adolescent male rats in the present experiment was similar to effects in adult male rats (Malin et al., 1992; Phillips et al., 2004). Withdrawal for the adolescent male rats lasted longer than in previous studies of adult male rats. In light of these findings, it would be valuable to examine the duration of withdrawal as well as the extent and duration of symptoms in adolescent compared with adult smokers.

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NICOTINE WITHDRAWAL IN ADULT FEMALE RATS

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Malin et al. (1992) developed an animal model to examine nicotine withdrawal in rats. Several laboratories have used this model and all have reported that male rats display distinctive withdrawal behaviors after receiving and then discontinuing nicotine administration (Malin et al., 1992; O’Dell et al., 2004, Phillips et al., 2004). No published studies, however, have used this model to examine nicotine withdrawal in female rats. Gender differences have been reported in reasons for smoking, amount of smoking, and difficulties quitting (Grunberg, Winders, & Wewers, 1991; Perkins, Donny, & Caggiaula, 1999). Therefore, the present experiment examined nicotine withdrawal in female adult rats. Subjects were 24 Sprague-Dawley female rats aged approximately 56 days at the beginning of the experiment. Rats received 7 days of continuous SC infusion via Alzet osmotic pumps filled of saline or 3.16 mg/kg of nicotine hydrogen tartrate (expressed as base) identical to similar studies. Behavioral observations were made at baseline, during nicotine infusion, and 20 hours post minipump removal (optimal time to detect withdrawal behaviors in adult male rats), and 44 hours post minipump removal. Throughout the experiment, daily estrous samples were collected. Rats that had received nicotine had significantly more withdrawal behaviors compared with saline rats 20 hours after pump removal (F[1,22]= 9.386, p<0.01). Rats in the nicotine condition continued to display more withdrawal behaviors than saline rats 44 hours after pump removal (F[1,22]= 4.050, p=0.057). These findings suggest that withdrawal in adult females is similar to that observed in adult males at 24 hours post-pump removal, but persists for a longer duration than male withdrawal.

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NICOTINE WITHDRAWAL IN ADOLESCENT FEMALE RATS

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Malin et al. (1992) developed a rat model to assess nicotine withdrawal. This model has been replicated in several laboratories with adult male rats (Malin et al., 1992; O’Dell et al., 2004; Phillips et al., 2004). Recently, Shafer et al. (under review) examined nicotine withdrawal in male adolescent rats and Hamilton et al. (under review) examined nicotine withdrawal in female adult rats. Whereas behaviors associated with nicotine withdrawal last approximately 24 hours in adult male rats, these behaviors last two days in adult female rats and at least two days in adolescent male rats. The present experiment used Malin’s animal model to examine nicotine withdrawal in female adolescent rats. Subjects were 24 Sprague-Dawley female rats that were 21 days old at the beginning of the experiment. Adolescence in rats spans approximately 21 - 42 days (Spear & Brake, 1983). Rats received 7 days of continuous SC infusion via Alzet osmotic minipumps of saline or 3.16 mg/kg of nicotine hydrogen tartrate (expressed as base), identical to Malin et al. (1992), O’Dell et al. (2004), and Phillips et al. (2004). Behavioral observations were made at baseline, during nicotine infusion, 20 hours post minipump removal (optimal time to detect withdrawal behaviors in other studies), and 44 hours post minipump removal. Rats that had received nicotine displayed significantly more withdrawal behaviors compared with saline rats 20 hours after pump removal (F[1, 18] = 14.44, p<0.05) and 44 hours after pump removal (F[1, 22]= 9.56, p<0.05). The extent and persistence of nicotine withdrawal behaviors for adolescent female rats were similar to recent findings with adolescent male rats and adult female rats, but lasted longer than nicotine withdrawal behaviors in adult male rats. These findings help to clarify the role of age and sex in the extent and duration of behaviors associated with nicotine withdrawal.

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POS1-95  PREGNATAL TOBACCO EXPOSURE AFFECTS WORKING MEMORY LOAD IN YOUNG ADULTS
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Prenatal tobacco exposure (PTE) is associated with cognitive impairments including deficits in attention, learning and memory, and executive function. These goal-directed behaviors depend on working memory and behavioral inhibition. To understand the potential role of neuropsychological deficits associated with PTE on these cognitive processes, the current study examined the effects of PTE on both interference resolution and increasing working memory demands in 18 to 21-year-olds. Study participants were 61 young adults from the Maternal Health Practices and Child Development Project (MHPDC). The MHPDC is a longitudinal study of the effects of prenatal substance exposure on developmental outcomes in offspring. Women were assessed during each trimester of pregnancy, with their children at birth, 8, and 18 months, and 3, 6, 10, 14 and 16 years. Each phase included an evaluation of growth, behavioral, psychological, and cognitive function. Subjects with (n = 28) and without (n = 33) PTE were evaluated using a modified Sternberg task, a cognitive paradigm in which subjects view a set of letters, remember this set across a short delay, and then indicate whether a probe letter corresponds to one of the letters in the target set. Working memory load was manipulated by increasing the number (1, 4, or 6) of letters in the target set. To evaluate interference, a probe letter was presented that had appeared in the target set of the immediately preceding trial. The effects of PTE on working memory and interference resolution were assessed controlling for offspring, maternal, and environmental characteristics. PTE exposure was significantly associated with working memory load, but not interference. Thus, deficits in working memory may be critical to our understanding of prenatal tobacco effects on the cognitive control of behavior.
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POS1-96  PATTERNS AND VARIATIONS IN QUIT ATTEMPT SYMPTOMS: FIRST, LAST, AND MOST DIFFICULT ATTEMPTS
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Enhanced understanding of patterns and variations in the experiences of quitting smoking could prove useful in developing treatments for tobacco dependence and examining familial substrates of dependence. The Lifetime Tobacco Use Questionnaire (LTUQ), a Web-based retrospective tool for assessing tobacco/cocaine use across the lifespan, was administered by computer-assisted interview to N=69 adults reporting a history of regular weekly use of cigarettes, and multiple quit attempts of a least three months’ duration. Respondents were part of a larger group (N=314) tested to date in a 5-year study of participants in longitudinal studies of tobacco use, conducted at the University of Pittsburgh and Oregon Research Institute. Some 62% of respondents were female; 81% were White, 17% were Black; mean age was 28.2 years; 60% reported education level of high school, equivalent, or additional training. Participants rated the intensity of standard withdrawal/abstinence symptoms at several time points: at baseline, before they first used tobacco; just prior to regular use of tobacco; at their first and their most recent quit attempts of at least three months; and at their most difficult quit attempt, regardless of the duration. Those reporting their first quit attempt as most difficult (FIRST, n=20) paralleled those who reported that neither their first nor their most recent quit attempt was the worst (OTHER, n=19). Both groups’ cessation symptoms declined overall from the first to the most recent quit attempt. However, the OTHER group reported strikingly higher symptoms occurring in a quit attempt sometime between the first and most recent quit attempts. Those whose most recent quit attempt was the most difficult (RECENT) reported significantly higher craving for tobacco (F=3.550; df=2, 66; p=.034) and anxiety (F=3.995; df=2, 66; p=.023) in their most recent quit attempt. These findings reflect the feasibility of systematically exploring declines and increases in withdrawal symptoms across multiple quit attempts. This information could be useful in designing more efficacious and predictive approaches to treatment.
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POS1-97  NICOTINE WITHDRAWAL IN SUB-THRESHOLD SMOKERS
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Several authors have reported that nicotine withdrawal symptoms are experienced by occasional smokers. Through individual semi-structured interviews we have collected case histories from 35 adult ‘sub-threshold smokers’ who smoke fewer than 6 cigarettes per day and therefore do not maintain a threshold level of nicotine in their serum. Most subjects identified a set length of abstinence (often a few days) which predictably evokes moderate to severe withdrawal symptoms. For example, Ms A is a 21-year-old Caucasian who began smoking monthly at 20. She smokes 2-3 cigs/day, 4-5 days/week. She can go ~36 hrs between cigarettes before experiencing a headache and irritability. A few subjects reported no withdrawal symptoms, but did crave cigarettes in response to social or emotional cues. These data confirm that sub-threshold smokers, including those who do not smoke daily, commonly experience withdrawal symptoms, and that these symptoms are an important factor determining the frequency of smoking.
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POS1-98  DSM-IV, ICD10 AND FTND: MEASURING NICOTINE DEPENDENCE IN AFRICAN CANADIAN SMOKERS
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As part of a larger pharmacokinetin study, we present findings from African Canadian (AC) smokers (n=138) where we evaluated nicotine dependence (ND) with three standard tests: DSM-IV, ICD10 and FTND. Study population characteristics were: 44% female, 35 ± 9 yrs of age, 9 ± 5 cigarettes/day (CDP) and 8% menthol smokers. The DSM-IV, ICD10 and FTND have been shown to measure different aspects of ND. DSM-IV evaluates the maladaptive pattern of substance use by measuring both the psychological and physiological aspects of ND; FTND evaluates the levels of physiological ND. ICD10 measures the ‘dependence syndrome’, which is the behavioural, cogniitive and physiological phenomena that develop after repeated substance use, and it contains questions common to DSM-IV and FTND. Concordance of the three tests was poor in this population of light smokers (<10 CDP). The majority of ACs (88%) were classified as ND by DSM-IV and 79% met criteria for physiological dependence (tolerance or withdrawal). Very few ACs were classified as highly dependent (7%) by FTND; in fact 64% of the population was minimally ND. About half of the population (47%) was classified as ND by ICD10. The low CDP seen in ACs is consistent with similar findings in African Americans. In AC smokers, like other light smokers of various ethnicities and ages, different ND measures can result in contrary classifications of ND. CDP may contribute to the disparity seen in physiological ND (e.g. 79% DSM-IV and 7% FTND). For instance, 71% scored 0/3 on the question ‘How many cigarettes do you smoke each day?’ To highlight the impact of this question we adjusted its scoring to the inter-quartile ranges of CDP specific to our population. The number of individuals classified as highly ND tripled (20%) and only half were minimally dependent (49%). In light smoking adult populations, tests for ND need to be assessed further.
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POS1-99  THE ABILITY OF TOBACCO DEPENDENCE MEASURES TO PREDICT WITHDRAWAL FOLLOWING A SMOKING CESSATION ATTEMPT

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Withdrawal symptoms have long been considered to be a primary manifestation of tobacco dependence. Recent research has demonstrated strong relations between these symptoms and relapse, suggesting that withdrawal does index dependence. This research examined the relations between three tobacco dependence measures, the Wisconsin Inventory of Smoking Dependence Motives (WISDM-68), the Fagerstrom Test ofNicotine Dependence (FTND) and the Nicotine Dependence Syndrome Scale (NDSS), and measures of withdrawal. Smokers who participated in a randomized double-blind placebo controlled smoking cessation trial (N = 608) rated their withdrawal symptoms four times a day using ecological momentary assessment during the week before their target quit day (TQD) and two weeks after the TQD. When these data were analyzed using linear regression and controlling for treatment effects, the results showed that none of the full-scale tobacco dependence measures predicted measures of withdrawal and craving severity. However, individual subscales did have significant relations with withdrawal measures. For instance, the NDS Drive subscale and two WISDM-68 subscales (Negative Reinforcement and Positive Reinforcement) all predicted the increase in withdrawal symptoms on the quit day (b's = .09-.12, p's < .05). Individual sub-scales also predicted the trajectory of craving symptoms following the quit day. These results illustrate the importance of assessing tobacco dependence as a multidimensional construct and suggest that withdrawal may be associated with different aspects of dependence than is relapse.

This study was conducted at the University of Wisconsin. Supported by NIH Grants #P50-CA84724-05 and #P50-DA0197-06.

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POS1-100  EFFECTS OF NICOTINE VS. PLACEBO PATCH ON ANGER AND HOSTILITY ACROSS 45 DAYS OF ABSTINENCE: MODERATION BY DRDR A2 ALLELE


Smokers were randomly assigned to a continuing to smoke control group (n=38) or to abstain from smoking for 45 days. The immediate quit group received either active nicotine patch (n=90) for the first 38 days of abstinence or placebo patch (n=80). The use of large financial incentives resulted in 83% of the nicotine group and 90% of the placebo group maintaining chemically verified abstinence for the full 45-day period. Relative to placebo, nicotine patch reduced abstinence-related anger and irritability more than other withdrawal-induced negative mood states such as anxiety and depression which failed to resolve to smoke group levels. The nicotine patch and continuing smoking groups reported similar levels of anger/irritability that were significantly lower than the placebo group across time. Furthermore, baseline measures of trait anger and hostility predicted larger abstinence-related increases in anger/irritability symptoms. A significant Patch Type x Time x Genotype interaction suggested that individuals homozygous for the DRDR A2 allele experienced greater reductions in anger from the nicotine patch during the first week of abstinence when compared to A1 allele individuals.

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POS1-101  DENICOTINIZED CIGARETTES ATTENUATE NICOTINE WITHDRAWAL SYMPTOMS AND ATTENTIONAL DEFICITS DURING AN 8-DAY PERIOD


Denicotinized cigarettes have been shown to attenuate nicotine withdrawal symptoms for several hours; however, few studies have investigated this effect for longer periods. In this study, we examined the effects of denicotinized cigarettes on nicotine withdrawal signs and symptoms for 8 days. Smokers (mean cigarettes per day = 25; mean FTND = 5.7) were randomly assigned to one of three groups: tobacco deprivation (n = 5 to date), denicotinized cigarettes (n = 6 to date), or nicotine cigarettes (n = 5 to date). Participants adhered to these conditions for 8 days, after which they resumed (or continued) smoking nicotine cigarettes. Compliance was monitored via expired air CO and urine nicotine levels. A battery of subjective and cognitive measures was assessed at baseline, repeatedly during the 8-day experimental phase, and after resumption of smoking. Measures included the Minnesota Nicotine Withdrawal Scale (MNWS), the Tobacco Craving Questionnaire (TCQ), and the Two-Letter Search (TLS), a test of visual scanning and attention. Deprived smokers reported increased withdrawal symptoms and tobacco craving throughout the 8 days. In contrast, scores on the MNWS and TCQ were unchanged from baseline for the denicotinized and nicotine cigarette groups. Similarly, performance on the TLS test was slowed for the deprived group, but not for the two smoking groups. These preliminary results suggest that components of tobacco smoke other than nicotine attenuate the exoclinic withdrawal and cognitive deficits seen during an 8-day period of tobacco deprivation. These data also suggest that denicotinized cigarettes might enhance success of quit attempts by suppressing withdrawal signs and symptoms during the first week of nicotine abstinence.

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POS1-102  GENETIC TESTING FOR NICOTINE ADDICTION SUSCEPTIBILITY AMONG ADOLESCENT PRIMARY CARE PATIENTS: INTEREST AND CORRELATES OF INTEREST

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OBJECTIVES: Genetic tests for nicotine addiction susceptibility may offer primary care providers new tools to reduce smoking among adolescents. This study examines adolescents' interest in, and reasons behind interest in, such testing and correlates of interest.

METHODS: The sample included 211 healthy patients (ages 13-21) recruited from a primary care adolescent medicine clinic. Subjects completed a one-time behavioral survey immediately prior to or following a general medical check-up. A 4 point self-report survey item served as the dependent variable.

RESULTS: Sixty-two percent of adolescents reported a fair amount of interest or more in genetic testing (p < .01). Among the 72% of adolescents who provided a reason for their interest, 35% would find the information interesting for general or non-specific reasons, 30% would find it personally useful (e.g., prevention and control of smoking), 8% noted it would be irrelevant (e.g., nonsmoker), and 13% stated it would be important (e.g., not useful). After adjusting for the effects of survey response bias, demographics, and beliefs about the harms of smoking, school performance and interest in cancer susceptibility testing remained associated with interest in nicotine addiction susceptibility testing (adjusted R2 = .21; p < .0001).

CONCLUSIONS: Many adolescent primary care patients will likely be receptive to comprehensive tobacco control programs that incorporate genetic testing. Similar to adults interested in participating in genetic testing, these adolescents may be characterized by higher levels of educational achievement and greater interest in DNA-based preventive medicine. The offer of such testing will be contingent upon the development of safe and effective genetic tests for nicotine addiction susceptibility and protocols to protect against untoward effects of testing.

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POS1-103  GENOME-WIDE LINKAGE ANALYSIS FOR SMOKING GENES IN TWO ETHNIC GROUPS

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As part of the Genetic Epidemiology Network of Arteriopathy, hypertensive sibships were collected and smoking behavior recorded. Using an affected sibpair design and genome-wide microsatellite data (~10cM coverage), we identified 214 white sibships (502 sibpairs; mean [SD] age= 55.68 [10.56]) from Rochester, MN and 206 African-American sibships (376 sibpairs; age= 57.97 [8.94]) from Jackson, MS, who had ever smoked for at least 3 years, and performed nonparametric linkage analysis using GENEHUNTER. We found evidence of linkage on chromosome 3 in both whites (LOD=1.76 @109cM) and African-Americans (LOD= 2.03 @122cM). Both of these peaks had a secondary smaller peak at 140-147cM that was only statistically suggestive in the African-Americans (LOD=1.4). Additional suggestive peaks (LOD>1.3) were found in the white sample (chromosome 8 (26cM) and 19 (38 cM)) and African-American sibships (chromosome 10 (153 cM)) but did not overlap with corresponding regions in the other ethnic group. This is the first study to identify a chromosomal region that has replicate evidence of linkage to smoking in two independent samples that differ geographically and ethnically. Positional candidate genes in this chromosome 3 region include dopamine and glutamate receptors, as well as GABA neurotransmitter. Fine mapping in this region is now needed to elucidate the genetic factors giving rise to this linkage signal in these two ethnic groups.

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POS1-104  IDENTIFICATION OF SUSCEPTIBILITY LOCI GENES FOR NICOTINE DEPENDENCE USING A COMBINED LINKAGE AND ASSOCIATION ANALYSIS APPROACH

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Epidemiological studies have strongly indicated that genetics play a significant role in the determination of nicotine dependence and other smoking-related behaviors. However, the susceptibility genes for these phenotypes remain largely unknown. We have been using a combined linkage and association analysis approach to identify susceptibility loci/genes for nicotine dependence. Populations investigated in our studies have included the Framingham Heart Study cohort, as well as the Caucasian and African-American populations recruited from the Mid-South states of the USA. Several genomic regions on different chromosomes have been mapped by linkage, and some of them have been replicated in two independent populations. This indicates that some of these regions are likely to harbor susceptibility genes for nicotine dependence. Furthermore, by using a family-based association analysis approach, we recent demonstrated that allelic variants of several candidate genes such as nicotinic acetylcholine receptor alpha 4 subunit (CHRNA4), dopa carboxylase (DDC), catechol-O-methyltransferase (COMT), and brain-derived neurotrophic factor (BDNF), are significantly associated with nicotine dependence. Some of these detected associations are found to be gender- or ethnic-specific. Although genomic research for susceptibility genes on nicotine dependence is still in the early stages, recent findings from this and other laboratories indicate that such a systematic approach may eventually lead to the identification of genes associated with nicotine dependence and other smoking related behaviors.

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POS1-105  SIGNIFICANT ASSOCIATION OF BDNF HAPLOTYPES IN EUROPEAN-AMERICAN MALE SMOKERS BUT NOT IN EUROPEAN-AMERICAN FEMALE OR AFRICAN-AMERICAN SMOKERS

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Brain-derived neurotrophic factor (BDNF) influences dopamine and serotinin neurotransmission in the brain, both of which are involved in the reward system of addiction. The BDNF gene is located in a genomic region on chromosome 11p where we and others have found ‘significant’ linkage to nicotine dependence (ND). We tested the potential role of variants within BDNF in vulnerability to ND, which was assessed by Smoking Quantity (SQ), the Heaviness of Smoking Index (HSI), and the Fagerstrom Test for ND (FTND). Six single nucleotide polymorphisms (SNPs) in BDNF were analyzed in an extensively phenotyped cohort of 602 nuclear families with smokers and non-smokers of African-American (AA) or European-American (EA) ancestry. Individual SNP analysis revealed that two SNPs in the pooled male and three SNPs in the EA male samples were significantly associated with at least one adjusted ND measure. However, none of these associations remained significant after correction for multiple testing. Haplotype analysis of rs6848320-rs988748-rs2033024-rs7934165 revealed that a major T-C-T-G haplotype was significantly associated, even after Bonferroni correction, with the three ND measures in the pooled and EA male samples (maximum Z = 3.00, P = 0.002 and maximum Z = 3.13, P = 0.0009 for SQ, respectively). No significant association of a major haplotype with ND was found in the AA or EA female smokers. The significant association of BDNF variants with ND implies that this gene plays a role in the etiology of ND in EAs and that its involvement is gender specific. BDNF may warrant further investigation in ND.

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POS1-106 USING ITEM RESPONSE MODELS TO UNDERSTAND THE NICOTINE DEPENDENCE SYNDROME

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Little is known about the relative severity of Diagnostic and Statistical Manual (DSM-IV) symptoms of nicotine dependence (ND) or whether a typical sequence of symptoms characterizes individuals above a diagnostic threshold. Using data from the National Epidemiological Survey on Alcohol and Related Conditions (NESARC), the current study used a Rasch logistic item response model to assess the unidimensionality of the construct of nicotine dependence, to identify which symptoms are associated with low and high levels of dependence, and to evaluate the capacity to assess reliably a continuum of dependence with a 15-question DSM-IV based index of ND. The NESARC measure of nicotine dependence symptoms provided reasonable coverage of the dependence syndrome and analyses suggested that most smokers responded in a predictable manner. However, the NESARC measure suggested a somewhat different pattern of ND symptoms than was estimated in a previous national survey of ND symptoms conducted by the National Comorbidity Study (NCS). Independent efforts to survey the prevalence of the ND syndrome in the NESARC and NCS have resulted in unique formulations of questions designed to survey each of the DSM-IV ND symptoms. Differences in the operationalization of symptoms across surveys appear to influence thresholds for determining the presence or absence of individual symptoms and consequently may influence thresholds for estimating the prevalence of ND in national surveys. Certain symptoms such as reducing activities due to smoking was consistently associated with severe levels of ND across surveys. However, symptoms such as tolerance or withdrawal symptoms were not associated with ND. Smoking cessation or psychological problems were associated with different levels of dependence severity across studies. Much of these differences may be traced to subtle differences between the two interviews in the wording of items used to assess the symptoms. A better understanding of the influences of survey questions in the assessment of nicotine dependence would improve our understanding of these measures relationship to the construct of nicotine dependence.

The National Epidemiological Survey on Alcohol and Related Conditions (NESARC) was conducted and funded by the National Institute on Alcohol Abuse and Alcoholism, with supplemental support from the National Institute on Drug Abuse. The National Comorbidity Survey was supported by the National Institute of Mental Health (R01 MH/DA46376, R01 MH49098, R01 MH52861), National Institute on Drug Abuse (supplement to R01 MH/DAAE376), and W.T. Grant Foundation (00135190). Ronald C. Kessler, Ph.D., Principal Investigator.

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POS1-107 A COMPARISON OF THE HOOKED ON NICOTINE CHECKLIST AND THE FAGERSTROM TEST OF NICOTINE DEPENDENCE IN ADULT SMOKERS

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Diminished autonomy is a core feature common to all forms of dependence involving drugs or behaviors. The Hooked on Nicotine Checklist (HONC) is a reliable and valid measure of diminished autonomy over tobacco. It has not previously been compared with the Fagerstrom Test of Nicotine Dependence (FTND) in adult smokers. In this study, 1350 smokers (mean age = 41; mean cigarettes smoked per day = 18.5) completed both measures. Factor analysis yielded one factor for both the HONC and the FTND. Mean HONC score was 7.0, and mean FTND score was 4.6; the measures correlated at r = 0.44. The HONC had higher internal consistency (alpha = 0.82) than the FTND (alpha = 0.61; z = 11272 = 7.1, p < 0.001). The measures correlated similarly with age at smoking onset and days smoked/month, but the FTND correlated higher with cigarette consumption. Subjects who used nicotine replacement therapy or bupropion during an abstinence attempt scored higher on both, while those who maintained abstinence for > 3 days scored lower. The HONC has several advantages: (1) it measures a clearly defined construct; (2) each item has face validity; and it has (3) better psychometric properties; (4) a logical cut point (zero symptoms), (5) greater sensitivity to the onset and low levels of dependence, and (6) easily interpretable scores. The HONC is uniquely suited for use with smokers whose cigarette consumption is low.

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POS1-108 NICOTINE PLACE PREFERENCE CONDITIONED IN ADOLESCENT RATS PERSISTS INTO ADULTHOOD AND IS PREVENTABLE BY IMMUNIZATION AGAINST NICOTINE

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Previous studies in our laboratory confirmed findings from other groups that adolescent rats are far more susceptible than adults to nicotine conditioned place preference (CPP). Adolescent CPP was prevented by passive immunization against nicotine. The present study was performed to determine whether nicotine CPP during adolescence would persist into full adulthood and whether nicotine immunization during adolescent conditioning would prevent persistent nicotine reinforcement effects. Subjects were 9 male and 13 female 30-day-old Sprague-Dawley rats. Each rat was given a free choice trial in an automated CPP apparatus with two distinctly different compartments to determine its initial preference. One treatment group received 18 mg i.p. normal rabbit IgG. Starting a day later, it received nicotine bitartrate 0.21 mg/kg s.c. as the base paired for 20 min. with the initially non-preferred side and saline paired with the initially preferred side, for 4 successive days. A second group was treated identically, except that it was pretreated with 18 mg i.p. IgG from rabbit antiserum against a nicotine vaccine (3’aminnomethyl nicotine-rePA or NicVax). A control group for spontaneous shifts in preference was pretreated with normal rabbit IgG and it received saline s.c. paired with both compartments. Each group consisted of both male and female rats. At adult age of 73 days, each rat was retested under free choice conditions for time spent in the initially preferred and initially non-preferred compartments. Non-immunized, previously nicotine-conditioned rats displayed significantly greater preference for the initially non-preferred side than did immunized nicotine-conditioned rats, r = 0.001, or saline control rats, p = 0.002. The non-immunized nicotine-conditioned group also displayed a significantly greater change from its initial preference than did the immunized, nicotine-conditioned group, r < 0.001, or the saline controls, p = 0.009. There were no significant gender effects. The results suggest that nicotine reinforcement during adolescence is more persistent in the rat has surprisingly long-lasting effects and these effects are preventable by immunization at the time of conditioning.

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POS1-109 ANALYSIS OF CHAMBER SHAPE ON NICOTINE-INDUCED SEX DIFFERENCES IN THE EXPRESSION OF BEHAVIORAL SENSITIZATION

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The present experiment tested the hypothesis that environmental configuration affects the detection of nicotine (NIC)-induced sex differences in rats. A pilot study examined behavioral sensitization following 13 intravenous (IV) NIC injections in male and female rats by testing them in round or square locomotor activity compartments. Rats were randomly assigned to the female round (FR), male round (MR), female square (FS), and male square (MS) groups (n = 4/group). Rats were administered a baseline-saline activity session in the locomotor activity chambers for 60 minutes. The activity response to NIC (0.05 mg/kg/injection) was assessed on two occasions: on day 1 and day 13. The preliminary data suggested that FR rats exhibited statistically more rearing than FS, MR, or MS groups. This outcome is consistent with Harrod et al., (2004), which reported sex differences in behavioral sensitization to NIC. To more fully test this hypothesis, a separate experiment was conducted with 11-15 rats/group. The method was identical to the pilot except rats were administered a 14th NIC injection (on day 32) to determine the expression of behavioral sensitization. The results indicated a sex difference in response to acute NIC; males exhibited decreased activity relative to females. Repeated NIC-induced behavioral sensitization. The results indicated a sex difference in response to acute NIC; males exhibited decreased activity relative to females. Repeated NIC-induced behavioral sensitization in rats. The results indicated a sex difference in response to acute NIC; males exhibited decreased activity relative to females. Repeated NIC-induced behavioral sensitization in rats. The results indicated a sex difference in response to acuteNIC-induced sensitization.

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POS1-110

STRAIN DIFFERENCES IN SERUM COTININE BUT NOT IN VOLUNTARY NICOTINE CONSUMPTION AMONG ADOLESCENT MALE AND FEMALE MICE

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The effects of nicotine in adult mice have been shown to be highly dependent on genetic background, but the interactions between genetics and the pharmacological effects of nicotine during adolescence are relatively unknown. Voluntary oral nicotine consumption models have been adapted for use with adolescent mice given the ease of administration, continuous nicotine exposure, and production of acceptable levels of nicotine bioavailability (e.g., Klein, 2004). The present experiment builds on these reports to evaluate strain-related differences in nicotine intake and cotinine levels between 2 inbred mouse strains. Voluntary oral nicotine consumption behavior was assessed in 43 periadolescent (i.e., 35 days of age) male and female C57BL/6J and DBA/2 mice, using a three-bottle choice design. Mice had continuous access to either tap water or two freebase nicotine solutions (25 and 50 mg/ml) over a seven-day period. Serum cotinine was measured on the last day of the experiment. Adolescent mice did not differ by strain or sex in nicotine intake (both volume and mg/kg) on the last day of the experiment, a finding inconsistent with reports of nicotine consumption in adult mice of the same strains. Surprisingly, DBA/2 mice displayed higher cotinine levels on the last day of the experiment than did C57BL/6J mice. The presence of a strain difference in cotinine levels despite similar amounts of nicotine intake may suggest strain differences in nicotine metabolism among adolescent mice.

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POS1-112

COMPENSATORY NICOTINE SELF ADMINISTRATION DURING REDUCED ACCESS TO NICOTINE: AN ANIMAL MODEL OF NICOTINE EXPOSURE REDUCTION

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Smoking reduction is being evaluated as an alternative to cessation or as a transitional goal toward cessation for smokers who cannot or will not quit. Because compensatory increases in smoking behavior are a major obstacle to achieving meaningful levels of reduction (those that reduce harm), understanding the mechanisms underlying compensation would be valuable. The goal of this study was to develop an animal model of nicotine exposure reduction and to use it to examine potential predictors of compensation. Eighteen outbred Holtzman Sprague-Dawley rats initially trained to self-administer nicotine (0.03 mg/kg/infusion) during 23 h sessions were exposed to a progressive reduction of access to nicotine from 23 h/day to 10, 6, and 2 h/day. Rates of NSA during these reduction phases were compared to NSA rates prior to access reduction in order to compute a compensation index (CI). Correlations between the CI and baseline self-administration variables (nicotine intake, diurnal variation) and nicotine pharmacokinetic variables (elimination half-life, clearance) were examined to determine if any would predict the degree of compensation during reduction. Results showed significant compensatory increases in NSA at all access durations (CI=1.3, 1.9, and 2.3 during the 10, 6, and 2 h/day periods, respectively). There was considerable variability in the CI between rats (range 0.61 to 4.6 at 2 h/day), which is similar to humans undergoing reduction protocols. Neither baseline NSA variables or pharmacokinetic parameters were significantly correlated with the degree of compensation during the 2-h access period. The present findings are the first to demonstrate significant compensatory increases in NSA when duration of access to nicotine is reduced, and that such an access-reduction assay may serve as a useful animal model to examine potential mechanisms underlying compensation in the context of smoking reduction.

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POS1-111

RESPONSIVITY TO NICOTINE AND A SOCIAL STRESSOR IN ADOLESCENT AND ADULT RATS

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The rate of smoking initiation during adolescence is high and the propensity to continue use into adulthood is greater for those who begin use during this developmental period. Additionally, adolescence is a developmental period that is filled with social stresses. The purpose of the present study was to assess the effects of repeated nicotine (NIC) administration on responsivity to a social stressor (SS) in adolescent and adult male rats. Over a period of 5 days, adolescent (postnatal days (PND) 31-35 or 41-45) or young adult (PND 60-64) rats were administered NIC (0.6 mg/kg/sc) or saline (SAL) and subjected to a SS (i.e., larger rat was placed in the subject’s homecage). Immediately following the SS subjects were placed in an activity chamber for 20 minutes and behavior was recorded. Preliminary results indicate that the SS was not sufficient to discern group differences. Both NIC and SAL treated PND 35 animals were more active than PND 45 or PND 64 animals on trials 2-5. Across the 5 days, animals administered NIC showed successive increases in locomotor activity (LA) across trials while animals administered SAL exhibited decreased LA relative to trial 1. Exposure to the novel environment increased LA, an effect which habituated over time in SAL-treated animals. Interestingly, NIC may decrease the aversiveness of the novel environment resulting in increased exploration across days. Alternatively, NIC stimulated activity may be due to an enhanced responsivity to nicotine’s reinforcing effects rather than its anxiolytic properties. Regardless, younger adolescent animals appear to be more active in general and the pattern of NIC stimulated activity was similar in all ages.

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POS1-113

THE REINFORCEMENT ENHANCING EFFECT OF NICOTINE DEPENDS ON THE INCENTIVE VALUE OF THE NONPHARMACOLOGICAL REINFORCER

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Recent experiments from our laboratory demonstrate that nicotine (NIC), administered independent of behavior, enhances responding for discrete nonpharmacological stimuli (NPs) in rats. Based on these and other findings, we have hypothesized that NIC can enhance the incentive value of nonpharmacological reinforcers. This hypothesis makes important predictions about the intrinsic reinforcing value of NPs and the effects of NIC. Specifically, NIC should have a more pronounced enhancing effect on more reinforcing NPs compared to NPs with no incentive value. In preliminary studies we have obtained indirect evidence that some auditory/visual stimuli are more reinforcing than others. For example, a stimulus composed of 5-s extinction of a house light accompanied by an 83 db tone (HL-ON) supported high response rates, whereas a stimulus composed of the same tone and 5-s illumination of a stimulus light (STIM-ON) supported responding at low rates. Moreover, NIC (0.9 mg/kg/session) appeared to have a more pronounced reinforcement enhancing effect on the HL-ON stimulus. In the present study, we directly compared the incentive value of these two stimuli by randomly assigning rats to one of two stimulus conditions (HL- OFF or STIM-ON). Stimuli were presented for making a fixed number of presses on an active lever. Across daily 1-h sessions, the HL-OFF group pressed at higher rates than the STIM-ON group, confirming that this stimulus was more reinforcing. After responses stabilized, rats in each group were randomly assigned to one of two drug conditions [NIC (0.4 mg/kg) or saline]; SC injections of the assigned solution were given 5-min before each of the remaining test sessions. Saline injections did not affect responding for either stimulus. The HL-OFF group showed increased responding following NIC administration, whereas response rates for the STIM-ON group were unchanged by NIC. This study strongly supports our prediction that the relative reinforcing value of nonpharmacological stimuli determines the degree to which nicotine exerts its reinforcement enhancing effects.

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POSI-114 A PHARMACOLOGICAL DISSOCIATION OF THE PRIMARY REINFORCING AND REINFORCEMENT ENHANCING EFFECTS OF NICOTINE

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Recent experiments from our laboratory have demonstrated that a concurrent reinforcement paradigm can behaviorally dissociate the primary reinforcing (RP) effects of nicotine (NIC) from its reinforcing enhancement (RE) effects (i.e., enhancing the incentive value of a discrete visual stimulus or VS). The present studies employed this concurrent (NIC+VS) paradigm to determine whether or not the discriminative stimulus effects of nicotine could be dissociated pharmacologically. One group of rats (NIC+VS) received co-presentation of nicotine (0.06 mg/kg free base) and VS for responding on a randomly designated active lever, pressing a second lever had no programmed consequence. A second group (VS-Only) received similar contingencies, but vehicle was infused instead of nicotine. For the 2-Lever group, pressing one lever resulted in VS presentation, whereas pressing the second lever produced a NIC infusion. Across daily 1 hr self-administration sessions, the 2-Lever and NIC+VS groups responded for the VS at rates that were similar to each other but higher than VS-Only controls. In contrast, the NIC+VS group self-administered more than twice the amount of nicotine taken by the 2-Lever group. This pattern replicates the previously described synergistic increase in responding for the VS induced by NIC when both reinforcers are delivered for making a single operant (NIC+VS) or concurrently available responses (2-Lever group). Pharmacological pretreatment tests were conducted as single-session probes during maintenance of self-administration; after rats met a response-stability criterion (<30% variability for 3 consecutive days). The competitive metabotropic glutamate 5 receptor antagonist MPEP attenuated the RP, but not the RE effect of nicotine. Surprisingly, the non-competitive nicotinic acetylcholine receptor antagonist mecamylamine had the opposite effect; the nicotine-induced enhancement of responding for VS was attenuated but responding for NIC alone was not affected. Follow-up studies suggest that new learning (i.e., extinction) may be required for mecamylamine to attenuate nicotine-seeking. Funding: NIDA (10464 & 19279).

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POSI-115 MECAMYLAMINE ATTENUATES CUE-INDUCED REINSTATEMENT OF NICOTINE-SEEKING BEHAVIOR IN RATS

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Mecamylamine, a noncompetitive nicotinic cholinergic antagonist may attenuate tobacco smoking in humans trying to quit and inhibits nicotine self-administration in animals. This study, using a response-reinstatement model of relapse, examined whether the motivational effects of a nicotine-associated stimulus are sensitive to pretreatment with mecamylamine. Male Sprague-Dawley rats were trained to intravenously self-administer nicotine (0.03 mg/kg/infusion) on an FR5 schedule. Each infusion was accompanied by a compound visual stimulus (1 s onset of a lever light followed by offset of a house light for 20 s during which time no infusions could be obtained). After the nicotine-maintained responding was extinguished by withholding the delivery of nicotine (saline substitution) and its associated stimulus, reinstatement tests were conducted. Response-contingent re-presentation of the stimulus without further availability of nicotine significantly reinstated extinguished responding at the previously nicotine-reinforced active lever. Pretreatment with mecamylamine (0.5, 1, 2 mg/kg, SC) dose-dependently attenuated the stimulus-induced reinstatement of lever responding. Mecamylamine did not change food-taking and -seeking responses, whereas the highest dose (2 mg/kg) decreased nicotine self-administration behavior. The results confirm previous findings that stimuli accompanying nicotine self-administration effectively elicit reinstatement of nicotine-seeking behavior after extinction and demonstrate that mecamylamine, besides suppressing self-administration of nicotine, effectively attenuated stimulus-induced nicotine-seeking behavior. These findings suggest that the response-reinstatement procedures used in this study may be useful for studying neurobiological mechanisms of nicotine-seeking behavior and that mecamylamine may be a potential candidate of pharmacological agents for treatment and prevention of relapse to tobacco smoking in abstinent smokers. This work was supported by California TRDRP grant 12RT-0188 and NIH grant DA17288 (X. Liu) and DA10464 (R.A.Caggiula).

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POSI-116 CHARACTERIZATION OF BUPROPION SUBSTITUTION FOR THE CONDITIONAL STIMULUS EFFECTS OF NICOTINE

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RATIONALE: From a Pavlovian conditioning perspective nicotine is typically conceptualized as the unconditional stimulus (US) that enters into an association with other stimuli (bar, smoke odor). Very little research has explored whether nicotine functions as a conditional stimulus (CS).

OBJECTIVES: We sought to extend previously published research from this lab by characterizing the ability of bupropion (Zyban) to substitute for a nicotine CS. Evidence for substitution in an operant drug discrimination task is mixed.

METHODS & RESULTS: In the conditioning phase, 15 rats had nicotine (0.4 mg base/kg) paired intermittently with 4-sec access to a liquid sucrose US (36 per 20-min session). Intermixed were saline sessions without sucrose. Nicotine acquired the ability to evoke anticipatory food seeking (goal tracking). Once conditioned responding stabilized, testing began. A test occurred every fifth day provided performance criteria were met on intervening training days. Testing was 4 min and no sucrose occurred. Rats received nicotine (0.025-0.4 mg/kg, SC) 5 min or bupropion (5-30 mg/kg, IP) 15 min before the test. Nicotine-evoked goal tracking was dose dependent (ED50=0.11 mg/kg). Bupropion (20 mg/kg) fully substituted for the nicotine CS (ED50=9.93 mg/kg). The activity pattern challenges a locomotor account of this substitution. Upon demonstrating substitution, a new set of rats (n=16) were trained with a nicotine CS. On test days, the duration of the nicotine-like effects of bupropion were tested. The 20 mg/kg bupropion dose was given IP 5 to 180 min before a test. There was still partial substitution to nicotine up to 90 min after bupropion administration.

CONCLUSIONS: Nicotine readily serves as a signal for sucrose reward. Goal tracking evoked by bupropion was comparable in strength and duration to the nicotine CS. A future challenge will be to determine the mechanisms responsible for this substitution. In doing so, we might gain a better idea of why Zyban is an effective smoking cessation aid.

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POSI-117 EFFECTS OF TOPIRAMATE IN COMBINATION WITH INTRAVENOUS NICOTINE IN OVERNIGHT ABSTINENT SMOCKERS

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Topiramate is an anticonvulsant agent, which may also be effective for treatment of alcohol and cocaine addiction. A recent clinical study suggested utility of topiramate for smoking cessation in alcohol dependent smokers. The effects of topiramate on tobacco addiction have not been systematically examined in humans. The goal of this study was to determine topiramate’s effects on acute physiological and subjective effects of intravenous (IV) nicotine in overnight abstinent smokers. Seven male and 5 female smokers participated in a double-blind, placebo-controlled, crossover study, which consisted of one adaptation and 3 experimental sessions. In each of 3 experimental sessions, participants were treated orally with a single 25 or 50 mg topiramate or placebo. Starting two hours following the medication treatment, subjects received an IV saline injection, followed by 0.5 and 1.0 mg/kg IV nicotine. The injections were given 30 minutes apart. Topiramate treatment at 50 mg, compared to 25 mg or placebo, attenuated the baseline heart rate and nicotine-induced heart rate increases. Topiramate, compared to placebo, enhanced the ratings of subjective effects from nicotine including drug strength, good drug effects, head rush, and drug liking. These results suggest that topiramate may enhance the subjective effects of nicotine and attenuate the heart rate response to nicotine. While the exact mechanism is unclear, enhancement of the dopaminergic system and attenuation of the noradrenergic system may mediate topiramate’s effects on the subjective and cardiovascular responses to nicotine, respectively. The utility of topiramate for smoking cessation needs to be examined further in controlled clinical trials.

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**POS1-118**

**EFFECT OF VARENICLINE ON REINFORCING EFFECTS ASSOCIATED WITH SMOKING**

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Various reinforcing effects of nicotine have been shown to play a significant role in the continuation of smoking behavior. Varenicline is a novel, selective nicotinic receptor partial agonist that binds specifically at the alpha 4 beta 2 nicotine receptor. Partial activation of this receptor by varenicline is believed to underlying its beneficial effects on craving and nicotine withdrawal symptoms. Varenicline also blocks nicotine binding at the alpha 4 beta 2 receptor, which should reduce reinforcing effects of smoking. Treatment with varenicline 1 mg bid or bupropion 150 mg bid was compared with placebo in two identically designed, randomized, double-blind, 12-week studies (the target quit date was at Week 1, 7 days after baseline). In the two studies, the Modified Cigarette Evaluation Questionnaire (mCEQ), which measures the smoker’s experience of reinforcing effects, was assessed as an important secondary outcome in patients who smoked during treatment. Subscales on Smoking Satisfaction and Psychological Reward were prespecified as particularly relevant outcomes. Data were analyzed using a repeated measures model. In each of the two studies, varenicline showed a statistically significant benefit (p<0.05) versus placebo in reducing scores on four of five subscales: Smoking Satisfaction, Psychological Reward, Enjoyment of Respiratory Tract Sensations, and Craving Reduction upon smoking. Standardized effects sizes (in absolute value) in the two studies were 0.35 and 0.47 on the Smoking Satisfaction subscale, and 0.23 and 0.37 on the Psychological Reward subscale. The effect of bupropion versus placebo was less consistent, with statistically significant benefit across both studies only for Psychological Reward (standardized effect sizes [in absolute value] were 0.17 and 0.20). Neither varenicline nor bupropion differed statistically from placebo on the Aversion subscale. Data from the two studies suggest that varenicline reduces reinforcing effects of smoking and appears favorable over bupropion in mitigating such effects.

Funding: Pfizer Global Pharmaceutical.

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**POS1-119**

**EFFECTS OF THE OPIOD ANTAGONIST NALTREXONE ON THE ACUTE NICOTINE-INDUCED EEG AROUSAL AND MOOD RESPONSE IN CIGARETTE SMOKERS**

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The reinforcing actions of smoking have been attributed, in part, to the arousing and mood-elevating properties of nicotine, which influences numerous neurotransmitter systems. As nicotine affects the release of endogenous opioid peptides, this study explored the effects of an acute dose of naltrexone, an oral opioid receptor antagonist, on the electroencephalographic (EEG) and self-reported mood changes induced with acute administration of nicotine gum. In a double-blind repeated measures design with 18 (10 male) overnight cigarette deprived smokers, spectral EEGs induced with acute administration of nicotine gum. In a double-blind repeated measures design with 18 (10 male) overnight cigarette deprived smokers, spectral EEGs and self-reports with mood, euphoria and withdrawal symptoms scales were acquired in response to placebo and nicotine gum (4 mg) following pre-treatment with naltrexone (50 mg) or a matching placebo. Preliminary analysis found nicotine decreased self-ratings of withdrawal, increased ratings of euphoria and, in male smokers, increased subjective alertness. Nicotine-induced EEG alterations included diffuse reductions in slow-wave (delta and theta) activity and preferential increases in anterior fast alpha (alpha2 vs. alpha1) activity, particularly in the right frontal region. Naltrexone pre-treatment prevented both the euphoric and alerting (in males) influences seen with nicotine. EEG theta reductions induced with nicotine were abated with naltrexone, as were reductions in frontal and occipital delta and prefrontal increases in anterior fast alpha. These observations of naltrexone blockade of nicotine effects support a role for opioid mechanisms in mediating certain activation properties of nicotine.

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**POS1-120**

**ETHANOL DOES NOT AFFECT DISCRIMINATIVE STIMULUS EFFECTS OF NICOTINE IN RATS**

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Consumption of alcohol increases the number of cigarettes smoked, but the mechanism underlying this effect is unclear. One explanation is that ethanol, which possesses central nervous system depressant effects, may reduce the subjective effects of nicotine and therefore produce a compensatory increase in smoking behavior. Here, we used the two-lever drug discrimination choice procedure as an animal model for assessing the ability of ethanol to alter the psychomotor and subjective effects of nicotine. Male Sprague-Dawley rats (n = 24) were trained under a discrete-trial schedule of food-pellet delivery to respond on one lever after an injection of a training dose of 0.4 mg/kg nicotine and on the other lever after an injection of 1 ml/kg of saline vehicle. Injections of nicotine or saline were given subcutaneously 10 min before the start of the session. A range of doses of ethanol were substituted for the training dose of nicotine. Ethanol was also administered together with various doses of nicotine to assess possible alteration of the dose-response curve for nicotine discrimination. Ethanol failed to generalize to the nicotine training stimulus over a large range of doses (less than 5% of responses emitted on the nicotine-associated lever with doses of ethanol ranging from 0.1 to 1 g/kg). Also, when ethanol was administered in combination with nicotine, it did not produce a significant shift of the dose-response curves for nicotine discrimination. Thus, the ability to discriminate the effects of nicotine does not appear to be altered by ethanol administration. However, the high dose of 1 g/kg ethanol given either alone or in combination with nicotine, markedly depressed food-maintained responding. This later effect was associated in some rats with an attenuation of the discriminative-stimulus effects of the training dose of nicotine. These results suggest that previous reports of increased tobacco smoking following ethanol consumption in humans are connected, in some way, with an increase in motivation to consume nicotine that is produced by ethanol, rather than with a decrease in the subjective response to nicotine.

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**POS1-121**

**NICOTINE/CANNABINOID INTERACTIONS IN ADOLESCENT VS ADULT RATS**

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Studies show that a significant number of adolescents use cigarettes, and that more than half of the teens that smoke daily also use illicit drugs. We have shown previously that chronic treatment with nicotine produces sensitization to its locomotor-activating effects in male adult rats but not male adolescent rats. Thus, it appears that there are different adaptations in response to chronic nicotine in adolescent than adult rats. It is not known, however, whether nicotine use during adolescence alters the subsequent effects of illicit drugs, such as 9-THC (9-tetrahydrocannabinin). In this study, the effect of repeated nicotine administration was examined on the behavioral effects of subsequently administered 9-THC. Rats were treated with once-daily injections of 0.4 mg/kg nicotine for seven days and locomotor activity was measured for 1 hour daily. On day 8, the effects of 9-THC on locomotor activity were measured. Adolescent males pretreated with nicotine were sensitized to the locomotor-decreasing effects of 9-THC, shown by a decrease in the total distance traveled in a 30 min test session compared to vehicle-treated rats. In contrast, the adult rats appeared to have developed tolerance to the effects of 9-THC subsequent to treatment with nicotine. In a separate group of rats, the effects of the same nicotine treatment were examined on cannabinoid receptor binding. In this study, the rats were killed on day 8 and cannabinoid receptor density was measured using autoradiography. Nicotine produced significant increases in cannabinoid receptor density in the prelimbic regions of the prefrontal cortex and in the CA3 region of the hippocampus of adolescent rats, but no changes in binding in the adult rats. Thus, there are both increases in the behavioral effects of 9-THC and in cannabinoid receptor binding subsequent to nicotine administration in adolescent, but not adult male rats. These data suggest that smoking may make adolescent males more vulnerable to the effects of cannabinoids and that the time during development of nicotine administration is a determining factor in the subsequent long-term adaptations that occur.

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METHYLPHENIDATE INCREASES SMOKING

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RATIONALE: Methylphenidate (RITALIN®), a commonly prescribed stimulant, is widely abused by adolescents and young adults. Adolescence and young adulthood is also when most individuals begin to smoke regularly. Adolescents and young adults that report using illicit methylphenidate are significantly more likely to smoke. The reason for the high incidence of smoking among users of illicit methylphenidate is unknown.

OBJECTIVE: In a series of experiments conducted in our laboratory, the acute effects of a range of doses of methylphenidate (10, 20, and 40 mg) and placebo were assessed in 16 cigarette smokers who were not attempting to quit, and were without ADHD or other Axis I psychiatric disorders.

METHODS: Each dose of methylphenidate was tested once while placebo was tested twice. One hour after ingesting drug, participants were allowed to smoke ad libitum for four hours. Measures of smoking included total cigarettes smoked, total puffs, latency to the first cigarette, and carbon monoxide levels. Snacks and decaffeinated drinks were available ad libitum, and caloric intake during the four-hour smoking session was calculated.

RESULTS: Methylphenidate dose-dependently increased the total number cigarettes smoked, number of puffs, and carbon monoxide levels. As expected, methylphenidate dose-dependently decreased the number of food items consumed and caloric intake.

CONCLUSIONS: The results of this experiment suggest that methylphenidate, like d-amphetamine, increases rates of cigarette smoking. Future studies are needed to elucidate the behavioral and pharmacological mechanisms that mediate methylphenidate-induced increases in spontaneous smoking.

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PROLONGED OCCUPANCY OF NICOTINIC ACETYLCHOLINE RECEPTORS BY NICOTINE IN HUMAN BRAIN: A PRELIMINARY STUDY

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The addictive properties of cigarette smoking have been attributed primarily to nicotine, which initiates its effects at beta2-containing nicotinic acetylcholine receptors (beta2-nAChR) in brain. The extent and duration of brain beta2-nAChR occupancy by nicotine after smoking one cigarette, two cigarettes, and using the nicotine inhaler was studied. To determine the extent and duration of brain beta2-nAChR occupancy by nicotine, three non-treatment seeking smokers, including a 21 yo Caucasian male (Subject 1), a 33 yo Caucasian female (Subject 2), and a 64 yo Caucasian female (Subject 3), underwent two separate imaging sessions with [123I]5-IA-85380 ([123I]5-IA) SPECT before and after cigarette smoking and using the nicotine inhaler. Since [123I]5-IA interacts directly with the nicotine binding site on beta2-nAChRs, each smoker was asked to abstain 4-5 days prior to each SPECT scan day. Each subject had a bolus plus continuous infusion of [123I]5-IA over 12-14 h. Each subject had three SPECT scans with infusion lasting 6-8 h, followed by scans after smoking a cigarette or using the nicotine inhaler. Subjects 1 and 2 had six additional SPECT scans with 9-14 h of infusion and 2-6 h after smoking the cigarette and Subject 3 had 3 additional SPECT scans post-challenge with cigarette or inhaler. Scanning began 1.5-2 h after cigarette smoking or inhaler use. Serial arterial blood samples were obtained for 20 min, followed by venous blood samples for the remainder of the study to measure plasma cotinine and nicotine levels. Occupancy of beta2-nAChR after smoking one cigarette ranged from 34% to 62% and from 35% to 56% after two cigarettes in a region dependent manner. Occupancy of beta2-nAChR by nicotine after using the inhaler ranged from 18% to 44%. Nicotine continually occupied beta2-nAChR 1.8 h to 6 h after smoking a cigarette or using the nicotine inhaler, whereas plasma nicotine levels peaked at 4-10 minutes, even in the presence of continued radiotracer infusion. These data raise important questions about why individuals smoke more frequently than would be predicted by the long-lasting duration of occupancy of brain beta2-nAChR by nicotine.

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**POS1-124** NEURAL SUBSTRATES OF RESISTING THE URGE TO SMOKE

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BACKGROUND: Several published reports have demonstrated changes in regional brain activity in smokers presented with cigarette-related cues. We sought to examine such brain responses when smokers are presented with cigarette-related cues and actively resist the urge to smoke.

METHOD: Forty-six tobacco-dependent smokers underwent functional magnetic resonance imaging (fMRI), during which they were presented with cigarette-related and neutral cues. During cigarette cue presentation, subjects were instructed either to allow themselves crave cigarettes or to actively resist craving.

RESULT: Resistance of the urge to smoke resulted in signal increases in the anterior and posterior cingulate cortices and medial superior frontal gyrus and signal decreases in the occipital and sensorimotor cortices compared to the cigarette cue exposure with craving. Subjective urge to smoke was elevated during both the absence and the resistance of craving during cigarette cue exposure compared to neutral cue exposure.

CONCLUSION: When smokers are exposed to cigarette-related cues and resist the urge to smoke, brain regions associated with arousal and heightened attention become activated, indicating that these regions mediate resistance to craving. Resistance to craving also deactivated the primary visual and sensorimotor cortices, indicating the disengagement of these regions when resisting craving. These brain activity changes occurred during the resistance of craving, despite the subjective sense from subjects that they were craving strongly.

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**POS1-125** DIFFERING ACTIVITY PROFILES OF NICOTINE AND ITS CNS METABOLITE AND TOBACCO ALKALOID, NORNICOTINE

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Cigarette smoking and other forms of tobacco use deliver an array of substances including nicotine and nornicotine, in addition to their metabolites. While nornicotine is a relatively minor systemic metabolite of nicotine, it accumulates at relatively high levels in brain after repeated nicotine administration. We examined the effects of α-nornicotine on various combinations of neuronal nicotinic acetylcholine receptor subunits expressed in Xenopus oocytes and compared those responses to responses evoked by acetylcholine and (-)-nicotine. Of the subtypes studied (α4β2α3β4, α3β3α2β2, α2β1β2α2α3β2, α3β3β2β3, and α7), we found that receptors containing the ligand-binding domain of the α6β4 subunits (in the form of an α6β4α3 chimera) were most responsive to nornicotine. The maximum responses of receptors formed by α6β3, β2α3, and β2β3 subunits were 53 ± 4 % the size of the maximum responses evoked by ACh; and the EC50 for nornicotine was only 3.7 ± 1.5 μM, which was roughly one fourth of the EC50 for ACh with these receptors. We also found that α7 receptors were relatively responsive to nornicotine. The maximum responses of α7 receptors, measured as net change, were 51 ± 5 % the size of the maximum responses evoked by ACh; and EC50 for nornicotine was 74 ± 5 μM. These values for α7: 3β3α2β3α2β3, and α7 receptors were not significantly different from the Imax and EC50 values for (-)-nicotine with the same receptors, respectively. Receptors containing α6β4 subunits have been suggested to have a role in nicotine-evoked dopamine release. The α7-type neuronal nicotinic receptors have been suggested to be potential therapeutic targets for Alzheimer’s disease, schizophrenia and possibly other indications. Therefore understanding the actions of nornicotine in the brain may have significance for both emerging therapeutics and the management of nicotine dependence.

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**POS1-126** NICOTINE SENSITIZATION OF MONKEY STRIATAL DOPAMINE RELEASE

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Nicotine induced tolerance and sensitization are well described. Nicotine sensitization is especially prominent in rodents but not easily observed in primates. The present study used microdialysis techniques to study dopamine release in conscious monkeys. Repeated nicotine administration in doses of 32 or 100 μg/kg bid lowered baseline dopamine release in the dorsal striatum of monkeys after overnight abstinence. With a lowered baseline, a greater facilitation of striatal dopamine release was induced by acute nicotine administration compared to that obtained under naive control conditions when the baseline was higher. Impaired dopamine release was transiently normalized by acute nicotine in a dose-dependent manner. These results support our previous positron emission tomography (PET) data. Striatal dopamine utilization measured with [11C]L-DOPA is reduced with chronic nicotine administration. It is transiently normalized following a single nicotine dose in overnight abstinence monkeys. A rational basis for using noninvasive PET imaging in future research to study tobacco smokers and brain dopamine utilization in humans is established.

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**POS1-127** SUBJECTIVE REACTIONS TO TWO METHODS OF NICOTINE/COTININE ADMINISTRATION

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Intravenous infusion (IV) of nicotine/cotinine is the gold standard for characterizing the pharmacokinetics and metabolism of nicotine. An oral administration procedure was developed as an alternative to the invasive hospital-based infusion protocol. The present analysis compares subjective reactions to nicotine/cotinine with these two different modes of administration. Two groups of participants from the SRI Northern California Twin Registry received nicotine/cotinine from either IV or oral routes. The IV group (n=174) underwent a 30-minute infusion of nicotine and cotinine (0.5-2.0 μg/kg/min) during a 12-hour stay at San Francisco General Hospital. The Oral group (n=46) received 2 mg nicotine and 10 mg cotinine and stayed 10 hours at SRI International’s research facility. The two groups were similar with respect to age, gender, BMI, baseline heart rate, alcohol use, smoking status, oral contraceptive use, and plasma 3′/hydroxycotinine/cotinine ratio (mean 0.30), an indicator of CYP2A6 activity and nicotine clearance. At baseline and peak drug effect, participants completed a subjective reactions questionnaire (scale of 1-10, 10-maximum) for light-headedness, dizziness, buzz, headache, and nausea. Both groups experienced significant increase from baseline in 4 of the 5 symptoms; the IV group also reported a significant increase from baseline in overnight abstinent monkeys. A rational basis for using noninvasive PET imaging in future research to study tobacco smokers and brain dopamine utilization in humans is established.

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POS1-128 EXPERTIMENTAL AND MATHEMATICAL MODELING OF THE BLOOD TO BRAIN TRANSFER OF NICOTINE AND COTININE

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Blood-brain barrier (BBB) nicotine transfer has been well documented in view of the fact that this alkaloid is a cerebral blood flow marker. However, limited data are available that describe BBB penetration of the major tobacco alkaloids after chronic nicotine exposure. This question needs to be addressed given long-term nicotine exposure alters both BBB function and morphology. In contrast to nicotine, it has been reported that cotinine (the major nicotine metabolite) does not penetrate the BBB, yet the presence of cotinine in the brain parenchyma has been well documented after nicotine exposure. Surprisingly, therefore, the literature indirectly suggests that CNS cotinine distribution occurs secondarily to nicotine brain metabolism. Therefore, using the in situ brain perfusion model we assessed the BBB transfer of [3H]nicotine and [3H]cotinine in naive animals and in animals exposed chronically to S(-)nicotine (4.5 mg/kg/d) through osmotic minipump infusion.

RESULTS: Our data demonstrate that: 1) [3H]nicotine BBB uptake is not altered in the in situ perfusion model after chronic nicotine exposure [no significant difference in total brain [3H]nicotine uptake was noted between naive (3.11 +/- 0.42 x 10^-2 m/L/s/g) and nicotine exposed (3.31 +/- 1.1 x 10^-2 m/L/s/g); rats), 2) [3H]cotinine penetrates the BBB and 3) similar to [3H]nicotine, [3H]cotinine BBB transfer is not altered by chronic nicotine exposure; as the total brain uptake of [3H]cotinine in animals subjected to chronic nicotine exposure (Kin: 2.07 +/- 0.25 x 10^-3 m/L/s/g; PA: 2.11 +/- 0.25 x 10^-3 m/L/g) was found not to be significantly altered from control in whole brain (Kin: 2.03 +/- 0.17 x 10^-3 m/L/g; PA: 2.06 +/- 0.17 x 10^-3 m/L/g). Regionally. Major Points of SIGNIFICANCE: We have to our knowledge completed the first mathematical modeling of the blood to brain uptake and distribution of nicotine and cotinine (for both total brain and eight individual brain regions) in the naïve and chronic nicotine exposed states. In addition, our data (n=42) strongly suggests the BBB is intact during chronic nicotine exposure.

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POS1-130 CYP2A6 ALLELIC FREQUENCIES AMONG AFRICAN AMERICAN LIGHT SMOKERS SEEKING TREATMENT: CORRELATION WITH 3HC/COT RATIOS AND SMOKING

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CYP2A6 is the main enzyme responsible for the metabolic inactivation of nicotine. While studied more extensively in Caucasians, there is little information on CYP2A6 genetics in African Americans (AA), and virtually nothing known in light smokers (<11 cigs/day) seeking treatment. AA metabolize nicotine and cotinine more slowly, they initiate smoking later in life, smoke fewer cigarettes/day and have lower quit rates. This study examined correlates of CYP2A6 genotype in AA light smokers (pilot data n= 234 of 615) enrolling in a smoking cessation study. Allele frequencies for CYP2A6 *1N, *2, *4, *9 and *12 and the new *17 were 0.0%, 1.1%, 0.6%, 9.0%, 2.0% and 7.5% respectively; each was in Hardy-Weinberg equilibrium. Kruskal-Wallis nonparametric testing followed by Mann-Whitney tests were used to assess normal (NM, n=155, no variants), intermediate (IM, n=36, those with 1 copy of *9, *12) and slow (SM, n=43, those with *2, *4, *17 or 2 variants) metabolizers. Rank order differences for baseline 3hydroxycotinine/cotinine (cotinine ratio: an index of enzymatic activity, p<0.001) were seen with means (±SD) for NM 0.385 ± 0.297, IM 0.314 ± 0.353 and SM 0.188 ± 0.118 (NM=IM or SM, p<0.004, IM,SM, p=0.03). Differences were also seen for age of initiation (p=0.008) with means for NM 17.4 ± 5.4, IM 18.47 ± 5.6 and SM 21.1 ± 8.2 (NM vs SM, p=0.002). Baseline cigarette per day (NM 7.7, IM 7.5, SM 7.0) and duration of smoking (NM 23.5, IM 23.4, SM 20.7) showed some non-significant trends; no differences in FTND were seen. These data suggest that even among AA light smokers seeking treatment, genetic variation in CYP2A6 has an impact on smoking behaviours.

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POS1-131 A GENOME-WIDE SEARCH FOR QUANTITATIVE TRAIT LOCI ASSOCIATED WITH NICOTINE METABOLISM

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This study describes results from a search for quantitative trait loci associated with nicotine metabolism in a subsample of families from the longitudinal SMOFAM study. Drug administration and sample collection were conducted in 55 families with three or more smokers among first-degree relatives (224 individuals). Following oral administration of ammonium chloride, subjects were given 2 mg of deuterium-labeled nicotine and 10mg of labeled or unlabeled cotinine (depending on smoking status). Saliva samples were collected at 6, 12, 24, 36, 48, and 60 hours. Cotinine concentration in saliva was determined by gas chromatography-mass spectrometry. Cotinine oral clearance was computed as dose/area under the saliva concentration time curve. The 3’-hydroxycotinine/cotinine ratio in saliva at 8 hours, a marker of the rate of metabolism, was also computed. Family members were genotyped for 763 dinucleotide repeat microsatellite markers distributed across the 22 autosomes (average inter-marker distance < 5 cm). A multistage data checking approach was used to minimize errors in pedigree structure, sample identity, and genotypes. Multipoint LOD score were computed using the QT statistic. Phenotypes with significant linkage peaks included the 3’-hydroxycotinine/cotinine ratio (chromosome 1, 6 cM, LOD score = 2.72). Effort is underway to identify culture variants genes known or suspected to have functional significance of relevance to nicotine metabolism within the regions containing the linkage peaks. Preliminary results support the hypothesis that nicotine metabolism is genetically heterogeneous and multifactorial.

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Substantial interindividual variability exists in the rates of nicotine clearance in humans. Age, sex, and genetic variation in the main nicotine metabolic inactivating enzyme CYP2A6 might influence this variability. Liver samples (n=28) were assessed for their CYP2A6 levels, nicotine metabolism activity, and CYP2A6 genotype (CYP2A6*2, *4, *9, *12). The CYP2A6 alleles investigated are frequent in Caucasians and associated with decreased (or loss of) CYP2A6 function. Liver samples with at least one CYP2A6 variant allele (n=9) had substantially lower CYP2A6 levels (0.8±0.5 vs.2.4±2.5, p=0.02) and Vmax/Km (catalytic efficiency, 0.29±0.23 vs. 0.58±0.58, p=0.04), and trended towards lower Vmax (maximum nicotine metabolism, 17.7±9.7 vs. 30.6±31.4, p=0.2) compared to homozygous wildtype livers (n=19). In those livers without genetic CYP2A6 variants, to limit biases from genetic variation, the impact of age and gender was examined. The wildtype livers in three different age groups (2-9 (n=6), 16-23 (n=6), and 31-53 (n=7)) had similar CYP2A6 levels (1.9±1.8, 3.4±3.9, 1.9±1.2) and activity (28.2±20.5, 46.6±49.5, 18.9±11.9) respectively. However female (n=9) compared to male livers (n=10) had significantly higher CYP2A6 levels (3.5±3.0 vs. 1.4±1.1 p=0.04), Vmax (45.8±40.3 vs. 16.9±9.5 p=0.02) and Vmax/Km (0.65±0.7 vs. 0.34±0.2 p=0.04). The Km (affinity for nicotine) was similar in all comparisons. These results indicate that the higher rates of nicotine clearance observed in wild type individuals, particularly women, is likely due to upregulation of CYP2A6 levels suggesting steroid hormone regulation of CYP2A6-mediated metabolism. Faster CYP2A6 metabolism has been associated with higher levels of smoking, increased failure on nicotine patch, and higher cancer risk.

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POS1-133
NICOTINE AND SMOKING ELEVATE BRAIN CYP2D6: A ROLE IN NEUROPROTECTION AGAINST PARKINSON’S DISEASE?
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CYP2D6 is an enzyme that metabolizes clinically used CNS-acting drugs such as antidepressants, opioids, and endogenous neural compounds such as catecholamines. Genetically reduced CYP2D6 has been associated with an increased risk for Parkinson’s disease (PD), likely via reduced metabolic inactivation of neurotoxins such as paraquat, organophosphate pesticides, and MPTP. The neuroprotective effects of smoking are well documented for PD; smokers are 50% less likely to develop the disease and there is a dose-dependent negative association with its development. The mechanisms are unclear but may involve receptor and enzyme alterations. Nicotine can protect against dopaminergic neuron degeneration in animal models of PD. As CYP2D6 can deactivate many of the PD causing neurotoxins, we hypothesize that the neuroprotective effects of smoking against PD are mediated in part by increased CYP2D6 in the brain. Here we show that CYP2D6 is higher in most brain regions of human smokers, including substantia nigra, an area affected by PD. We also show that in African green monkeys, chronic nicotine treatment (0.3 mg/kg bid., s.c, 18 days) increases CYP2D in brain regions such as cerebellum (1.3 fold, p=0.02) and frontal cortex (1.7 fold, p=0.001). These findings suggest that nicotine is a component of cigarette smoke that may enhance neuroprotection against PD, through induction of the protective metabolic actions of CYP2D6. Efficacy of some centrally acting CYP2D6 substrate drugs may also be altered in smokers, due to changes in local brain metabolism.

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**POS2-1 TEAM SPORTS PARTICIPATION WITH A COACH AND ADOLESCENT INITIATION OF SMOKING AND DRINKING IN A NATIONAL REPRESENTATIVE SAMPLE**

Anna M. Adachi-Mejia*, Ph.D., James D. Sargent, M.D., Jennifer J. Gibson, M.S., Meghan R. Longacre, Ph.D., Madeline A. Dalton, Ph.D., Dartmouth Medical School

**BACKGROUND:** Adolescent involvement in extracurricular activities and sports, particularly with a coach present, may help prevent adolescents from trying smoking or drinking by occupying their time, motivating them to take care of their health, and providing supportive adult role models. We examined this potentially protective relationship between extracurriculars and adolescent initiation of smoking and drinking.

**METHODS:** We conducted telephone surveys with a nationally representative sample of 6522 U.S. adolescents (ages 10-14) in 2003. Participants were asked if they had ever tried smoking or drinking, and how often they participated in: team sports with a coach, other sports without a coach, and other extracurriculars.

**RESULTS:** One-third of adolescents (30.6%) reported weekly and 25.0% reported daily participation in team sports with a coach. Adolescents who were female, had higher grades in school, lived in suburban and rural areas, or were from higher SES families were more likely to participate weekly in team sports led by a coach (p<0.0001). Overall, 29.6% reported weekly participation in other sports without a coach and 25.9% participated daily. Even after controlling for sociodemographics, parent characteristics, family smoking, spending money, school performance, and friend smoking or drinking, daily participation in a team sport with a coach was associated with a lower likelihood of trying smoking (OR=0.67, 95% CI 0.48,0.94) and drinking (OR=0.64, 95% CI 0.45,0.91) compared to no participation. Participating in other sports without a coach was not significantly associated with having tried smoking or drinking. Any participation in school clubs or weekly participation in religious activity was significantly associated with a lower likelihood of trying smoking but not of trying drinking.

**CONCLUSIONS:** Sports participation alone was not associated with a lower likelihood of initiating smoking or drinking. However, participation in team sports led by a coach was associated with a lower likelihood of smoking or drinking initiation. Also, participation in school clubs or religious activity was associated with a lower likelihood of initiating smoking.

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**POS2-2 TOBACCO PREVENTION PROGRAM FOR CHILDREN: A TWO-YEAR LONGITUDINAL STUDY**

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This study compared the efficacy of an environmental approach for obesity prevention in children to an environmental approach for modifying expectancies related to the use of tobacco and other drugs. A total of 743 children in 2nd through 7th grades were enrolled in the Wise Mind study and were assessed at four time points across the two-year longitudinal study. The tobacco prevention program targets children's attitudes and behaviors using the school, home, and Internet contexts. Children participated in a variety of didactic and interactive activities at school, online, and at home involving their peers, teachers, and parents. The environmental approach for weight gain prevention focused upon modification of eating habits and physical activity within the same contexts. The weight gain prevention program resulted in reduction of dietary fat intake, increased carbohydrate intake, and increased physical activity in comparison to the tobacco prevention program. The tobacco program resulted in healthier expectancies for positive and negative consequences of smoking in comparison to the weight gain prevention program and compared to baseline at each assessment point, Wilk's Lambda (3, 627) = .983, p = .01. Significantly fewer children reported smoking for the first time in the tobacco prevention program (3.2%), as compared to the obesity prevention program (5.9%) at 6 months from baseline. Chi-Square (1, N = 735) = 2.94, p = .03. Problem-solving skills and intent to smoke were also impacted favorably in the tobacco prevention program. These findings are interpreted in light of previous prevention programs attempting to influence both attitude and behavior.

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**POS2-3 DEVELOPMENT OF AN INTRANET-BASED TOBACCO PREVENTION PROGRAM FOR FIFTH GRADE STUDENTS**

Judy Andrews*, Judith Gordon, Sarah Hampson, Oregon Research Institute

**INTRODUCTION:** School-based tobacco prevention programs have demonstrated varied levels of effectiveness and may suffer from lack of implementation fidelity. This study aims to develop an optimally effective intranet-based tobacco prevention program for 5th graders to be delivered in the school. The final program will consist of 13-16 effective ‘components’ delivered across eight ‘lessons’ over a four-week period. Each component consists of one or more activities that are designed to change theoretically derived and empirically supported mechanisms that are predictive of children’s intentions to use or use of tobacco. Targeted mechanisms include (a) changing children’s social images or prototypes of tobacco users, (b) changing children’s perceptions of what their peers think about smokers (normative social images of tobacco users), (c) decreasing subjective norms, or beliefs about the proportion of students’ peers who smoke, (d) increasing implicit negative affect toward tobacco use, (e) increasing knowledge of health consequences, (f) increasing risk perceptions of health consequences, (g) increasing self-efficacy through teaching resistance skills, (h) increasing understanding of the power of addiction, (i) decreasing optimism bias, and (j) increasing their perception of cumulative risk.

**METHOD:** Each activity is iteratively evaluated using both qualitative and quantitative research. Initial focus and user groups are conducted to evaluate knowledge acquisition, likeability and usability of each activity. Activities are grouped into components that are changed in an iterative fashion following the focus and user groups. Components are experimentally evaluated in the laboratory to assure that each component is effective at changing the targeted mediating mechanism. Only effective components will be retained in the program.

**CONCLUSIONS:** The usefulness of this iterative, developmental process and lessons learned will be reviewed.

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POS2-4  THE IMPACT OF MIDDLE SCHOOLS ADHERENCE TO THE CDC GUIDELINES FOR PREVENTING TOBACCO USE ON: STUDENT SMOKING RATES, SCORES ON PRE- AND POST-TEST OF STUDENT PSYCHOSOCIAL VARIABLES, PARENTAL SMOKING RATES, AND MOTIVATION TO QUIT

Martha S. Tingen*, Ph.D., Medical College of Georgia, Georgia Prevention Institute; Jeannette O. Andrews, Ph.D., Medical College of Georgia, School of Nursing, Augusta, Georgia

Although there have been minor declines in youth tobacco initiation, rates remain high and increase with each grade of school. The Centers for Disease Control and Prevention (CDC) identified seven recommendations in the School Guidelines for Preventing Tobacco Use and Addiction. The purpose of this study was to examine whether middle school student smoking rates and mean scores at pre and post-test on specific psychosocial variables, and parental smoking and cessation rates were different among schools meeting the CDC guidelines.

METHODS: A descriptive design was used to evaluate the school policies of 23 middle schools in a Southeastern state, where students and parents were enrolled in a tobacco prevention and cessation study. Two sample t-tests were used to examine potential relationships among the identified variables. Also, the number of guidelines met by each school was correlated with student smoking rates, mean scores at pre and post-test, and parental smoking rates using a Spearman Rank correlation coefficient (alpha level of 0.05).

FINDINGS/CONCLUSIONS: Of the 23 schools, one met all seven CDC recommendations, five met 75%, five met 50%, and 12 met 25% or less. Two of the seven CDC recommendations, 'Curriculum' and Tobacco 'Cessation Efforts,' showed statistically significant differences in key student psychosocial variables of intention to use and drug use behavior.

This study was funded by the Georgia Department of Human Resources, Tobacco Use Prevention Section, to the primary author.

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POS2-5  TAILORING TOBACCO MESSAGES TO TARGET ADOLESCENT SMOKERS

Amy M. Duhig*, Ph.D., Indiana University Purdue University-Indianapolis; Amy E. Latimer, Ph.D., Tricia Dahl, B.S., and Suchitra Krishnan-Sarin, Ph.D., Yale University

Although limited research has examined the content of adolescent tobacco prevention messages (Pechman et al., 2003), no research has examined the content of tobacco cessation messages. The goal of this study was to assess ethnically diverse adolescent smokers' (N= 120; 45.0% Caucasian, 40.8% African-American, 9.2% Hispanic, 5% other) preferences for the content and source of persuasive cessation messages. Adolescents completed self-report measures asking them to rate the importance of topics commonly covered in cessation messages (e.g., health risks) in encouraging them to quit smoking and the most believable source of this information. Female smokers reported that appearance-related messages (e.g., "smoking makes you unattractive") are more important in persuading them to quit smoking as compared to male smokers (p = .06; trend). In addition, African-American smokers placed a higher importance on messages emphasizing the fact that tobacco ads and products target teenagers and that smokers are often not accepted by non-smoking peers (i.e., classmates; p < .002 and p = .07; trend, respectively), when compared with Caucasian smokers. Significant differences emerged between light and heavy smokers. Compared to heavy smokers, lighter smokers indicated that the following issues were more important in making them want to quit smoking: 1) short- and long-term health problems, 2) smoking making you unattractive, 3) tobacco ads and products targeting adolescents and 4) being turned down by people that they want to date (all p's < .01). Adolescents indicated that same-age current smokers and successful quitters would be the most believable as the source of smoking cessation information. Findings indicate that distinctions exist by gender and by ethnicity, regarding the content and source of messages that may pique adolescents' interest in smoking cessation.

This study was conducted while the first author was at Yale University School of Medicine. Supported by NIAAA grant P50AA015632.

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POS2-6  DOES THE INFLUENCE OF PARENTS’ AND SIBLINGS’ SMOKING CHANGE DURING ADOLESCENCE: A PROSPECTIVE STUDY

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OBJECTIVE: To prospectively study changes in the influence of parents’ and older siblings’ smoking on adolescent smoking transitions over the course of adolescence.

METHODS: In sample of 5520 children, parents’ and older siblings’ smoking were measured when these children were in 3rd grade. The smoking status of these children was calculated at four grade intervals during their late childhood and adolescence: up to 5th, 5th to 7th, 7th to 9th, and 9th to 12th. The adolescent smoking transitions were: 1) never smoking to trying smoking, 2) trying to monthly smoking, and 3) monthly to daily smoking.

RESULTS: Parents’ smoking influences increased over the course of adolescence, both for the transition from never to trying smoking (p < .05) and for the transition from monthly to daily smoking (p < .01). Surprisingly, the probability, per smoking parent, that parents’ smoking influenced their adolescent to make the transition from monthly to daily smoking in the 9th to 12th grade interval was high: 20% (95% CI: 13%, 28%). In contrast, there was no evidence that older siblings’ smoking influences changed (p > .05) across the grade intervals for any of the smoking transitions.

CONCLUSIONS: In contrast to previous theory, the results provide new evidence suggesting that the influence of parents’ smoking increases during adolescence.

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POS2-7  SCHOOLMATES AND ADOLESCENT SMOKING: WHAT IS THE PROSPECTIVE INFLUENCE OF SAME-AGE AND OLDER SCHOOLMATES’ SMOKING ON ADOLESCENTS’ SMOKING TRANSITIONS?

Jonathan B. Bricker*, Ph.D., M. Robyn Andersen, Ph.D., K. Bharat Rajan, M.S., Arthur V. Peterson, Ph.D., Fred Hutchinson Cancer Research Center

This paper reports the first longitudinal investigation of the extent to which same-age and older (i.e., at least two years older) schoolmates’ smoking prospectively influences adolescents’ smoking transitions occurring between 7th and 9th grade, and 9th and 12th grade. The adolescent smoking transitions were: 1) never smoking to trying smoking, 2) trying to monthly smoking, and 3) monthly to daily smoking. Using data from the Hutchinson Smoking Prevention Project (N = 8,388), results showed no evidence that same-age schoolmates’ smoking influenced any of the adolescent smoking transitions at any of the grade intervals. In contrast, results showed evidence that older schoolmates’ smoking influenced smoking transitions during the 7th to 9th grade interval. For example, the probability, per older schoolmate, that one older schoolmate influenced the adolescent to make the first transition to trying smoking during the 7th to 9th grade interval was 0.6% (95% CI: 0.2%, 1.0%). Results show that schoolmates’ smoking influence may be greatest when: (1) an individual is in the period of early adolescence, (2) a schoolmate is older (e.g., at least two years older) than the adolescent, and (3) the adolescent smoking transition is never to trying. In contrast to recent cross-sectional studies, results suggest that targeting older schoolmates’ smoking exposure on or before the time the adolescent is in the junior high/middle school years (i.e., 7th to 9th grades) may be valuable in preventing smoking.

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POS2-8
A MULTI-LEVEL ANALYSIS OF THE EFFECT OF SCHOOL SMOKING RATE ON THE RELATIONSHIP BETWEEN SMOKING AND DEPRESSION
Michael O. Chaiton, M.Sc., University of Toronto; Bo Zhang, M.Sc., University of Toronto

This study examined how the smoking rate at a school influences the relationship between smoking and depression symptoms among adolescents. Information on tobacco use and CES-D depression symptoms was collected from a randomly chosen sample of 3382 students in grades 7-12 from 126 secondary schools in Ontario, Canada from the Centre for Addiction and Mental Health 2003 Ontario Student Drug Use Survey who had been administered the CES-D questions. The effect of school smoking rate on the relationship of smoking and depression was examined using multi-level regression analyses separately for males and females, controlling for age, SES, and alcohol drinking. Males who reported ever smoking were more likely to report higher current depression symptoms in schools with lower smoking rates than those with higher smoking rates (-3.84, t ratio -2.07, p=0.041). While there was less variation in CES-D scores between schools for females; there was a strong effect of school ever smoking rate on reported current depression symptoms (-4.5, t ratio: -2.41, p=0.017) Contextual effects may be important to understanding the link between smoking and depression in adolescents, particularly in males. Future research and prevention should include environmental determination of smoking and depression. No funding.

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POS2-9
GENDER DIFFERENCES IN THE ASSOCIATION OF OBSERVED FAMILY PROCESSES AND ADOLESCENT CIGARETTE SMOKING EXPERIMENTATION
Mark J. Ersfeld*, Kristen Hewell, Joyce Ho, Lauren S. Wakschlag, Sydney L. Hans

The influence of family context on adolescent smoking is well-established (e.g. Kodl & Mermelstein, 2004; Miller-Day, 2002). However, observed family processes have rarely been studied in regard to youth cigarette smoking patterns (Melby et al., 1993). In this study, we explored the association of observed parent-adolescent relationship quality and boys' and girls' cigarette smoking experimentation. Our sample consisted of 63 urban African-American mothers and their adolescents (mean age=14, 44% girls), from a pregnancy cohort over-sampled for maternal prenatal substance use. Adolescents were classified as either smoking "experimenters" (n = 38, 60%) or "non-experimenters" (n = 25, 40%) based on combined mother and adolescent reports. Observed family processes were assessed in terms of Teen Receptivity and Parent-Teen Connectedness using the Scale of Intergenerational Relationship Quality (SIRQ) (Wakschlag et al., 2001) during a problem-solving discussion. Analyses were conducted for girls and boys separately. Both dimensions of family processes distinguished non-experimenting girls from experimenting girls (Teen Receptivity t(28) = -2.38, p = 03 and Parent-Adolescent Emotional Connectedness t(28) = -2.01, p = 06). However, family processes did not distinguish experimenting boys from non-experimenting boys. Future research should investigate how and why, for urban African-American adolescents in families with high rates of smoking, positive family engagement is not as salient for boys' cigarette smoking experimentation as it is for girls. It is possible that other factors such as peer and same-sex parental modeling are more salient influences on boys' cigarette experimentation. Studies that examine multiple dimensions of family processes and longitudinal patterns of smoking will be important in elucidating individual differences in these pathways.

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POS2-10
OLDER PEERS AND DESIRE TO BE OLDER ASSOCIATED WITH EARLY ADOLESCENT RISK OF SMOKING AND DRINKING
Meghan R. Longacre, Ph.D., Anna M. Adachi-Mejia*, Ph.D., Jennifer G. Gibson, M.S., Todd F. Heatherton, Ph.D., and Madeline A. Dalton, Ph.D., Dartmouth Medical School

BACKGROUND: Youth are more likely to smoke or drink if their same-aged peers do. Little is known, however, about the influence of associating with older peers and desire to be older on adolescent smoking/drinking.

METHODS: We conducted telephone surveys with 2432 youth, aged 9-13, recruited from 26 NH/V/T public schools between 2002-2004. We asked about association with older (>2 years) peers, desire to be 21 years old, ever tried smoking/drinking, and the likelihood of smoking/drinking in the next year if or offered by a friend (susceptibility). Two outcomes variables, smoking risk and drinking risk, were created by combining ever tried smoking/drinking with susceptibility to smoking/drinking.

RESULTS: Overall, 16.7% and 23.4% of adolescents were at risk of smoking or drinking, respectively. Nearly half (46.4%) associated with older peers at least some times, and 63.3% expressed some desire to be 21 years old. Even after controlling for sociodemographics, school, family and peer smoking/drinking parent and child characteristics, and R-rated movie viewing, adolescents who associated with older peers most of the time were nearly twice as likely to be at risk of smoking (OR=1.97; 95% CI 1.17-3.33) and drinking (OR=1.97; 95% CI 1.22-3.19) compared to adolescents with older peers some of the time and never associated with older peers. Those who reported the highest level of desire to be 21 years old were significantly more likely to be at risk of smoking (OR=1.68; 95% CI 1.05-2.71) and drinking (OR=2.17; 95% CI 1.39-3.38) in the fully adjusted model compared to adolescents not wishing to be older.

CONCLUSIONS: Associating with older peers and desire to be 21 are significantly associated with risk of smoking/drinking during early adolescence, supporting the notion that adolescents begin drinking and smoking to appear more mature. These indicators can be assessed easily by parents or pediatricians to identify children at risk for later substance use.

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POS2-11
DOES SOLITARY SMOKING INCREASE ADOLESCENTS’ RISK FOR POOR PSYCHOSOCIAL AND BEHAVIORAL OUTCOMES? RESULTS FROM A NINE-YEAR LONGITUDINAL STUDY
Joan S. Tucker*, Ph.D., Phyllis L. Ellickson, Ph.D., Rebecca L. Collins, Ph.D., and David J. Klein, M.S., RAND Corporation

This longitudinal study utilized data from the RAND Adolescent/Young Adult Cohort Study, initially comprised of over 6,000 youth, to compare grade 8 solitary cigarette smokers (n = 541) to adolescents who restricted their smoking to social settings (n = 562) on adolescent psychosocial functioning and young adult outcomes. Compared to social-only smokers, solitary smokers at grade 8 believed more strongly in the positive consequences of smoking (relaxes you, helps you get away from your problems) and less strongly in the negative consequences of smoking (makes you do poorly in sports, gets you into trouble at school). Solitary smokers also tended to earn poorer grades, engage in more deviant behavior, devote less time to school and athletics, and devote more time to social activities (parties/dances, dating) at grade 8. By age 23, solitary smokers had lower educational attainment, poorer self-rated health, and higher likelihood of alcohol problems. However, solitary and social-only smokers did not differ in young adulthood in engagement in deviant behavior (selling drugs, predatory violence, stealing) or likelihood of drug problems. Although solitary smokers tended to smoke more heavily than social-only smokers, most of the differences between solitary and social-only smokers in adolescence and young adulthood remained after controlling for frequency of smoking at grade 8. In sum, results from this study indicate that solitary smoking during middle school is not uncommon and is associated with a wide range of psychosocial and behavioral difficulties both concurrently and during the transition to young adulthood. From a research standpoint, there is much to learn about patterns of solitary smoking and other forms of substance use during adolescence, what motivates adolescents to engage in solitary use, and the mechanisms through which it is associated with poor outcomes. For health care providers and other practitioners, asking adolescent clients whether they smoke when alone may be a relatively easy and effective way of identifying youth who are in particular great need of substance use prevention efforts and other forms of assistance.

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POS2-12  ADOLESCENT NONSMOKERS: WILLINGNESS, CONFIDENCE AND ACTIONS TO HELP SMOKING PEERS QUIT
Kathleen A. Kealey¹*, Sue L. Mann, M.P.H., Arthur V. Peterson, Jr., Ph.D.; Fred Hutchinson Cancer Research Center

Innovative smoking cessation interventions are needed to reduce teen smoking prevalence. Because adolescent smokers have endorsed ‘help from friends’ as a preferred quitting method, it is of great interest to know the extent to which adolescents are interested in helping their peers who smoke to quit. Using a large (N=8,277), population-based sample of adolescent nonsmokers, this study examines willingness, confidence, and encouragement provided to help others quit. Data were collected via classroom surveys, with classroom and telephone follow-up of absentees, from enrolled high school juniors in 50 Washington high schools. Survey participation was 93.1%. Nonsmokers (50.3% female, mean age 16.7 years) included both never- and former-smokers who reported no smoking during the three months prior to survey. Results: 89% of the nonsmokers reported willingness to help a friend or another student quit smoking; 89% reported confidence that they would be able to help a friend quit smoking; and 44% reported having encouraged friend(s) to quit smoking in the past 12 months. Moreover, 32.2% reported positively on all three outcomes: being willing, confident, and having encouraged friend(s) to quit. Breakdowns by gender, never- vs. former-smokers, number of lifetime cigarettes smoked, and other variables revealed segments of the nonsmoker adolescent population most interested and confident in supporting friends’ quit efforts. These results provide strong motivation for determining how best to capitalize on nonsmokers’ interest in helping their smoking classmates, and for including nonsmokers in smoking cessation interventions.

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POS2-14  THE RELATION OF CHILDREN’S EARLY COGNITIONS TO SUBSEQUENT CIGARETTE USE: A PROSPECTIVE ANALYSIS
Judy A. Andrews¹*, Sarah Hampson, Maureen Barkley, Elizabeth Tildesley, Oregon Research Institute

According to the Theory of Planned Behavior, children’s attitudes combine with subjective norms to influence children’s subsequent intentions and behavior. In this paper we examine if growth in children’s attitude and subjective norms over a four year period, beginning when children are in the 1st through 5th grade, is related to average cigarette use over the past year, reported three years later, when children are in the 7th through the 11th grade. Data are from the Oregon Youth Substance Use Project (OYSUP), an ongoing cohort-sequential longitudinal study, which follows over 900 children for a period of nine years, beginning in elementary school. Attitudes are defined as social images or prototypes of children their age that smoke and subjective norms are defined as perceptions of smoking habits of other kids their age. Latent growth modeling (LGM) was used to estimate the growth parameters of both attitudes and subjective norms, over the initial four assessments (following children from the 1st through 5th grade until the 4th through 8th grade). The model fit the data well (CFI = .978; RMSEA = .036) and the mean and variance of the intercept and slope of both attitude and subjective norms were significant. Using LGM, controlling for age and gender, we predicted smoking in the past year (when children were in the 7th through 11th grade) from the growth parameters of attitudes and subjective norms. Again the model fit the data well (CFI = .979; RMSEA = .031). With both subjective norms and attitude in the model, only the intercept and slope of subjective norms (p<.001, for both) predicted smoking in the past year. However, both the intercept and slope of subjective norms were significantly correlated with the slope of attitude. In a model estimating only the regression parameters of smoking on the intercept and slope of attitude, the slope of attitude significantly predicted smoking (p<.001). Further analyses will examine gender differences. These findings emphasize the importance of early tobacco prevention programs focusing on changing children’s subjective norms or perceptions of use by friends and prototypes of smokers.

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POS2-13  THE INFLUENCE OF PARENT, PEER AND PERSONAL PERCEPTIONS ON PERSISTENT CIGARETTE SMOKING
Arpana Agrawal¹*, Michele L. Pergadia¹, Kathleen K. Bucholz¹, Andrew C. Heath¹ and Pamela A.F. Madden¹; ‘Washington University School of Medicine, St. Louis

The opinions and smoking behavior of parents and peers, along with personal perceptions, have been proposed as correlates of cigarette smoking. We examine the relationship between persistent smoking and 14 risk factors, including parental smoking and approval of smoking, health consequences of smoking, and cigarette provision. We used data from 1,905 male and 2,644 female adolescent and young adult same-sex twins aged 11-23 years. Multinomial logistic regression was used to study the association between individual risk factors and a categorical measure of persistent smoking. Experimenters (< 20 cigs), regular smokers who had quit for at least a month, and current regular smokers were contrasted using each risk factor, and their interactions with gender. All risk factors were associated with persistent smoking. When jointly modeled, peer cigarette use, peer approval of smoking, parent awareness of adolescent’s smoking, romantic partner’s current smoking and peer and self provision of cigarettes were significantly associated with persistent smoking. With the exception of peer provision, which had a stronger influence on all stages of smoking in males, all other correlates were more strongly associated with smoking persistence than with experimentation or smoking cessation. Interactions between peer smoking, peer approval and peer provision were not significant predictors of persistent cigarette smoking. Our findings underscore the role of peer influences, which overwhelm the highly significant univariate effects of parent approval, personal perceptions of the health hazards of smoking and most interestingly, parental smoking. Furthermore, we show that protective effects extend well past the stage of experimentation and influence escalation to persistent cigarette use in adolescent and young adult men and women.

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POS2-15  TOBACCO ADVERTISING ON THE INTERNET
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INTRODUCTION: Higher cigarette prices and the subsequent growth of small, independent Internet tobacco vendors have made Internet users the newest targets for the promotion of tobacco products. This study examines the prevalence and characteristics of New Jersey adults who reported seeing tobacco products advertised on the Internet.

METHODS: Data were analyzed from the 2001, 2002, and 2005 New Jersey Adult Tobacco Surveys (NJATS), a random-digit-dial (RDD) telephone survey conducted with a statewide representative sample. Respondents who reported having access to or used the Internet were asked if they had ever seen tobacco products advertised on the Internet.

RESULTS: The proportion of adult Internet users reporting exposure to tobacco product advertising on the Internet has increased in each survey year (6.9% in 2001, 15.6% in 2002, and 17.8% in 2005). Recall of tobacco product advertising on the Internet was higher among 18-24 year olds and those who reported receipt of direct mail cigarette advertising. In 2005, adult Internet users most often reported seeing tobacco products advertised on the Internet via pop-up or banner ads (57.7%), followed by email messages (25.6%) and websites (12.7%).

CONCLUSIONS: Recall of tobacco advertising by Internet users increased between 2001 and 2005, particularly among certain subgroups. The Internet has created tremendous advertising and marketing opportunities for the tobacco industry, both for major tobacco companies and smaller vendors. There is an urgent need for expanded surveillance of Internet tobacco sales and marketing practices.

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POS2-16

EXPOSURE TO TOBACCO-RELATED MEDIA AND ADVERTISING AMONG OCCASIONAL AND REGULAR CIGARETTE SMOKERS: A COMPARISON OF BIDI AND CONVENTIONAL CIGARETTE SMOKERS

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Much is known about traditional risk and protective factors associated with conventional cigarette use; however, there is a paucity of such research on bidi smoking. Bidis, hand-rolled cigarettes from India, are popular among a subpopulation of US adolescents. This study used a statewide representative survey of Maryland youth to compare conventional smokers and bidi smokers on tobacco-related media and advertising outcomes. Adolescents used in the current analyses (N = 6,593) reported a median age of 14 years, with a gender distribution that was approximately equivalent (51% female; 49% male). Adolescents were classified into 4 groups based on their pattern of smoking and type of cigarette smoked: Occasional Bidi Smokers (n = 59) and Regular Bidi Smokers (n = 180) and Occasional Conventional Smokers (n = 2,628) and Regular Conventional Smokers (n = 3,726). Those individuals reporting both conventional and bidi smoking were excluded from analyses. Multivariate and univariate analyses of covariance and chi-square analyses were conducted to examine differences between the four groups. Bidi Smokers, regardless of their pattern of smoking (i.e., Occasional or Regular), reported less overall exposure to both Pro- (F (1, 6180) = 10.28, p <.001, f^2 = .002) and Counter-Tobacco-related Media and Advertising than Conventional Smokers (F (1, 6180) = 13.16, p <.001, f^2 = .002) at similar or lower levels of bidi exposure. Although Regular Bidi Smokers owned comparable amounts of Tobacco-related Merchandise as Occasional Bidi Smokers, Regular Bidi Smokers were significantly less likely to own tobacco-related advertisement material. Only 24% of Conventional Smokers to own Tobacco-related Merchandise, c2 (3, N = 3,412) = 29.57, p <.001, Crämér’s V = .09; c2 (3, N = 2,459) = 12.01, p <.001, Crämér’s V = .07, respectively. These findings suggest that factors that influence bidi smoking may differ from those related to conventional smoking. As a result, exclusive bidi smokers may challenge existing models of smoking initiation. Future research is needed to better characterize this group of adolescents in order to identify other unique risk and protective factors associated with bidi smoking.

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POS2-17

AN ANALYSIS OF 546 COMMERCIAL NOVELTY POSTCARDS (1901-1959) FROM 20 COUNTRIES, PORTRAYING CHILDREN AS TOBACCO SMOKERS

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Americans first discovered picture postcards during the Columbian Exposition in Chicago in 1893. At this event, images printed on the backs of governmental postal cards served as souvenirs which could be mailed within the U.S. for two cents. Private mailing cards, as we know them today, became a legal means of communication by an Act of Congress passed on May 19, 1898. After this date, individual printers were allowed to illustrate, issue, and sell them. By 1905, postcard use and collection became a popular activity, both in North America and in Europe. Before World War I, millions of German and English postcards, covering a wide variety of topics, were shipped annually to the U.S. Although societal injunctions against children using tobacco were strong during the early 20th century, one relatively common theme portrayed in novelty postcards was the depiction of pipe, cigarette or cigar smoking by children in a variety of winsome poses. Often, boys or girls were mimicking the smoking behaviors of their elders. The authors have accumulated 546 commercial, child-focused, tobacco-related novelty postcards dating from 1901-1959.

FINDINGS: Sixty two percent of this collection are actual photographs and 38% are drawings. These cards, printed in 20 countries, are listed here by production percentage: Germany (25%); England (21%); France (17%); United States (12%); Holland (6%); Belgium (6%); Italy (4%); Austria (3%) and Sweden (3%). Canada, Ceylon, Czechoslovakia, Philippines, Poland, Portugal, Russia, South Africa, Spain, Switzerland and Turkey each produced less than 1%. The children were shown using the following forms of tobacco: pipe (50%); cigarette (29%); and cigar (21%). Interestingly, only 6% of the children were portrayed as being sick or miserable as a result of their smoking activity. In 15% of the sample, infants, toddlers or pre-schoolers were shown smoking. A representative sample of these cards exemplifies the data here presented.

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POS2-18

ADOLESCENT NEVER SMOKERS’ PERCEPTIONS OF CHANGE IN CIGARETTE ADVERTISING IMAGERY FROM 1988-2003

William G. Shadel, RAND Corporation

Tobacco Company marketing practices have changed significantly during the two decades (e.g., substantial budgetary increases, restrictions in potential advertising outlets) in ways that could have an effect on adolescent smokers. A critical gap in the literature is how the model imagery in cigarette advertising may have changed during these last 20 years. Imagery is considered one of the key ingredients of cigarette advertising and information about how that imagery has changed over time has the potential to provide insight into tobacco company marketing practices and what features of that imagery are appealing to adolescents. The purpose of this study was to compare never smoking adolescents’ evaluations of the models displayed by advertisements for four different cigarette brands across three key periods in the recent history of adolescent smoking. A sample of 84 never smoking adolescents (ages 11-17) was recruited using print media for a larger study of adolescents’ reactions to a variety of pro- and anti-smoking print advertising. The design for this study was a 4 (advertising brand type: Kool, Camel, Newport, Marlboro) X 3 (time period: 1988-1989, 1992-1993, 1999-2003) fully within subjects design. Model ratings were made along several theory-driven mediators of the persuasion process (i.e., model likeability, attractiveness). Results revealed that regardless of brand type, cigarette advertisements were rated significantly more positively for more recent years compared to earlier years (all p’s <.033). These significant effects held even after controlling for gender, age, and prior exposure to smoking in the media. These findings should be cause for concern, primarily because they indicate that despite heavy restrictions on where and how cigarettes are advertised, Tobacco Companies appear to have constructed their advertisements to be maximally appealing to adolescent never smokers compared to advertisements from that were developed and used in the past. Thus, future tobacco control efforts need to address the content of cigarette advertisements in order to eliminate its appeal for at risk adolescents.

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POS2-19

A MICROANALYSIS OF CHANGES IN CIGARETTE BRAND ADVERTISING IN 20 POPULAR MAGAZINES FROM 1999-2003

William G. Shadel, Ph.D.; RAND Corporation

Cigarette advertising expenditures in magazines with >15% youth readership increased from November 1998 to June 2000 following the Master Settlement Agreement (MSA) and, as a likely response to public pressure, decreased from 2002 to November 2000. However valuable these studies were to showing Tobacco Companies responsiveness to the MSA and to public pressure, their conclusions could be augmented with a more fine-grained microanalysis of the actual frequency with which cigarette advertisements for specific brands appear in magazines that vary in level of youth readership. In the current study, every issue of 20 popular magazines from January 1999 to December 2003, each with varying degrees of youth readership (i.e., 11% for People to 27% for Vogue), was scanned for cigarette advertisements. Each cigarette advertisement was coded for brand, content, and year/issue/page(s) on which the advertisement appeared. Analyses have thus far focused on changes over time in specific brands advertised as a function of youth readership (<15% for low youth readership magazines [LYR] and > 15% for high youth readership magazines [HYR]). Several interesting patterns have emerged from these analyses. Many brands (e.g., Newport) maintained a steady advertising presence in magazines over time, regardless of percentage of youth readers. Some brands (e.g., Marlboro) decreased significantly in advertising frequency over time in both LYR and HYR (p < .030). Still other brands (e.g., Camel) decreased in advertising frequency from 1999-2002 across both LYR and HYR, but were advertised more frequently in LYR and HYR in 2003 (p < .05). These data extend previous studies of advertising expenditures by tracking every brand advertised in every issue of 20 magazines over a 5-year period. Although recent agreements between some Tobacco Companies and some magazine publishers may further restrict magazine advertising in venues where youth may be exposed to it (e.g., high school library copies of magazines), the present micro-analysis suggests that a closer inspection of brand specific advertising in particular outlets over time is warranted.

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POS2-20  PARENTAL ATTITUDES ABOUT SMOKING AND DRINKING IN THE MOVIE RATING SYSTEM
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BACKGROUND: Based on evidence indicating that children with greater exposure to smoking in the movies are more likely to initiate smoking themselves, public health campaigns have suggested that movies containing smoking be rated R. Critics claim that parents have not expressed a desire for the rating system to reflect smoking. The extent to which parents are concerned about their children’s exposure to health risk behaviors in the movies (such as smoking and drinking) is largely unknown. Objective: We explored parental attitudes regarding the inclusion of smoking and drinking as additional criteria for the Motion Picture Association of America (MPAA) movie rating system.

DESIGN: N=2435 parents of children in grades 4-6 recruited from 26 NH and VT public schools between 2002-2004 were surveyed by telephone. Semi-structured interviews were conducted with a random sub-sample of 60 parents.

RESULTS: A majority of parents believed that the MPAA rating system should also be based on whether there is smoking (51.9%) or alcohol use (65.9%) in the movies. Further, 29.0% and 41.9% of parents reported that movies with cigarette smoking or alcohol use, respectively, should be rated R. Parents were significantly less likely to endorse these beliefs if they or their spouse smoked or consumed alcohol. In-depth interviews revealed that parents who wanted to know whether smoking or drinking occurred in a movie were most concerned because their child might model these behaviors, especially when the portrayed behavior was positive. Conversely, parents who were less concerned if a movie contained smoking or drinking cited their child’s existing exposure to these behaviors in “real life” as more significant than exposure vis-a-vis the movies.

CONCLUSIONS: The MPAA rating system was designed as a guide for parents to decide appropriate movie selections for their children. Current criteria for the MPAA rating system do not address whether smoking or drinking occurs in the movie. Therefore, we recommend that the MPAA rating system be modified to include additional criteria.

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POS2-21  PHASES IN DESIGNING A TOBACCO COUNTER-MARKETING CAMPAIGN FOR AFRICAN-AMERICAN YOUTH IN DC

Tobacco products are heavily marketed in the District of Columbia, and certain ones are marketed disproportionately to African Americans (AAs) (mentholated, discount, generic brands) and youth. Without preventive intervention, many AA children in our nation’s capital are highly vulnerable to initiate a lifelong smoking habit and develop cancer. To address this crisis, we developed and pilot tested a school-based smoking prevention intervention for DC AA youth built upon principles of counter-marketing (i.e., use of commercial marketing tactics to counter pro-tobacco influences and increase pro-health messages).

Our study was carried out in two phases. In Phase I, online tobacco industry documents (www.tobaccodocuments.org) were searched to identify marketing references to AAs and youth. A qualitative approach was used to analyze 200+ records and identify common marketing themes and tactics. The resulting categories included (1) recruiting new smokers via industry studies of youth culture, (2) understanding regional differences affecting smoking uptake, maintenance, and brand loyalty via industry studies of AA culture, (3) prominent investments in AA community, ethnic, and cultural events to enhance the industry’s image, (4) lower income smokers and youth in urban areas to make smoking affordable, and (5) AAs via geography and urbanicity. In Phase II, focus groups were conducted with AA students in Grades 6-8 attending 1 of 4 middle schools located in low SES DC wards hardest hit by cancer. The focus groups determined students’ knowledge, attitudes, intentions, and beliefs about smoking and the tobacco industry. All data were analyzed qualitatively and revealed that the sample had low levels of awareness of the tobacco industry’s targeting and marketing tactics. Being informed of these tactics produced negative affect, feelings of social injustice, and a desire to effect anti-tobacco and pro-health change at the individual, local, and societal levels among students. The process of combining the results of Phases I and II into a school-based counter-marketing campaign is ongoing and a pilot evaluation is scheduled for the Fall of 2005.

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POS2-22  HOW DO PSYCHOLOGICAL FACTORS INFLUENCE ADOLESCENT SMOKING PROGRESSION? THE EVIDENCE FOR INDIRECT EFFECTS THROUGH TOBACCO ADVERTISING RECEPIENCY

The objective of this study was to determine whether novelty-seeking and depression symptoms had mediated or indirect effects on adolescent smoking progression through tobacco advertising receptivity. Over 1000 adolescents were followed from grade 9 to grade 12 and completed annual surveys that measured demographics, smoking behavior, tobacco advertising receptivity, novelty-seeking personality, depression symptoms, family and peer smoking, alcohol use and marijuana use. Latent Growth Modeling indicated that novelty-seeking had a significant indirect effect on smoking progression through baseline tobacco advertising receptivity (beta=.003, z=2.026, p =.043). For each standard deviation increase in novelty-seeking, the odds of being more receptive to tobacco advertising increased by 12% (i.e., being in a specific category or higher), which in turn, resulted in an 11% increase in the odds of smoking progression from 9th-12th grade. The indirect effect from depression symptoms to smoking progression did not reach significance (beta=0.201, z=1.856, p =.064). These findings may inform future research on other factors that influence tobacco advertising receptivity, and inform programs aimed at preventing adolescent smoking initiation and progression.

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POS2-23  DEVELOPMENT AND VALIDATION OF A SMOKING MEDIA LITERACY SCALE
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BACKGROUND/PURPOSE: Adolescents are exposed to 8.5 hours of mass media daily, and exposure to smoking mass media messages is associated with increased smoking. Thus, media literacy presents a promising framework for innovative tobacco control programs. We aim to develop a reliable smoking media literacy (SML) scale and to test its criterion validity by examining associations between SML scores and measures of smoking.

METHODS: Likert-type scale items (120) were developed based on a comprehensive theoretical framework of media literacy with eight core concepts. Items were eliminated or altered based on expert and student reviews. The resulting 51-item scale was given to all available students at a local high school (N=1216), iterative principal components analysis (PCA) aided scale development. Criterion validity was tested by determining associations between media literacy scores and the major predictors of smoking based on the theory of reasoned action: current smoking (last 30 days), intention to smoke (Pierce susceptibility), smoking attitudes, and smoking norms.

RESULTS: PCA revealed one strong factor representing all eight media literacy core concepts. Internal consistency of the final 18 item scale was excellent (Cronbach’s alpha=.88). SML was lower in current smokers (p<.0001) and those susceptible to smoking (p<.0001) and norms (p<.0001). After controlling for all demographics and measures of smoking, the effect on smoking progression did not reach significance (beta=.001, z=1.856, p =.064). These findings may inform future research on other factors that influence tobacco advertising receptivity, and inform programs aimed at preventing adolescent smoking initiation and progression.

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POS2-24  PSYCHOSOCIAL CORRELATES OF CIGARETTE, CIGAR, AND WATERPIPE USE IN COLLEGE FRESHMEN

Stephanie Y. Smith*, Barbara Curbow

OBJECTIVE: To explore the association of psychosocial characteristics (i.e., demographics, social norms, pluralistic ignorance, and risk perception) with tobacco use (i.e., cigarette, cigar, and waterpipe) in college freshmen.

DESIGN: The data are from a cross-sectional internet survey administered to college freshmen attending a private university during the 2003-2004 academic year, N=411.

METHODS: Multinomial logistic regression was used to determine differences in psychosocial correlates of tobacco use (i.e., never, ever, current). Results: The psychosocial profiles of tobacco smokers differed by type of smoker and by type of tobacco smoked. Overall, 17 psychosocial characteristics were associated with ever and current use (p<0.05). Compared to never smokers, current cigarette smokers spent >=$30 weekly, were highly influenced by peers to smoke and found smoking to be highly socially acceptable, and believed in physiological benefits when using cigarettes alone. Current cigar smokers were male, spent >=$30 weekly, were highly influenced by peers to smoke cigars and waterpipe, found cigars highly socially acceptable, believed the likelihood becoming addicted when using cigars socially was low. Current waterpipe smokers were male and White, spent $0-$29.99 weekly, were highly influenced by friends and believed peers looked cool when smoking waterpipe, overestimated peer 30-day waterpipe prevalence; believed the likelihood of getting sick when using waterpipe socially and the likelihood of becoming addicted to waterpipe when using alone was low.

CONCLUSIONS: College freshmen are exposed to and experiment with a variety of tobacco products. The findings suggest the importance of psychosocial attributes of tobacco use and the need to target substance use prevention and treatment efforts on college campuses specifically by type of user and by type of product used. The tobacco control community needs not only to pay attention to conventional forms of tobacco but all forms of tobacco use.

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POS2-25  STATE-SPECIFIC EFFECTS OF WITHDRAWAL IN COLLEGE SMOKERS

Carla J. Rash*, M.A., Michael S. Businelle, M.A., Darla E. Kendzor, M.A., Scott M. Patterson, M.A., and Amy L. Copeland, Ph.D., Louisiana State University

The current study considered implications of the state-specific learning theory applied to withdrawal conditions of college cigarette smokers. A central question under consideration was whether withdrawal states produce state-specific learning effects in a college recall test for smokers. This is an important question as most treatment programs introduce cessation and relapse prevention coping skills while participants are in a state of physiological withdrawal. A 2 x 2 design was used to investigate state-specific learning effects in smokers during nicotine withdrawal using a list of 20 common words. State at learning (smoking (S) or withdrawal (W)) was crossed with state at recall (S or W) resulting in 4 experimental conditions: WS, WW, SW, and SS. Inclusion criteria specified smoking at least 10 cigarettes per day for at least one year. College smokers (N=99; 66% female) participating through the psychology experiment pool were randomly assigned to condition at baseline assessment, and returned the following day for the learning trial. Twenty-four hours following the learning trial, participants were asked to recall words from the learning trial. Nicotine withdrawal was defined as a minimum of 12 hours abstinence from smoking. During non-withdrawal periods, participants were permitted to smoke at their normal rate prior to the experimental task. Measures of urge to smoke, nicotine withdrawal, nicotine dependence, and affect were also collected. A state-specific effect on recall was not found, F(1, 94)=1.25, n.s. Contrary to studies using heavy smokers, these findings indicate that state-specific effects are not a factor for college smokers. This may be due, in part, to the lower rate of smoking and to the variable patterns of smoking found in this population.

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POS2-26  INITIAL REACTIONS TO SMOKING PREDICT RISK FOR LIFETIME REGULAR SMOKING IN A POPULATION-BASED SAMPLE OF YOUNG ADULTS

Claire A. Bush*, Scott H. Kollins, Ph.D., Bernard F. Fuemmeler, Ph.D., M.P.H., F. Joseph McClernon, Ph.D., Duke University Medical Center

Previous research has provided mixed results with respect to the relative contributions of pleasurable versus unpleasant initial reactions to smoking as predictors of subsequent smoking status. The aim of this study was to further explore this relationship in The National Longitudinal Study of Adolescent Health (Add Health) dataset, a nationally-representative sample of young adults (N=9402 for the study sample). Nine items from Wave III of the Add Health survey asked about initial reactions to smoking. We first conducted exploratory factor analysis on these items, which yielded a 2-factor solution, with one item that did not load on either factor (dizziness). The factors were generally associated with Pleasurable and Unpleasurable initial reactions. Logistic regression was then used to predict subsequent regular smoking. Pleasurable initial reactions were associated with a greater probability of being a regular smoker after adjusting for age, ethnicity, gender, and education level (O.R. = 1.78, 95% C.I. = 1.71-1.86); while Unpleasurable initial reactions were associated with a lower probability (O.R. = 0.91, 95% C.I. = 0.89-0.93). These results add to previous work by demonstrating that initial reactions to smoking play a role in predicting later smoking risk. Further work is necessary to identify the mechanisms that underlie this relationship.

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POS2-27  ASSESSING COLLEGE STUDENTS’ AUTONOMY OVER SMOKING WITH THE HOOKED ON NICOTINE CHECKLIST

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The Hooked on Nicotine Checklist (HONC) is a 10-item instrument designed to measure symptoms of diminished autonomy over smoking, a key aspect of dependence. Autonomy is diminished when symptoms present a barrier to cessation. In this study we explored the psychometric properties of the HONC among 300 college students who were current smokers. Sixty percent of subjects did not smoke every day and 31% had smoked on fewer than 10 of the preceding 30 days. Factor analysis revealed that the HONC measures a single dimension; internal consistency was high (alpha = 0.89), as was concurrent validity. HONC scores were higher among subjects who began smoking at a younger age, smoked every day, smoked more cigarettes per day, smoked within an hour of arising, had ever attended a smoking cessation program, were less confident about their ability to quit, or predicted they would be smoking in five years. Never daily smokers reported nine of the ten symptoms although at lower rates than subjects who had ever smoked daily. In a logistic regression, after controlling for smoking frequency the HONC predicted the likelihood of a failed cessation attempt, with each additional symptom doubling that likelihood. Addition of the HONC score to the logistic regression removed the measures of tobacco consumption as predictors. This suggests that the HONC is more valid than cigarette consumption as predictors. This study confirms that symptoms of diminished autonomy can be present in people who have never smoked daily.

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POS2-28  EXPRESSIVE WRITING AS A SMOKING CESSATION TREATMENT ADJUNCT FOR YOUNG ADULT SMOKERS

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Since 1983 smoking in young adults has remained stable, with a prevalence of 24%. Despite the high prevalence of smoking in young adults, few interventions have been designed specifically for this group. This study examined the efficacy of expressive writing as a treatment adjunct for smoking cessation. Participants included 196 smokers aged 18-24 years (N=20 years, SD=2.86 male, 110 female; 93% white). A randomized, two-group design was employed with 52 weeks of follow-up. Participants were randomized to smoking cessation only (N=99) or expressive writing plus smoking cessation (N=97). Both conditions received 4 individual visits plus 6-weeks of transdermal NRT which began on the quit day following the week 2 visit. The expressive writing condition wrote for 2 consecutive days pre- and 3 consecutive days post-quit day. The smoking cessation group completed a control writing assignment. At end of treatment (week 8), biochemically confirmed 7-day point-prevalence abstinence for the expressive writing condition was significantly greater than for the smoking cessation condition (33% vs. 20%, p=0.043, OR=2.05 95% C.I. 1.0 to 3.7 from logistic regression adjusting for gender). At 24 and 52 weeks, abstinence rates were similar for expressive writing vs. smoking cessation (12% vs. 11% at 24 weeks; 11% vs. 11% at 52 weeks). The results suggest that expressive writing has promise as a treatment adjunct for smoking cessation for young adults, but lengthier interventions or the use of boosters should be tested to extend treatment effects.

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POS2-29  COLLEGE STUDENTS’ SMOKING BEHAVIOR: DAILY VS. OCCASIONAL SMOKING

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The smoking rate among college students, who make up over a third of the 18-24 year old population, has been increasing at an alarming rate. Prior research suggests that college smoking patterns are unique, however standard characterizations of smoking status (e.g., never, former, current smoker) are frequently used with this population, potentially obscuring important differences between subtypes of smokers. In order to explore smoking subtypes, a convenience sample of college students (N=823) at a northeastern university completed a web-based survey of smoking and health. Participants were 90% white, 2% African American, 5% Asian and 3% Hispanic, average age was 20.14 (SD=1.47); 83% of the sample were female. Of the 823 participants, 64% (n=519) reported having smoked a cigarette in their lifetime and 25.3% (n=207) reported smoking 100 or more cigarettes in their lifetime. Current smoking was reported by 24.2% (n=198) of the students, with 50% (n=99) reporting daily smoking and 50% (n=99) reporting occasional smoking. Differences between daily and occasional smokers were examined in terms of smoking behavior and associated psychosocial variables. Occasional smokers reported significantly (p<0.05) lower levels of nicotine dependence (FTND), smoking fewer cigarettes per day, and were less likely to identify as a smoker. Additionally the setting they smoked in (social vs. alone, weekend vs. weekday, evening vs. day) differed significantly (p<0.05). Cessation barriers differed with occasional smokers citing the presence of other smokers as the greatest barrier to quitting. Significant differences (p<0.05) on psychological variables including depression and stress were also found.

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POS2-30  THE OCCASIONAL SMOKER: NOT YOUR AVERAGE SMOKER

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The Canadian Tobacco Use Monitoring Survey (CTUMS) is an ongoing random digit dialling survey of over 20,000 Canadians 15 years of age and older, with half the sample consisting of 15-24 year olds. Over time occasional smokers represent a greater proportion of current smokers (18% in 1994 compared to 23% in 2004). They smoke more cigarettes on weekends regardless of sex, age group and occupational status. Two-thirds of occasional smokers under age 25 report attending school compared to 37% of daily smokers. A greater proportion of occasional smokers believe that smoking should be prohibited in restaurants (46%) and in bars (21%) compared to daily smokers (34% and 11% respectively). Two-thirds of current daily smokers report reducing the number of cigarettes smoked as a quitting strategy, in close agreement with 86% of occasional smokers report having ever been daily smokers. Half of occasional smokers report no quit attempts lasting 24 hours in the past year. Of those who did make such an attempt, 16% report that none of these attempts lasted one week. One-third report starting to smoke again because their family/friends smoke or they were going out more (e.g., bars, parties) compared to 15.6% of daily smokers. As occasional smokers become a larger fraction of current smokers, research targeted at untangling the composition of this group should be undertaken to better understand its dynamics, specifically how daily smokers evolve into occasional smokers on the road to quitting, and occasional smokers who never evolve into daily smokers.

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POS2-31  COLLEGE STUDENT BELIEFS REGARDING CIGARETTE EXCISE TAX INCREASES

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Cigarette taxation is an effective tobacco control strategy. In addition to facilitating smoking cessation across age groups, higher taxes are associated with less adolescent experimental smoking. Mississippi has one of the lowest state cigarette excise taxes in the country. We assessed the level of support for raising the state excise tax among students at a large, four-year, public university in Mississippi. Data from 1,769 usable surveys (88.7% response rate) gathered from a random sample of undergraduate classes were analyzed. Approximately 31% of the respondents were classified as current (past 30-day) smokers, with 9.3% reporting current daily smoking. Despite considerable publicity on legislation to raise the tax, only 3% of the students were able to estimate the current excise tax within 100% of the actual level; most students (90%) said they did not know. Over two-thirds (68.3%) expressed support for a $1/pack increase in the excise tax and 71.3% would support a $ 0.50 increase. More nonsmokers supported a tax increase (83.9% vs. 37.2% for $1 increase; 86.0% vs. 42.6% for a $0.50 increase). In a multivariate analysis, students more likely to support a tax increase included those with higher GPA’s and nonsmokers. Alcohol consumption status, gender, Mississippi resident status, Greek status, and year in school were not significant predictors in the multivariate model. Opinions differ between college smokers and nonsmokers, but both substantially support a cigarette tax increase, despite the absence of potential uses of tax revenues on the survey. While the societal impact of such tax increases needs to be considered, the public opinion among this segment of the population for a cigarette tax increase appears favorable.

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COMMERCIAL SOURCES OF CIGARETTES FOR COLLEGE STUDENTS

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Understanding how and where young adults acquire tobacco products is important for implementing effective tobacco control strategies. For example, some are concerned that the Internet is becoming a source of tobacco products for minors. Other studies have addressed the acquisition of tobacco products from noncommercial sources. In a university where tobacco products are still available on campus, it is important to assess how many students acquire tobacco products via this venue. To assess common commercial sources of cigarettes among college students, we analyzed 1,769 usable surveys (88.7% response rate) gathered from a random sample of undergraduate classes at a four-year institution. Approximately 31% of the respondents were classified as current (past 30-day) smokers, with 9.3% reporting current daily smoking. Current smokers indicated where they buy cigarettes and could select multiple options. The most common purchase site was gas stations (84%), followed by tobacco specialty stores (21%). Fewer than 1% buy cigarettes on the Internet, and 11% buy cigarettes on campus. A small group of mostly occasional smokers checked no sources, and we infer they borrow from friends. Daily smokers were more likely to report using tobacco specialty stores. In addition, a substantial portion of current smokers reported that they use their campus account card (typically funded by parents) to buy cigarettes on campus (41%) and off campus (22%). Daily smokers were more likely to report both behaviors. College campus health personnel must learn where students acquire cigarettes to inform policy changes. While this study assessed commercial cigarette sources, noncommercial sources are likely more important among occasional and experimental smokers.

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THE DEVELOPMENT AND ASSESSMENT OF NICOTINE DEPENDENCE IN YOUTHS-II (DANDY-II)

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A cohort of over 1200 6th graders, were interviewed 10 times through the 9th grade (three each school year). In confirmation of the DANDY I study, symptoms of dependence emerged soon after smoking initiation. Two-thirds of subjects who met IDC-10 criteria for nicotine dependence did so prior to the onset of daily smoking. Subjects were divided at the median according to how quickly they developed symptoms of lost autonomy as measured by the Hooked on Nicotine Checklist. Girls were approximately four-fold more likely to have a faster onset (p = .03), confirming the results from DANDY I. Maternal, paternal, sibling and peer smoking were not related to the speed of onset. Girls were also much more likely than boys to develop IDC-10 dependence (OR= 3.0, p = .05). Among never smokers at baseline, the following factors predicted progression to inhaling from a cigarette: negative coping skills, avoidant coping, impulsivity, risk taking, novelty seeking, low self-esteem, poor problem solving, distractibility, availability of tobacco, parental, peer and sibling smoking; positive coping skills were protective. Among inhalers, the subsequent loss of autonomy over tobacco and IDC-10 dependence was predicted by the experience of relaxation in response to the first inhalation (p = .01). Among the many psychosocial factors measured, only manifest anxiety, depression, and negative self-esteem predicted the onset of dependence among youths who had tried smoking. In other words, many personality and social risk factors increase or decrease the likelihood of experimentation but do not influence the development of dependence once exposure to the drug has occurred. This suggests that dependence might be driven primarily by the individual’s neurophysiology rather than psychologic characteristics.

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INDICATORS AND MEASUREMENT ITEMS FOR OUTCOME EVALUATION IN YOUTH SMOKING CESSATION INTERVENTIONS

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The purpose of this project is to recommend selection of a standard set of measures for outcome evaluation of youth smoking cessation interventions, and identify key measurement issues. This work is a collaboration between Health Canada, the Canadian Tobacco Control Research Initiative, and the Youth Tobacco Cessation Collaborative. The population of interest is youth 14-18 years of age. A review of the published and grey literature was conducted on measurement of smoking cessation intervention outcomes. Recognized Canadian and American experts in youth cessation and evaluation provided input and reviewed the product produced. The literature acknowledges many challenges associated with measurement of youth smoking behaviors, particularly with regard to cessation. The existing measures are not ideal; however, they still provide useful information in situations where decisions must be made regarding better practices. Three indicators of behavior change are recommended: (1) abstinence, (2) reduction, and (3) quit attempts. Six items from the Helping Youth Smokers Quit project are recommended as part of a core set of core measures. Measurement (and consequently program evaluation) of youth smoking cessation outcomes remains a pressing challenge. How can we best address post-intervention measurement issues such as biochemical validation, follow-up timing, and intent-to-treat vs. attrition analyses? Are concepts such as “slips” relevant in youth cessation? And importantly, are the measurement items we are using meaningful to youth? Gaps where there is either no consensus or there is no item currently developed to measure a concept of interest will be discussed.

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RACIAL/ETHNIC DIFFERENCES IN CONSISTENCY OF SELF-REPORTED SMOKING OVER A SIX YEAR INTERVAL FROM ADOLESCENCE TO YOUNG ADULTHOOD

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Given the wide spread use of survey-based data in tobacco research, this study examines the consistency of adolescent self-reports of cigarette smoking over a 6-year time interval and patterns of inconsistent reporting according to sociodemographic subgroups and psychological covariates. Using nationally representative data from the National Longitudinal Study of Adolescent Health, a series of multivariate models were used to examine predictors of inconsistent reporting of smoking from the first wave of adolescent interviews compared to the third wave of young adult interviews. The median age of Wave 1 respondents (N=20,572) was 16 years of age with 59% Non-Hispanic White, 23% Non-Hispanic Black, 7% Hispanic, 3% Asian and 8% Other. Wave 3 consists of 15,170 Wave 1 respondents who were re-interviewed 6 years later (18-26 years old). Inconsistent reporting was identified in 9.7% of young adults who denied any lifetime smoking at Wave 3 despite reporting various stages of smoking at Wave 1. For example, 22% of young adults at Wave 3 who denied lifetime smoking endorsed puffing, light, occasional, or daily smoking at Wave 1. These discrepancies may reflect recall distortions, possibly due in part to age or infrequent smoking patterns. However, our findings also show that minority youth were more likely to inconsistently report across smoking stages compared to Non-Hispanic White youth, even in models controlling for age, gender, and poverty level. In multivariate analyses, Non-Hispanic Black respondents were more likely to report having never smoked at Wave 3 despite reporting 6 years earlier that they had been puffers (OR 1.78 (1.07-2.98), p<.05), light smokers (OR 3.98 (2.14-5.33), p<.001), or occasional smokers (OR 5.00 (2.77-9.04), p<.001) were more likely than females to report at Wave 3 having never smoked or only puffed when they had reported daily smoking at Wave 1 (OR 0.25 (0.12-0.55), p<.001). Further research is needed to better understand factors that impact youth’s honesty in reporting substance use and the extent to which response and recall distortions impact how we interpret longitudinal survey results for specific subgroups of youth.

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POS2-36  EFFECT OF AUDIOTAPING ON ADOLESCENTS’ SELF-REPORTS OF SMOKING AND SUBSTANCE USE

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Audiotaping is often used for quality assurance in research interviews. However, little is known about whether taping may suppress adolescents’ reports of socially undesirable behaviors, such as smoking and substance use. The objectives of this study were to examine characteristics of adolescents who refuse to be taped, to evaluate the acceptability of taping, and to determine whether taping affects self-reports of smoking and substance use. Participants were 492 adolescents, aged 12-17 (mean=13.9, 52.6% female, 80.2% Caucasian) enrolled in the Transdisciplinary Tobacco Use Research Center/New England Family Study. As part of a larger assessment, measures of tobacco and substance use were obtained by structured diagnostic interview. At the end of the interview, subjects completed a self-report measure to assess their experience with the interview. Half of the subjects were asked to consent to be audiotaaped as part of a quality assurance plan; 47% refused. There were no differences in refusal rates based on demographic variables. A series of t-tests indicated that audiotaaped subjects did not differ significantly in self-reported honesty, comfort with the interview, concern about confidentiality, or ratings of interviewer empathy and professionalism. A series of logistic regressions were conducted to determine whether audiotaping suppresses subjects’ self-reports of tobacco or substance use. After controlling for age, there were no significant differences by audiotape status in the percentage of subjects who reported ever smoking (even a puff), weekly smoking, daily smoking, or current smoking. There were also no differences by audiotape status in rates of self-reported alcohol or marijuana use (ever used, used in past year, or used weekly in past year). In summary, although many adolescents refused to be audiotaaped, voluntary taping had little impact on honesty of responding to potentially sensitive questions about smoking and substance use. Subjects who were concerned about the personal nature of the interview appeared to decline taping, and taping did not appear to have a negative effect on rapport.

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POS2-37  VALIDITY OF ADULT RECALL OF ADOLESCENT TOBACCO USE AND AFFECT: THE LIFETIME TOBACCO USE QUESTIONNAIRE

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The Lifetime Tobacco Use Questionnaire (LTUQ) is a Web-based instrument under development, which aims to collect psychometrically sound data on tobacco use across the lifetime. In 2004-2005, the LTUQ was administered to 204 adults (mean age 32.4 yr, 1.5SD) who had participated as children in a longitudinal study on adolescent development, which aims to collect psychometrically sound data on tobacco use. These results suggest recall validity of adult reports of ever use, age of first tobacco use, and weekly amount of use. It also appears that adult recall of affect prior to first tobacco use has reasonable correspondence with depressive symptoms when assessed in adolescence.

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POS2-38  SMOKING ACQUISITION ASSESSMENT IN A NATIONAL SAMPLE OF UNDERAGE ADOLESCENTS

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Adolescent smoking is often portrayed as an all-or-nothing phenomenon. A classification based solely on the number of days smoked does not measure the process of change that moves adolescents toward smoking initiation. Underage youth from the NSDUH public-use file (N=13,638) were classified into one of the TTM’s 5 Stages of Smoking Initiation: Precontemplation (PC), Contemplation (C), Preparation (P), Action (A) and Maintenance (M). This study assessed whether the stages were better at understanding vulnerability relative to prevalence measures. Youth who had never smoked but did not express a firm commitment not to smoke in the future (i.e., C) reported significantly higher mean scores on the smoking risk factors relative to non-smoking youth who reported a firm commitment not to smoke in the future (i.e., PC). Specifically, youth in C reported significantly more favorable attitudes toward substance use; higher levels of illicit substance use, fighting, risk-taking and lower levels of religiosity (p’s < .001) relative to youth in PC. Similarly, youth who were currently smoking at different levels (i.e., P vs. A/M) differed on the majority of these risk factors. Results suggest that collapsing across levels of smoking into a dichotomous measure of prevalence loses critical information. Exploratory analyses revealed that youth differed dramatically on their level of past month illicit substance use by Stage. Of the regular smokers (i.e., youth in A/M) one-quarter reported hard substance use, over half reported marijuana use, and almost two-thirds reported alcohol use, whereas the non-smokers (i.e., PC/C) reported minimal use of other substances (6% for alcohol, 1% for marijuana, and 2% for hard substances). A more sensitive measure of the process of smoking initiation will aid in the design and implementation of more effective prevention interventions.

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POS2-39  ACUTE AND CHRONIC EFFECTS OF SMOKING ON LUNG FUNCTION IN TOBACCO DEPENDENT ADOLESCENTS

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Numerous studies provide evidence of the detrimental effects of smoking on the respiratory system, yet few investigate adolescent smoke exposure in relation to pulmonary function. Our aim was to investigate smoking behavior and exposure on pulmonary function among adolescents. Fifteen adolescent smokers (mean age 15.7 SD 1.2 years, 60% female, 80% Caucasian, mean years smoking 2.9 SD 1.9, mean Fagerstrom Test for Nicotine Dependence 5.8 SD 2.1, mean cigarettes per day 15.1 SD 6.7) performed a pulmonary function test before and after smoking a single cigarette for a puff topography experiment, prior to participating in a randomized placebo-controlled treatment trial. Regression analyses revealed that chronic tobacco exposure measured in pack-years was associated with a marked reduction forced expiratory flow 25% to 75% (FEF25%-75%), (p = .014). Furthermore, puff topography measures demonstrated an inverse relationship between mean puff velocity and both forced expiratory volume in one second (FEV1), (p = .017) and FEF25%-75% (p = .037). Although cautioned by a small sample size, these preliminary findings indicate a measurable impact of smoking on pulmonary function among heavy adolescent smokers, and suggest a specific contribution of puff velocity to that decline.

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POS2-40 PATTERNS OF DSM-IV NICOTINE WITHDRAWAL ACROSS SEX AND COHORTS IN U.S. ADOLESCENT AND AUSTRALIAN ADULT TWINS
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We examined variations in DSM-IV nicotine withdrawal (NW) across sex and age cohorts in adolescent and young adult regular smokers. Data: telephone diagnostic interview in 3277 Missouri girls and boys (80% girls; age: 15-21), and 6,257 Australian women and men (55% women; age: 24-36). Overall, no sex or cohort difference emerged in rates of NW (44%). NW was significantly associated with smoking persistence (SP; OR=1.9), heavy smoking (HS: >20 cigarettes/day, OR=2.3), difficulty quitting (more strongly in adults (OR=4.9) versus adolescents (OR=3.1)), DSM-IV major depression (MD), OR=2.9), and social anxiety (SA, OR=1.9). Across cohorts, males with NW reported more decreased heart rate, trouble sleeping, SP and HS and less depressed mood upon NW (DM) and MD than females (p<0.05). Across sex, adults with NW reported less nervousness, DM, SP, and SA, and reported more restlessness, increased appetite, HS and MD compared to adolescents with NW (p<0.05). Sex by cohort interactions suggest that girls meeting criteria for NW are most likely to report DM (68%) compared to all other groups (women: 52%, men: 38%, boys: 39%;p<0.05). Across groups, DM was also associated with MD (OR=1.8), and this association was significantly higher in adolescents (OR=3.6) compared to adults (OR=1.7) with NW. Findings suggest differences in symptomatology by sex and age, and possible overlap between depressed mood associated with nicotine withdrawal and major depression, especially in adolescent female smokers.

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POS2-41 CORRELATES OF ADOLESCENT TOBACCO SMOKING URGES: MEASURES OF DEPENDENCE AND SMOKE EXPOSURE
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Smokers undergo some degree of nicotine craving, even when not attempting to quit. The aim of the current analysis was to examine the relationships among pre-quit (baseline) level of dependence, consumption, and smoke exposure, with degree of smoking urges assessed both at baseline and one week after a quit attempt among adolescent smokers participating in a cessation trial using nicotine-replacement therapy. 120 teenage smokers (mean +/- SD: 15.2 +/- 1.33 yrs, 70% female; mean reported number of cigarettes per day (CPD): 18.8 +/- 8.56) were recruited. Pearson product-moment correlations showed that baseline (pre-quit) Questionnaire of Smoking Urges (QU5) total scores were significantly associated with several dependence-scale scores, including the Fagerstrom Test for Nicotine Dependence (FTND) (p=0.02, r=0.26); the original Fagerstrom Tolerance Questionnaire (FTQ) (p=0.02, r=0.24); the modified mFTQ (Killen) (p=0.01, r=0.28), and the mFTQ (Prokhovor) (p=0.01, r=0.25), but not with CPD, expired carbon monoxide (CO), or plasma cotinine (COT). Further analysis indicated that baseline plasma COT (an index of nicotine exposure) was correlated at trend level with urge to smoke at one week post-quit (p=0.09, r=0.21). However, baseline plasma COT, CO, CPD or the various dependence scale scores were not significantly correlated with urges to smoke at one week post-quit. These preliminary results suggest that level of dependence rather than consumption or exposure influence the degree of adolescent smoking urges for tobacco during pre-quit smoking. In contrast, exposure, rather than dependence, may influence the degree of urge to smoke associated with quit attempts.

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POS2-42 DOES ALLOWING ADOLESCENTS TO SMOKE AT HOME AFFECT THEIR CONSUMPTION AND TRAJECTORY?
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Parental attitudes toward smoking have been shown to influence adolescent smoking initiation, but few reports examine their impact on progression to daily smoking and adolescent consumption. We analyzed data from 294 adolescents completing a smoking questionnaire designed as a screening tool for a smoking cessation program. Teenage smokers (65% Female, 53.7% African American, 41.5% Caucasian, mean Fagerstrom Test for Nicotine Dependence 5.3 SD 2.9, mean CPD 13.9 SD 10.0) were asked questions regarding their smoking behavior, including if they were allowed to smoke at home, how many cigarettes they smoked per day, and details of their smoking histories. Adolescents allowed to smoke at home (n=133) had a mean CPD of 15.6 SD 11.1, while those not allowed to smoke at home (n=161) had a mean CPD of 12.0 SD 8.5. Linear regression analyses revealed that compared to those who were not allowed to smoke at home, teens allowed to smoke at home had greater CPD (p=0.006), but had not been daily smokers for longer (p=0.189). Inferences for trajectory are cautioned by the cross sectional nature of the data on allowance of smoking in the home. Prospective studies of in-home smoking policies with consumption and trajectory, as well as topography variables are warranted, as these may impact smoke exposure and carry implications for health harm.

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POS2-43 CHARACTERISTICS OF EARLY AND LATE ONSET SMOKERS
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Smoking initiation often occurs in adolescence and is considered part of the risk-taking behavior adolescents engage in. Although risk-taking in adolescence is regarded as developmentally normal, high risk-taking behavior may have detrimental long-term consequences. Previous research suggests that early smoking onset is associated with greater subsequent dependence and reduced likelihood of quitting. To identify factors that might predict early initiation, we compared early onset smokers (EO; n=46), who started smoking between 10 and 14, with late onset smokers (LO; n=109), who began regular smoking after age 17, on demographic variables, smoking patterns and history, and cofactors for smoking (depression, anxiety, personality traits, alcohol intake). Preliminary analyses revealed EO were marginally more likely than LO to be white and female; gender and race were therefore included in subsequent analyses. EO had fewer years of education than LO (13.5±2.3 vs. 14.5±2.1; p<0.01) and proceeded more quickly from experimentation to regular smoking (1.5±1.1 years vs. 2.3±1.6 years, p<0.01). EO ultimately became more dependent (FTND: 5.2±2.5 vs. 3.8±2.4; p<0.05). Significant group differences were also found for reason for initiation, with EO reporting social reasons higher than LO (7.3±3.0 vs. 5.6±3.2, p<0.05). Our findings suggest that developmental trajectories should be taken into consideration in designing intervention and prevention programs. Further research including direct measures of decision-making, assessments of peer and parental influences and parental bonding, etc. is needed to extend our understanding of the link between high-risk behavior and smoking, and how it can be broken.

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POS2-45  INHALANT AND TOBACCO USE IN FLORIDA YOUTH
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PurPOSE: To determine the relationship of inhalant use to tobacco use among youth in Florida. Methods: The Florida Youth Substance Abuse Survey 2004 is a comprehensive assessment of youth substance abuse attitudes and practices obtained by sampling youth from sixty-five counties.

RESULTS: The sample consisted of 80,345 students from 6th to 12th grade: ages 10 to 19+ years (mean 14.5 years ??7.9), 53% male with 59% White, 19% African-American, 16% Hispanic, 5% Asian, 3% Native American, and 7% other. 37.6% reported lifetime use of at least one inhalant and 15.6% to current use. 13% were lifetime users of inhalants and 5% to current users. Among lifetime inhalant users: 15% were daily smokers versus 5% of Never Users of Inhalants (NIU); 25% had used their first cigarette at age 10 years or younger versus 8% of NIU; 55% of inhalant users thought smoking > 1 pack a day posed a great risk versus 66% of NIU; 47% thought it was very easy to get cigarettes versus 31% of NIU, 20% thought it not wrong at all to smoke cigarettes versus 8% of NIU, 55% thought it might make them look cool versus 29% of NIU, 26% thought they would smoke as an adult versus 6% of NIU; 58% thought their parents would think it wrong to smoke versus 83% of NIU, 47% of their siblings smoked cigarettes versus 30% of NIU. CONCLUSION: Inhalant users are a high risk group for cigarette use. Prevention efforts should be directed to these students at an early age.

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POS2-46  IMPULSIVITY IN ADOLESCENT SMOKERS AND NON-SMOKERS
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PurPOSE: The purpose of this study was to assess whether physical activity (PA) mediates the relationship between inattention and nicotine dependence. 962 adolescents (52% female; 83% Caucasian) participated in a longitudinal cohort study, 9th to 12th grade, to evaluate biobehavioral predictors of smoking adoption. Annual surveys measured smoking behavior, nicotine dependence, tobacco exposure, PA, team sport participation, and substance use. We measured self-reported ADHD symptoms, including inattention and hyperactivity-impulsivity, in the fall of 10th grade. We fit a four-wave Latent Growth curve Model (LGM) for nicotine dependence (starting with 10th grade fall), with level centered at 12th grade, to test the indirect effect of inattention on nicotine dependence through PA and team sport participation, controlling for hyperactivity-impulsivity and other covariates associated with smoking. A single factor represented 12th grade PA, indicated by vigorous and moderate PA, and strengthening and toning. The LGM fit the data well with a linear trend, chi-square(35,962)=46.91, p=0.09, CFI=.98, WRMR=.64, & RMSEA=0.02. Inattention and PA did not have significant direct effects on nicotine dependence (p>0.05). However, team sport had a significant negative effect on nicotine dependence (ß=-.220, p=0.009). Further, inattention (ß=-0.56, z=-3.438, p=0.001) had a significant effect on team sport, suggesting an indirect effect of inattention on nicotine dependence through team sport participation. This indirect effect was significant (ß=-0.04, z=-2.255, p=0.0241), suggesting that team sport participation may decrease the effect of inattention on nicotine dependence. However, because inattention did not have a significant direct effect on nicotine dependence, the result suggests a delayed effect for team sport participation on the relationship between inattention and nicotine dependence.

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POS2-49  ADVERSE EVENT REPORTING AMONG DEPENDENT ADOLESCENTS DURING NICOTINE REPLACEMENT THERAPY TRIAL: GENDER AND ETHNIC DIFFERENCES

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Many adolescent smokers have tried unsuccessfully to quit smoking at least once, most frequently with acute abstinence methods, and many desire formal cessation treatment. Nicotine replacement therapy has been shown to be a useful aid for tobacco cessation among highly dependent adolescents. Medication side effects however can prevent treatment adherence and studies have shown group differences in sensitivity to adverse events. In the current analysis we examined gender and ethnic differences in adverse event reporting among adolescents who requested smoking cessation treatment. This analysis is based on 120 adolescents randomized (72% white, 70% female; age: 15.2±1.33 years; smoking: 18.6±8.56 CPD; Fagerstrom Test of Nicotine Dependence score: 7.04±1.29) within a nicotine replacement therapy trial. Of 745 total adverse events documented during the trial, the most common were pruritus (15.5%), headache (10.2%), and fatigue (8%). Partial correlation revealed that as compared to boys, girls reported a significantly higher number of adverse events (p < .001). Moreover, as compared to African Americans, European Americans reported a significantly higher number of adverse events (p < .001). Further analysis will uncover which side-effects are associated with gender and ethnicity. Optimal nicotine replacement therapy should recognize these gender and ethnic differences among adolescent smokers seeking cessation treatment.

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POS2-50  WEB-BASED SUPPORT AS AN ADJUNCT TO GROUP-BASED SMOKING CESSATION FOR ADOLESCENTS

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Although group-based programs remain the most common treatment approach for adolescent smoking cessation, success rates for these programs have been relatively modest, and their reach may be limited. Web-based adjuncts may be one way to boost the efficacy and reach of group-based approaches. The purpose of this study was to evaluate the efficacy of enhancing the American Lung Association’s Not on Tobacco program (NOT) with a web-based adjunct (NOT Plus). Twenty-nine high school schools were randomly assigned to either the NOT program alone or to the NOT Plus condition, which included access to a specially designed website for teens, along with proactive phone calls from the group facilitator to the participant. Self-reported smoking behavior was obtained at end-of-program and at a 3-month follow-up. In a multivariate model controlling for student gender, grade, race, and baseline smoking rate, there was a significant condition effect at end-of-program (OR = 2.74, 95% CI = 1.08-6.84) and at 3-month follow-up (OR = 2.17, 95% CI = 1.15-4.08). Approximately 57% of adolescents reported visiting the website, and among the NOT Plus condition, use of the website was associated with cessation significantly at end-of-program (p < .05). Adolescents in urban schools were more likely to access the website than those in rural schools. Participants who visited the website rated it positively on several dimensions. Reasons for not using the website will be discussed, as well as its value as an adjunct.

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POS2-51  CONTINGENCY MANAGEMENT FOR SMOKING CESSATION IN ADOLESCENT SMOKERS

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Contingency management (CM) approaches, in which desired behaviors (for e.g., abstinence from recent drug use) are directly reinforced, have been successfully used to reduce tobacco use in non-treatment seeking as well as in treatment seeking adult smokers. However, despite the promise of CM for smoking cessation in adult smokers, there has been a paucity of research on CM as a treatment for adolescent smokers. This pilot study evaluated the use of contingency management (CM) in combination with weekly cognitive behavioral therapy (CBT) for smoking cessation in adolescent smokers. Twenty-eight adolescent smokers participated in a one-month, school-based smoking cessation program and were randomly assigned to receive either CM in combination with CBT or CBT alone. In the CM + CBT group, biochemical verification of abstinence was obtained using twice daily breath carbon monoxide levels and once daily semi-quantitative urine cotinine levels during the first two weeks; followed by daily appointments during the third week and once every other day during the fourth week. Participants in this group were monetarily reinforced for staying abstinent on a schedule of escalating magnitude of reinforcement with a reset contingency. Participants in both groups received weekly CBT sessions. All daily appointments were conducted at local high schools and weekend appointments were held at other public locations. At the end of one week and one month of treatment, abstinence verified using quantitative urine cotinine levels was higher in participants in the CM-CBT group (one week: 76.7%; one month: 53.0%) when compared to the CBT alone group (one week: 7.2%; four weeks: 0%). These preliminary results provide a strong initial signal supporting the utility of CM techniques for smoking cessation in adolescents and demonstrate the feasibility of implementing such a program in a school setting.

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POS2-52  YOUTH TOBACCO CESSATION PROGRAMS: WHO ARE THE TREATMENT SEEKERS?

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Despite recent declines in youth smoking, prevalence remains unacceptably high. The majority of youth smokers report they want to quit, but very few seek cessation treatment or quit successfully. The Helping Young Smokers Quit (HYSQ) evaluation project conducted baseline surveys of 881 youth smokers, who were enrolled in 41 cessation programs, in 18 states across the US. These surveys provide a characterization of youth who seek, or are mandated to participate in, smoking cessation treatment. At the completion of their program, 801 of the 881 youth were surveyed again (91% response rate). This paper will describe youth cessation treatment seekers and successful quitters, and discuss strategies for successfully retaining youth in the research study. Among the 41 cessation programs, 30 were school-based. 67% of programs relied on voluntary enrollment only; 7% were exclusively mandatory. Overall 74% of youth reported voluntary participation. Most enrolled youth (68%) reported average or below average grades; most (68%) had been suspended or expelled from school. More than half (55%) smoked daily; on average they smoked 6 cigarettes/day. At baseline, 44% of youth planned to quit in the next 30 days, and 77% planned to quit in the next 6 months. Individual characteristics, including demographics, addiction, relationships with smokers, self-efficacy, physician advice, rules and enforcement about smoking at home and school, and depressive symptoms will be analyzed for associations with changes in smoking status between baseline and end of program.

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POS2-53  EVALUATION OF A COGNITIVE-BEHAVIORAL SMOKING CESSATION TREATMENT FOR ADOLESCENTS AND YOUNG ADULTS

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Nicotine addiction often begins in adolescence or young adulthood, yet reviews have highlighted a lack of empirically validated cessation treatments for these groups. We are conducting a cessation study in these groups using a novel cognitive-behavioral treatment, the Modified Brief Office Intervention (M-BOI), added to randomized, double-blind, placebo-controlled bupropion treatment. As data collection is continuing, preliminary results are given here. METHODS: Data are presented on 15 participants, all between 14 and 25 years of age. Participants smoked ≥10 cigarettes daily for the past 6 months, had an expired CO level of ≥10 ppm, and had a failed quit attempt. One week after the screening visit, participants begin the 10-session M-BOI and either 9 weeks of placebo or 300mg bupropion. Smoking data were analyzed at 4 weeks of treatment using a repeated measures general linear model; the effects of baseline cognitive and mood variables on response (≥50% smoking reduction) were analyzed using either linear or logistic regression. RESULTS: At 4 weeks, the mean participant rating of treatment acceptability was 3.64 (3 = somewhat helpful; 4 = very helpful) and mean rating of whether a participant would recommend the treatment was 3.5 (3 = probably recommend; 4 = definitely recommend). Additionally, 11 of 15 participants (73.3%) were responders. Analysis showed a significant within-subject reduction in smoking between baseline and week 4 of treatment (F = 43.975; p < .001); no changes were seen between screening and baseline (F = .049; p < .827). Ratings of current depressive symptoms and depression history failed to predict response. The effect of participant rated self-efficacy to resist smoking (Smoking Self-Efficacy Questionnaire) on treatment response approached significance (F = 4.566; p = .052), as did a more positive participant rated view of self (Cognitive Style Test for Teens; F = 3.429; p = .087). CONCLUSIONS: Preliminary data indicate that the M-BOI is an acceptable treatment in this population and that participants would recommend the treatment to friends. Furthermore, there is some evidence that this treatment is effective for adolescents and young adults.

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POS2-54  RECRUITMENT: REFERRAL SOURCES OF ADOLESCENT AND YOUNG ADULT SMOKERS FOR RESEARCH STUDIES

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INTRODUCTION: Even with the recent decrease in prevalence, adolescent smoking continues to be a major public health problem in the United States. At least 80% of smokers initiate smoking prior to age 18. Hence, adolescence is an age of particular vulnerability for the initiation and progression of smoking. Therefore, prevention and treatment efforts are increasingly being targeted for adolescent and young adult smokers. There seems to be a universal problem of difficulty in recruiting adolescent and young adult smokers into research studies. The purpose of this poster is to examine the referral sources for adolescent and young adults in nicotine research studies. METHODS: We systematically examined 152 screening calls from potential participants in the age range 12-21 received for participation in several smoking related studies. The studies used several different creative approaches to recruitment, including community newspaper advertisement, local college group emails, school presentations, flyers, referrals from adolescent medicine and psychiatric clinics, word of mouth/peer referrals, school based clinics, and advertising in movie theaters. RESULTS: The majority of the calls were made to 18 (60%) and the average age was 18.9. Newspaper advertisements (50.6%) were the most successful fruitful source of recruitment, followed by local college-wide emails (19.7%), flyers (14.5%), word of mouth (5.9%), referrals from adolescent medicine and psychiatric clinics, word of mouth/peer referrals, local college group emails, advertising in movie theaters. CONCLUSIONS: The best source of research referrals for adolescents under 18 seems to be from the high schools, and for young adults, newspaper advertisements, and college group emails. Referrals from clinics, including high-school based clinics, were disappointingly low. Possible reasons for differences in referral sources and implications for clinical research with adolescents and young adults will be discussed.

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POS2-55  RELAPSE PREVENTION FOR ADOLESCENT EX-SMOKERS: INTERVENTION DEVELOPMENT

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Most efforts at tobacco control among adolescents consist of smoking prevention or smoking cessation. One largely overlooked topic is relapse prevention for adolescent ex-smokers. The current study builds upon previous research on relapse-prevention for adults. Specifically, Brandon et al. (2004) developed a series of eight relapse-prevention booklets that were successful in helping ex-smokers to remain quit over a period of two years. However, there are significant differences in smoking and quitting behaviors between adults and adolescents. The current study endeavored to redesign the content and format of the Brandon et al. booklets to better suit the needs of adolescent ex-smokers. The process of redesigning the booklets was based upon qualitative analyses including a series of focus groups and learner-verification sessions with 23 adolescent smokers and ex-smokers at three Florida public high schools. These qualitative analyses resulted in many changes to the adult relapse-prevention booklets. Among the changes were that: (a) the number of booklets was reduced from eight to five, (b) a greater emphasis was placed on planning ahead to avoid relapse, (c) the booklets were made to be more colorful and to contain more photographs, (d) the health consequences of smoking were presented more graphically (e) more bullet-pointed facts were presented in place of paragraphs, and (f) examples, photographs, and experiences described in the booklets were changed to better reflect the lives of adolescents. Issues of student recruitment, research logistics, and parental consent are also described, and the newly designed adolescent relapse-prevention booklets are presented.

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POS2-56  GENDER DIFFERENCES IN QUITTING EXPECTATIONS DURING ADOLESCENCE

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The aim of this work was to analyze the differences in quitting expectations in male and female adolescents. 7103 adolescents from 13-18 y/o, where asked about: a) they had ever thought about quitting; b) they would like to quit; c) they believed they were going to be smokers in five years; d) how many quit attempts had they made; and e) how much time they had remained abstinent. Results show that females refer more frequently having thought about quitting than male (76 % vs. 64%: p<0,001); at all ages, female have 50% more possibilities of agreeing with this question. Girls also refer more frequently than boys that they have a willingness to quit (70% vs 60%: p<0,001). Nevertheless, girls believe more frequently than boys that they will remain smokers in a five-year-time (60% vs. 54%: p<0,01; OR=1.31[1.1-1.6]). The earlier the age of smoking initiation, the lower the belief that they will be smoke-free in five years. Girls refer more frequently having tried to quit: 30% more of them have made at least one attempt. 30% of the girls vs. 17% of boys have made at least three quitting attempts (p<0,001). Of those who are still smoking, one in three boys and only one in four girls refer that they have been at least one month without smoking (p<0,001). The differences are higher in the youngest group (those who are 13-14 y/o). The differences between genders in adolescent smoking behaviour in those fields related to quitting expectations.

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**POS2-57** HEALTH BEHAVIOR CORRELATES OF MAKING A QUIT ATTEMPT AMONG ADOLESCENT SMokers

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Health risk behaviors are associated with initiation and progression of cigarette smoking among adolescents. However, health risk variables have not been examined in relation to making a prohealthy choice such as smoking quit attempts. To determine the health behavior correlates of making a quit attempt, data from the 2003 national school-based Youth Risk Behavior Survey (YRBS) were analyzed. Health risk variables included: tobacco use, alcohol and drug use, physical activity, sexual behaviors, and behaviors resulting in violence or injuries. The sample consisted of 4040 adolescents (45% female, mean age=16.3 years) who had smoked in the last year. Fifty-five percent reported making a smoking quit attempt in the last year. Separate chi-square analyses were conducted for boys and girls to examine the relationship between making a quit attempt and each of the assessed health behaviors. Among girls, making a quit attempt was associated with initiation of smoking before age 13, daily cigarette smoking, having a usual brand of cigarettes, wearing seatbelts when others are driving, having sex forced upon them, being depressed in last year, and daily physical education classes. Among boys, making a quit attempt was associated with daily cigarette smoking, wearing seatbelts when others or self are driving, being depressed in last year, decreased likelihood of a suicide attempt resulting in injury, decreased likelihood of using cocaine, heroin, methamphetamine, steroids, and intravenous drugs. Information about health risk variable correlates of making a quit attempt may inform the development of effective cessation interventions for youth. Such efforts may focus on reducing nicotine use in the context of reducing drug use for boys, and on increasing physical activity when making a quit attempt for girls.

The YRBS was conducted and funded by the CDC.

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**POS2-58** CORRELATES OF NICOTINE REPLACEMENT THERAPY USE AMONG ADOLESCENT SMOKERS WITH PSYCHIATRIC COMORBIDITY MAKING A QUIT ATTEMPT

Laura MacPherson, Ph.D., David R. Strong, Ph.D., Susan Ramsey, Ph.D., and Richard A. Brown, Ph.D., Brown Medical School and Butler Hospital

Little information exists describing use of nicotine replacement therapy (NRT) in relation to cessation efforts among adolescent smokers, especially those who are at especially high risk for persistence of smoking into adulthood. The present study is a descriptive investigation of correlates of NRT use during a quit attempt in the first month post-hospitalization among a sample of comorbid adolescent smokers participating in randomized control trial of MI vs. brief advice. It was expected that gender, smoking/quit history, intention to quit, withdrawal symptoms, prior NRT use and presence of an externalizing disorder would predict NRT use among quit attempters. Participants were 46 adolescent smokers (M = 16.1 years old, 62% female, 95% White) who made a quit attempt during the first month post-hospitalization. At the time of hospitalization, participants averaged 14.1 (8.6) cigarettes per day and 40% reported NRT use during the post-hospital quit attempt. Univariate chi square and ANOVAs were conducted. NRT use was unrelated to demographics, treatment condition, or duration of post-hospital quit attempt. Baseline smoking level (p = .039), recent withdrawal symptoms (p = .046), use of the patch while hospitalized (p = .003) substance use disorders (p = .032), and affective disorders (p = .007) were related to NRT. In the context of a small sample size, the present results highlight the importance of regular smoking experience and consideration of psychiatric comorbidity in adolescents’ use of NRT as part of cessation efforts. Additional research is needed to identify mechanisms through which factors such as smoking experience and psychiatric comorbidity may influence adolescents’ use of and compliance with NRT products during cessation efforts.

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**POS2-59** SMOKING ENJOYMENT AND NICOTINE PATCH COMPLIANCE AMONG ADOLESCENT SMOKERS UNDERGOING CESSION TREATMENT

Kara S. Bagot*, B.A., Maria J. Gasior, M.D., Ph.D., Emily J. Luther, B.A., and Eric T. Moolchan, M.D.

While many smokers describe smoking as pleasurable, few reports have examined links between hedonic effects of smoking and cessation treatment process. Given the known relationship between treatment adherence to nicotine replacement therapy and treatment outcome, we explored the relationship between smoking enjoyment and compliance with the nicotine patch for cessation treatment in addicted adolescent smokers enrolled in a placebo-controlled randomized clinical trial. One hundred and three participants (mean ± SD, age 15.2 ± 1.36 years, cigarettes per day 19.1±8.63, Fagerstrom Test for Nicotine Dependence 7.11 ± 1.28, 71% female) were included in the current analysis. Via an internally-developed visual analog scale entitled Your Historical Enjoyment of Smoking, prior to the treatment phase (baseline) we assessed smoking enjoyment retrospectively throughout participants’ smoking histories. The scale was comprised of 8 questions querying lifetime enjoyment of smoking. For the current analysis, we used Question 8, which asked ‘how much do you enjoy smoking now?’ Linear regression analyses controlling for randomization group revealed a significant relationship (p=0.05) between smoking enjoyment at baseline and increased patch compliance during the treatment phase. Further exploitation of factors influencing compliance with nicotine replacement therapy in a larger sample of adolescent smokers is warranted.

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**POS2-60** IMPACT OF RECRUITMENT METHODS ON ORIENTATION ATTENDANCE

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There is relatively little information on the effectiveness of various recruiting methods for clinical research. The aim of this study was to identify which recruitment methods are successful for orientation attendance, as well as continued study participation. Women aged 18 to 40 were recruited (n=316) through television, newspaper and radio ads, flyers and personal referrals for a quit smoking study investigating the effect of the menstrual cycle on smoking relapse. Women interested were screened over the phone for study eligibility and, if eligible, were scheduled for an orientation visit. Recruitment methods, attendance rates, and demographic and smoking variables were recorded for each woman. Women recruited through newspaper ads were excluded from analysis (due to the small number of calls received), as well as ineligible women. Women recruited through television ads (n=143) were less likely to attend an orientation visit (35.6% v. 57.2%, p<0.0001) and less likely to have a past 24-hour quit attempt (74.1% v. 87.1%, p=0.0013) compared to all other recruits. Women recruited through radio ads (n=102) were more likely to attend an orientation visit (67.7% v. 42.2%, p<0.0001) and smoked longer on average (11.6 years v. 9.6 years, p=0.0195) compared to all other recruits. This trend continued, as women recruited through radio ads were more likely to stay in the study until their assigned quit date compared to women recruited through television ads ( 48.7% v. 27.7%, p=0.0219). Women recruited through flyers (n=47) and personal referrals (n=24) were not significantly different from all other recruits. Additionally, age, cigarettes per day, number of days between phone screen to scheduled orientation, motivational level and previous quit attempts did not significantly impact orientation attendance rates or continued participation. These data suggest that while attendance rates and continued participation may differ by recruitment method, demographic and smoking variables did not impact either.

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POS2-61

HOW BEST TO PROMOTE TOBACCO TREATMENT: TOBACCO USER PREFERENCES

Terry Bush*, Susan M. Zbikowski, Tim McAfee, Sharen Ross, Free and Clear, Inc.

This market research study aimed to obtain 2100 participants to determine which messages are most effective at motivating tobacco users to seek treatment. Participants (n=2000) completed a web survey sent via email to pre-identified tobacco users. Mean age of respondents was 46 (43 for females, 49 for males); 51% were male; most were white (90%), educated beyond high school (73%) and 95% used tobacco daily; 44% had no intention in quitting in the next 6 months (7% had quit). The survey asked participants to rate the impact of 27 statements on their likelihood of taking action to quit tobacco. The strongest reasons for quitting were financial: 'I could spend the money I spend on tobacco on other things' (72%), 'Tobacco costs me a lot of money' (70%); followed by health effects, 'I will be able to breathe better' (68%), 'I will live longer' (84%).

COMMENTS: This study is a marker research study aimed to obtain 2100 participants to determine which messages are most effective at motivating tobacco users to seek treatment. Participants (n=2000) completed a web survey sent via email to pre-identified tobacco users.

Funded by Free and Clear, Inc.

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POS2-62

SMOKING CESSATION PHARMACOTHERAPY PREFERENCES AMONG RURAL SMOKERS


INTRODUCTION: Bupropion and nicotine replacement therapy (NRT) are first-line pharmacotherapies for smoking cessation. This study compared preference for NRT versus bupropion and identified contraindications for pharmacotherapy among rural smokers. Additionally, we explored demographics, comorbidities, smoking cessation history and prior pharmacotherapy use related to medication preferences.

METHODS: We analyzed data from a population-based disease management intervention study for smokers in rural primary health care. 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 no-cost throughout the study. Of 750 adults (mean age=47 SD=13.12); 59% were female, 33% were unemployed and 51% had less than high school education.

RESULTS: Similar proportions of smokers requested bupropion (34%) versus NRT (35%). Over one third of participants had used NRT (47%) and bupropion (33%) in the past. Most who requested pharmacotherapy had no contraindication for their preferred medication (bupropion, 94%; NRT, 96%), only 26% (5%) of those who requested pharmacotherapy were ineligible. For bupropion, history of seizure (5%) and binge drinking in the past year (4%) were contraindications more frequently reported. Previous bupropion use (OR=6.4, CI 4.3-93) and number of cigarettes per day (OR=6, CI 4.1-98) were related to medication requested, i.e., light smokers and those who had never used bupropion before were significantly more likely to request bupropion.

CONCLUSION: In this study a majority of smokers requested and were eligible for pharmacotherapy for smoking cessation. Findings support the Clinical Practice Guidelines for physicians to offer pharmacotherapy to all smokers to facilitate stopping smoking.

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POS2-63

WHAT TO WAIT FOR THE BUPROPION IN THE TREATMENT OF SMOKERS WITH CARDIOVASCULAR DISEASES?

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Smoking cessation in patients with atherosclerotic cardiovascular disease is a great challenge. Although the morbidity/mortality rate from cardiovascular disease declines by 50% one year after cessation of cigarette smoking, part of this population is not motivated to quit smoking. Finding alternative methods for helping smokers with heart disease quit smoking has become a strategic need in cardiovascular disease therapy. We evaluated the usefulness of bupropion, and tolerance to the product, in smokers with cardiovascular diseases, taking into account the continuous and routine use of several medications by the study population. Secondly, we investigated variables that could predict the success of smoking cessation or the occurrence of smoking relapse. Success rate in smoking cessation was 50% at week 12. With regard to the number of comorbidities and side effects, univariate analysis revealed significant differences among patients in the Success and Failure Groups at week 12. A significant difference was verified when comparing success rates among men and women, leading to a greater interest in gender comparative analyses. Significant differences were also observed between men and women relative to age, comorbidities, medication use, presence of side effects, depression and anxiety score, and alcohol consumption. Age was positively associated with success and negatively associated with comorbidities. We conclude that this clinical trial with bupropion in smokers with cardiovascular diseases proved to be safe and effective, especially during the treatment period (week 12), and that factors like age and the presence of comorbidities are variables that can interfere with success rates.

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POS2-64

THE COMBINATION OF NRT + COPD THERAPY IS MORE EFFECTIVE FOR SMOKING CESSATION

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Smoking delivers tobacco smoke in respiratory tract directly and it is the first organ which suffers from smoke. Our study has shown that about 85% of smokers who smoke about 20 cigarettes per day during at least 5 years have symptoms of bronchial inflammation and the obstructive respiratory syndrome (COPD). Very often quitting causes COPD exacerbation and about 30% of quitters relapse during first week of quitting to relief the exacerbation symptoms. For this reason we include preventive and treatment therapy for COPD in the smoking cessation program. The aim of this study was evaluate the efficacy of two smoking cessation programs: 1. NRT; 2. NRT in combination with COPD treatment. The study group consisted of 72 smokers (men-56, women-16) motivated to quit. They had 23.6±2.5 years smoking history, 42.7±2.6 age, a mean Fagerstrom score of 6.9±0.3, and 24.4±2.4 pack/year smoke intensity. Lung function parameters (LFP) and clinical symptoms (CS) were monitored for 3 months after the initial of treatment. The group was divided into two sub-groups by random choice. The group 1 (34 patients) had the treatment program # 1, and the group 2 (38 patients) - the program #2. In the group 1 FEV1, FVC, MMEF%75 tended to decrease and Rtot tended to increase in 2-3 days after quitting and reached their minimum in 2 weeks, 8.2%, 12.3%, 10%, 48%, accordingly. In 3 weeks after quitting the parameters started to normalize. The clinical symptoms in the group 1 demonstrated the same dynamics. In the group 2 LFP and CS did not decrease. In 6 months the quit rate in group 1 was 47%, in group 2 - 86%. Thus, the combination therapy doubles the success rate of quitting.

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OVERCOMING TOBACCO DEPENDENCE WITH COMBINATION MEDICATIONS: LEVELING THE TREATMENT PLAYING FIELD

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High levels of tobacco dependence tend to decrease success rates. However, combination medications may offer advantages for highly dependent smokers. We analyzed 789 smokers treated at a specialty tobacco treatment clinic. The primary outcome was 4-week and 6-month abstinence rates. Re-treatment rates that follow up were considered still smoking. Overall, 59% of smokers were abstinent at 4 weeks, and 36% were abstinent at 6 months. Those who used more medications tended to have higher abstinence rates. At 4 weeks, those patients who used no medications had a 31% (32/104) abstinence rate, 52% (96/186) with one medication, 64% (216/335) with 2 medications, 74% (98/132) with 3 medications, and 82% (27/33) with 4 or more medications (p=.000). This trend persisted, but flattened through 6-month abstinence (20% who used no medications, 37% using one medication, 37% using 2 medications, 42% using 3 medications, and 42% using 4 or more medications) (p=.017). In logistic regression, the number of medications (past abstinence) at 4 weeks [adjusted odds ratios=2.03 (95% CI:1.27-4.47) for 1 medication, 4.73 (7.24-8.40) for 2 medications, 5.83 (2.98-11.40) for 3 medications, and 11.80 (4.10-33.95) for 4+ medications] was higher among those with higher markers of dependence. Those smokers who used combination medications had good or better rates of success both at 4-weeks and 6-months than those with lower markers of dependence. These findings support the use of combination pharmacotherapy in treating and overcoming high levels of tobacco dependence.

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RELATIVELY FEWER SMOKERS WILL RE-TREAT WITH THE SAME SMOKING CESSATION PHARMACOTHERAPY

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Most smokers make multiple quit attempts and many use some form of pharmacotherapy as an aid, but little is known about repeated use of the same pharmacotherapy (re-treatment) for subsequent quit attempts. To explore this question we analyzed data from callers responding to television ads seeking smokers to be pre-screened for various clinical trials testing new cessation medications at the OHSU Smoking Cessation Center. A pre-screening telephone questionnaire developed by the Center was used to pre-screen candidates for enrollment in the following studies: a) a clinical trial of nicotine replacement therapy (NRT) to treat nicotine dependence in cigarette smokers (N=345); b) a study of nortriptyline treatment for smokers with elevated plasma nortriptyline concentrations (N=97); c) a study of subjects randomized to receive nicotine patches and a prophylactic medication (N=73); and d) a study of combinations of nicotine patches and varenicline (N=133).

The main finding was that smokers who tried to quit smoking and were considered still smoking were more likely to re-treat with a similar drug or drug class. Re-treatment data are as follows: patch, 39.5%; gum, 21.2%; lozenge, 3.2%; inhaler, 9.3%; nasal spray, 1.1%; bupropion, 22.4%; and nortriptyline, 25.2; and those using 3 medications, 27.2% (p<.001). Therefore, despite having higher markers of dependence, those smokers who used combination medications had good or better rates of success both at 4-weeks and 6-months than those with lower markers of dependence. These findings support the use of combination pharmacotherapy in treating and overcoming high levels of tobacco dependence.

RELATIVELY FEWER SMOKERS WILL RE-TREAT WITH THE SAME SMOKING CESSATION PHARMACOTHERAPY

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We studied the correlation of belief about drug assignment (active dose versus placebo dose), abstinence status, baseline characteristics, and side effects in two clinical trials using nortriptyline to treat cigarette smoking (N=345). Abstinence was assessed at treatment termination and at one-year follow-up. Belief about assignment was assessed at one year follow-up. NRT studies indicate that subjects are frequently uncertain about treatment and that uncertainty may affect treatment and outcome. Nortriptyline is of interest because it is an efficacious and low-cost treatment for tobacco dependence, but it has identifiable side effects. Four questions were addressed: (1) Did subjects identify the correct dose at better than chance? (2) Is the belief that one is on active drug related to abstinence status? (3) What characteristics predict correct identification of dose? (4) What variables predict belief about dose? Data indicated that subjects can identify dose at better than chance levels but belief about dose was unrelated to abstinence status at one year. Subjects who were on active drug and who were smoking at the end of treatment were significantly more likely to believe they had received placebo than those who were on a drug and who were abstinent. There were no other relationships between belief about drug assignment and outcome at the end of treatment, and there were no relationships between belief and abstinence status at one-year follow-up. Baseline variables failed to predict correctness of dose or whether dose was identified as active or placebo. Regardless of actual drug assignment, subjects identified themselves on active drug if they experienced side effects such as dry mouth, lightheadedness, shaky hands and blurred vision that were unlikely to be related from nicotine withdrawal. We conclude that while nortriptyline is identifiable by subjects, evidence is weak that this knowledge is related to smoking treatment outcome. Assessing beliefs about drug assignment both early and late in clinical trials would allow a more definitive answer to the question of the influence of beliefs on outcome.

LEVEL OF NICOTINE REPLACEMENT AND IMPACT ON SUCCESSFUL SMOKING CESSATION


The nicotine patch remains the mainstay of conventional smoking cessation therapy. With standard nicotine replacement therapy, metabolism is the main determinant of replacement level after patch administration. We have previously found that the rate of nicotine metabolism differs between individuals and is related to gender, CYP2A6 and CYP2B6 genotype. We hypothesise that individuals whose plasma nicotine levels on patch match those achieved while smoking would be more likely to succeed with a quit smoking attempt. We investigated level of nicotine replacement in a UK cohort who participated in a trial of effectiveness with different levels of behavioural support (the PIP study) in which all participants used 16 hour, 15mg nicotine patches only. Nicotine and cotinine plasma concentrations were determined pre treatment whilst smoking normally (V1), and whilst on NRT at 3 days post quit attempt (V2). A (log) ratio of cotinine at V1:V2 was used to assess replacement level, and cessation was assessed at 4 weeks post quit date, using an intention to treat analysis. After excluding from the analysis all those who claimed to have had any cigarettes between quit day and V2, those who had relapsed at 4 weeks had a marginally lower replacement level at V2 when adjusted for age and gender (mean ratios 0.46 and 0.49 respectively, p=0.2). However, the mean exhaled carbon monoxide concentration in those who had relapsed at week 4 was 5ppm at V2 and 2ppm in those who had not (p<0.0001), suggesting continuing smoking was confounding the association. After adjusting for exhaled CO at V2 in the regression model, those with a higher replacement level had an increased (p=0.054) odds of quitting smoking (OR=1.54, 95%CI 0.85-2.77) or without (OR=1.66, 95%CI 0.99-2.77) control for V1 cotinine concentration. There is some evidence that more complete replacement of nicotine on cessation increases the likelihood of success, but continued smoking despite self reported abstinence is likely to cloud these associations. Measurement of exhaled CO provides a good surrogate for this.
POS2-69  TRAINING PHYSICIANS AND PHARMACISTS IN SMOKING CESSATION COUNSELING: PRELIMINARY RESULTS

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Project TEAM is community-based, effectiveness study designed to enhance smoking cessation counseling skills among physicians and pharmacists participating in a 3-h continuing education program with video vignettes and role-playing counseling segments. Clinicians randomized to the control condition participated in a comparable-length program addressing skin cancer prevention. Health care providers’ counseling practices were assessed by adherence to the 5 A’s model (Ask, Advise, Assess, Assist, and Arrange) documented during patient exit interviews from physicians’ offices/clinics and pharmacies at baseline and 3-months post-training. The baseline survey was completed by a total of 562 patients from 6 communities (of 16 total; study ongoing): 255 patients were seen by 13 study physicians, and 307 were seen by 17 study pharmacists. Mean age of the patients was 43 years (SD=14), 65% were female, 88% white, 21% reported current smoking, and 4% reported other forms of tobacco use. At baseline, patients seen by a study pharmacist reported significantly lower rates of asking about smoking behavior compared to patients seen by a study physician (5% vs. 33%, p<0.01). In preliminary analysis, we compared the impact of the continuing education program on the 5 A’s from baseline to 3 months. For patients counseled by a study physician, we have observed a significant increase in ‘Ask about smoking’ (28.2% vs. 17.0% in the intervention group vs. 38% to 27% in the control group, p<0.05). To date, statistically significant changes have not been observed in ‘Asking about smoking’ among patients counseled by pharmacists or the other 5 A’s counseling activities for either physicians or pharmacists. Our ongoing data collection will increase study power (targeted sample size for exit interviews is 1,568 individuals). The study will examine patient quit rates by treatment group, too.

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POS2-70  NRT MAY WORK BY PROMOTING RECOVERY FROM SMOKING LAPSEES RATHER THAN PREVENTING LAPSEES

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We report a reanalysis of data from a clinical trial (n=496) comparing two modes of delivery of Nicotine Replacement Therapy (Transdermal TN versus Nasal Spray NS). The study was designed to test a nicotine replacement protocol (n=226) from a similar trial. The study utilized multivariate survival methods to examine treatment effects on time to lapse for those abstaining, and time to recovery for those currently smoking, from target quit date to end of treatment (2994 events). A two-component mixture was used to account for the (a modeling term for long-term abstinence) and abdication (giving up on quitting). Overall, NRT had effects on both time to lapse (HR=0.74, p=0.01), and time to recovery (OR=1.26, p=0.06). These effects were robustly equal in magnitude, with HRLapse approximately equal to 1/HRRecovery (Wald ChiSquare(1)=0.15, p=0.7). NRT also affected the probability of long-term abstinence (OR=1.33, p=0.04), and the probability of abdication (OR=0.29, p=0.01). These effects were significantly different in magnitude (Wald ChiSquare(1)=6.89, p=0.01). TN was significantly better than NS at slowing time to lapse (HR[TN]=0.68 vs. HR[NS]=0.84, Wald ChiSquare(1)=6.89, p=0.01), but the two did not differ in affect on cure. TN was also significantly better than NS at speeding time to recovery (HR[TN]=1.61 vs. HR[NS]=1.01, Wald ChiSquare(1)=9.33, p=0.003). TN was substantially better than spray at preventing abdication (OR[TN]=7.17 vs. OR[NS]=2.09, Wald ChiSquare(1)=12.43, p=0.0004). These data contribute to the extensive literature documenting the efficacy of NRT, but suggest that when time to lapse and time to recovery are examined, NRT may have greater effect on helping smokers recover from lapses. Moreover, nicotine patch may be more effective than nicotine spray in this regard. Future studies are needed to examine if there are differences in time to lapse and time to recovery for different subgroups of smokers (e.g., men vs. women) using these treatments. Research Supported by TTURC P5084718 Research Supported by TTURC P5084717.

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POS2-71  USE ANALYSIS OF MAILED NRT

Ken Wassum, Free & Clear

Many telephonic tobacco cessation programs use mail delivery of nicotine replacement therapies (NRT) in providing services to their participants. The Free & Clear program surveyed 139 randomly selected recipients of mailed nicotine patches consisting of state quit line callers (n=92) and an employer group (n=47) to evaluate this service. Participants were eligible to receive up to 8 weeks of nicotine patches and all had full coverage for the medication. The medication was received in three different ways: 5x3 (6 weeks with 3 week refill opportunity) n=49; 4x4 (4 weeks with 4 week refill opportunity) n=43; 8 weeks (single shipment) n=47. Survey respondents were interviewed to determine utilization of patches; use of patches by shipment; use patterns (daily vs. sporadic); whether NRT was received by planned quit date; and satisfaction with patch services. Satisfaction with both cessation services and patch services were very high: 93.5%. Patch use of 8 weeks or more was highest (40.5%) among those receiving 8 weeks in a single shipment, but this delivery also had the highest percentage of non-use of any patches (16.7%). Of those receiving split delivery, 31.6% used all 8 weeks in the 4 x 4 group as compared to 18.8% in the 5 x 3 group. Non-use of patches was lowest in the 4 x 4 group (6%). Among those receiving a refil, use of all patches in the second shipment was highest in the 5 x 3 group (35%) compared with those in the 4 x 4 group (24.1%). Conclusions: Survey results support split delivery of nicotine patches as effective and barrier free adjunct to behavioral therapy. Mail order NRT recipients report high satisfaction with this service and few obstacles in the refill process. While fulfillment of 8 weeks in one shipment resulted in the highest overall use of patches, this method also resulted in the highest non-use of patches. Split delivery of NRT offers a cost effective delivery approach to provide nicotine patches via the mail. The provider will present further analysis and discuss implications of these findings on NRT services in Quit Lines.

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POS2-72  INCREASING ACCESS TO SMOKING CESSATION TREATMENT: THE EFFECTIVENESS OF A FREE NICOTINE PROGRAM AMONG CHINESE AMERICANS

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Chinese Americans constitute the largest segment of Asian Americans in NYC and are at particularly high-risk for excess tobacco-related morbidity and mortality. To increase access to evidence-based cessation treatment, the NYCDOH collaborated with Columbia University to distribute free nicotine patches (NRT) through two community-based organizations. Currently, there is no data on the effect of providing free NRT on medication use and smoking cessation among this high risk minority population. The purpose of this study was to analyze the impact of the program on the use of pharmacotherapy and cessation rates in this minority immigrant population, to test the hypothesis that providing free patches through community-based organizations will produce quit rates comparable to those achieved in clinical settings, and to explore the factors associated with smoking cessation. A total of 375 Chinese smokers were recruited via advertisements throughout the target community. Eligible smokers received a six-week course of nicotine patches. At three months, follow-up telephone interviews were conducted to assess quit rates and use of pharmacotherapy. Among 214 participants interviewed at three months, 41% reported quitting. Those factors associated with smoking cessation included the number of nicotine patches used, self efficacy, and length of quit attempts in the past twelve months. We did not find any significant association between quitting and demographics or other tobacco use behaviors. At three months, quit rates are significantly higher than those previously reported for over the counter nicotine patches (8-10%) and comparable to those achieved in clinical practice. The results have important policy implications. First, providing free medication increases access to effective cessation treatments for hard to reach populations. Second, community based organizations have the capacity to provide this treatment effectively and are a critical resource for dissemination of public health programs to immigrant communities. Finally, collaboration between health department and local community organizations may be necessary to the ensure sustainability of these programs.

This on-going study is conducted at the Columbia University, Mailman School of Public Health. Funded by the Centers for Disease Control and Prevention, grant number 5 K01 DP000087-02.

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POS2-73 DEVELOPMENT AND PRELIMINARY EFFICACY OF AN EXPOSURE- AND ACCEPTANCE-BASED DISTRESS TOLERANCE TREATMENT FOR EARLY SMOKING LAPSERS

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A significant percentage of individuals attempting smoking cessation lapse within a matter of days and very few are able to recover to achieve abstinence. Recent research findings suggest that how one reacts to the discomfort of nicotine withdrawal and quitting smoking is a promising avenue of investigation and may have important treatment implications. The present research describes preliminary data examining the efficacy of a novel distress tolerance treatment for early smoking lapses that utilizes behavioral exposure to nicotine withdrawal and training in skills based in Acceptance and Commitment Therapy (ACT). Participants (n = 15) were ‘early smoking lapsers’, selected on the basis of having had no quit attempt (in the past 10 years) that was sustained from more than 72 hours. The seven-day point prevalence abstinence rate at the end of treatment was 33.3%. At the 8- and 13-week post quit date follow-up assessments, the seven-day point prevalence abstinence rates were 26.7% (11 participants completed) and 20% (10 participants completed), respectively. The average longest period of abstinence at any time during the 13-week follow-up period was 27.3 days (SD=19.7). The majority of participants were able to remain quit for a considerably longer time period than they ever had in the past 10 years.

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POS2-74 USING NICOTINE REPLACEMENT THERAPY (NRT) TO REDUCE THEN STOP SMOKING

Tobias Danielsson* and Mikael Franzon, Pfizer Consumer Healthcare

INTRODUCTION: NRT aids smoking cessation, but fewer than half of smokers attempt to quit each year. For smokers not ready to abruptly quit, additional strategies are needed to encourage cessation. We studied using NRT to reduce smoking as a prelude to cessation.

METHODS: Six randomized, double-blind, placebo-controlled studies of NRT for smoking reduction enrolled 2,424 smokers who smoked at least 15 cigarettes per day (cpd) and had smoked for at least 3 years. All subjects enrolled were unable or unwilling to quit, but wanted to reduce smoking. Four studies used nicotine gum, two used nicotine inhaler. Subjects were allocated active or placebo NRT, and instructed to reduce their smoking as much as possible. The primary efficacy parameter was a reduction in cpd by at least 50% vs baseline, sustained from wk 8 to month 4, verified by a decrease in carbon monoxide. Secondary measures included whether reduced smoking led to cessation.

RESULTS: At 4 months, twice as many smokers using NRT had reduced their cpd by at least 50% compared to smokers using placebo: 193/1215 (15.9%) vs 81/1209 (6.7%). Using NRT to reduce smoking promoted cessation, and NRT doubled the number of abstinent smokers at 1 year vs placebo: 7 day point prevalence abstinence rates 8.15% vs 4.05% (OR 2.10, 95% CI 1.4, 2.8). In the NRT treatment group, 30% (58/193) of those who had reduced their smoking by half at month 4 were abstinent at 1 year, compared to 18.5% (58/311) of those using placebo.

CONCLUSIONS: NRT is twice as effective as placebo for reducing smoking by 50% or more, and these reductions can be maintained. Reducing smoking promotes cessation in smokers not able or ready to abruptly quit; one-third of those who reduced their smoking by at least half at month 4 with NRT subsequently stopped smoking completely.

These studies were supported by Pfizer Consumer Healthcare.

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POS2-75 ASSOCIATION OF GENETIC VARIATION IN MU OPIIOD RECEPTOR INTERACTING PROTEINS WITH RESPONSE TO NICOTINE REPLACEMENT THERAPY

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Extending a previous finding of an association of functional genetic variation in the mu-opioid receptor gene and response to nicotine replacement therapy, we explored the role of genetic variants in two genes encoding mu-opioid receptor interacting proteins, namely ARRB2 and HINT-1. Participants were 382 smokers treated for nicotine dependence with either transdermal nicotine (TN) or nicotine nasal spray (NS) for 8 weeks in an open label randomized trial. Abstinence was biochemically verified at end of treatment (EOT) and 6-month follow-up. In a logistic regression model controlling for OPRM1 genotype and other covariates, there was a statistically significant interaction between ARRB2 genotype and treatment assignment on abstinence at EOT. Specifically, the relative efficacy of TN vs. NS was greater among smokers with ARRB2 TT genotypes compared to CT or CC genotypes. Participants with the ARRB2 TT genotype also reported significantly higher levels of compliance with TN than did participants with CT or CC genotypes. Participants with the HINT1 TT genotype had significantly higher abstinence rates at 6-month follow-up, but as they were drug-free during this time, this may not be a pharmacogenetic effect. While replication in larger samples is necessary, these results suggest the potential value of exploring associations of genetic variation in mu opioid receptor interacting proteins with addiction-related phenotypes, including pharmacogenetic outcomes.

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POS2-76 CYP2B6 METABOLIZES BUPROPION: IMPACT OF GENETIC VARIATION ON SMOKING CESSATION

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The abstinence rates for smokers treated with bupropion may be improved by identifying CYP2B6 genetic variants that affect bupropion metabolic activation to hydroxybupropion, if they result in altered cessation rates. Previously, genetically decreased CYP2B6 activity was found to decrease smoking cessation abstinence in both placebo and bupropion treatment arms. We hypothesized that genetic variants resulting in increased CYP2B6 activity will increase smoking cessation abstinence. We investigated the effect of the CYP2B6 variants G516T and A785G on outcomes of smokers treated with bupropion. We haplotyped 424 smokers and frequencies found were 51.2% CYP2B6 *1/*1 (no variants), 37.5% CYP2B6 *1/*6 (6% of both variants on the same allele), 3.3% CYP2B6 *1/*4 (A785G variant only), 0.9% CYP2B6 *4/*6 and 7.1% CYP2B6 *6/*6. No other combinations were found. The *4 allele has previously been associated with increased bupropion metabolism and the *6 allele with both increased nicotine and decreased efavirenz metabolism; therefore, the population was grouped according to estimated CYP2B6 activity: CYP2B6 *1/*1 (normal), CYP2B6 *1/*4 and *4/*6 (increased) and CYP2B6 *1/*6 and *6/*6 (unknown). There were no significant differences across these groups in baseline measures (cigs/day, FTND score, craving, withdrawal or side effects) or in abstinence rates (end of treatment or 6 month followup). No robust genotype by treatment interaction was seen although the sample sizes were small. Despite previous data showing genetically decreased CYP2B6 activity resulting in increased bupropion-mediated smoking cessation, a suspected increased activity variant (*4) and an unknown activity variant (*6) did not alter abstinence rates. In summary, genetic variants that increase CYP2B6 activity and bupropion metabolism did not affect cessation outcomes.

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**POS2-77**

**ADHERENCE TO BUPROPION SR IN A SMOKING CESSATION EFFECTIVENESS TRIAL**

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Patient adherence underlies the internal validity of clinical efficacy trials. Despite the importance of adherence to maximizing therapeutic outcomes, efficacy trials of bupropion SR for smoking cessation rarely report rates of medication adherence. The purpose of this study is to describe bupropion SR adherence rates in the context of combined behavioral and pharmacotherapy interventions, and to examine whether bupropion SR adherence impacts smoking cessation outcomes. 1,524 cigarette smokers were randomly assigned to high or low intensity behavioral interventions and to receive an eight-week prescription of either 150 mg or 300 mg per day of bupropion SR. The 4 treatment conditions were collapsed for purposes of this paper. 1,017 participants completed 3 month follow-up assessment of smoking status and adherence. The baseline sample was 57% female, averaged 45 years of age, and smoked an average of 23.2 ± 9.8 cigarettes per day. Overall, 28.5% reported having stopped taking medication during the treatment phase because of side effects and 13.6% reported having stopped taking medication because it was not working. 38.9% reported having missed taking a bupropion SR dose over the course of treatment and 12.0% reported deliberately taking less than prescribed. Smokers at 3 months report- ed taking bupropion SR for significantly fewer days than did nonsmokers (39 vs. 51 days; p < 0.0001). Those taking medication as prescribed were less likely to have also reported smoking since treatment (63.2%) than were those who did not take medication as prescribed (74.8%); p < 0.02. Enhancing medication adherence among patients prescribed bupropion SR is likely to improve smoking cessation out- comes.

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**POS2-78**

**THE EFFECTS OF BODY IMAGE ON SMOKING CESSATION IN INDIVIDUALS LIVING WITH HIV/AIDS**

Michelle Corovne Fingeret*, Ph.D., Damon J. Vidrine, Dr.PH., Roberto C. Arduino, M.D., and Ellen R. Gritz, Ph.D.

In the general population, lower smoking cessation rates are found among individ- uals concerned about their body image and weight. Increased attention has been given to the body image concerns of individuals living with HIV/AIDS as HIV infection and treatment can significantly alter physical appearance. With considerable varia- tion in the types of bodily changes experienced in this population (e.g., wasting, lipodystrophy), body image concerns are expected to be complex and diverse. The purpose of this study was to examine whether body image concerns were associat- ed with smoking cessation rates among individuals living with HIV/AIDS. Ninety-five smokers at an HIV clinic were recruited to participate in a smoking cessation inter- vention with proactive cellular phone counseling. Three month follow-up data col- lected on 77 participants (81.1% follow-up rate) indicated smoking abstinence rates (biochemically confirmed) of 23.4%. Body image concerns were significantly associ- ated with depression (r = .42), anxiety (r = .33), stress (r = .26), and social support (r = .35), all variables known to affect cessation rates. However, participants with a moderate level of body image concerns were 3.5 times more likely to have quit smoking at follow-up compared to other participants (OR=3.54; 95% CI 1.12-11.20, p=0.03). These findings demonstrate a unique and complex relationship between smoking and body image among individuals living with HIV/AIDS that differs from the relationship found in the general population. Moderate levels of body image concerns in this population may be indicative of realistic body perceptions associated with positive mental health. Further research is needed to examine these effects.

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**POS2-79**

**BODY IMAGE AND BODY SATISFACTION IN NORMAL AND OVERWEIGHT/OBESE WOMEN SMOKERS AND NEVERSMOKERS**

Cynthia S. Pomerleau*, Ph.D., University of Michigan; Karen K. Saules, Ph.D., Eastern Michigan University

To test the hypothesis that women smokers, particularly those who are overweight or obese, have poorer body image and greater body dissatisfaction than never- smokers, we studied 587 women 18-55 years old (mean age [SD] 34.3 [9.8]; 77% White) recruited to participate in laboratory investigations not focused on weight con- cerns at the University of Michigan Nicotine Research Laboratory. The sample con- sisted of 420 women smokers (FTND 4.6 [2.5]; cigarettes/day 18.2 [8.4]) and 167 neversmokers; 44% of each group were overweight or obese (BMI GE 25). Since the groups differed significantly on age and education, these variables were included as covariates in subsequent analyses. Questionnaires included a measure of body dis- satisfaction and the Body Image Questionnaire (Fallon & Rozin, 1985), which asks respondents to identify which of ten silhouettes of increasingly larger female bodies best represents a) how she looks; and b) how she wishes she looked. Assessments of depression and anxiety were also administered. Smokers answered questions about smoking-related weight concerns. Smokers did not differ from neversmokers on perceived body shape but scored significantly higher on preferred body shape and body dissatisfaction, as well as on anxiety and depression. Effects for weight cate- gory and interaction effects on preferred shape and body dissatisfaction suggested greater severity in overweight/obese smokers. Overweight/obese smokers were sig- nificantly more concerned than normal-weight smokers about postcessation weight gain and lower in self-efficacy about avoiding relapse if weight increased. Our find- ings suggest that overweight/obese smokers will require special attention to body image and mood problems if they are to achieve and maintain a healthful weight and/or to quit smoking successfully.

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**POS2-80**

**THE RELATIONSHIP OF BODY IMAGE DISSATISFACTION TO CIGARETTE SMOKING IN COLLEGE STUDENTS**

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This study examined the association of cigarette smoking status and body image dissatisfaction as measured by the Multidimensional Body-Self Relations Questionnaire (MBSRQ) in 1575 young adult college students. Respondents were current cigarette smokers ( N = 482) or never tobacco users ( N = 1093). Smoking status was found to be significantly associated with 5 of the 10 MBSRQ subscales, with current smokers having lower scores on Fitness Orientation, Health Evaluation, and Health Orientation (all P < 0.001) and greater severity in overweight/obese smokers. Overweight/obese smokers were sig- nificantly more concerned than normal-weight smokers about postcessation weight gain and lower in self-efficacy about avoiding relapse if weight increased. Our find- ings suggest that overweight/obese smokers will require special attention to body image and mood problems if they are to achieve and maintain a healthful weight and/or to quit smoking successfully.

**Funding:** Mayo Clinic Nicotine Research Program.

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POS2-81  BODY IMAGE DISCREPANCY AND SMOKING TOPOGRAPHY AMONG NEVER-OVERWEIGHT FEMALE SMOKERS

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The discrepancy between a woman’s perception of her weight and her actual weight has received little empirical attention among women smokers, and its impact on smoking and weight-related behaviors is unclear. Using data collected from participants in studies of women’s weight concerns, dysfunctional eating, and smoking, we studied women who reported never being overweight during their adult lives (lifetime BMI<25). Women who thought they had a weight problem in the past were classified as body image discrepant (BID, n=21), while those who denied any weight problem in the past were classified as non-body image discrepant (NBID, n=18). Results showed that BIDs smoked significantly more cigarettes per day (p<.05), BIDs were significantly more likely to report having begun smoking for weight control and anxiolytic purposes, whereas NBIDs were significantly more likely to have endorsed taste as a reason for beginning to smoke. BIDs had a higher CAGE Alcohol scores (p<.05) than NBIDs. They were significantly more likely than NBIDs to diet (BID 65.7%; NBID 55.6%; p<.05) and scored higher on the Cognitive Restraint subscale of the Three-Factor Eating Questionnaire (p<.05). Thus, although further research is necessary, these preliminary results suggest that a discrepancy between perceived and actual weight may influence many biobehavioral outcomes including smoking initiation and smoking-related behavior.

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POS2-82  RELATIONSHIP BETWEEN WEIGHT CONCERNS, BODY IMAGE DISSATISFACTION, AND COGNITIVE STYLE VARIABLES TO COLLEGE WOMEN’S SMOKING

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Although considerable research has been conducted on women’s smoking and weight concerns, the relationship between smoking, weight concerns, and body image is unclear. Using data from a study on weight concerns and smoking in college women, we studied the relationship between smoking, weight concerns, and body image. Scores on the Body Dissatisfaction subscale of the Eating Disorder Inventory-2 (EDI-2) and reasons for smoking were used to create the following categories: no weight concerns (NWC; n=40), weight concerns with low body dissatisfaction (WCL; n=24), and weight concerns with high body dissatisfaction (WCH; n=32). Controlling for Body Mass Index (BMI), WCH had higher scores than WCL and NWC on cognitive style variables, including the Fear of Weight Gain (RWFW; p<.01) and Self-Control (SCSE; p<.01) subscales of the Brief Mizes Anorectic Cognitions Questionnaire (BMAC). WCH also had higher scores than WCL and NWC on several subscales of the EDI-2, including the Drive for Thinness (DT; p<.001), Bulimia (B; p<.001), Ineffectiveness (IE; p<.001), Interpersonal Distrust (ID; p<.05), and Interceptive Awareness (IA; p<.001). Controlling for BMI, WCH smoked fewer years (M=4.36) than WCL (M=6.45, p<.05) and smoked fewer cigarettes in the past 30 days (p<.05). WCH were marginally more depressed (CES-D M=21.66, p=.08) than WCL (M=17.25) and NWC (M=17.21). Although further research is necessary, the finding that those with high body dissatisfaction had begun smoking more recently suggests that body dissatisfaction and related cognitive style variables may play a role in smoking initiation by weight-concerned college women.

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POS2-83  RELIABILITY AND VALIDITY OF THE WEIGHT CONCERNS SCALE (WCS) IN YOUNG ADOLESCENT BOYS AND GIRLS

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Relationships have been reported between smoking behavior and weight concerns. Identifying measurement instruments that can reliably and validly measure these weight concerns is an essential first step. The purpose of this study was to investigate the psychometric properties of the Weight Concerns Scale (WCS) in 6th grade boys and girls. The WCS is a five item, self-reported survey that employs a five-point Likert scale. The study used a cross-sectional design utilizing baseline data from a parent study (Susan Albrecht, PI) on the mechanism of cigarette smoking as an initiator to smoking vs. escalation to smoking for the purpose of weight management. The study employed a convenience sample of 91 6th grade students who met inclusion, which consisted of 48 girls and 56 boys. The students were 11-13 years of age; 31.7%-11% of age, 65.4%-12% of age and 2.9%-13 years of age, predominantly White 91.3%, with 8.7% being classified as Other, and had a Mean Basal Metabolic Index (BMI) of 20.26 (SD=5.0). The results indicated that the WCS was a reliable tool with Cronbach alpha of .72, standard error of measurement of .48 and a split-half coefficient of .78 using Spearman-Brown formula. The WCS had face, criterion (concurrent & predictive), and construct validity established by validity coefficients and factor analysis. The criterion validity coefficients were statistically significant with the weight concern measures in the Youth Risk Behavior Survey (ASSCo). Convergent validity of the WCS was supported by its relationship with the BMI weight. Factor analysis demonstrated the unidimensionality of the WCS with 56.1 of the total variance explained by the primary factor. Present study supports the reliability and validity of the WCS and the hypothesis of unidimensionality of the WCS items in a 6th grade student population. This study provides evidence that the WCS is a sound measure of weight concerns with middle school students and as such can be a valuable tool to use in smoking prevention research.

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POS2-84  THE PREVALENCE OF WEIGHT CONCERNS IN A SMOKING ABSTINENCE CLINICAL TRIAL

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Recent research has demonstrated there is a high prevalence of weight concerns in smokers and that smokers with weight concerns may respond poorly to treatment for tobacco dependence. Most studies have focused only on females or have consisted of small samples. In this study of a 12-week randomized trial of nicotine inhaler, bupropion, or both for smoking cessation, 50% of the 1012 female smokers and 26% of the 680 male smokers, at study entry, were weight concerned. In examining the impact of weight concerns on the 12-week point-prevalence smoking abstinence, 26% of non-weight concerned smokers quit smoking compared to 22% of weight concerned smokers (p= 0.06). This study, which includes a large sample of both genders, provides further evidence that approximately half of females who are seeking smoking cessation are weight concerned and that one quarter of males smokers are weight concerned. Additionally, being weight concerned may impact the short-term success rates of stopping smoking using pharmacotherapy.

Support for this trial was provided by the National Cancer Institute through the North Central Cancer Treatment Group. Medication was supplied by Glaxo Wellcome and Pharmacia Pharmaceuticals.

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POS2-85  EXAMINATION OF POST CESSION WEIGHT GAIN

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The majority of smokers gain weight after quitting; however the effect of any post cessation weight gain on abstinence remains unclear. Fear of weight gain has long been considered a barrier to quitting while actual post cessation weight gain has not been consistently found to affect outcome. The current study assessed the role of weight gain and weight concern on abstinence in 124 smokers who were randomly assigned to receive either transdermal nicotine or nicotine nasal spray over an 8-week treatment period. Abstinence was biochemically verified at end of treatment (EOT) and body weight was self-reported at pre-treatment and EOT. Overall, 58% of the sample gained weight, and the mean weight gain was 3.32 lbs (SD = 8.73). EOT abstinence was associated positively with weight gain (t = -2.35; p=.02) while higher levels of pretreatment weight concern were associated with less weight gain at EOT (r = -.22; p=.02). When these bivariate analyses were stratified by sex, they were significant for females only. A logistic regression model of EOT abstinence with an interaction term for sex X weight concern indicated a trend toward weight concern for females being less likely to quit (OR = .65; p=.07). Participants who gained weight were 4% more likely to quit for every pound of weight gained (OR = 1.04; p=.055). A logistic regression model was also estimated for a dichotomized weight gain at EOT variable (weight gain vs. no weight gain) for females only. For each increment increase in weight concern, females were 32% less likely to gain weight (OR = .68; p=.01). Despite the relatively small sample size and the use of self-reported weight, these data contribute to a body of literature on the importance of weight concern and weight gain in smoking cessation, especially for women. These data suggest that if female smokers can be counseled to alleviate their weight concern, they may be more likely to quit successfully.

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POS2-86  DIETING, BINGE EATING, AND SMOKING TRAJECTORIES FOR CHILDHOOD-ONSET VERSUS LATER-ONSET WEIGHT PROBLEMS

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We hypothesized that among women with a history of weight problems, childhood onset may confer higher risk of unhealthy eating and dieting behaviors, including smoking to control weight. Using data collected from participants in studies of women’s weight concerns, dysfuntional eating, and smoking, we studied women who reported being overweight or obese at some time in their adult lives (i.e., lifetime adult BMI > 25), comparing those who reported early onset of weight problems (by age 12; EO; n=43) with those reporting a later onset (after age 12; LO; n=92). EO were significantly more likely than LO to be currently obese (i.e., BMI>30; EO 61%; LO 28%; p<.01) and have a history of lifetime (EO 58%; LO 37%; p<.05) and past-6-month bingeing (EO 54%; LO 34%; p<.05). They also had higher levels of depression (CESD; EO 15.9±8.0, LO 12.1±9.2; p<.05) and marginally (higher anxiety (STAI; EO 48.3±14.7, LO 42.6±13.9; p=.05) before quit day. Of 81 subjects, 25 quit for more than 24 hours, 30 quit less than 24 hours, and 26 did not reach quit day. Those who quit for more than 24 hours gained more weight than those who quit for less than 24 hours (4.04±3.04 vs. 1.90±2.73lbs, p=.008). Those who did not reach quit day (N=26) showed significantly higher scores in 5 of the 11 EDI-2 subscales compared to those who did reach quit day (N=55); Bulimia (1.81±3.19 vs. 0.58±1.08, p=.012), Ineffectiveness (2.65±3.78 vs. 0.82±1.31, p=.002), Interpersonal Distress (2.59±3.24 vs. 1.20±2.74, p=.050), Interceptive Awareness (2.58±3.13 vs. 0.87±1.36, p=.001), and Impulse Regulation (2.92±3.90 vs. 0.82±1.42, p=.000). Results from this study show that factors associated with eating disorders may play a role in initiating a successful quit attempt. This study may indicate the use of the EDI to tailor cessation strategies to individual needs.

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POS2-87  PSYCHOLOGICAL FACTORS ASSOCIATED WITH EATING DISORDERS AND SMOKING CESSATION

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In female patients with eating disorders the frequency of cigarette use is linearly related to body dissatisfaction and drive for thinness. Many women list fear of weight gain as a major deterrent from smoking cessation and weight gain following smoking cessation is common. Many studies have examined smoking rates and addictive behaviors among females with eating disorders but few have examined eating disorder factors in female smokers not diagnosed with an eating disorder. In this study, relapse, eating disorder factors, smoking dependency and short-term weight gain with smoking cessation were measured in 81 women ages 18-40 to determine which factors associated with eating disorders correlate with nicotine dependency and relapse. Eating disorder factors were measured with the Eating Disorder Index-2 (EDI-2). Nicotine dependence was measured by the Fagerstrom questionnaire. Higher scores in each scale represent greater symptoms of eating disorders or nicotine dependence respectively. Subjects were asked to quit smoking for at least 24 hours. The EDI and Fagerstrom questionnaires were administered on a baseline visit before quit day. Of 81 subjects, 25 quit for more than 24 hours, 30 quit less than 24 hours, and 26 did not reach quit day. Those who quit more than 24 hours gained more weight than those who quit for less than 24 hours (4.04±3.04 vs. 1.90±2.73lbs, p=.008). Those who did not reach quit day (N=26) showed significantly higher scores in 5 of the 11 EDI-2 subscales compared to those who did reach quit day (N=55); Bulimia (1.81±3.19 vs. 0.58±1.08, p=.012), Ineffectiveness (2.65±3.78 vs. 0.82±1.31, p=.002), Interpersonal Distress (2.59±3.24 vs. 1.20±2.74, p=.050), Interceptive Awareness (2.58±3.13 vs. 0.87±1.36, p=.001), and Impulse Regulation (2.92±3.90 vs. 0.82±1.42, p=.000). Results from this study show that factors associated with eating disorders may play a role in initiating a successful quit attempt. This study may indicate the use of the EDI to tailor cessation strategies to individual needs.

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POS2-88  ASSOCIATION BETWEEN TOBACCO USE AND DIETARY INTAKE OF FRUITS AND VEGETABLES AMONG 3,414 PATIENTS PRESENTING FOR DENTAL CARE


BACKGROUND: Unhealthy behaviors, such as tobacco and alcohol abuse, are known to often be clustered together in many individuals. However, research assessing the clustering of poor dietary patterns and smoking is more limited.

PURPOSE: To compare intake of fruits and vegetables among tobacco users and non-users who enter the dental care system.

METHODS: Tobacco users (n = 470) and non-users (n=2944) presenting for dental care at 40 general and periodontal dental practices across the southeastern U.S. completed a post-visit survey including the question: “Do you now eat five servings of fruits or vegetables daily?” Association between tobacco use and positive response to a question regarding daily fruit and vegetable intake, after adjusting for age, gender, and county-level income and rural-urban status was assessed using logistic regression.

RESULTS: Among the 3,414 patients, mean age was 46; 61% were female. Tobacco users were younger (43 years vs. 47 years) compared to non-users, and more frequently from low income counties (33% vs. 28%) (both p<0.01). Compared to non-users, tobacco users less frequently reported daily consumption of five servings of fruits and vegetables (12% vs. 18%, p = 0.001). After adjustment, the association between tobacco use and less fruit and vegetable intake was maintained (Odds Ratio=0.83 (95% CI 0.47-0.83)).

CONCLUSIONS: Fruit and vegetable intake was low among dental care seekers, and even lower among tobacco users. Because high-risk persons who enter the dental care system may not be regular users of medical care, identifying tobacco users when they enter the dental care system may be a useful strategy for targeting multiple risk factor interventions focusing on tobacco and diet.

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POST-TREATMENT CHANGE IN SMOKING AND ITS ASSOCIATION WITH FUTURE SMOKING AND CESSATION EFFORTS AMONG ADOLESCENTS WITH PSYCHIATRIC COMORBIDITY

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Despite increased study of adolescent smoking cessation, little is known about how initial change following an intervention relates to longer-term smoking outcomes. The present study investigated this relationship among psychiatrically hospitalized adolescents (n = 183, 63% female, 95% White) who participated in a controlled trial of MI vs. brief advice. Quit Attempters (n=37), Reducers (n=45), and Maintainers (n=101) were assembled based on having made a quit attempt, reduced smoking by 50% or more, and reduced smoking by < 50% in the first week post hospital discharge, respectively. HLMs and GEEs were conducted to test group differences in average number of cigarettes per day and odds of making a quit attempt during subsequent weeks of a 12-month continuous follow-up assessed with the TLFB. Results of the HLM models indicated that after controlling for covariates, Quit Attempters smoked less during follow-up than the other change groups (beta = -1.69, p < .01) and Reducers smoked less than Maintainers (beta = -3.30, p < .001) although there was an interaction of the latter group effect with a linear time effect (beta = .06, p < .002). In the GEE models,Quit Attempters evidenced higher percent of quit attempts during follow-up than the other two change groups (beta = .82, p < .001), in the context of a group by time interaction (beta = -.029, p = .003). Reducers also had greater average percent of quit attempts during follow-up than Maintainers (beta = .47, p = .008). In all models, group differences were stronger in the first few months and decreased over time. Findings have implications for initial post-treatment change as it relates to subsequent smoking and cessation outcomes.

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POST-SHYNESS AND SOCIAL ANXIETY-RELATED SMOKING IN A COLLEGE SAMPLE

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Social anxiety has been found to be a risk factor for developing nicotine dependence (Sonntag, et al., 2000), and poor social relations have been found to be correlated with cigarette use (Stein, et al., 1996). The purpose of this study was to investigate the relationship between a related construct, shyness, and smokers’ perceived use of cigarettes to reduce anxiety in social situations. 1,774 usable surveys (89% response rate) were collected in a random sample of undergraduate classes. Participants completed items on tobacco use and a 9-item Shyness Scale (Cheek & Buss, 1981). Past 30-day smokers responded to two smoking-prohibited situations assessing social anxiety-related smoking effects (situational urge to smoke, general anxiety, speech inhibition, and anxiolytic effects if smoking were allowed) as it relates to subsequent smoking and cessation outcomes.

INTRODUCTION: To increase our understanding of the personality trait of hostility, the biological variable of nicotine sensitivity and risk factors for cigarette smoking, we included them in various regression models for identifying smokers designated as Current, Moderate to Heavy, and Number of Cigarettes-smoked-per-day.

METHODS: Data were obtained through computer-assisted telephone interviews in late 1998 to early 1999. A sample (N, 1502) was selected through random-digit dialing. All respondents were residents of Long Beach CA and at least 18 yrs of age.

RESULTS: Prevalence of current smokers was 18% (N, 275). A forward stepwise logistic regression with Current Smokers as the dependent variable determined a model with hostility, health status, alcohol drinking status, and demographic variables of income, education, and ethnic group. A corresponding logistic regression applied to identifying Moderate-Heavy smokers produced a model comprised of two biopsychological variables — first cigarette-of-the-day sensitivity and nicotine dependence. Linear regression with Number of Cigarettes-smoked-per-day as the dependent variable identified a model of nicotine dependence and alcohol-drinking frequency. Follow-up ANOVA found that both hostility and first cigarette-of-the-day sensitivity differed by five ethnic groups.

CONCLUSIONS. These results confirm previously reported findings of hostility’s strong association with current smoking and lack of association with number of cigarettes smoked. Variables with significant links to number of cigarettes smoked were first-cigarette-of-the-day sensitivity, nicotine dependence, and frequency of drinking alcohol. These results may contribute to understanding certain discrepancies in the rank ordering of ethnic groups according to smoker prevalence compared to numbers of cigarettes smoked. For instance, risk factors such as hostility, nicotine sensitivity, and alcohol intake patterns could play a role in smoking prevention and cessation programs that seek to address specific vulnerabilities.

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SUBJECTIVE EFFECTS OF TRANSDERMAL NICOTINE AMONG NONSMokers: OVERALL EFFECTS AND MODERATION BY PERSONALITY

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Despite the potential relevance of the subjective effects of nicotine to smoking, relatively few studies have assessed these effects among nonsmokers. The present study examined the subjective effects of transdermal nicotine among 92 undergraduate nonsmokers (45 female;<100 cigarettes lifetime). Participants each attended 2 lab sessions separated by one week. During each session, baseline ratings of empirical-ly-derived headrush, fatigue, energy, positive affect, and negative affect factors and nausea (Perkins et al., NTR 2003), as well as broader measures of positive and negative affect (PANAS PA and NA) and personality (behavioral inhibition and behavioral approach; BIS and BAS), were obtained immediately before application of a 7-mg Habitrol patch or placebo patch (double-blind; order counterbalanced). Assessments of subjective effects were repeated 4 and 5 hours after patch application (cognitive and motivational tasks were conducted between the two latter assessments).

Test-retest reliability of baseline subjective effects suggested moderate stability for head-rush, fatigue, and energy factors (rs = .53-.65); but the brief positive and negative affect factors (rs = .33 and .38) were not as stable as the PANAS measures (PA and NA r=. 61 and .70). Overall, the subjective effects of nicotine, relative to placebo, were generally modest and unpleasant. Although nicotine prevented an increase in fatigue related to relaxation, it tended to increase negative affect factors for PANAS NA that occurred with placebo, p<.03, and tended to cause a relative increase in nausea, p=.08. (Note that 2 additional participants discontinued due to nausea in the nicotine patch condition.) Interestingly, the magnitude of several subjective effects of nicotine was moderated by personality. For example, the degree to which nicotine resulted in relatively greater PANAS NA was enhanced among participants with greater dispositional negative affect, p<.01, and behavioral inhibition, p<.05. These results draw attention to the role of personality in shaping the subjective effects of nicotine and may be relevant to models of smoking initiation and maintenance.

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**POS2-93**

**THE RELATIONSHIP BETWEEN HOSTILITY AND CIGARETTE USE AMONG COLLEGE STUDENTS**

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Although studies have linked hostility with poor health outcomes as an independent risk factor, this trait has also been shown to be related to other risk factors, such as cigarette smoking. This study sought to examine the relationship between hostility and cigarette use in a college population by analyzing 1,789 usable surveys (89.7% response rate) gathered from a random sample of undergraduate classes at a four-year institution. A 27-item version of the Cook-Medley Hostility scale was used. Three subscale scores were calculated: Cynical Attitudes, Hostile Affect, and Aggressive Responding. Approximately 31% of the respondents were classified as current (past 30-day) smokers, with 9.3% reporting current daily smoking. Current smokers had significantly higher scores on the Hostile Affect and Aggressive Responding subscales when compared to both non-current smokers and never smokers. Higher scores on the Hostile Affect scale were significantly associated with current cigarette use, even after controlling for demographic and other respondent characteristics. Some studies suggest a moderating role of gender in the relationship between hostility and smoking; we were unable to demonstrate such a relationship in the present analysis. Although this study employs a cross-sectional rather than a longitudinal design, it does provide some evidence on the relationship between hostility and cigarette smoking in college students. Future studies using alternative designs should explore this relationship in this understudied, but important, population.

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**POS2-94**

**DEHYDROEPIANDROSTERONE SULFATE, CORTISOL, MOOD STATE, AND SMOKING CESSATION: RELATIONSHIP TO RELAPSE STATUS AT 4-WEEK FOLLOW-UP**

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Previous reports by Wilkins et al. (2005) suggest that increased baseline DHEAS levels may act as a natural antidepressant to attenuate negative affect during cocaine withdrawal and abstinence, decreasing the probability of relapse. The current study extends this model to assess factors related to risk of relapse in a sample of otherwise healthy male and female participants with nicotine dependence. Separate repeated measures ANOVAs were used to examine mood state, dehydroepiandrosterone sulfate (DHEAS) and cortisol levels across three assessment periods in participants who had relapsed over a 4-week follow-up period compared to those who maintained abstinence. Total scores on the Profile of Mood States differed between those who had relapsed and those who maintained abstinence (p=.03). However, DHEAS and cortisol levels, as well as the ratio of cortisol to DHEAS, did not differ significantly between groups. Interestingly, DHEAS levels fluctuated significantly between initial nicotine abstinence and 24 hours of abstinence (p=.02). These findings suggest that although DHEAS-related enhancement of resiliency to withdrawal may occur, the extent of this protective effect may be modulated by additional factors that warrant further research.

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**POS2-95**

**CIGARETTE SMOKING AND MOOD ACROSS THE MENSTRUAL CYCLE**

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Forty-one female undergraduates (mean age: 20.1 years; SD: 2.64 years) were divided into four groups: smokers/oral contraceptive users (n=10), smokers/non-oral contraceptive users (n=8), non-smokers/oral contraceptive users (n=13) and non-smokers/non-oral contraceptive users (n=10). Participants completed the Quick Mood Scale, Beck Depression Inventory, Beck Anxiety Inventory, Perceived Stress Scale, and Shortened Premenstrual Assessment Form across two consecutive menstrual cycles. Ovulation was verified in non-oral contraceptive users by luteinsing hormone urine assay and basal body temperature. Three-way repeated-measures ANOVA found significant main effects of smoking status indicating that throughout the menstrual cycle smokers experienced increased depression (p<.05), decreased cheerfulness (p<.05) and decreased friendliness (p<.05) relative to non-smokers. Main effects of phase revealed increases in negative affect during the late luteal phase consistent with a PMS-like pattern. Smoking status x Phase interactions demonstrated that smokers were more depressed (p<.05) during the follicular phase than non-smokers. Non-smokers reported increased clumsiness (p<.05), drowsiness (p<.05) and clear headedness (p<.05) compared with smokers during the late luteal phase, indicating that smokers do not show PMS-like increases in these symptoms. This suggests that smoking may mask some PMS-like symptoms during the latter part of the menstrual cycle in young women, because young female smokers experience higher levels of negative affect than non-smokers of comparable age.

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**POS2-96**

**RELIABILITY AND VALIDITY OF SELF-REPORTED DAILY SMOKING EXPERIENCES**

Ovide F. Pomerleau, Cynthia S. Pomerleau, and Sandy M. Snedecor, University of Michigan, Ann Arbor, MI

Response to the first cigarette of the day along six dimensions (global pleasant sensations; global unpleasant sensations; rush/buzz; relaxation; dizziness; nausea) was assessed in 555 daily smokers (mean [SD] age 38.1 [12.2]; 60.5% female; 74.5% White). Correlation coefficients were calculated for measures that might be expected to be associated with these Daily Smoking Experiences (DSE)-namely, retrospective reports of experiences upon early smoking experimentation, indices of dependence, and psychological cofactors for smoking. Each dimension was correlated with report of the same dimension upon initial experimentation with smoking (r=.20, p<.001 for all dimensions). FTND was inversely related to dizziness (r=-.21, p<.001) and nausea (r=-.10, p<.05), and positively to pleasant sensations (r=.16, p<.001). Pleasant sensations were positively and significantly associated with 5 of 7 withdrawal symptoms, unpleasant sensations with 6, rush/buzz with 5, relaxation with all 7 symptoms, and dizziness and nausea each with one symptom. Patterns of positive correlations were also found with measures of depression, anxiety, and disordered eating. No correlations were found with alcohol or caffeine intake. In addition, in 17 individuals who had completed the questionnaire twice, test-retest reliability was computed, controlling for time between administrations. Even in this small sample, a significant correlation emerged for pleasant sensations (r=.57, p<.05), with trends for nausea (r=-.48, p<.10) and relaxation (r=.47, p<.10). We conclude: The first cigarette of the day, after overnight abstinence, recapitulates some of the patterns of innate sensitivity elicited upon early experimentation with nicotine. DSE dimensions are modestly associated with measures of dependence. Correlations with measures of smoking-related psychopathology may be suggestive of self-medication. Preliminary evidence of test-retest reliability will require replication in larger samples.

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POS2-97

EARLY LIFE STRESS INFLUENCES SMOKING PERSISTENCE BUT NOT INITIATION: THE NEW ENGLAND FAMILY STUDY

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Early life stress (ELS) has been linked to increased propensity for self-administration of various drugs of abuse as well as permanent dysregulation of stress response and social behavior systems in animal models. Retrospective human studies have also revealed effects of ELS on many psychological and behavioral disorders in adults including drug and alcohol abuse and smoking. However, we know of no studies including prospective measures of ELS and comprehensive measures of adult smoking outcomes. In data collected through the New England Family Study, we examined the influence of four prospectively-measured early life stressors (loss of a parent, foster home placement, unfavorable emotional environment, hospitalization), as well as additional indicators of early adversity (teen mother, and increased housing density) on several indices of adult smoking. Participants were 1540 adult offspring (59% female) of mothers (mean age 25, 23% low SES) recruited into the National Collaborative Perinatal Project. ELS measures were collected at age one; adversity measures at birth. Offspring were re-contacted as adults (mean age 39) and completed the Lifetime Interview of Smoking Trajectories, a comprehensive measure of lifetime smoking. We used increasing effects of ELS on lifetime trajectories of smoking such that no significant effect of ELS emerged for smoking initiation (ever puff or age of onset of smoking), but significant effects emerged for lifetime weekly smoking, lifetime daily smoking, and current smoking (all chi square>5.11, p<.05). The same pattern of effects emerged for offspring of teen mothers, while housing density significantly influenced current smoking only (F=8.89, p<.05). ELS was also associated with higher levels of daily cigarettes smoked as well as more times abstinent (F=5.46, p<.05). Results improve upon previous retrospective studies and suggest a particular influence of ELS on the persistence but not the development of adult smoking. ELS may be an important confound in twin and prenatal smoking studies; developmental and mechanistic studies are needed to further investigate links between ELS and smoking trajectories.

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POS2-98

INFLUENCE OF NICOTINE DEPENDENCE ON THE ASSOCIATIONS BETWEEN GAMBLING AND PSYCHIATRIC DISORDERS

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BACKGROUND: Tobacco is often smoked in gambling venues, and people with gambling problems are frequently nicotine dependent. Nonetheless, little is known regarding the influence of nicotine dependence on the associations between varying levels of gambling (non-low-frequency, low-risk, at-risk, and problem/pathological) and psychiatric disorders.

METHODS: The National Epidemiologic Survey of Alcohol and Related Conditions (NESARC) surveyed 43,093 U.S. adults. Past 12-month DSM-IV diagnoses were determined using the Alcohol Use Disorder and Associated Disability Interview Schedule, DSM-IV version (AUDADIS-IV). Chi-square and logistic regression analyses using SUDAAN software were performed.

RESULTS: Among non-nicotine-dependent respondents, increasing gambling severity was associated with greater psychopathology for the vast majority of Axis I and Axis II disorders. This pattern was not typically observed among nicotine dependent subjects and seen for only several diagnoses (e.g., alcohol abuse/dependence and antisocial personality disorder). Significant nicotine-by-gambling interactions were observed for multiple Axis I and II disorders, and in all cases a stronger association between gambling and psychopathology was observed in the non-nicotin-dependent group.

DISCUSSION: Nicotine dependence influences the associations between gambling and multiple psychiatric disorders. Nicotine dependence accounts for some of the elevated risks for psychopathology associated with subsyndromal and problem/pathological levels of gambling. Additional research is needed to advance prevention and treatment strategies for individuals with gambling, smoking and other mental health problems.

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POS2-99

TRANSDERMAL NICOTINE ATTENUATES DEPRESSION SYMPTOMS IN NON-SMokers: A PRELIMINARY PLACEBO CONTROLLED TRIAL

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Despite well established links between nicotine dependence and depression, little research has examined the effects of nicotine on depression symptoms. Thus, we conducted a four-week, double-blind, placebo-controlled trial of transdermal nicotine in non-smoking individuals with depression symptoms. Non-smokers with > 3 depression symptoms as measured by the Center for Epidemiological Studies Depression scale (CESD) were recruited. Mood and cognitive performance were measured at baseline and at 1, 8, 21, and 28 days. Participants were randomly assigned to wear a nicotine (3.5 mg/day during weeks 1 and 4; 7 mg/day during weeks 2 and 3) or placebo patch. The final sample consisted of eleven non-smokers with mean age of 32.36 (SD = 10.74) and mean baseline CESD score of 27.36 (SD = 10.53). After adjusting for baseline values, a significant quadratic trend indicated that CESD scores declined to a greater degree in the nicotine patch group, but returned to placebo patch group levels by the last visit, p < .05. This return to baseline levels was coincident with a decrease in nicotine administration from 7 to 3.5 mg/day. Evidence of some improvement in attention as measured by the Conners’ Continuous Performance Task was also observed (e.g., increased Beta). These preliminary findings suggest a role for nicotinic receptor systems in the pathophysiology of depression and that nicotinic compounds should be evaluated for treating the disorder.

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POS2-100

PSYCHIATRIC PATIENTS AT INTAKE: TOBACCO USE PROFILE AND INTEREST IN QUITTING SMOKING

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Smoking is well documented to be over-represented among psychiatric patients. But although the tobacco standard of care stipulates that medical encounters should include asking about smoking, advising smokers to quit, and arranging for tobacco cessation treatment, this is rarely done in the context of psychiatric treatment. In order to assess receptivity to quitting in patients seeking psychiatric treatment, we collected smoking-related data in 146 outpatients at their intake interviews at the University of Michigan Depression Center. Of these, 16 were missing diagnostic data or received no diagnosis. Of the remaining 130, 51% were diagnosed with Major Depressive Disorder, 16% with Comorbid Depression and Anxiety, 8% with Comorbid Depression and Dysthymia, and fewer than 5% each with Generalized Anxiety Disorder, Panic Disorder, and a variety of other psychiatric disorders. Patients were 69% female and 86% Caucasian. Mean age (SD) was 35.7 (11.6). Smoking status was as follows: 32% were current smokers, another 11% were exsmokers, and 57% were neversmokers. No significant differences based on smoking status were found in age, gender, or race. Other tobacco use (cigars, pipes) was reported by no current smokers, 21% of exsmokers, and 4% of neversmokers. Current smokers had a Fagerstrom Test for Nicotine Dependence score of 3.2 (2.3), smoked 12.5 (8.5) cigarettes/day, and smoked 26.9 (11.3) years. When asked if they were willing to participate in a smoking cessation program, 33% (40% of all with non-missing data) responded positively. We conclude that a substantial portion of smokers seeking psychiatric treatment are interested in quitting and recommend that psychiatric units routinely offer smoking cessation treatment to all smoking patients.

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POS2-101

DEPRESSION HISTORY AND CURRENT DEPRESSION PREDICTS SMOKING DURING THE FIRST WEEK OF A QUIT ATTEMPT

Sandra J. Japuntich*, Stevens S. Smith, Douglas E. Jorenby, Megan E. Piper, Michael C. Fiore, and Timothy B. Baker, University of Wisconsin-Madison

This study examined the relation between depression status and relapse to smoking. 677 smokers (55.1% female, mean age = 42.8) participating in a smoking cessation trial (Smith et al., 2001) provided data on relations among current depression, depression history and depression-related measures and follow-up abstinence status. This study had broad inclusion criteria, including individuals with current depression, including taking anti-depressant medications. Depression history predates relapse at 1 week post-quit (Past Depression OR = 5.62, 95% CI = 3.36-9.38; Current Depression OR = 40.60, 95% CI = 12.60-130.87), but not at 6-months post-quit (Past Depression OR = 1.08, 95% CI = .61-1.91; Current Depression OR = .93, 95% CI = .50-1.71). Prediction models including depression-related measures showed that depression history was a powerful predictor of early failure. Smoking during the first week was not predictive of smoking at 6 months in those with a history of depression, but was predictive among those with no history of depression. In sum, the data suggest that current and past depression are risk factors for early cessation failure, but for depression-positive individuals, this does not doom ultimate quitting.

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POS2-102

THE RELIABILITY OF THE FAGERSTROM TEST FOR NICOTINE DEPENDENCE, THE MINNESOTA NICOTINE WITHDRAWAL SCALE, AND THE TIFFANY QUESTIONNAIRE FOR SMOKING URGES FOR SMOKERS WITH AND WITHOUT SCHIZOPHRENIA


There is little research examining the psychometric properties of smoking-related measures in psychiatric smokers. Recent studies, however, have been raised about the use of the Fagerstrom Test for Nicotine Dependence (FTND) with smokers with schizophrenia (Steinberg et al., 2005). In this preliminary study, we examined the reliability of the FTND, Minnesota Nicotine Withdrawal Scale (M-NWS), and the Tiffany Questionnaire for Smoking Urges (TQSU) in smokers with schizophrenia (SS; n=61) and control smokers (CS; n=114) recruited into three studies of schizophrenia and control smokers at Yale University. Baseline data was combined from two treatment studies and a laboratory study that had similar inclusion criteria. SS and CS did not differ on a number of demographic (e.g., gender, age) and smoking variables (e.g., daily smoking, carbon monoxide levels, plasma cotinine). SS included a higher proportion of African-American participants than CS. SS reported higher W-NWS, and TQSU Factor 1 scores while the two groups did not differ on baseline FTND or TQSU Factor 2 scores. The internal consistencies (Cronbach’s alpha) of the smoking measures were found to be high and comparable between diagnostic groups for the FTND (SS a = 0.71, CS a = 0.72), M-NWS total scores (SS a = 0.91, CS a = 0.87), TQSU Factor 1 (SS a = 0.67, CS a = 0.71), and TQSU Factor 2 (SS a = 0.89, CS a = 0.86). Similarly, the pattern of test-retest correlations were also high and comparable in both groups for the FTND (SS r = 0.76, CS r = 0.76), M-NWS total scores (SS r = 0.75, CS r = 0.70), TQSU Factor 1 (SS r = 0.82, CS r = 0.73), and TQSU Factor 2 (SS r = 0.92, CS r = 0.81). The FTND, M-NWS, TQSU Factor 1, and TQSU Factor 2 were significantly correlated with average cigarettes consumed per day for SS (r = 0.68, 0.37, 0.72, 0.46 respectively, all p<.05) and CS (r = 0.73, 0.35, 0.65, 0.34 respectively, all p<.05). Our findings suggest that these measures may be reliable for use with smokers with schizophrenia. Future analyses will examine reliability in smokers with other psychiatric disorders.

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POS2-103

EFFECT OF MENTAL ILLNESS AND SUBSTANCE ABUSE HISTORY ON NATURALISTIC SMOKING CESSATION TREATMENT OUTCOME

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OBJECTIVE: To determine the effect of mental illness and substance dependence history on naturalistic smoking cessation treatment outcome.

METHOD: Male smokers (n = 231) were treated with naturalistic treatment (including group therapy, nicotine replacement therapy, and/or bupropion HCl) in an 8-12 week specialized program for mentally ill and substance dependent smokers at the Greater Los Angeles VA Medical Center. Smoking abstinence at the end of the program was defined as a self-report of at least 1 week of abstinence and an exhaled carbon monoxide level < 8 ppm. Logistic Regression was performed with smoking abstinence at the end of treatment as the dependent variable and mental illness and substance dependence diagnoses as covariates (controlled for the number of cigarettes per day).

RESULTS: 84 subjects (36.4%) were classified as smoking abstinence at the end of treatment. Schizophrenia or Schizoaffective Disorder (B = -1.06, SE = .43, p = .01) and Alcohol Dependence (B = -2.70, SE = .36, p = .05) were associated with a lower likelihood of being smoking abstinence at the end of treatment compared to other mental illness and substance abuse diagnoses. Total number of weekly clinic visits and length of substance abstinence were both positively associated with successful treatment outcomes (r = .23, p = .001 and r = .19, p = .007, respectively).

CONCLUSION: Schizophrenia/Schizoaffective Disorder and Alcohol Dependence were associated with poorer outcomes to smoking cessation treatment than other mental illnesses and substance dependencies, while greater program participation was associated with better outcomes. These data imply that smokers with specific mental illness and substance abuse histories should be targeted for treatment retention efforts.

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POS2-104

A PLACEBO-CONTROLLED STUDY OF BUPROPION SR ADDED TO HIGH DOSE NICOTINE REPLACEMENT THERAPY FOR SMOKING CESSATION OR REDUCTION IN SCHIZOPHRENIA

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OBJECTIVE: This study aimed to determine whether there is a benefit of adding bupropion SR to high-dose combination nicotine replacement therapy (NRT) patch and gum for smoking reduction and cessation in schizophrenia.

METHOD: Outpatients were assigned to bupropion SR 300 mg/day or placebo for 12 weeks added to NRT patch, gum and cognitive behavioral therapy (CBT). NRT gum was dispensed up to 18 mg/day from the quit-date, and NRT patch was dispensed at 21 mg/day weeks 4-8, 14 mg/day weeks 9-10, and 7 mg/day weeks 11-12. The primary outcome was the rate of significant reduction or cessation (at least 50% reduction in cigarettes/day and at least 40% reduction in expired air carbon monoxide [CO]) at week 12. Secondary outcomes included reduction in CO, abstinence at weeks 8, 12, 24, and 52, and change in psychiatric symptoms.

RESULTS: Subjects on bupropion + dual NRT had a greater rate of significant reduction or cessation at weeks 12 (80% vs. 31%, p=0.036) and 24, lower CO levels from the quit date through week 24 (F=13.8, p<0.001), and a significantly greater 4-week continuous abstinence at week 8 (52% vs 19%, p=0.014) vs. placebo and dual NRT. In subjects on bupropion and dual NRT, relapse rates were 31% during NRT taper. Abstinence rates did not significantly differ at week 12 (36% vs 19%), week 24 (20% vs 8%), or week 52 (12% vs 8%).

CONCLUSION: Bupropion SR added to dual NRT and CBT is well tolerated and more effective than dual NRT and CBT for significant smoking reduction or cessation in schizophrenia.

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POS2-105

METHADONE DOSE AND PEAK DAILY SMOKING AMONG DRUG TREATMENT OUTPATIENTS

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BACKGROUND: Smoking cessation interventions among methadone patients are roughly half as effective as similar interventions conducted among people in recovery for alcoholism and four-fold less effective than interventions in the general population. We describe daily methadone dose patterns and smoking patterns among methadone patients, and explore the relationship between daily methadone dose timing and peak smoking rates. If daily peaks in methadone absorption create peaks in smoking, patients that are trying to quit may find it hard to abstain during those times of the day.

METHODS: In this naturalistic study 20 methadone patients, over a period of 19 days, used electronic cigarette packs to record their smoking patterns and called a voice mailbox daily to report their methadone dose and timing.

RESULTS: Adherence to study procedures was excellent; we collected data on 6,246 smoking occasions and 375 methadone dose times. All participants smoked at their highest rate of the day after they took their methadone. Seventeen of 20 (85%) smoked at their highest rate within 2 hours after taking methadone. Most patients take their methadone, and smokers tend to smoke a lot, in the morning. Yet, among 4 participants who routinely took their methadone in the afternoon, peak smoking rates still occurred 2-4 hours after taking methadone. Also, across all days where at least 2 hours elapsed between starting smoking and taking methadone, participants still smoked more in the 2-hour block following methadone than they smoked in the first 2-hour block of the day (p=0.0001).

CONCLUSIONS: Daily methadone administration, as currently practiced in a majority of facilities, may pose a barrier to quitting smoking. Future studies should explore the relationship of methadone pharmacokinetics to cigarette smoking rates, the effects of targeted acute NRT (i.e., nasal spray) post-methadone on smoking patterns and smoking cessation, and the effects of alternate forms of methadone dose administration (either slow-release or split dosing) on cigarette smoking patterns and smoking cessation.

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POS2-106

FACTORS THAT PREDICT CLIENT-COLLATERAL AGREEMENT OF TOBACCO USE AFTER SUBSTANCE ABUSE TREATMENT

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In Tennessee from 2003-2004 over 82%(n=1,015/N=1,238) indicated upon admission to substance abuse treatment that they had used tobacco products and 79.6%(n=986) of their collaborators (e., wife, husband, friends, child, and relatives) indicated that the client had used tobacco products after treatment. Biochemical verification of nicotine use at admission and after treatment was not possible but instead was verified by clients (treatment subjects) and their collateral responses from a non-probabilistic administered telephone survey. Collateral reports of smoking status are often used when in-person biochemical verification is not possible, such as in phone-based interventions. Assessment of agreement between clients and collaterals was measured by the kappa statistics (cf. Fleiss, 1981). The overall (non-model adjusted) agreement was moderately high, kappa=.74, p<.001 and remained high (p<.0001) for our demographic adjusted probability (agreement) model. By using a set of Logistic Regression equations, one for the clients and one for the collateral, and relating the predicted probabilities through a probability transfer function (Lipsitz et al, 1994) we derived predicted agreement statistics for demographic profiles of the clients. Results show that younger male clients exhibited substantially lower estimates of agreement than younger female clients but converge to similar agreement levels as age increases (p< .04). In addition, female clients who had abused alcohol as a child relative to male clients who had abused alcohol exhibited lower levels of client and collateral agreements (OR=19, p<.04) and exhibit non-linear but increasing agreement over their relevant age range. The results indicate that collateral reports of smoking status by recovering substance abusers are likely to be valid and informative.

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POS2-107 WILLOUGHBY TO QUIT SMOKING AMONG SUBSTANCE ABUSE CLIENTS
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Smoking is highly prevalent among substance abuse clients. Cessation interventions have targeted clients during treatment, but little work has been done to investigate the feasibility of delivering cessation intervention post treatment. In this study, we analyzed predictors of willingness to quit smoking among clients who had been discharged from publicly funded substance abuse treatment facilities in Tennessee. Using non-probabilistic sampling, data were collected between January 2005 and June 2005 at six months from intake via telephone interviews. Over 81% (n=1,015/N=1,238) indicated at the time of intake that they currently used tobacco products and over 80% sampled reporting using tobacco products at the time of the six-month interview. More than 16% (n=152) of the clients expressed interest in quitting smoking within 30 days of intake and 35% (n=330) of clients expressed a willingness to quit by the end of the interview month. Significant factors related to willingness to quit smoking included having a lower nicotine dependency (ORs=2.32/2.82, p<.01), being African American (OR=2.05, p<.001), having minor children (ORs=0.66, p=.02), and living with someone who abused alcohol (ORs=2.30, p=.03). African American clients who were married and had less than six months of abstinence by the time of admission were less willing to quit (OR=3.66, p=.006) than their Caucasians counterparts. Further, older clients who abused marijuana or hashish were less willing to quit smoking cigarette (OR=0.94, p=.01), while older clients who abused sedatives before treatment were more willing to quit (OR=1.9, p=.03). These results could assist in identifying and targeting those segments of substance abuse clients who are more likely to participate in a smoking cessation intervention program.

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POS2-108 SMOKING’S EFFECT ON HANGOVER SYMPTOMS
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Epidemiological, laboratory, and clinical research consistently suggest that drinking and smoking are highly comorbid, with significant public health outcomes. However, the more proximal consequences of co-occurring drinking and smoking, such as hangover, have seldom been studied. The current study sought to examine the unique effect of smoking on hangover, and to determine if there is an interaction between drinking and smoking in predicting hangover. Smokers (n=115, reporting 100 lifetime cigarettes and past-month smoking; age 18-19; 57% female; 96% Caucasian) completed a daily web-based survey for 8 weeks to assess history of smoking and smoking patterns. The current study examined the effects of alcohol on smoking urge in heavy social drinkers who smoke. The sample consisted of 51 subjects (aged 21-35) who consumed 10 or more drinks per week and smoked at least once weekly, with no more than 25 cigarettes daily. They were divided into three subgroups: light smokers (LS; <20 cigarettes/week); moderate smokers (MS; 20-49 cigarettes/week); and heavy smokers (HS; >50 cigarettes/week). The study consisted of three separate evening sessions with a placebo, 2-, or 4-alcohol drink equivalent, given in random order. Participants were smoke-free for three hours prior to and throughout testing. C.rating was assessed by the Brief Questionnaire of Smoking Urge at pre-drink baseline, and at several intervals post-beverage consumption. Results showed that HS reported greater overall smoking urges than MS, who had greater urges than LS (p=.001). After placebo consumption, HS reported increased smoking urges over time, but placebo did not increase smoking urges in either LS or MS. In contrast, after alcohol consumption (high dose), LS and MS reported increased in smoking urges (dose x time; p=.001), but alcohol did not increase urge beyond that of the placebo in HS. The low alcohol dose increased smoking urge only in LS (p=.001). In sum, minimally deprived heavier smokers have high smoking urges regardless of beverage content. However, lighter and moderate smokers show sensitivity to alcohol’s effects on smoking urges, with the lightest smokers (‘chippers’) reporting increased urges even with relatively low levels of alcohol. Alcohol can produce robust increases in smoking urges in light and moderate smokers that approach or exceed the baseline of their heavier smoking counterparts.

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POS2-109 INFLUENCE OF COMORBID HEAVY DRINKING AND SUBACUTE DEPRESSIVE SYMPTOMS ON ACUTE TOBACCO ABSTINENCE EFFECTS
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Previous studies suggest that smokers with history of major depression and/or alcohol dependence experience greater difficulty quitting/maintaining abstinence, but little is known about smokers with subacute levels of depressive symptoms or alcohol use. This study examined acute tobacco abstinence effects in smokers with and without subacute depression who were light or heavy drinkers, without current major depression or alcohol dependence. 101 smokers enrolled in a treatment study using Contingency Management techniques and Frequent Brief Behavioral Intervention (Cooney, 2000). Subjects were grouped as depressed-heavy drinkers (n=9), nondepressed-heavy drinkers (n=19), depressed-light drinkers (n=23) or nondepressed-light drinkers (n=50), based on CES-D scores (depressed >10; non-depressed <10) and drink consumption (light <10 drinks/month; heavy >20 drinks/month). Mood and nicotine withdrawal symptoms, evaluated using the Profile of Mood States (McNair, 1992) and Symptom Rating Scale (Hughes & Hatsukami, 1986) respectively, were compared over the first eight days in abstinence smokers. No significant group differences were observed on vigor, tension, confusion or anger subscales of the POMS. Significant differences were found on the depression and fatigue subscales (p<.05) with depressed smokers experiencing more depressive symptoms and heavy drinkers experiencing more fatigue. Significant changes were also observed on CES-D scores (p<.05) with increases in nondepressed light and heavy drinkers and decreases in depressed heavy drinkers. No significant differences were observed on the symptom rating scale. Our findings suggest that the presence of co-morbid subacute heavy drinking or depressive symptoms does not have a significant impact on nicotine withdrawal symptoms but does produce differential mood changes during acute tobacco abstinence.

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POS2-110 SENSITIVITY TO ALCOHOL-INDUCED SMOKING URGES: EFFECTS OF SMOKING BACKGROUND
Alyssa M. Epstein, Illinois Institute of Technology; Patrick J. McNamara, Adrienne M. Delliger, Andrea C. King*, University of Chicago

While alcohol acutely increases smoking urges and cigarette consumption, little is known about whether these effects may vary as a function of subjects’ background smoking behaviors. The current study examined the effects of alcohol on smoking urge in heavy social drinkers who smoke. The sample consisted of 51 subjects (aged 21-35) who consumed 10 or more drinks per week and smoked at least once weekly, with no more than 25 cigarettes daily. They were divided into three subgroups: light smokers (LS; <20 cigarettes/week); moderate smokers (MS; 20-49 cigarettes/week); and heavy smokers (HS; >50 cigarettes/week). The study consisted of three separate evening sessions with a placebo, 2-, or 4-alcohol drink equivalent, given in random order. Participants were smoke-free for three hours prior to and throughout testing. Crating was assessed by the Brief Questionnaire of Smoking Urge at pre-drink baseline, and at several intervals post-beverage consumption. Results showed that HS reported greater overall smoking urges than MS, who had greater urges than LS (p=.001). After placebo consumption, HS reported increased smoking urges over time, but placebo did not increase smoking urges in either LS or MS. In contrast, after alcohol consumption (high dose), LS and MS reported increased in smoking urges (dose x time; p=.001), but alcohol did not increase urge beyond that of the placebo in HS. The low alcohol dose increased smoking urge only in LS (p=.001). In sum, minimally deprived heavier smokers have high smoking urges regardless of beverage content. However, lighter and moderate smokers show sensitivity to alcohol’s effects on smoking urges, with the lightest smokers (‘chippers’) reporting increased urges even with relatively low levels of alcohol. Alcohol can produce robust increases in smoking urges in light and moderate smokers that approach or exceed the baseline of their heavier smoking counterparts.

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POS2-111 ALCOHOL SELF-ADMINISTRATION: EFFECT OF NICOTINE REPLACEMENT

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It is well established that alcohol use and smoking behavior are highly correlated, particularly for individuals who are moderate to heavy drinkers. However, much is still unknown concerning the interaction of alcohol and nicotine. Human laboratory studies examining interactions of nicotine and fixed-doses of alcohol have demonstrated alterations in craving, subjective intoxication, and mood. Although transdermal nicotine replacement is the most commonly used nicotine replacement strategy, its effects on alcohol reactivity and self-administration behavior have not yet been investigated. Using an alcohol self-administration paradigm developed by our group (O’Malley et al., 2002), the primary aim of this project was to examine, within subjects, whether transdermal nicotine replacement (21mg/day), as compared to mild nicotine withdrawal (placebo patch), alters reactivity to alcohol following exposure to a priming drink (.03 g/dl) and subsequent ad-libitum drinking. Subjects (n=19) were non-treatment seeking moderate to heavy drinkers, who were not alcohol dependent and smoked at least 15 cigarettes per day. Results demonstrated that subjects consumed more drinks per minute during the ad-lib period when they were nicotine deprived, compared to when they had received nicotine replacement. Secondary outcomes of alcohol and tobacco craving, subjective intoxication, and mood will also be presented. Implications for alcohol-nicotine interactions, and smoking cessation in alcohol drinkers will be discussed.

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POS2-112 MOTIVATION FOR CHANGING ALCOHOL USE AMONG HEAVY DRINKERS IN SMOKING CESSATION TREATMENT

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That heavy drinkers significantly reduce their alcohol use when attempting to quit smoking has been shown previously (Kahler et al., 2005). However, there is a great deal of variability in the degree to which smokers believe it is important to make such changes, with those who perceive that it is especially important to change being at especially high risk of lapsing to smoking when they do drink. In this study, we examined variables that might contribute to motivation to change drinking while quitting smoking among 145 heavy drinking smokers, who were not alcohol dependent and were involved in a randomized smoking cessation trial. Perceived importance of changing drinking was the single strongest predictor of change in average drinks per week during the 8 weeks of smoking cessation treatment. Perceived importance of change was positively and significantly associated with high motivation to quit smoking, greater readiness to change drinking in general, greater current alcohol-related problems, greater perceived association between drinking and smoking, and having a history of smoking lapses when drinking alcohol. Smoking rate, level of tobacco dependence, and drinking quantity and frequency were not significantly related to perceived importance of changing drinking. Results suggest that perceived importance of changing drinking during smoking cessation is a robust predictor of reductions in alcohol use and indicate which variables might most strongly contribute to motivation for change and serve as potential targets for interventions aimed at reducing the high health costs associated with combined smoking and heavy alcohol use.

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POS2-113 IMPACT OF DSM-IV LIFETIME ALCOHOL USE DISORDERS, DEPRESSION AND THE TWO COMBINED ON SMOKING-RELATED VARIABLES

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To explore the independent and combined impact of lifetime alcohol use disorders (abuse or dependence) and lifetime depressive disorders, on smoking-related variables, we studied smokers (N=369; 52% female, 71% White; mean [SD] age 36.5 [10.6] years), assessed via the CIDI. Because of sex differences in the prevalence of both AUD and MDD, sex was included in all models. Using a logit model, both AUD and MDD were significantly associated with increased likelihood of lifetime Nicotine Dependence. Significant differences were found for the following Russell Motivation for Smoking (modified) subscales, with patterns of increased severity observed for the specified cofactor and for women: Motivation (MDD, p<.001); Psychosocial (AUD, p<.05; sex, p<.05); Addictive (MDD, p<.001; sex by MDD, p<.05; Automatic (MDD, p<.01; sex by MDD, p<.05); and Anxiolytic (MDD, p<.0001; sex, p<.01). A similar pattern was observed for the Weight Control Smoking Scale, with significant elevations for MDD (p<.01) and for women (p<.0001). On the Michigan Nicotine Reinforcement Questionnaire, significant elevations were found on the Negative Reinforcement subscale for both AUD (p<.05) and MDD (p<.0001), with a sex by AUD interaction (p<.05) such that women with AUD scored higher than other groups. No significant differences emerged for Positive Reinforcement. Little evidence emerged for an MDD by AUD interaction, suggesting that these two cofactors have an additive but non-potentiating influence on smoking. Women with MDD or AUD may be especially vulnerable to indices known to be associated with difficulty quitting.

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POS2-114 SEX-SPECIFIC DIFFERENCES BETWEEN SMOKERS WITH AND WITHOUT DSM-IV ALCOHOL ABUSE

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The prevalence of alcohol abuse, as defined by DSM-IV, is significantly lower among females than among males. We studied a sample of 366 smokers recruited from the community to participate in laboratory studies to determine what characteristics differentiated female smokers with lifetime alcohol abuse (LAA), regardless of alcohol dependence diagnosis, from female smokers without LAA, and to see if these characteristics were different than the factors that distinguished male smokers with and without LAA. All participants provided data on the Composite International Diagnostic Interview modules for alcohol use disorders and depression. Other baseline measures included demographics, the Tridimensional Personality Questionnaire (TPQ), and the Michigan Nicotine Reinforcement Questionnaire (MNR-Q). When tested by ANOVA, TPQ- Harm Avoidance score differed significantly for both sex (p<.01) and LAA (p<.01), with a significant interaction of sex with LAA (p<.01); Female smokers with LAA had a mean (SD) of 9.7 (4.5), while those without LAA had a mean score of 6.3 (4.5). Males showed no significant differences in mean scores. MNR-Q Negative Reinforcement Score also differed significantly (p<.001), with a sex by LAA interaction (p<.01); Female smokers with LAA had higher MNR-Q negative reinforcement scores than female smokers without LAA, with mean scores (SD) of 14.0 (5.2) vs. 9.1 (5.4), whereas male smokers with LAA had similar scores to those without (7.96 (5.2) vs. 8.08 (5.3). These data suggest that certain factors that characterize smokers with LAA might differ by sex, including the personality trait of harm avoidance and negative reinforcement smoking, possibly because women with LAA are more abstinent and more severely affected than men with LAA.

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POS2-115 PREDICTORS OF NICOTINE DEPENDENCE AMONG ALCOHOL AND SUBSTANCE ABUSE CLIENTS

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Rates of smoking and nicotine dependence (ND) are known to be higher among alcohol and drug abuse clients than in the general population. Understanding correlates of ND in this population may help target cessation interventions to those most in need, and identify those most at risk for treatment failure. Clients who were treated at publicly-funded facilities in Tennessee (n=1,236) were interviewed from January through June 2005. Overall, 82.4% reported smoking > 100 cigarettes in their life, and 76.9% reported currently smoking. Among current smokers, 69.3% were classified as low to medium dependent, 23.5% as high dependent, and 7.2% as very high dependent, based on the Fagerstrom Test of Nicotine Dependence. Multiple regression analysis was used to identify direct and moderating effects on ND of demographics, smoking history, general health, alcohol and drug use, and treatment-related variables. Greater ND was associated with lower education (β=2.03, p<.01), being older and in poor health (age and health interaction, β=.027, p=.001), and more years as a smoker for African Americans but not whites (interaction β=.07, p<.001). ND also was associated with several treatment-related variables, including use of sedatives/hypnotics prior to treatment (β=.668, p=.02), having received more intensive alcohol and drug treatment services (β=.372, p=.04), and less use of alcohol or illicit drugs since treatment (β=.615, p=.04). Results indicate high rates of smoking and ND among post-treatment substance abuse clients, with ND associated with poorer socioeconomic and health status, greater likelihood of polydrug abuse, and greater need for intensive substance abuse services.

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POS2-116 PREDICTORS OF MOMENTARY SMOKING AND DRINKING URGES IN ALCOHOL DEPENDENT SMOKERS

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Identifying factors which influence alcohol and tobacco craving in alcohol dependent smokers may guide the development of theory and interventions. The aim of this report is to examine individual differences which predict in vivo smoking and drinking urges in a sample of alcohol dependent smokers who recently participated in a smoking cessation intervention. METHOD: Alcohol dependent participants (N=99) were recruited from a substance day treatment program in which they received concurrent tobacco cessation treatment, and completed baseline measures of mood, anxiety, alcohol and nicotine dependence, readiness for change, and abstinence self-efficacy. After discharge from the program, participants completed 14 days of Ecological Momentary Assessment of smoking urges, drinking urges, and smoking behavior using an electronic diary. RESULTS: Individuals consistently reported more smoking urges on days when they smoked (p<.0001) compared with non-smoking days. A positive relationship was found between baseline level of nicotine dependence and momentary smoking urge (p<.001), and baseline level of alcohol dependence showed a similar trend as a predictor of smoking urge (p=.062). Results also revealed an interaction effect suggesting the predictive relationship between nicotine dependence and momentary urge to smoke was dependent on daily smoking status (p<.01). There were also interaction trends suggesting that baseline depressed mood (p=.051) and level of alcohol dependence (p=.068) predicted urge to smoke differentially on smoking and nonsmoking days. In predicting momentary alcohol urges, trends were evident suggesting higher alcohol urges among those with more severe alcohol dependence (p=.069) with an interaction trend suggesting that this relationship was also dependent on daily smoking status (p=.056). These results suggest that pretreatment severity of nicotine and alcohol dependence and depressed mood are associated with in vivo craving experienced after treatment, and this relationship is moderated by current smoking status. This implies that severely dependent individuals may be good candidates for treatments that focus on controlling craving.

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POS2-119  FAVORITE CIGARETTE OF THE DAY IN A RANDOM SAMPLE OF WOMEN SMOKERS

Ann M. Mehringer*, M.S., Cynthia S. Pomerleau, Ph.D., and Sandy M. Sneider, M.S., University of Michigan, Ann Arbor, MI, Raphaela Ninowski, M.A.

From a Random Digit Dialing survey of American women, we assessed current smokers (n = 371) on smoking and demographic variables. Respondents were 34±7.6 years old, 49.6% married, and 87.6% White, with an FTND score of 4±2.6. When asked ‘which cigarette of the day would be the most difficult for you to give up?’, 341 women provided answers codable into 5 categories: first cigarette of the day (FIRST; 40%), cigarette with meal (MEAL; 27%), last cigarette of the day (LAST; 13%), cigarette during daily routine (ROUTINE; eg., driving to work; 7%), and cigarette to enhance mood, substance (coffee/alcohol) or event (ENNANGE; 5%). The remaining 8% gave nonspecific or uncodable responses. Response groups differed on age (p<.01), which was covaried in subsequent analyses. Differences emerged in smoking rate (p<.001), years smoked (p<.05), Heaviness of Smoking Index (p<.001), time to first cigarette (p<.001), and self-rated health (p<.05). In Post Hoc analyses, FIRST were older, more dependent, smoked more cigarettes/day for more years, and smoked sooner after waking. LAST smoked the fewest cigarettes/day and were least dependent. ENNANGE rated their health significantly better than did ROUTINE. No differences were found for race, household income, education, marital status, BMI, daily caffeine or alcohol consumption, dieting severity, depression, age of smoking initiation, number of quit attempts, or readiness to quit smoking. Finding valid phenotypes is critically important for genetic research on smoking. The FTND is coded as 1 for ‘first’ and 0 for any other response. Examining more closely the richness contained in that ‘other’ category is a novel approach that may prove useful as a phenotyping tool.

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POS2-120  THE ASSOCIATION BETWEEN LABORATORY MEASURES OF CUE REACTIVITY AND DIFFICULTY REMAINING ABSTINENT FROM SMOKING

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Relatively little is known about how reactions to drug cues (CR) in the laboratory relate to real world difficulties refraining from smoking. A few studies have examined the degree to which CR predicted time to relapse, although most of this work has relied on self-reported urges and many of the studies were underpowered. Recently, researchers have found it useful to expand the range of measures for assessing CR across multiple response systems. Such approaches have found evidence, for example, that heart rate and performance on a smoking Sroop task relate to relapse risk. The current research examined in 2 studies the extent to which a broad-based battery of CR measures (including self-reported urge, behavioral choice, and affect-related facial expressions) related to smokers’ reported difficulty refraining from smoking. Experiment 1 included 315 smokers (49% female; 82% Caucasian; 15% African-American; mean age=26; mean cigs/day=20). Experiment 2 included 66 smokers (58% female; 80% Caucasian; 14% African-American; mean age=25; mean cigs/day=24). At the beginning of the studies, participants were asked to report past difficulty refraining using a multi-item scale (Difficulty). All were 12-hours deprived and exposed to cigarette cues while asked to report their urge to smoke (Urges) on a 0-100 scale. Participants in the second study also participated in a behavioral choice task found to index smoking motivation in our prior studies (Choice). Additionally, for half these participants (n=34), positive and negative facial expressions evinced during the cue exposure (Face) were coded using the Facial Action Coding System. As expected, participants in both Experiment 1 (M72±46; p<.001) and Experiment 2 (M83±77; p<.001) reported a strong urge to smoke during cue exposure. Related to the aim of this study, we found significant correlations between Difficulty and all 3 CR measures, as follows: Urge (r = 0.26, p < .0001), Choice (r = 0.27, p < 0.04), and Face (r = 0.37, p < 0.03). Findings suggest that smokers’ CR may relate to prior difficulties refraining from smoking. Such a link provides support for the ecological validity of cue exposure research conducted in the laboratory.

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POS2-121  EFFECT OF TOBACCO DEPRIVATION ON PERFORMANCE OF AN ATTENTIONAL BLINK TASK

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Although much research has demonstrated a relationship between nicotine and sustained attention, little is known about the effects of nicotine or nicotine withdrawal on automated attentional processes. The attentional blink (AB) task is a widely used measure of the time course of attentional processing; the AB effect occurs when processing of one target (T2) is impaired by ongoing processing of a previously presented target (T1), such that T2 cannot be perceived or reported. Never-smokers (n = 28 to date) and smokers (n = 40 to date) were randomly assigned to perform an AB task with one of three presentation duration conditions (96, 113, or 130 ms). Smokers were tested either after overnight tobacco deprivation or during ad lib smoking. Each subject completed 48 trials of an AB task. Each trial consisted of 16 individually presented, emotionally neutral words with T1 and T2 presented in red and the 14 distracter words presented in black. T1 was presented at serial position 4, 5, or 6. Eight lags (1-8) were used between T1 and T2. Subjects were required to recall both red words (T1 and T2). Preliminary results demonstrated significant effects of lag (p < .001) and presentation duration (p < .001) on recall of T2 (for correct T1s). These effects were qualified by a robust lag by duration interaction (p < .001) indicating that performance on early lags declined steeply in the fastest duration condition (96 ms). However, no significant effects of smoking status were observed. Thus, the AB was reliably influenced by presentation duration, but not by smoking status. Fast, automated attentional processes assessed by the AB task may be less influenced by the deleterious effects of nicotine withdrawal than more effortful attentional processes assessed by sustained attention tasks. This research was supported by the Intramural Research Program of NIH, NIDA.

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POS2-122  CRAVING AND NEGATIVE AFFECT ARE NEGATIVELY ASSOCIATED WITH P3 AMPLITUDE TO RARE NONTARGET STIMULI IN VISUAL ODDBALL TASK

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Nicotine deprived smokers generally exhibit lowered performance on tasks requiring attentional control. A psychophysiological index of attentional control is the amplitude of event-related brain potential (ERP) P3 components elicited by rare nontarget (P3a) and rare target stimuli (P3b). Since smokers in withdrawal are generally lower in attentional control, we hypothesized the P3a and P3b would be greater in satiated smokers than smokers in withdrawal. We compared 16 smokers who were randomly assigned to overnight deprivation with 20 smokers who were instructed to smoke as usual, including smoking a cigarette in the laboratory prior to performing a computerized oddball task. This traditional P3 evoking task included 240 trials of visual stimulus, with an inter-stimulus interval of 1.5 sec. Trials included randomized presentation of a “B” as standard trials (70%), an “A” as rare target trials (15%), and a by 5 inch bright blue rectangle as rare non-target trials (15%). Participants were instructed to press a key in response to targets only. At each of the 10 scalp sites evaluated, there were non-significant differences between satiated and withdrawal groups, albeit in the predicted direction. In addition, a composite P3a measure derived by averaging the seven frontal and central sites was correlated with Wisconsin Smoking Withdrawal Scale (WSWS) craving (r = -.41, p = .01), anxiety (r = -.37, p = .03) and sadness (r = -.38, p = .02) subscales. These findings indicate lower P3a amplitude may provide a marker of attentional deficit associated with withdrawal-related craving and negative affect.

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POS2-123

SMOKING CUES ELICIT HEIGHTENED CIGARETTE CRAVINGS, BUT SUPPRESSED ALCOHOL CRAVINGS, AMONG SMOKERS CARRYING THE DRD2 TaqI A1 POLYMORPHISM

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Carriers of genetic polymorphisms in the dopamine signaling pathway have been reported to exhibit heightened cigarette craving reactions after laboratory exposure to smoking cues. Particularly well studied is the TaqI A1 polymorphism at the D2 dopamine receptor gene (DRD2), which has been found to predict cue-induced craving, as well as various negative outcomes related to substance use (e.g., persistent smoking). Consistent with the incentive-salience role of dopamine in potentiating specific motivational responses to appetitive cues, we hypothesized that carriers of the A1 polymorphism would exhibit stronger cigarette craving reactions and weaker alcohol craving reactions in response to smoking cues than non-carriers. To test this hypothesis, 127 non-alcoholic smokers (mean age=37.7 years, 53% female, 65% completed some college, 60% income >$20K, 44% African American, 24% Caucasian, 23% Hispanic) were recruited by advertisement and exposed to neutral (changing a light bulb) and smoking (lighting up after a meal) situations, using scripted-guided imagery under controlled laboratory conditions. Participants completed craving questionnaires before and after each condition, which were separated by a neutral video. Consistent with previous research, smoking cues elicited both cigarette craving (p<0.0001) and, to a lesser extent, alcohol craving (p<0.002). Supporting the study hypothesis, compared to non-carriers (n=72), A1 carriers (n=55) exhibited significantly higher levels of cue-induced cigarette craving, but lower levels of alcohol craving (p<0.0001). The results support the view that dopamine plays a central role in activating cue-congruent (cigarette craving in this sample), while suppressing cue-incongruent (alcohol craving) motivational responses.

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POS2-124

CIGARETTE ADVERTISING IN STORES STIMULATES CRAVING: EVIDENCE FROM A CONTROLLED EXPERIMENT

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Cigarette advertising in stores encourages adolescents to experiment with smoking and influences their cigarette brand choice. Does such advertising increase daily consumption, deter quitting, or encourage relapse? This study examined reactivity to retail cigarette advertising among young adult smokers. Forty-four daily smokers (ages 18-24) were paid $50 to abstain from smoking overnight and complete a guided imagery under controlled laboratory conditions. Participants completed craving questionnaires before and after each condition, which were separated by a neutral video. Consistent with previous research, smoking cues elicited both cigarette craving (p<0.0001) and, to a lesser extent, alcohol craving (p<0.002). Supporting the study hypothesis, compared to non-carriers (n=72), A1 carriers (n=55) exhibited significantly higher levels of cue-induced cigarette craving, but lower levels of alcohol craving (p<0.0001). The results support the view that dopamine plays a central role in activating cue-congruent (cigarette craving in this sample), while suppressing cue-incongruent (alcohol craving) motivational responses.

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POS2-125

EXTINCTION-BASED SMOKING CESSATION TREATMENT ATTENUATES EVENT-RELATED BRAIN RESPONSES TO SMOKING CUES

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Extinction-based smoking cessation treatments using reduced nicotine cigarettes (RNCS) should attenuate smoking cue-reactivity. To answer this question, seventeen (n=17) dependent smokers were scanned using BOLD fMRI three times: 1) at baseline, 2) following 2-4 weeks of smoking RNCS while wearing a 21 mg nicotine patch, and 3) 2-4 weeks after quitting smoking while continuing to wear the patch. During scanning, subjects viewed smoking-related pictures (e.g., lit cigarette) and pictures of people engaged in everyday activities (e.g., using a stapler). Event-related responses to smoking and control cues were analyzed for regions of interest (ROIs) known to subserve reward, attention, motivation, and emotion in one month continuously abstinent (n = 5; 29%) vs. relapsing smokers. In amygdala and right superior frontal gyrus (SFG) greater cue reactivity was observed prior to treatment. Further, future abstinent smokers exhibited greater cue reactivity in thalamus and ventral striatum prior to treatment and greater evidence of extinction following treatment compared to future relapsers. These results support the notion that smoking cues elicit brain responses to smoking cues in frontal and limbic regions; and that these treatments might work best for those smokers who are 1) most sensitive to drugs initially and 2) show the greatest evidence of extinction during treatment.

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POS2-126

CUE-ELICITED BRAIN ACTIVATION AND SUBJECTIVE CRAVING IN CURRENT AND FORMER SMOKERS USING FMRI

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Neuroadaptations induced by chronic use of nicotine and craving induced by nicotine-cue exposure are significant factors in predicting relapse to smoking. Results of animal and human studies suggest that neuroadaptations induced by repeated drug use involve altered neurotransmission and brain metabolism as well as changes in behavioural and attentional processes triggered by specific drug-related stimuli. It is not known whether the long-term adaptations are reversible over time. To investigate the brain correlates of craving we conducted a proof of concept study of subjective craving in never-smokers (i.e. less than 100 cigarettes/lifetime) (N=4), current smokers in withdrawal (N=4) and past smokers in early remission (i.e. <6 months remission) (N=4) using auditory and visual cues in conjunction with functional magnetic resonance imaging (fMRI). Results showed that nicotine deprived current smokers and former smokers in early remission exhibited similar neural responses to visual smoking cues in well-defined regions (including significantly decreased activation (p<0.05)in both the ventrolateral and dorsolateral prefrontal cortex, and amygdala) relative to never smokers. Subjective measures of craving, however, showed that only current smokers deprived of nicotine reported significant craving using the Questionnaire of Smoking Urges (QSU) (i.e. Desire to Smoke; p<0.05;Intention to Smoke; p<0.05 and Expected Relief of Withdrawal; p<0.05) than both past smokers in early remission and controls (never smokers). These results suggest that nicotine-induced neuroadaptations persist following smoking cessation and neural reactivity to smoking cues may occur without conscious awareness. This preliminary findings may have implications for craving and relapse to smoking.

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DOES CUE-REACTIVITY EXTINGUISH WITH REPEATED LABORATORY SESSIONS?

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In laboratory-based investigations of cue reactivity, nicotine-dependent individuals generally report high levels of craving in response to cues associated with tobacco. However, at least two studies involving alcohol and cocaine suggest that over repeated laboratory visits, cue-induced ratings of craving and desire for drugs of abuse tend to be lower and/or not significantly different from reactivity to neutral control cues (Hersh, Bauer, & Kranzler, 1995; Modesto-Lowe et al. 1997). This suggests that individuals’ response to cues may extinguish as cues are presented over multiple presentations. The present study investigated whether craving in response to smoking-related cues extinguishes over multiple experimental sessions. Over 4 experimental sessions held one week apart, 19 non-treatment-seeking nicotine-dependent males participated in cue presentations that involved handling either smoking-related paraphernalia (i.e. cigarettes) or neutral paraphernalia (i.e. pencils). Ratings of craving, as measured by the Questionnaire for Smoking Urges - Brief form (QSU-B), were collected before (baseline ratings) and after cue presentation. As expected, smoking related cues evoked higher craving relative to neutral cues, F(1, 18) = 10.00, p < .01. However, contrary to expectation, no Session × Cue Type interaction was apparent; post-hoc tests revealed that smoking-related cues, in comparison to neutral cues, evoked significant increases in craving. In Sessions 1, 2, 3 and 4, respectively, df = 18, p < .05, and a trend (p < .07) for Session 3. While there was some evidence for reduced craving over sessions, F(3,54) = 3.44, p < .05, this effect was attributable to differences in baseline craving ratings; when baseline was subtracted from post-cue ratings, the resulting change scores showed no evidence of effects of session. Results suggest that although there may be a reduction in baseline craving during repeated laboratory sessions, cue-reactivity (craving evoked by smoking cues vs. neutral cues) may not extinguish over multiple sessions in non-treatment seeking nicotine-dependent individuals.

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THE ONSET OF SMOKING, DAILY SMOKING AND NICOTINE DEPENDENCE ACROSS THE LIFESPAN

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While early initiation of smoking has been linked to increased incidence of nicotine dependence (ND) and ND, little is known about the timing of transitions among major smoking milestones and how early transitions relate to risk for ND. Objective: To examine the interrelationship between smoking onset (SO), daily smoking (DS) and ND. Methods: Face-to-face interviews were conducted in 2001 and 2002 on a nationally-representative sample of U.S. adults as part of the first wave of the National Epidemiologic Survey on Alcohol and Related Conditions. DSM-IV ND was measured by the NIAAA, Alcohol Use Disorder and Associated Disabilities Interview Schedule. Analyses focused on 18,013 individuals who reported smoking 100+ lifetime cigarettes. Results: Over 90% of the sample had reached DS and 39.2% reached ND. The average age of SO was 16.4 years; 97% of ever smokers initiated smoking by age 25. An average of 2.5 years elapsed between SO and DS; 86.4% reached DS within 5 years. In contrast, an average of 13.6 years elapsed between DS and ONSET of ND. The highest risk for developing ND occurred within 5 years after DS; however, risk decreased slowly such that significant risk (<20% incidence for onset of ND) was observed even 31-40 years after DS onset. While age of SO and DS were independently related to risk for ND across the lifespan, the time from SO to DS did not predict who would become ND after controlling for age of SO. Notably, most daily smokers (59%) failed to meet criteria for past and/or current ND despite an average of 24 years since the onset of DS. Conclusions: While the transition from SO to DS appears to be relatively rapid and is generally observed during adolescence, risk for ND continues for many years after DS and may be largely unrelated to individual differences in the speed of transition to daily smoking. Prospective studies of the transitions between smoking milestones are needed to clarify what factors determine risk for progression at different stages of smoking.

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DOES CUE-REACTIVITY EXTINGUISH WITH REPEATED LABORATORY SESSIONS?

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In laboratory-based investigations of cue reactivity, nicotine-dependent individuals generally report high levels of craving in response to cues associated with tobacco. However, at least two studies involving alcohol and cocaine suggest that over repeated laboratory visits, cue-induced ratings of craving and desire for drugs of abuse tend to be lower and/or not significantly different from reactivity to neutral control cues (Hersh, Bauer, & Kranzler, 1995; Modesto-Lowe et al. 1997). This suggests that individuals’ response to cues may extinguish as cues are presented over multiple presentations. The present study investigated whether craving in response to smoking-related cues extinguishes over multiple experimental sessions. Over 4 experimental sessions held one week apart, 19 non-treatment-seeking nicotine-dependent males participated in cue presentations that involved handling either smoking-related paraphernalia (i.e. cigarettes) or neutral paraphernalia (i.e. pencils). Ratings of craving, as measured by the Questionnaire for Smoking Urges - Brief form (QSU-B), were collected before (baseline ratings) and after cue presentation. As expected, smoking related cues evoked higher craving relative to neutral cues, F(1, 18) = 10.00, p < .01. However, contrary to expectation, no Session × Cue Type interaction was apparent; post-hoc tests revealed that smoking-related cues, in comparison to neutral cues, evoked significant increases in craving. In Sessions 1, 2, 3 and 4, respectively, df = 18, p < .05, and a trend (p < .07) for Session 3. While there was some evidence for reduced craving over sessions, F(3,54) = 3.44, p < .05, this effect was attributable to differences in baseline craving ratings; when baseline was subtracted from post-cue ratings, the resulting change scores showed no evidence of effects of session. Results suggest that although there may be a reduction in baseline craving during repeated laboratory sessions, cue-reactivity (craving evoked by smoking cues vs. neutral cues) may not extinguish over multiple sessions in non-treatment seeking nicotine-dependent individuals.

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SMOKING AT NIGHT AS AN INDEPENDENT INDICATOR OF DEPENDENCE AND PREDICTOR OF SMOKING CESSATION OUTCOME

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Time to first cigarette in the morning is consistently found to be a useful measure of nicotine dependence and predictor of outcome among smokers trying to quit. However, many highly dependent smokers wake up and smoke during the night. This study aimed to investigate the frequency of night-time smoking and identify whether it is an independent predictor of six month outcome among 1021 consecutive patients attempting to quit at a tobacco treatment clinic. Baseline and treatment variables were recorded and logistic regression was used to identify factors associated with abstinence at six month follow-up. 320 patients (31%) reported tobacco abstinence six months after their target quit date (no tobacco use in prior 7 days). 46% of the patients reported at baseline that they sometimes woke up during the night and smoked. In univariate analyses these patients were less likely to be abstinent at six month follow-up (27% vs 36%, p<0.01). In multivariate analyses, absence of night-time smoking at assessment remained a significant predictor of abstinence six months after the target quit date (OR=1.4, p=0.005), while controlling for all other significant predictors of outcome (older age, more children, full employment, education beyond high school, having private health insurance, over 30 minutes to first smoke in the morning, use of treatment medication, and attendance at more counseling sessions). Awakening during the night to smoke is very common among smokers seeking help to quit, and is an independent marker of dependence. Researchers and clinicians should include at least one item assessing this smoking behavior in their assessments.

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POS2-131 CYP2B6 AND CYP2A6 GENOTYPE: IMPACT ON ACQUISITION OF ICD10 TOBACCO DEPENDENCE IN CAUCASIAN ADOLESCENTS

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CYP2B6 metabolizes both bupropion and nicotine. The CYP2B6*5 (R487C) genetic variant results in slow activity and has been associated with decreased abstinence in the placebo and bupropion arms of a smoking cessation trial (Lerman et al., 2004) with slow CYP2B6 metabolism associated with increased craving. Among CYP2A6 slow metabolizers, CYP2B6*6 (Q172H and K262R) and *4 (K262R) increase nicotine and cotinine clearance (Ring H.Z., SRNT abstract 2005), although we have not reproduced this metabolic effect (Hoffmann et al., SRNT 2006 abstract). We have previously shown an influence of CYP2A6 slow metabolism on acquisition (O’Loughlin et al., 2004). Therefore we investigated the influence of CYP2B6*6 and *4, with fast metabolism, on rates of conversion to tobacco dependence using ICD10 in 297 adolescents who has smoked >1 cigarette. In both CYP2A6 normal metabolizers and slow/intermediate metabolizers rates of conversion were higher in those with CYP2B6 fast variants compared to those without. For example, in the CYP2A6*1/*1 normal metabolizers, the incidence rate of conversion to ICD10 dependence in CYP2B6 fast metabolizers was 9.9/100 person-years (p-y) and 7.7/100 p-y for CYP2B6*1/*6 and *1/*4 genotypes respectively, in contrast to 5.9/100 p-y in normal CYP2B6 metabolizers. Likewise, in the CYP2A6 slow metabolizers the incidence rate for CYP2B6 fast metabolizers was 12.0/100 p-y and 11.3/100 p-y for CYP2B6*1/*6 and *1/*4 respectively, in contrast to 5.4/100 p-y in those with the normal CYP2B6*1/*1 genotype. These data suggest a role for CYP2B6 genetic variation in acquisition of nicotine dependence in both CYP2A6 normal and slow nicotine metabolizers.

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POS2-132 NICOTINE DEPENDENCE AMONG AFRICAN AMERICAN LIGHT SMOKERS

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Approximately 50% of African American smokers are light smokers (smoke > 10 cigarettes a day), yet this group is understudied despite being at risk of smoking-related death and disease. The purpose of this study was to assess nicotine dependence among a sample of African American light smokers. The Cigarette Dependence Scale (CDS), the Fagerstrom Test for Nicotine Dependence Scale (FTND), and the Nicotine Dependence Syndrome Scale (NDSS) were administered to 700 African American light smokers (67% female; mean age = 45 years), 75% of whom smoked 6-10 CPD. Biochemical measures included carbon monoxide and serum cotinine. Statistical analyses revealed that the CDS showed the strongest association with biochemical markers (r = 0.28 for cotinine and 0.25 for CO). Compared to those who smoked 1-5 CPD, smokers who averaged 6-10 CPD scored higher on all three dependence measures (p < 0.001) and both biochemical measures (p < 0.001). In addition, those who smoked 6-10 CPD scored higher on three of the five NDSS subscales compared to those who smoked 1-5 CPD: Drive (p < 0.001), Stereotypy (p < 0.01), and Tolerance (p < 0.01). Given the different domains tapped by each of these three instruments, the use of multiple measures might yield the most comprehensive assessment of nicotine dependence.

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LESSONS LEARNED FROM THE GLOBAL TOBACCO SURVEILLANCE SYSTEM (GTSS): EXPERIENCES GAINED CONDUCTING SCHOOL-BASED SURVEYS IN OVER 130 COUNTRIES

Nathan R. Jones*, Ph.D., Charles W. Warren, Ph.D., Lela R. McKnight, Ph.D., Samira Asma, D.D.S.; CDC Office on Smoking and Health

The Global Tobacco Surveillance System (GTSS) has collected data on youth and adult tobacco use since 1999. Over 130 countries have conducted components of the GTSS among 2 million students throughout the world. The GTSS includes data collection through three surveys: the Global Youth Tobacco Survey (GYTS) for youth, and the Global School Personnel Survey (GSPS) and the Global Health Professional Survey (GHPS) for adults. The key strength of GTSS is consistency in sampling procedures, core questionnaire items, field procedures, and analysis of data across all survey sites. GTSS represents the most comprehensive tobacco surveillance system ever developed and implemented. Countries can use GTSS to monitor tobacco use at national, regional, and global levels. This poster will focus on select lessons learned during nearly 7 years of school-based survey activities.

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RPOS3-2  
PUBLIC SUPPORT IN ONTARIO FOR RESTRICTING THE SALE OF CIGARETTES

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Public support for policies and enforcement is a potent factor in implementing and maintaining tobacco control measures. We analyzed data from a province-wide general population survey to examine the extent of public support for restrictions on the sale of cigarettes. We also looked at attitudes toward penalties for sales and supply to youth. The CAMH Monitor Survey is a province wide random telephone survey of Ontario adults, aged 18 and older, carried out annually by the Centre for Addiction and Mental Health. Weighted data for 2004 (N= 2811; RR=59%) were analyzed. Current smoking among Ontarians declined from 26% in 2000 to 21% in 2004, and daily smoking from 20% in 2000 to 17% in 2004. A majority of Ontarians (51%) now favor further restrictions on the sale of cigarettes, with 30% favoring limiting sales to government outlets and 21% supporting a complete ban on the sale of cigarettes. Non-smokers twice as likely as smokers to favour changes (58% vs 27%), but even 14% of smokers thought cigarettes should not be sold. Attitudes toward sales to minors are strongly supportive of penalties, with 86% favoring loss of license for retailers who are not compliant and 80% supporting fines for informal supply of cigarettes by friends and family. A majority of Ontarians now favor major changes in the way cigarettes are sold. Changes in public attitudes occur faster than changes in behaviour, since the proportion of smokers, who are much less supportive, is also declining quite dramatically. New provincial legislation to be implemented May 31, 2006 will impose some restrictions on retail sales, and by 2008, no above-counter displays will be permitted. With increased sales of discount cigarettes and difficulties in raising taxes on cigarettes, restrictions on access for both adults and youth may be an important way to support and hasten the decline in cigarette consumption.

Funding: Ontario Ministry of Health and Long Term Care Centre for Addiction and Mental Health.

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RPOS3-3  
THE EFFECT OF SMOKING BANS ON MYOCARDIAL INFARCTIONS: THE BOISE EXPERIENCE

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BACKGROUND: Secondhand smoke (SHS) has been shown to have adverse effects on the heart increasing the risk of an acute myocardial infarction (MI). SHS causes an estimated 53,000 deaths every year and there is evidence that nonsmokers are more susceptible to the deleterious effects of SHS than are current smokers. Although data supports the association between SHS and myocardial infarction rates, there is scant clinical evidence showing that smoking bans decrease myocardial infarction rates.

METHODS: A ban on smoking in restaurants and other public buildings became effective in the State of Idaho on July 1, 2004. We used this opportunity to study the effect this smoking ban had on myocardial infarction rates in Boise City. Boise is a city of approximately 190,000 with two major hospitals serving the metropolitan area. Boise City residents admitted to either hospital with a primary diagnosis of myocardial infarction during the period of July 1, 2002 through June 30, 2005 were included in the study. Utilizing International Disease Classification, ninth revision (ICD-9) codes, we examined admission rates for myocardial infarction. Generalized additive models were run in SAS Proc GAM on daily MI counts using a Poisson distribution and a log link function, and controlled for weather, outdoor air quality, and time. Separate models were run for all patients and non-smokers.

RESULTS: There was a total of 808 Boiseans admitted with the diagnosis of MI during the 24 months prior to the smoking ban and total of 389 admissions in the 12 months post ban for an overall crude rate reduction of 3.6% and a 9.4% crude rate reduction among non-smokers. After controlling for weather, outdoor air quality and time the MI rate decreased 32% among nonsmokers (p=002) and 18% among all patients (p=.088). This is in contrast to urinary tract infections (UTI) which showed non-significant increases of approximately 10% admission rates over the same time period using similar GAM models.

CONCLUSION: Idaho’s smoking ban may have decreased the number of MIs among nonsmokers in the City of Boise. This study was conducted while the first author was at the Boise State University as a Master’s of Health Science degree candidate. The study was supported by the American Heart Association and Mountain States Tumor Medical Research Institute

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RPOS3-4 EFFECTS OF HOME SMOKING RESTRICTIONS ON ADOLESCENT SMOKING

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Recent research suggests that parents can engage in a variety of behaviors to influence their children’s smoking. One way that parents may effectively reduce child smoking is by employing home smoking restrictions, or policies that limit smoking in the home. Although there is evidence that home smoking restrictions are associated with reduced smoking prevalence among adolescents, research on home smoking policy has focused almost exclusively on the binary outcome of adolescent smoking or nonsmoking. There is, however, reason to believe that home smoking restrictions may have significant effects on adolescents who are already smoking. The present study is the first to examine the relation between home smoking policy and several behavioral and cognitive variables among adolescents who are already smoking. Results indicated that more restrictive home smoking policies were significantly associated with less smoking on weekdays and weekend days, longer time intervals prior to the first cigarette of the day, greater motivation to quit smoking, greater confidence in ability to quit smoking within the next six months, and higher estimated risk perception for smoking. Further, these results were obtained while controlling for parental smoking status and gender. These findings suggest that smoking-specific parenting practices, in the form of home smoking restrictions, may impede adolescent progression to adult smoking behavior by reducing the number of cigarettes they smoke while increasing motivation and self-confidence to quit.

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RPOS3-5 TOBACCO IN VIDEO GAMES: WHERE THERE’S SMOKING, THERE’S DRINKING

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Because the presence of tobacco in movies and on television creates the impression that smoking is both attractive and common, the negative impact of smoking, especially on adolescents, in these media has been studied extensively. Despite the fact that smoking is also present in many video games, we are unaware of any research on the presence of tobacco in video games, which has grown in recent years to become an even larger industry than the movie industry in terms of sales and revenue. Thus, the purpose of this initial study was to investigate the characteristics of video games that contain the presence of tobacco. Chi-square tests were computed to compare video games with smoking present to video games with no smoking on seven other variables, namely, the presence of alcohol, violence, blood/gore, language, gambling, and sexuality, as well as overall game rating. Using the online search engine maintained by the Entertainment Software Rating Board, 62 games with smoking and a random selection of 62 non-smoking games were chosen for analysis. It was determined that video games with smoking differ from those without smoking on three of the seven dimensions. Video games with smoking present were less violent, had a rating of Teen (13+) in the majority of cases, and, most importantly, consistently co-occurred with the presence of alcohol. Of immediate interest is the fact that alcohol was present in all games with smoking, and that drinking occurred in only one game without smoking. These results demonstrate a near perfect association between smoking and drinking. The co-occurrence of alcohol and tobacco has the potential to not only glamorize, but even more importantly, normalize smoking for video gamers. Thus, investigating the effects of smoking in video games ought to become a priority for the tobacco control community, especially given the additional result that 76% of smoking games are rated Teen (13+). If smoking, especially when paired with drinking, creates the impression in the minds of youthful video gamers that smoking is socially acceptable, there exists an urgent need for campaigns and policies to address the issue of smoking in video games.

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RPOS3-6 A REVIEW OF BRITISH AMERICAN TOBACCO’S CHEMOSENSORY RESEARCH PROGRAM

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With increased restrictions on tobacco advertising and product promotion, the tobacco industry must find innovative ways to sell their cigarettes. One strategy has been to improve smokers’ perceptions of the sensory characteristics of cigarettes by changing the chemical composition of the cigarette. One such program by British American Tobacco (BAT), known as the “Chemosensory Program” was designed as a necessary first step toward adding or eliminating chemicals that influenced the sensory perception of smoking. This paper reviews BAT internal documents related to the “Chemosensory Program.” In particular, this paper reviews three projects that were designed to identify methodological issues, namely, the addition of specific chemicals) for allowing smokers to enjoy their smoking experience with less effort, less irritation and less aftertaste. This review provides insights into tobacco industry attempts to manipulate and maintain the pleasurability of the smoking experiences, attempts that are ongoing today.

Funding: Physicians for a Smoke-Free Canada, Canadian Tobacco Control Research Initiative.

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RPOS3-7 ASSOCIATION OF CIGARETTE SMOKING AND EXPOSURE TO SPECIFIC FORMS OF MASS MEDIA AMONG ADOLESCENTS

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BACKGROUND/PURPOSE: Exposure to smoking-related mass media messages significantly increases adolescent smoking initiation. It is not known, however, whether general exposure to mass media, without regard to particular smoking content, is associated with increased smoking. Also, it is not known whether there are particular types of mass media such as television, movies, internet, music, video games, and books/newspapers that are independently associated with adolescent smoking. The purpose of this study was to assess the associations between exposure to particular forms of mass media and smoking.

METHODS: We conducted a cross-sectional survey of all adolescents at a large suburban high school. The questionnaire assessed current (30-day) smoking and susceptibility to future smoking defined by Pierce, and students reported exposure to various specific types of mass media messages. We also assessed 16 covariates shown to be related to smoking. We used logistic regression to assess both the univariate and multivariate relationship between each of the independent variables (media types) and each of the 2 smoking outcomes.

RESULTS: Of the 1211 respondents, 19% reported current smoking and 50% were susceptible to future smoking. Students were exposed to an average of 8.6 hours of electronic mass media daily, including 2.6 hours of music, 2.3 hours of internet, and 2.3 hours of television. Univariate analyses showed that each additional hour of daily movie exposure was associated with an odds ratio of smoking of 1.95 (95% CI: 1.17, 3.24) and that each additional hour of daily music exposure was associated with an odds ratio of smoking of 1.21 (95% CI: 1.14, 1.29), while each hour of reading books was associated with a reduced odds ratio of smoking of 0.73 (95% CI: 0.60, 0.90). After controlling for all covariates, however, only daily music exposure was independently associated with an increased odds ratio of smoking.

CONCLUSIONS: Of the various types of mass media messages, music exposure seems to most strongly associated with smoking, and specific smoking-related content in mass media types such as TV and movies may be more important than general exposure.

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RPOS3-8

POINT-OF-SALE TOBACCO MARKETING PRIOR TO THE ELIMINATION OF TOBACCO RETAIL DISPLAYS

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BACKGROUND: The retail environment provides important opportunities for tobacco industry communication with current, former and potential smokers. Six of 13 Canadian provinces and territories have passed legislation that will eliminate the display of cigarettes at the retail environment. We undertook a study to improve understanding of tobacco industry marketing strategies and activities at point-of-sale in Canada’s most populated province, one year prior to elimination of power wall “enhancements” and three years prior to the complete elimination of tobacco retail displays.

METHODS: Within 20 cities in Ontario, Canada, 24 stores were randomly selected from lists of convenience stores, gas stations and grocery stores. Trained observers captured the range, type and intensity of tobacco marketing and promotional strategies. Fieldwork occurred from April to July 2005. Results for convenience stores are reported, weighted to reflect all such stores in the 20 selected cities.

RESULTS: All convenience stores have power walls with most including price signs (73%), colored shelf liners behind cigarette packs (81%), colored shelf gliders sitting flat against the shelf rail (84%) and extra horizontal or vertical display pieces going beyond the rows of cigarettes (85%). Fifty-eight percent of stores have at least one cigarette countertop display. In most stores tobacco products or accessories are within one foot of the cash register (80%) or within one foot of candy, snack foods or toys (85%). Thirty-six percent of stores have signs advertising cigarettes. One-quarter (26%) of stores have signs facing the outside of their premises that can be seen by non-customers.

DISCUSSION: A high proportion of convenience stores in the 20 Ontario cities sampled are marketing cigarettes extensively. Marketing devices include power walls with a range of enhancing features, countertop displays close to the cash register and to other items children buy, and signs advertising cigarettes. Repeat visits to stores in the spring of 2006 will indicate whether marketing activities have intensified immediately prior to the elimination of power wall “enhancements.”

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RPOS3-9

SHORT TERM HEALTH EFFECTS OF SECOND-HAND TOBACCO SMOKE ON BAR AND NIGHTCLUB WORKERS IN IBADAN, NIGERIA

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OBJECTIVE: Cigarette and other tobacco products are currently freely smoked in Nigerian pubs, bars and nightclubs. This study was conducted on the effects of passive tobacco smoke on the health of workers in these places.

METHODS: A cross-sectional survey was carried out using questionnaires that had been designed for the purpose of evaluating the health status of the workers as well as their knowledge about the dangers of passive tobacco smoke. The study also included a self-reported component on issues such as general health feeling and most common ailments in the last twenty-four hours.

RESULTS: A total of two hundred and seventy (270) bar and nightclub workers were surveyed. Mean age was 25.5 years (SD +/- 4.5). One hundred respondents (37%) thought they had smoked up to 100 cigarettes in the past while 61 (22%) were current smokers. All the current smokers smoked cigarettes and had attempted to quit smoking at least once. All the respondents were of the opinion that smoking was harmful to both smokers and those around them. The mean attendance at a clinic for consultation over the past 12 months was 10.5 (SD +/- 0.65). The commonest symptoms at presentation were fever (24%), nausea and vomiting (16%), cough (15%), backache (10%) and allergic eye symptoms (8%). Ninety-seven respondents (44%) felt unwell and had taken some over-the-counter medication or local concoction about 24 hours prior to the survey. One hundred and forty eight (55%) respondents classified their general health condition as good while one hundred and eleven (40%) of them thought that it was bad.

CONCLUSION: The fact all the respondents thought that smoking was dangerous to their health and had attempted to quit at one time or the other is a pointer to a need for smoking cessation programs that directly address these set of people. Qualitative studies such as focus group discussions and in-depth interviews will be required to achieve this.

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RPOS3-10

COMPARISON OF EXPOSURE TO SECONDHAND SMOKE AMONG 13-15 YEAR OLDS, 132 COUNTRIES IN 6 WHO REGIONS, 1999-2005

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BACKGROUND: Secondhand smoke (SHS) is an involuntary inhaled mix of compounds that causes or contributes to a wide range of adverse health effects. We examined self-reported SHS exposure among adolescents in 132 WHO member states, territories, or other autonomous regions using data from the Global Youth Tobacco Survey (GYTS)—1999-2005.

METHODS: A school-based, two-stage cluster survey of students aged 13-15 years. The first stage is a selection of schools proportional to school enrollment size, and the second stage is a random selection of classes. All students in the selected classes are eligible to complete self-administered questionnaires. GYTS data are weighted to adjust for nonresponse, the probability of selection of schools and classes, and country population. SUDAAN was used to compute standard errors of the estimates and 95% confidence intervals.

RESULTS: 747,603 students participated in this study. In most countries, the majority of adolescents in this age group attend regular private, public, or technical schools. GYTS data indicate that a large proportion of students all over the world were exposed to SHS at home and in public places and many have parents or best friends who smoke. Overall, 43.9% of students reported SHS exposure at home. Among the six Regions, exposure ranged from 78.0% in the European Region to 30.4% in the African Region. Over half 55.8% were exposed in public places, 46.5% had one or more parents who smoked, 17.9% reported that most of their best friends smoked, and 76.1% supported smoking bans in public places.

CONCLUSIONS: GYTS data show that world-wide exposure to SHS among students is very high (over 50%), but students want a ban on smoking in public places. Countries should use this positive public health evidence among youths to promote and enforce smoke-free public places and workplaces, including bars and restaurants.

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RPOS3-11  SECOND-HAND SMOKE EXPOSURE AND SUPPORT FOR RESTRICTIONS IN HOMES AND VEHICLES

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OBJECTIVE: Smoking restrictions in homes and vehicles reduce exposure to second-hand smoke and appear to influence smoking initiation among adolescents. This study reports on the prevalence of exposure to second-hand smoke in homes and public support for smoking restrictions in homes and vehicles in Ontario, Canada.

METHODS: We used 2004 Ontario data from two surveys: The Canadian Tobacco Use Monitoring Survey (CTUMS) (N=4,340 Ontario households), a nationwide tobacco-specific random telephone survey, and the CAMH Monitor (N=2,611 aged 18+), an Ontario-wide random telephone survey focusing on addiction and mental health issues.

RESULTS: Based on CTUMS, smoking was reported inside 14% of all households and 11% of households with children 0-14 years of age. This resulted in second-hand smoke exposure in over 630,000 households and represented over 176,000 Ontario children exposed to secondhand smoke in their homes. Of homes with no regular smokers, 90% did not allow smoking inside the home. Among those households where smoking was allowed but restricted, 89% allowed it in certain rooms only and 25% restricted smoking in the presence of children. The CAMH Monitor survey showed that a high proportion of adults (90%) believed that parents spending time with small children should not smoke at all inside the home. Support was high among never smokers (94%), former smokers (90%) and also current smokers (82%). Sixty percent of Ontario adults supported a legal ban inside the home if children are living there and 75% supported a legal ban on smoking in a vehicle when children are present.

CONCLUSION: Despite the high level of support for smoking restrictions in homes and vehicles, significant exposure to second-hand smoke still occurs in Ontario households and in households with children. No funding.

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RPOS3-12  SECONDHAND SMOKE EXPOSURE AMONG WOMEN AND CHILDREN AND ASSOCIATED RISKS

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OBJECTIVES: Characterize levels of SHS in homes with smokers in a number of countries. - Generate a global profile of SHS exposure among women and children. - Generate useful data in order to support more progressive smoke-free policies and programs aimed at reducing SHS exposure. - Identify base-line levels for monitoring the impact of tobacco control policies and programs on voluntary efforts to reduce SHS exposure in homes.

METHODS: Study Design: Cross-sectional exposure survey using area monitors and biological samples. - Study Population: A convenience sample of 40 homes with a child under 11 years of age was selected in over 30 countries. The precise study population was determined in each country based on past experience, accessibility, and feasibility. - Secondhand smoke exposure assessment: Homes: Air nicotine measured in homes using passive sampling. Biological Samples from Non-smoking Women and Children: Personal exposure to SHS of adult non-smoking women and children under 11 were assessed measuring hair nicotine.

RESULTS: A wide range of exposure to SHS is anticipated across countries and regions. Preliminary results show the highest levels of exposure in homes in Eastern and Southern Europe, often comparable to levels found in bars and restaurants (2.5µg/m³). Complete results for over 10 countries will be complete by the conference. While effective policies have reduced exposure to SHS in workplaces, the results of this study reinforce the need to develop programs and policies to protect women and children from exposure to SHS in their homes.

The study is funded by the Flight Attendants Medical Research Institute (FAMRI).

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RPOS3-13  LOWER RESPIRATORY ILLNESSES AND SECONDHAND SMOKE (SHS) EXPOSURE AMONG THAI CHILDREN UNDER FIVE

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OBJECTIVE: To determine whether exposure to secondhand smoke is associated with lower respiratory illnesses among children under five years of age.

METHOD: A case-control study was conducted at the Queen Sirikit National Institute of Child Health, Bangkok. A total of 426 children under five years of age admitted to the Institute with lower respiratory illnesses including asthma and pneumonia were recruited. The same number of controls, matched for sex and age, were also recruited from the well baby clinic. Information regarding exposure to SHS and other relevant factors was obtained from each child’s mother or care giver. Chi-square, t-test or Mann-Whitney U test were used to compare the 2 groups. Multiple logistic regression was used to obtain odds ratios and 95% confidence intervals.

RESULTS: Mothers of the cases were exposed to cigarette smoke during pregnancy significantly more than those of the controls (p-value < 0.0001). The number of cigarettes smoked at home per day by household members was significantly greater in homes of cases versus controls (p-value = 0.001). Household members of cases carried or gave food while smoking more frequently than household members of controls (Adjusted OR=4.4, 95% CI = 2.8-7.0). Mothers of all cases were more likely to have been exposed to secondhand smoke (Adjusted OR=1.3, 95% CI = 0.9-1.8). This was particularly significant among asthma cases (Adjusted OR=2.8, 95% CI = 1.4-3.8). Parental educational level and household income were also associated with respiratory illness in children under five.

Funding: Thai Health Promotion Foundation.

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RPOS3-14  IMPLEMENTING SMOKING HYGIENE POLICIES IN HOUSEHOLD WITH INFANTS EXPOSED TO SECONDHAND SMOKE: INTERVENTION TARGETED AT NON-SMOKING MOTHERS

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OBJECTIVE: To assess the effectiveness of an intervention to motivate non-smoking mothers to reduce their infants' exposure to secondhand smoke (SHS) at home.

METHODS: A total of 208 Chinese families with non-smoking mother, smoking father and infant living together in the same household, and attended a maternal and child health center were recruited in a randomized controlled trial, aiming to evaluate the effectiveness of a multi-step family smoking cessation intervention delivered onsite by a nurse smoking cessation counselor. As part of the intervention, the mothers were given guidelines and were motivated to implement the household no-smoking policy.

RESULTS: At baseline, the mothers reported having taken some steps such as taking the infants away from the smoke stream (69%) and opening the windows (88%). About 90% of the mothers perceived no difficulties in the execution of household no-smoking policy and expressed willingness to execute such policy. At 6 month follow up, about 37% of the intervention mothers have executed at least one no-smoking policy compared to the control (27%). The most popular policy executed were asking a smoker not to smoke within 3 meters’ vicinity of the infants (Intervention: 33% vs. Control: 21%) and to extinguish all cigarettes before entering home (Intervention: 28% vs. Control: 17%). Nevertheless, no significant difference was found between the intervention and control group on the mothers’ execution of household no-smoking policy.

CONCLUSION: While non-smoking mothers may have positive attitudes towards providing a smoke-free home for their infants, they may have faced difficulties in implementing a household no-smoking policy in real life. Preliminary evidence suggested that a one time intervention could be a first step to motivate mothers to protect their infants from SHS exposure at home, and further studies is desired to test an improved intervention recognizing the difficulties of executing such policy at home, and with a larger sample size to confirm its effectiveness.

Funding: CRGC/HKU.

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RPOS3-15  PREGNETS (NETWORK FOR THE PREVENTION OF GESTATIONAL AND NEONATAL EXPOSURE TO TOBACCO SMOKE) II: INTEGRATING SMOKE FREE INTERVENTIONS INTO PRE-NATAL NUTRITION PROGRAMS

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OBJECTIVE: To integrate smoking screening and cessation into routine intake of pregnant women to a pre-natal nutrition program, and to train staff to offer cessation services to pregnant smokers.

METHODS: The Canadian Pre-natal Nutrition Program (CPNP) offers nutritional support and health information to pregnant women. PREGNETS delivers training to health professionals and supports pregnant smokers aiming to reduce smoking. Pregnets partnered with CPNP representatives to integrate smoking cessation into CPNP projects in Ontario, Canada. A survey assessed their needs for training, and a one-day training workshop was held. A toolkit for CPNP staff was developed, and additional resources are available on the Pregnets website. Projects are encouraged to use a smoking screener and to assist women with smoking cessation, reduction, and second-hand smoke in homes when appropriate. A web-based discussion support group for pregnant smokers was also developed. Ongoing consultations with CPNP keep Pregnets aware of implementation issues. A pilot study of reimbursement for staff time is ongoing.

RESULTS: A partnership between Pregnets and CPNP representatives formed the basis for implementing cessation interventions. The needs analysis identified variability among projects in numbers of pregnant participants and proportion of smokers. Identified barriers to implementing smoking cessation included financial and staff resources, and lack of staff training. Integration of smoking cessation into programs for pregnant women requires both training and ongoing involvement of program staff.

Funding: Health Canada.

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RPOS3-16  PRENATAL NICOTINE EXPOSURE AFFECTS ADOLESCENT NICOTINE SELF-ADMINISTRATION

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Prenatal nicotine exposure causes a variety of persisting neural effects including alterations in nicotinic acetylcholine and dopaminergic systems, both of which are important for nicotine actions underlying tobacco smoking addiction. There is a significant association between maternal cigarette use during pregnancy and a greater subsequent risk of smoking in their female offspring. The current study was conducted to determine if there is a causative relationship between prenatal nicotine exposure and nicotine self-administration in adolescence and adulthood. Female rats were administered nicotine (6 mg/kg/day) or saline by minipump infusion during gestation. The female offspring were given access to IV nicotine self-administration (0.03 mg/kg/infusion) for four weeks beginning in adolescence and continuing into adulthood and then after a one-week cessation period given another week of nicotine access. Gestational nicotine exposure did not alter the initial phase of nicotine self-administration. However, after the withdrawal period, the group with gestational nicotine exposure showed significantly greater nicotine self-administration in a subsequent trial, so that the differences actually emerge only after the animals have undergone a period of withdrawal. These findings are in keeping with earlier work showing greater nicotine withdrawal deficits in cholinergic and serotonergic systems in adolescent rats who were exposed to nicotine prenatally. Our results also point to a biologic basis for the higher rates of smoking in adolescent daughters of women who smoke cigarettes during pregnancy and implicates a specific role of nicotine in this effect. This is important not only in characterizing the further dangers of maternal smoking but also the potential risks of nicotine-based treatments for smoking cessation during pregnancy. The focus of the persisting prenatal effect on enhanced nicotine withdrawal suggests an avenue for development of better treatments for smoking cessation in the offspring of mothers who smoked during pregnancy.

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RPOS3-17  HOUSING ALTERS THE EFFECTS OF NICOTINE WITHDRAWAL IN RATS

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Environmental conditions, including housing, affect the actions of amphetamines, cocaine, opiates, and nicotine (Bowling & Bardo, 1994; Bardo et al., 1999; Green et al., 2003; Elliott & Grunberg, 2005; Shafer et al., 2005). However, no studies have examined effects of housing conditions on withdrawal, a key element of addiction. The present experiment used an animal model of withdrawal based on Malin et al. (1992) to examine the effects of housing on nicotine withdrawal in male adolescent rats. Subjects were 72 Sprague-Dawley male rats that were 21 days old at the beginning of the experiment and that were housed in one of three ways: isolation (one animal in a standard cage), social (two animals in one standard cage), or super enrichment (12 animals in a large cage filled with toys). Rats received 7 days of continuous SC infusion via Alzet osmotic minipumps of saline or 3.16 mg/kg of nicotine hydrogen tartrate (expressed as base), identical to Malin et al. (1992), O’Dell et al. (2004), and Phillips et al. (2004). Behavioral observations were made at baseline, during drug infusion, and 20 hours post minipump removal (optimal time to detect withdrawal behaviors in adult male rats). Singly housed rats increased withdrawal behaviors after cessation of nicotine administration, consistent with previous reports. Rats in the social and super enriched housing conditions also increased withdrawal behaviors during and after saline or nicotine administration. Housing condition interacted with nicotine withdrawal, such that the single-housed rats that had received nicotine had the greatest increase in withdrawal behaviors. Rats that had received nicotine in the social and super-enriched housing conditions also increased withdrawal behaviors compared to appropriate controls, but these increases were less than what occurred in the isolated conditions. These findings indicate that nicotine withdrawal behaviors are apparent in rats and that housing affects and interacts with these withdrawal behaviors. It is, therefore, important to consider and report housing conditions in rat studies of nicotine withdrawal.

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**RPOS3-18 AGE DIFFERENCES IN THE MOTIVATIONAL PROPERTIES OF NICOTINE AND MECAMYLAMINE-PRECIPITATED NICOTINE WITHDRAWAL**

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INTRODUCTION: Tobacco use typically begins during adolescence, and the nature of these first experiences may affect the likelihood of continued use. Some studies suggest that adolescent rats are more responsive than adults to the rewarding effects of nicotine. Little is known about age differences in the aversive effects of nicotine withdrawal.

OBJECTIVE: Age differences were investigated in the motivational properties of nicotine and nicotine withdrawal using the conditioned place preference (CPP) and aversion (CPA) paradigms, respectively. Method: CPP: Male adolescent and adult Wistar rats received nicotine (0, 0.2, 0.4, 0.8 mg/kg, s.c.) or vehicle prior to 4 place conditioning cycles using an unbiased design. CPP was measured in drug-free animals 24 hours after the last conditioning session. CPA: Separate groups of rats were chronically treated with nicotine (0, 3, 6 mg/kg/day, s.c.) for 9 days. On day 0 of nicotine treatment, nicotine withdrawal was precipitated with mecamylamine (0 or 1 mg/kg, s.c.) or vehicle immediately prior to place conditioning sessions. CPA was measured on day 8 of nicotine treatment. On day 9, age differences in nicotine withdrawal symptoms were measured following administration of 1 mg/kg mecamylamine.

RESULTS: CPP: Nicotine administration produced dose-dependent place preference in adolescent, but not adult, rats. CPA: Adult, but not adolescent rats developed a CPA to the compartment associated with precipitated withdrawal from nicotine with mecamylamine. Both age groups expressed mecamylamine-precipitated withdrawal symptoms when chronically treated with 6 mg/kg/day nicotine. At a nicotine dose of 3 mg/kg/day, adults showed greater withdrawal symptoms compared to adolescents.

CONCLUSIONS: In agreement with previous findings, adolescents were more sensitive to the rewarding properties of nicotine than adults, as measured by CPP, an effect which may facilitate initiation of nicotine use. The results from the CPA experiment suggest, in contrast, that adolescent rats may be less responsive to the aversive effects of nicotine withdrawal. This may influence processes such as extinction of responding to nicotine.

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**RPOS3-20 CORRELATES OF CIGARETTE CRAVING IN ACUTE NICOTINE WITHDRAWAL**


This research project seeks to clarify the role of nicotine in modulating cigarette craving/the urge to smoke. Regular smokers (15+ cigarettes/day) came to the lab after overnight abstinence. They were allowed to smoke for 10 minutes and then went without smoking for 4 hours. At the end of the 4 hours, they were allowed another 10-minute smoking period. Measures included repeated blood samples, puff topography during smoking periods, and questionnaires on feelings of craving and mood. Subjects' plasma was assayed for nicotine and cotinine content, along with levels of endorphin, enkephalin, dopamine, serotonin, and cortisol, all known to be affected by nicotine. In Study 1, subjects were grouped as Female/Male and Hispanic/White/Black/Asian to investigate gender and ethnic differences as well as the distribution of craving reports and changes in blood constituents. For further pharmacological analysis of the influence of nicotine on craving, in Study 2 nicotine was augmented with a nicotine patch (vs. placebo patch). Differences were observed in nicotine boost with black (vs. white) and female (vs. male) smokers showing greater increases. On the other hand, self-reported craving for cigarettes over the abstinence period was lowest for white females. In study 2, nicotine patch only partially reduced craving and negative mood. The complexity of the relationships between subjective measures, objective smoking behavior, circulating concentrations of various substances, and demographic moderators is discussed.

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**RPOS3-21 COMPARISON OF IMAGERY VERSUS SMOKING CUES IN ELICITING CIGARETTE CRAVING AND OTHER DRUGS OF ABUSE**

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One of the most common symptoms reported by people attempting to quit smoking is craving for cigarettes. 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 other drugs of abuse. Smokers (n = 60) participated in two counter-balanced sessions, one after 12 hr of tobacco deprivation and the other after ad libitum smoking. Nonsmoker controls (n = 30) participated in one session. 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, participants completed visual analog scale questions assessing cigarette craving, urge to smoke, craving for drug of choice, and positive and negative mood. Smoking in the tobacco-deprived condition reported greater tobacco and drug craving than in the nondeprived condition at baseline and throughout the session. Depressed 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, nondepressed smokers reported greater subjective tobacco and drug craving only in response to smoking versus neutral cues. Increased craving report was observed immediately after cue presentation and remained elevated during the 30-min assessment period. The active cue condition also increased negative mood in nondepressed smokers. Smoking-related imagery and cue conditions had no effect in nonsmokers. These findings suggest that smoking cues are more effective than imagery in eliciting tobacco craving responses in nondepressed smokers and that smoking cues can occasion craving for other drugs of abuse.

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RPOS3-22  THE SEROTONIN TRANSPORTER GENE AND AFFECTIVE PROCESSING OF EMOTIONAL CUES DURING NICOTINE DEPRIVATION

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Converging lines of evidence suggest that nicotine and mood are related at a fundamental biological level, and it is at this nexus that genetic variation in response to nicotine administration and deprivation are most likely to become evident. In this study, startle probe methodology was used to examine the effects of nicotine administration and deprivation on emotional processes associated with drive and motivation. We also examined the differences in startle responding among those carrying the short (s) or long (l) form of the serotonin transporter gene, SERT (5HTTPLR). Though the relationship is complex and not fully understood, the s allele may reduce the transcriptional efficiency of the HTT promoter, therefore decreasing serotonin transporter expression and serotonin uptake. Smokers (n = 115) completed four laboratory sessions crossing deprivation (12-hour deprived vs. nondeprived) with nicotine spray (active vs. placebo). Participants viewed affective pictures (positive, negative, neutral) and slides involving cigarette cues, while startle probes were combined. We found that smokers homozygous for the l form of the SERT showed significantly greater startle suppression when provided with nicotine vs. placebo than those with the s/s or s/l variants. The results suggest that l smokers, who may have higher levels of 5-HTT and more rapid 5-HT clearance, experience substantial reduction in activation of the defensive system when exposed to nicotine. This effect was not specific to negative cues, suggesting a more generalized response to an aversive stimulus (the startle probe). Thus, this group of smokers may derive a substantial reinforcement benefit from the administration of nicotine in the form of reduced defensive activation in response to an aversive stimulus.

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RPOS3-23  THE DRD2 TAQ1-B POLYMORPHISM AND ITS RELATIONSHIP TO SMOKING ABSTINENCE AND WITHDRAWAL SYMPTOMS

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Nicotine enhances dopamine activity in mesolimbic circuits thought to be important for behavioral reward and reinforcement. The DRD2 gene has polymorphisms that have been linked to regulation of the dopamine system and to an increased prevalence of smoking. The present study examined the relationship of the DRD2-B polymorphism with short-term daily treatment outcome and withdrawal symptoms (WSWS) among smokers treated with venlafaxine or placebo. Smokers with the at-risk Taq1-B1 allele were expected to be less likely to abstain than those homozygous for the Taq1-B2 allele. Those with the at-risk allele were expected to report greater withdrawal symptoms than those without this allele. Smokers (n=131) recorded daily measures of smoking withdrawal symptoms and abstinence for 56 consecutive days, 14 pre-quit and 42 post-quit. Participants took the study medication during this 56-day period and used the nicotine patch post-quit. The B1/B1 and B1/B2 genotypes were combined into a single category of B1 carriers due to the small number of B2/B2 genotypes. The results showed that B2/B2 smokers were slightly more likely to be abstinent on a given day than those carrying the B1 allele. Significant DRD2-B x Time interactions were found for several WSWS scales, indicating that those smokers with the B2/B2 genotype tended to report less symptoms as a function of time. These findings suggest smokers with the B2/B2 genotype have greater daily abstinence and significantly less withdrawal symptoms than those with the B1 allele.

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RPOS3-24  MENSTRUAL CYCLE PHASE EFFECTS ON NICOTINE WITHDRAWAL AND CIGARETTE CRAVING: A REVIEW

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There is conflicting research on gender differences on the experience of withdrawal and craving and some have suggested that menstrual cycle effects may moderate this relationship. Given hormonal changes during the menstrual cycle, it is possible that abstinence-related symptoms such as withdrawal and craving vary as a function of menstrual phase as well. This review summarizes the modest but exerts we demonstrated that systemic administration of a potent calcineurin antagonist, cyclosporine, attenuates nicotine-induced locomotor sensitization and blocks the development of a conditioned place preference for nicotine. Furthermore, calcineurin administration blocks the nicotine-induced increase of phospho DARPP32 in the striatum at the Threonine 34 site. In the current work, we explored the contribution of calcineurin in the ventral tegmental area (VTA) for nicotine-induced locomotor activation and sensitization. Male Sprague Dawley rats (n=43) received daily subcutaneous injections of nicotine (0.35 mg/kg free base) or saline in combination with chronic VTA infusion of cyclosporine (1 ug/side/day) or PBS. Daily nicotine administration (16 days) led to a progressive increase in locomotor activity while co-administration of cyclosporine attenuated this nicotinic effect. Chronic cyclosporine administration, however, did not alter acute nicotine-induced locomotor activation. Animals treated with saline and cyclosporine for 16 days showed increased locomotor activity after receiving a nicotine challenge dose on day 17 with no difference between the two groups. Subsequent biochemistry analysis verified that cyclosporine infusion altered calcineurin activity in the brain as evidenced by increased phosphorylation of Synapsin I at its calcineurin sensitive site. Future experiments will examine the role of VTA calcineurin in nicotine reinforcement and reward.

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RPOS3-25  VTA CALCINEURIN INHIBITION MODULATES NICOTINE-INDUCED LOCOMOTOR SENSITIZATION

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The behavioral and reinforcing effects of nicotine are known to reflect underlying molecular changes in the brain, yet the role of effector proteins involved in these molecular changes is still under investigation. Recent work in our laboratory suggests the involvement of the serine/threonine phosphatase, calcineurin. In previous experiments, we demonstrated that systemic administration of a potent calcineurin antagonist, cyclosporine, attenuates nicotine-induced locomotor sensitization and blocks the development of a conditioned place preference for nicotine. Furthermore, cyclosporine administration blocks the nicotine-induced increase of phospho DARPP32 in the striatum at the Threonine 34 site. In the current work, we explored the contribution of calcineurin in the ventral tegmental area (VTA) for nicotine-induced locomotor activation and sensitization. Male Sprague Dawley rats (n=43) received daily subcutaneous injections of nicotine (0.35 mg/kg free base) or saline in combination with chronic VTA infusion of cyclosporine (1 ug/side/day) or PBS. Daily nicotine administration (16 days) led to a progressive increase in locomotor activity while co-administration of cyclosporine attenuated this nicotinic effect. Chronic cyclosporine administration, however, did not alter acute nicotine-induced locomotor activation. Animals treated with saline and cyclosporine for 16 days showed increased locomotor activity after receiving a nicotine challenge dose on day 17 with no difference between the two groups. Subsequent biochemistry analysis verified that cyclosporine infusion altered calcineurin activity in the brain as evidenced by increased phosphorylation of Synapsin I at its calcineurin sensitive site. Future experiments will examine the role of VTA calcineurin in nicotine reinforcement and reward.

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RPOS3-26

NUCLEUS ACCUMBENS CREB REGULATES NICOTINE CONDITIONED PLACE PREFERENCE IN C57BL/6J MICE

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Our previous work has shown that chronic nicotine regulates CREB phosphorylation in the nucleus accumbens of C57BL/6J mice. The VTA-accumbens dopamine pathway is thought to modulate motivational valance associated with the reinforcing effects of nicotine and other drugs of abuse. The purpose of this research was to determine whether interruption of nucleus accumbens CREB activity, with a dominant negative mutant CREB (HSV-mCREB), would affect nicotine reinforcement as measured using an unbiased nicotine conditioned place preference (CPP) paradigm. Following HSV-mCREB or HSV-LacZ control injections, animals received repeated pairings of nicotine or saline with one of two equally preferred but discriminatively different, isolated chambers. Behavioral control subjects received saline in both chambers. Here we show that untreated and HSV-LacZ infused mice acquire conditioned place preference to the nicotine-paired chamber in a dose-dependent manner, but infusion of HSV-mCREB into the nucleus accumbens blocks nicotine CPP. These data suggest that regulation of nucleus accumbens CREB is important for nicotine reinforcement.

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RPOS3-27

LONG-TERM CONDITIONED PLACE PREFERENCE AND PSYCHOMOTOR ADAPTATION TO NICOTINE IN ADOLESCENT RATS

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Animal models of adolescent nicotine exposure have revealed that exposure during this period of development can result in a profile of neurobehavioral alterations different from those seen when exposure occurs in adulthood. Few studies, however, have focused on whether such alterations may underlie lasting vulnerability to nicotine and/or tobacco addiction. We investigated the lasting nature of conditioned place preference (CPP) and psychomotor adaptation to nicotine using adolescent male Sprague-Dawley rats (n=10). On postnatal day 33 (P33), animals were given a pretest in the CPP apparatus, a two-chambered box with a door separating a black side from a white side. Beginning on P34, animals alternately received four 0.5 mg/kg nicotine injections and four physiological saline injections (both subcutaneously) over eight consecutive days. Nicotine injections were paired with the white side of the apparatus whereas saline injections were paired with the black side (saline injections were paired with both sides for control animals). On P42, the divider was removed and a post-conditioning test given. Rats administered nicotine displayed a significant preference for the white side of the apparatus when compared with controls (p<.05). 21 days later, on P62, a second post-conditioning test was given. nicotine-treated rats continued to display a significant preference for the nicotine-paired side relative to controls (p<.05). On P67, all animals received a physiological saline injection and baseline locomotor activity was recorded in an open field apparatus. 24 hours later, all animals received a challenge injection of 0.5 mg/kg nicotine (intraperitoneally) and it was found that rats administered nicotine during adolescence displayed significant tolerance to nicotine’s acute hypolocomotor effects relative to rats administered saline in adolescence (p<.01). These results demonstrate that nicotine exposure during adolescence produces long-lasting sensitivity to nicotine’s rewarding effects as well as tolerance to its hypoaffective effects.

This study was conducted while the first author was at George Mason University. Support provided by the Virginia Tobacco Settlement Fund and the Virginia Youth Tobacco Project.

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RPOS3-28

ACTIVE IMMUNIZATION AGAINST NICOTINE ATTENUATES SENSITIZED NICOTINE LCOMOTOR ACTIVATION.

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This study determined whether active immunization with trans-3?-aminoethylnicotine-EPA (NicVax) would result in high nicotine antibody titers in the rat, sufficient to interfere with both initial and sensitized nicotine locomotor activation. It also determined whether four high-dose exposures to nicotine would saturate and inactivate the induced antibodies. The subjects were 23 four-month-old male Sprague-Dawley rats. Thirteen were immunized five times over a 13-week period with 25 micrograms each of NicVax and Friends adjuvant, i.p. Ten rats were treated in the same manner with REPA (the carrier protein without nicotine) and Friends adjuvant. On four successive days, each rat was placed in a horizontal activity apparatus and habituated for 20 minutes. The rat was then injected s.c. with either 0.28 mg/kg nicotine bitrate expressed as the base or with saline alone and was returned to the activity monitor. Each rat’s daily nicotine activation score was its activity counts during the five minutes after nicotine injection minus its counts during the five minutes prior to nicotine. Serum samples were obtained at the conclusion of the locomotor study, three weeks after the fifth immunization, and were analyzed for nicotine antibody titer, as well as for free and bound nicotine. Nicotine antibody titers were undetectable in control rats and 10,694 ± 1,530 in immunized rats. Nicotine in sera was 95.2% bound in the immunized group, and free nicotine was markedly reduced in comparison with non-immunized controls. Immunization did not significantly affect activity scores in the absence of nicotine. In contrast, nicotine activation scores were significantly lower on each day in the immunized rats. ANOVA revealed highly significant effects of day, p=0.005 (confirming sensitization of nicotine activation) and of immunization, p=0.001. The nicotine activation scores, averaged over the four days for each rat, correlated negatively, r = -0.394, with antibody titers. Active immunization thus reduced titers sufficient to interfere with even sensitized nicotine locomotor effects. Large-scale cumulative nicotine exposure failed to saturate or inactivate nicotine antibodies.

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RPOS3-29

EFFECT OF N,N’-ALKYL-BIS-PICOLINIUM ANALOGS ON NICOTINE DISCRIMINATION AND NICOTINE-INDUCED HYPERACTIVITY IN RATS

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Antagonists selective for nicotinic acetylcholine receptor (nAChR) subtypes mediating nicotine-evoked dopamine release may have efficacy as smoking cessation agents. Recently, our group has synthesized and evaluated a number of these compounds. To date, behavioral experiments indicate that one compound, N,N’-dodecan-1,12-diydyl-bis-3-picolinidibromide (bpIDDB), decreases nicotine self-administration acutely in rats. In the present experiments, we determined whether bpIDDB and 5 structurally-related analogs with varying alkyl chain length would alter the discriminative stimulus and/or locomotor stimulant effects of nicotine. Mecamylamine and dihydro-8-erythroidine (DH-8-E) were included as positive controls. In Experiment 1, rats trained to discriminate nicotine (0.2 mg/kg) from saline were pretreated with bis-picolinium compounds (0.6 - 6 µmoles/kg) prior to the nicotine training dose. In Experiment 2, rats were sensitized to nicotine (0.4 mg/kg, once daily for 21 days) and then were pretreated with one of the bis-picolinium compounds (0.6 - 10 µmoles/kg, random order) prior to nicotine. Results indicated that mecamylamine and DH-beta-E were effective in both assays. In contrast, none of the bis-picolinium compounds altered nicotine discrimination up to doses that reduced the rate of responding. However, each of the bis-picolinium compounds dose-dependently attenuated nicotine-induced hyperactivity. Since the bis-picolinium compounds evaluated have been shown previously to inhibit nicotine-evoked dopamine release in vitro, these behavioral results suggest that nAChRs mediating nicotine-evoked dopamine release are involved in the hyperactivity produced by nicotine, but not in the discriminative stimulus effects of nicotine. Thus, bpIDDB may serve as a lead in the development of smoking cessation agents that selectively inhibit reward-relevant nAChRs.

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RPOS3-30  ANXIOLYTIC EFFECTS OF NICOTINE IN ZEBRAFISH

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Nicotine has been found in studies with rodents and humans to have anxiolytic effects. Anxiolysis may be an important determinant of tobacco addiction and relapse. Understanding the neural basis of nicotine-induced anxiolysis can help both with developing better aids for smoking cessation as well as with the development of novel nicotinic ligands for treating anxiety. Rodent models of nicotine-induced anxiolysis have been useful in determining some of neural mechanisms involved in the nicotine effects. Complementary non-mammalian models may also be useful. Zebrafish have been shown to be useful in studying nicotine-induced cognitive improvement. This study was aimed at determining whether a zebrafish model of anxiety would be sensitive to nicotine. When zebrafish are placed in a novel environment, they dive to the bottom to escape predation. We tested this diving response and in a study of nicotine effects. Zebrafish (N=10/group) placed in a novel tank spent the majority of time at the bottom third of the tank during the first minute of a five-minute session. The control fish showed a gradual decrease in time spent at the bottom over the rest of the test session. Nicotine treatment (100 mg/l for 3 min.) caused a significant decrease in the diving response throughout the session, while 50 mg/l was effective during the first minute. The nicotine effect was reversed by mecamylamine given together with nicotine, but not when administered shortly before the test session after nicotine dosing. This implies that the nicotine effect on the diving response was due to stimulation at nicotinic receptors, an effect blocked by mecamylamine and that once involved this effect is no longer dependent on ongoing activation of nicotinic receptors. The nicotine effect on the diving response did not seem to be a result of a general disorientation of the fish. The 100 mg/ml nicotine dose was shown in our earlier study to significantly improve spatial learning in zebrafish. Nicotine-induced anxiolytic effects can be modeled in the zebrafish. This will help with the investigation of the molecular bases of this effect and screening for novel anxiolytic compounds.

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RPOS3-31  CHRONIC NICOTINE TREATMENT INDUCES MONKEY HEPATIC AND CEREBRAL CYP2E1, AN ALCOHOL METABOLIZING ENZYME

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CYP2E1 metabolically inactivates alcohol as well as activating toxins including tobacco-specific carcinogens; it also produces high levels of reactive oxygen species. Previously it has been shown that CYP2E1 can be induced by nicotine in rats. Consistent with this, smokers show increased chlorzoxazone clearance, a specific substrate for CYP2E1, as well as faster alcohol metabolism. African Green monkeys (Cercopithecus aethiops) were treated twice daily for 22 days with 0.3 mg/kg nicotine or saline (s.c., n=6 per group). In control monkeys, the in vivo chlorzoxazone clearance (AUCinf=116 +/- 27 ng/ml/h, n=10) was faster than humans while the in vitro kinetic parameters for chlorzoxazone 6-hydroxyl- ylation (Vmmax=3.48 +/- 0.2 mmol/min/g, Km=95.37 +/- 1.75 microM) were similar to those reported for human liver. In the nicotine treated group, chlorzoxazone disposition in vivo was increased as indicated by a 52% decrease in chlorzoxazone AUCinf (p<0.01) and a 52% decrease in Tmax (p<0.05); hepatic CYP2E1 activity and protein levels respectively trended towards an increase of 1.27-fold (p=0.14) and 1.35-fold (p=0.07). Hepatic CYP2E1 levels correlated with the in vitro activity (r=0.74, p=0.004) and in vivo chlorzoxazone AUCinf (r=0.62, p=0.03). Nicotine also increased brain CYP2E1 levels in the frontal cortex and cerebellum by 1.5-fold (p<0.05). In conclusion, chlorzoxazone metabolism could be promoted by nicotine which is due to nicotine-induced CYP2E1 levels. Elevated hepatic and cerebral CYP2E1 levels may increase the activation of toxins in smokers and those on NRT and it may also contribute to the increased rates of alcohol metabolism and metabolic cross-tolerance observed in smokers.

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RPOS3-32  CYTOCHROME P450 2A6 (CYP2A6) GENOTYPE AND PHENOTYPE, AND EFFECTS ON SMOKING CESSATION

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CYP2A6 is responsible for nicotine metabolism and evidence suggests genetic variations affect smoking behaviour. The aim of this study was to ascertain if polymorphisms in the CYP2A6 gene were associated with smoking cessation in a placebo-controlled trial of the nicotine patch. Samples were genotyped for "2, 4, 9, 12 and 1x2", and cotinine and 3-hydroxycotinine measured in continuing smokers. Slow metabolisers were classed as those with one or two inactive ("2 or 4") or two reduced activity ("9 or 12") alleles (n=47), whereas intermediate metabolisers had one reduced activity allele (n=115). All others were assumed normal metabolisers (1x1) (n=554). Carriers of the duplication were classed as fast metabolisers ("1x2, n=19). The 3-hydroxycotinine: cotinine ratio (3HC:COT) is a good phenotypic marker of CYP2A6 activity and metabolic rate. There was a strong association between genotype grouping and the 3HC:COT ratio in smokers (r=0.38, p<0.001), and slow metabolisers had the lowest metabolic ratio. Slow metabolisers were thus hypothesised to retard their nicotine intake, smoke fewer cigarettes per day, be less addicted, and hence have a higher likelihood of quitting successfully, with or without active NRT. CYP2A6 genotype grouping was not related to Horn Russell score (p>0.2). There was also no significant relationship between 2A6 activity and successful cessation at 12 weeks (EOT), although there was a trend (reverse to anticipated) to increased quit rates with increased 2A6 function (slow 10.6%, int 13.9%, normal 16.2%, fast 36.8%, p=0.057). A logistic model of abstinence at 12 weeks including treatment group, age, sex and 2A6 activity suggested that treatment group (OR 1.9, 95% CI 1.26-2.89, p=0.002) and age (OR 1.02, 95% CI 1.01-1.05, p=0.011) were significantly associated with successful cessation, but sex (OR 1.4, 95% CI 0.95-2.1, p=0.08) or 2A6 activity (OR 1.4, 95% CI 0.99-2.09, p=0.056) were not. This study suggests that CYP2A6 genotype correlates with a phenotypic surrogate for CYP2A6 activity but is not associated with nicotine dependence. Furthermore, in our cohort, lower CYP2A6 activity does not predict increased cessation.

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RPOS3-33 THE SEROTONIN TRANSPORTER 5-HTTLPOLYMORPHISM AND TREATMENT RESPONSE TO NICOTINE PATCH: FOLLOW-UP OF A RANDOMISED CONTROLLED TRIAL

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In this follow-up of a randomized placebo-controlled clinical trial of nicotine replacement transdermal patch for smoking cessation, 741 smokers of European ancestry who were randomized to receive active patch or placebo patch were genotyped for the serotonin transporter gene-linked polymorphic region. The study setting was a primary care research network in Oxfordshire, United Kingdom. The primary outcome measures were biochemically-verified sustained abstinence from cigarette smoking at end of treatment and 26-week follow-up. The main effect of genotype was not associated with sustained abstinence from smoking at any end of treatment (SL: p = 0.33; SS: p = 0.81) or 6-month follow-up (SL: p = 0.05; SS: p = 0.21), and there was no evidence for gene-gender or genotype-smoking interaction. In summary, despite the theoretically important contribution of serotonin neurotransmission to smoking cessation, the serotonin transporter gene was not associated with treatment response to NRT patch for smoking cessation in this primary care based trial.

The study was funded by Cancer Research UK. NRT patch and placebo patches were provided by Ciba-Geigy Pharmaceuticals, who manufactured the patches. Personal funding for SPD was provided by career development awards from the Robert Wood Johnson Foundation Generalist Physician Faculty Scholars Program and the National Institute on Drug Abuse/National Institutes of Health grant PHS 1 K08 DA14276-01A1.

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RPOS3-35 GENE EXPRESSION PROFILING OF INTRAVENOUS NICOTINE SELF-ADMINISTRATION IN RATS

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A large body of genetic epidemiological data strongly implicates genetic factors in the etiology of smoking behavior. The aim of the present study was to identify the brain regions that undergo changes in activity following self-administration of nicotine and the genes that change their expression in these regions. We performed a c-fos immunoreactivity mapping to identify regions coupled to high-density microarray chip technology (AFFYMETRIX GeneChip®). Using a triad design, groups of male hooded Lister rats were ‘yoked’ to receive identical amounts of nicotine administered either actively or passively alongside control groups receiving similar number of saline infusions. This design permits the identification of brain regions and genes that are specifically modified by the voluntary self-administration of nicotine and to tease them apart from changes due to pure pharmacological action. Immediately following the last session of stable responding, brains were rapidly removed and stored at -80 degrees C until preparation for immunohistochemistry and microarray analyses. Active self-administration of nicotine increased the number of c-fos immunoreactive-positive cell nuclei in the shell region of the nucleus accumbens (NAc); these amounts were significantly higher compared to saline-yoked group of rats. From the expression profiling, a number of genes in the core and shell regions of the NAc differed significantly across the groups. Between-group comparisons of gene expression that may be attributed to the pharmacological actions of intravenous nicotine identified a specific list of genes that were different from those genes attributed to the voluntary self-administration of nicotine. Studies in progress will distinguish if these alterations are reversible and if the expression normalises by extinguishing the behaviour.

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RPOS3-36 CHARACTERIZATION OF THE HAPLOTYPE STRUCTURES OF THREE POTENTIAL NICOTINE METABOLIZING UDP-GLUCURONOSYLTRANSFERASE GENES

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Glucuronidation plays a major role in the detoxification of nicotine and other tobacco toxins and is carried out by UDP-glucuronosyltransferase enzymes (UGTs). In vitro studies using human liver microsomes have revealed UGT1A1, UGT1A9 and UGT2B7 to be the main enzymes responsible for glucuronidation of nicotine and its metabolites, cotinine and 3'-hydroxycotinine. In the present study, we characterized the genetic variation in these three UGT genes in participants from two existing studies of nicotine pharmacokinetics. Polymorphism discovery was conducted in 98 subjects from three ethnic populations using sequencing. Pairwise linkage disequilibrium and haplotype blocks were defined for the UGT1A gene cluster, which include both UGT1A4 and UGT1A9, and the UGT2B gene region. Further, 19 SNPs spanning 94 kb of the UGT1A4 gene region were genotyped in 212 Caucasian subjects, 21 UGT1A1 haplotypes defined by 16 tagging polymorphisms were identified, four of which had a frequency of more than 1% and accounted for 76% of all genotypes. For UGT2B7, 14 SNPs spanning a 11.3 kb region were genotyped, which defined ten different haplotypes. Four of the 10 haplotypes had a frequency of 11% or greater and accounted for 93% of all genotypes. This is the first investigation of UGT genotypes in individuals with in vivo nicotine metabolism phenotypes. Characterizing haplotypes will facilitate efforts to characterize the role of UGT genotypes in individual variation in nicotine glucuronidation.

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Recent studies have shown that weight gain after smoking cessation is a major concern to smokers and may be an obstacle when quitting smoking. The mu-opioid receptor (OPRM1), the primary site of action for the binding effects of the endogenous opioid beta-endorphin, has been previously linked to smoking cessation and weight gain. The A118G polymorphism in exon 1 of the OPRM1 gene codes for an Asn40Asp amino acid change and in a recent study the Asp allele was associated with more successful cessation rate and reduced weight gain after cessation. We attempted to replicate this effect of OPRM1 genotype on body mass index after a cessation attempt using nicotine replacement therapy. The participants under study took part in a randomized placebo controlled trial of the transdermal nicotine patch carried out in 1992. 1686 heavy smokers were recruited and provided with sufficient patches for 12 weeks. Abstinence was confirmed by saliva cotinine and carbon monoxide levels after 12, 24 and 52 weeks and participants were contacted again 8 years later. Follow up data reported abstinence rates as well as sex, body mass index (BMI), socioeconomic status, ancestry and smoking habits. Participants were also genotypyped for the A118G polymorphism of the OPRM1 gene. We measured the change in body mass index from baseline to 8 year follow up and compared it to genotype. The results indicate a significant association of OPRM1 genotype with BMI change amongst those who were quit at 8 years (p = 0.028) but not in those who continued to smoke (p = 0.96). Among ex smokers, we found that individuals with AG and GG genotypes (i.e. Asp allele carriers) had a increased BMI change (3.8±1.9 kg/m3) compared to those with AA (2.7±1.4 kg/m3) We therefore conclude that genetic variation at the gene encoding the mu opioid receptor contributes to weight gain after smoking cessation. This study was funded by Cancer Research UK.

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RPOS3-38 CHARACTERIZATION OF A NOVEL CYP2A6 ALLELE AND ITS IMPACT ON NICOTINE PHARMACOKINETICS AND SMOKING BEHAVIORS IN AN AFRICAN-CANADIAN POPULATION

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In humans, approximately 90% of nicotine is inactivated to cotinine by the hepatic enzyme CYP2A6. Genetic variations in CYP2A6 have been shown to affect nicotine metabolism and smoking behaviors; thus it is important to discover and characterize novel genetic variants. We have found a nucleotide change of 2161C>T in exon 4 of the CYP2A6 gene corresponding to an amino acid change of Arg203Cys, which we have temporarily termed CYP2A6*X. We examined the impact of CYP2A6*X by metabolizing by analyzing the pharmacokinetics of an oral nicotine dose in non-smoking South African Canadians. A lower trans-3-hydroxycotinine to cotinine ratio (3HC/COT), an indication of CYP2A6 activity, was observed in individuals with CYP2A6*1A/X or CYP2A6*X/X genotype (mean 3HC/COT = 0.08, N = 4) compared to CYP2A6*1A/1A individuals (mean 3HC/COT = 0.19, N = 48) (p = 0.05). Heterozygous individuals with CYP2A6*1A/X or CYP2A6*X/17 individuals respectively, suggesting that CYP2A6*X encodes an essentially inactive enzyme. Consistent with this, one homozygous CYP2A6*X/X individual did not produce any 3HC by 4.5 hours following nicotine administration, and had a higher area-under-the-curve (AUC), another indicator of CYP2A6 activity, for nicotine (AUC 2086 ng min mL-1) compared to those with CYP2A6*1A/1A (mean AUC of 1516 min mg mL-1, N = 48). The allele frequency of CYP2A6*X was 2.0% in African-Canadians (N = 558 alleles, 95% confidence interval [CI] 0.8% - 3.1 %). The CYP2A6*X allele occurred at a significantly greater frequency in non-smokers (3.2%, N = 9254 alleles) compared to smokers (0.7%, N = 2274 alleles) (p = 0.04). These findings agree with other studies that have shown higher frequencies of slow inactivator alleles (CYP2A6*2, *4, *9 and *12) in non-smoking versus smoking adults. Together these results suggest the novel CYP2A6*X variant encodes an inactive enzyme, which may be associated with a lower risk for being an adult smoker.

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RPOS3-39 OXIDANT VERSUS ANTIOXIDANT PROPERTIES OF TOBACCO TREATED BY PULSE ELECTROMAGNETIC WAVES

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The main toxicity of tobacco products and nicotine is due to its vast production of radical oxygen species (ROS) in humans. A recently developed technology, i.e. a pulse electromagnetic technology has shown the possibility to induce differential activity of treated tobacco products versus no treated products in vivo on the production of ROS. In a 90-day respiratory toxicity study Wistar rats were exposed to processed cigarette smoke versus non processed and were monitored by bio-markers of oxidative stress. The status of biomarkers of oxidative stress in male rats, i.e. superoxide dismutase (SOD) activity in rats exposed to the smoke from normal cigarettes was decreased in a dose-dependent manner to 81% compared to controls. However, in animals exposed to the smoke from treated cigarettes there were no differences in SOD activity in rats exposed to 32 cigarettes compared to controls indicating similar concentrations of superoxide radical in experimental group exposed to 32 treated cigarettes and in controls. Significantly decreased activity of glutathione peroxidase (GPx) in male and female rats in all experimental groups, but without any statistical difference compared to controls, indicated that there were still some reactive oxygen species that react with GPx which probably did not induce any damage in tissues. A slight and statistically insignificant change in malondialdehyde level in animals exposed to cigarette smoke also indicated that there was no lipid peroxidation in tissues. Specific biomarkers of exposure to tobacco smoke—thiocyanates and carboxyhemoglobin were highly positively correlated with antioxidant biomarkers, i.e. rats exposed to the smoke generated from 16 or 32 treated cigarettes showed no differences in concentration of thiocyanates in blood compared to control animals. These results indicate, at the least in relation to these specific biomarkers, that the rats exposed to the smoke from treated cigarettes during 90 days behaved as control animals without any sign of toxicity and exposure to tobacco smoke. Private funding, grant from Galenika Phar, Biomedical Department.

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RPOS3-40 EVALUATING POTENTIAL REDUCED EXPOSURE PRODUCTS FOR SMOKELESS TOBACCO USERS IN THE CLINICAL LABORATORY: A PRELIMINARY REPORT

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Several potential reduced exposure products (PREPs) are marketed to reduce smokeless tobacco (SLT) users’ exposure to tobacco toxicants. For example Star Scientific markets Stonewall™, a “hard snuff” product made with tobacco said to be low in tobacco specific nitrosamines (TSNs) while Swedish Match markets “snus”, products said to contain “the lowest possible levels of undesired components”. To date, there has been little objective assessment of the toxicant exposure associated with use of these products, perhaps because clinical methods to do so have not been described. The purpose of this preliminary report is to describe clinical methods that can be used to assess the toxicant exposure and other effects of PREPs for SLT users. SLT users (N = 10) completed four, 5-day conditions that differed by product used: Stonewall™, a snus product known as “General”, own brand SLT, or no SLT. Toxicant exposure was assessed by measuring cotinine (metabolite of nicotine) and NNAL (metabolite of the TSN NNK) in urine on condition days 1, 3, and 5. In addition, self-reported tobacco abstinence effects were measured daily. Relative to own brand, by day 5, no SLT use and Stonewall™ decreased urine cotinine and NNAL significantly, but General decreased urine cotinine only. Tobacco abstinence effects increased significantly by day 5 for no SLT use only. Relative to no SLT use, urine cotinine was significantly greater for Stonewall™ and General, and urine NNAL was significantly greater for Stonewall™. This preliminary data suggests that clinical laboratory evaluation of PREPs for SLT users may be valuable for measuring product-induced toxicant exposure and withdrawal suppression. If so, these methods should be included in any comprehensive PREP evaluation strategy.

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RPOS3-41  MACHINE-GENERATED SMOKE YIELD AND HUMAN TOPOGRAPHY ASSESSMENT OF THE NEW PREP MARLBORO ULTRASMOOTH

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Rigorous assessments of reduced harm claims of new PREPs are limited. In the absence of long term health outcomes, expectations regarding reduced harm rely heavily on toxic smoke constituent yield data. Such data may be misleading. The new carbon filter PREP, Marlboro UltraSmooth (MUS), was investigated using complimentary short-term assessment strategies which seek to explore potential reduced harm benefits beyond standard smoke chemistry analysis. Smoke particulate and gas-phase constituents were measured under both standard ISO (35ml puff vol, 60 sec puff interval) and intense (HealthCanada: 55ml puff vol, 30 sec puff interval) smoking regimens. Topography measures were obtained in a naturalistic study of Marlboro Lights smokers (N=22) using a portable topography device. A brand-switching design was used. After a 2 day Baseline (Marlboro Lights), subjects were switched to MUS (2 days) and Marlboro Ultra Lights (MUL: 2 days). Salivary cotinine, carbon monoxide boost, and subjective (urge to smoke, nicotine withdrawal and mood) responses were also obtained. As expected, toxic gas phase constituents of MUS were greatly reduced compared with MUL under FTC/ISO smoking conditions. However, substantially smaller gas phase constituent reductions were observed under the intensive machine smoking regimen. Topography measures showed that actual MUS smoking behavior is close to the intensive machine smoking regimen (55.4 ml puff vol, 22.3 sec puff interval). Evidence of compensatory smoking of MUS was found, with total smoke intake (puff volume x puff number) greater for MUS compared with MUL and Marlboro Lights (808 v. 601 & 533: p = 0.035). The total number of cigarettes smoked in each 2 day period was similar for the three brands. These data suggest that MUS has a low probability for reducing exposure to toxic smoke constituents, based upon actual human smoking performance and intensive smoke chemistry yields. Implications of these findings and benefits of short term evaluative strategies for PREPs will be discussed.

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RPOS3-42  DO MOUTHPIECE-BASED DEVICES ALTER PUFF TOPOGRAPHY?

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Understanding factors that influence smoking often involves measuring ‘puff topography’ via mouthpiece-based devices. For example, switching from ‘full flavor’ to ‘ultra-light’ cigarettes can make smokers smoke longer, more, and/or bigger puffs, while abstinence can increase puff volume and/or shorten interpuff interval (IPI). However, the mouthpiece may itself influence puff topography, and this study was designed to assess that possibility. Nine overnight-abstinent smokers (>15 'full flavor' or 'light' cigarettes/day) participated in six, approximately 2.5-hour sessions in which they smoked, ad libitum, a total of four own brand or ultra-light cigarettes while topography was measured using one of two mouthpiece-based devices (desktop or portable) or video recordings of smoking with no mouthpiece. Switching to ultra-light cigarettes altered topography (e.g., increased puff duration; P<0.01), while abstinence increased puff number for the first cigarette (P<0.05). All three measurement methods were reliable, as demonstrated by high correlations across cigarettes within each condition (e.g., puff duration and IPI; r’s > 0.87). Moreover, puff duration, number, and IPI were correlated highly across assessment methods (all r’s > 0.75). Measurement method influenced puff duration (P<0.01) and IPI (P<0.05), such that the desktop device was more similar to video recordings than was the portable device (e.g., puff duration was greater for desktop and video, relative to portable; P<0.01). Recording the details of smoking behavior was challenging, and required manual scoring that was time-consuming and labor-intensive. These results support mouthpiece-based topography assessment devices yield values that are highly correlated with those observed when no mouthpiece is used. The challenges of video recordings of smoking behavior limit use of this method of topography assessment.

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RPOS3-43  DIFFERENCES IN SMOKING TOPOGRAPHY BETWEEN MENTHOL AND NON-MENTHOL SMOKERS

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Information about smoking topography could provide insight into variations in nicotine dependence and tobacco-related health disparities among various populations. The purpose of this study was to assess differences in smoking topography between smokers of menthol and non-menthol cigarettes. Twenty three smokers ages 18 years and above were asked to smoke one cigarette of their usual brand using a hand-held topography device. Demographic and smoking-related variables were also collected. Menthol and non-menthol smokers were compared using Wilcoxon rank sum for continuous variables and Fisher’s exact test for categorical variables. The sample consisted of 11 African American (8 Females) and 12 Caucasians (7 Females). They had a mean age of 37.5 years (SD 8.7), smoked an average of 22.9 (SD 8.4) cigarettes per day, and 48% smoked menthol cigarettes. Menthol cigarettes were smoked by 73% of African Americans and 25% of the Caucasians (p= 0.03). There were no statistically significant differences between the menthol and non-menthol smokers by age, gender, age of initiation of cigarette smoking, and number of years smoked. Menthol smokers had a shorter puff duration of 1.4 seconds (SD 0.8) compared to 1.9 seconds (SD 0.5) for non-menthol smokers (p= 0.01), and a shorter interpuff interval of 13.5 seconds (SD 4.2) compared to 18.7 seconds (SD 5.8) in non-menthol smokers (p= 0.03). Menthol smokers also had non-significantly higher number of puffs per cigarette (p=0.21) average flow (p=0.10), and peak flow (p=0.49) than non-menthol smokers. There were no significant differences in the smoking topography parameters by ethnicity. This preliminary study found differences in the smoking topography of menthol cigarette smokers, who are predominantly African Americans, and non-menthol smokers. More studies are needed to better understand the role of menthol in smoking topography. Such knowledge could further our understanding of the mechanisms underlying the disproportionately higher tobacco-related morbidity among African Americans.

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RPOS3-44  MORE PUFFS AND SHORTER INTERPUFF INTERVAL IN SMOCKERS WITH SCHIZOPHRENIA USING CReSSmicro TOPOGRAPHY DEVICE

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Our previous work demonstrated increased nicotine levels in smokers with schizophrenia, likely due to differences in nicotine intake although few studies of smoking topography have been conducted. Understanding cigarette puffing parameters that determine nicotine intake will be crucial to developing effective pharmacotherapies for this group. Twenty subjects (10 schizophrenia or schizoaffective disorder and 10 controls) were assessed in a single day, 5-hour (10am-3pm) ad-lib smoking topography session using the CReSSmicro ambulatory device. We used a naturalistic design to measure typical smoking behavior and minimize artifact from laboratory smoking. The following smoking topography variables were measured: time to first puff, number of cigarettes smoked, puffs per cigarette, puff volume, puff duration, IPI (inter-puff interval), peak flow, average flow and time to peak flow. Smokers with schizophrenia smoked more puffs per cigarette (17.1 vs. 12.0; p<0.05) than control smokers. The time between puffs, or interpuff interval (IPI) was shorter in smokers with schizophrenia (14.3 vs. 16.8 s; p<0.05). Total puff volume was increased (667.3 vs. 633.1 ml, n.s.) and the time to peak was shorter in smokers with schizophrenia (0.28 vs. 0.35 s; p<0.05). Our findings are consistent with those reported by Tidy et al. (2005) who also found more puffs per cigarette and shorter IPI in schizophrenia. Time to peak may be an important variable for understanding nicotine boost which occurs from smoking a single cigarette. The CReSSmicro appears to be a viable tool for measuring smoking topography in schizophrenia in a naturalistic environment.

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RPOS3-45 MECAMYLAMINE BLOCKS NICOTINE-INDUCED ENHANCEMENT OF THE P20 COMPONENT OF THE AUDITORY EVENT RELATED POTENTIAL AND EVOKED GAMMA OSCILLATIONS

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Cigarette smoking is significantly more prevalent in individuals suffering from schizophrenia than in non-affected populations. Certain neurocognitive deficits and disruptions common in schizophrenia may be altered by smoking, leading to the hypothesis that schizophrenics may engage in smoking behavior to alleviate specific neurocognitive symptoms of the disorder. Research suggests that individuals suffering from schizophrenia have altered auditory event related potentials (ERPs) and abnormalities in evoked gamma oscillations, auditory stimulus-induced components of electrical activity in the brain and potential indices of sensory information processing. This study was conducted to examine the effect of acute administration of nicotine and the non-specific nicotinic antagonist mecamylamine on the P20 component of the auditory event related potential (ERP) and evoked gamma oscillations in mice. Nicotine (1 mg/kg) significantly increased P20 amplitude, an effect that was blocked by pretreatment with mecamylamine (2 mg/kg). Additionally, nicotine (1 mg/kg) increased the normal burst of evoked gamma following an auditory stimulus. The increase in evoked gamma was also blocked by mecamylamine (2 mg/kg) pretreatment. These results replicate findings that nicotine may enhance early sensory information processing in an established model (ERPs) and extend these findings in an emerging, novel model (evoked gamma oscillations) of sensory information processing. The results also support the hypothesis that nicotine may be beneficial to individuals with deficits in neurocognitive functions, such as those suffering from schizophrenia.

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RPOS3-46 PREFRONTAL NEUROPSYCHOLOGICAL IMPAIRMENT IS ASSOCIATED WITH SMOKING CESSATION TREATMENT FAILURE IN SCHIZOPHRENIA

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Patients with schizophrenia have higher rates of smoking (58-88%) than in the general population (~22%), and endure frequent cessation failure. These patients also exhibit numerous neurocognitive deficits, some of which may be ameliorated by cigarette smoking. The neurocognitive benefits derived from nicotine may, in turn, contribute to elevated rates of smoking and smoking persistence in schizophrenia.

The present study examined the relation between neurocognitive function and smoking cessation in schizophrenia. Treatment-seeking schizophrenic smokers (n=51) participated in a 10-week placebo-controlled trial of bupropion SR plus nicotine patch. Neuropsychological performance was evaluated in a subset of patients (n=27), prior to pharmacological treatment, on a standardized battery including Wisconsin Card Sorting Test (WCST), Visuospatial Working Memory (VSWM) task, Continuous Performance Test (CPT), Iowa Gambling Test (IGT), California Verbal Learning Test (CVLT), Digit Span of the WAIS-III, and Trail Making Test (TMT) Parts A and B. Subjects were matched as a function of endpoint smoking status (Quit versus Not Quit, assessed by end of trial 7-day point prevalence abstinence, confirmed by CO level <10 ppm) on demographic traits, smoking, and clinical outcomes. While there were no significant baseline differences between quitters and non- quitters, non- quitters exhibited significantly greater deficits in performance on TMT-B (p<0.01) and Digit Span backwards (p=0.02) compared to quitters. No associations were found between quit status and performance on other neuropsychological measures. Our findings confirm and extend the results of previous studies (Dolan et al., Schizophr. Res., 70: 263-275, 2004) which suggest deficits in working memory and executive function are associated with smoking cessation failure in schizophrenia. This may be important for the development of tailored smoking cessation treatments in this population.

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RPOS3-47 ATTENTIONAL EFFICIENCY IS MODULATED BY NICOTINE DOSE IN ALCOHOLICS BUT NOT CONTROLS

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One of the most frequently disregarded and potentially confounding factors when studying cognitive impairments in individuals with substance abuse is that of smoking status and nicotine withdrawal during testing. To address this issue, cognitive efficiency was measured in two groups of smokers: community controls without a history of alcoholism or illicit drug use (n=27; 21 male) and chronic alcoholics (n=28; 21 male). A third group of non-smokers (n=16; 12 male) was included in order to test for expectancy effects of nicotine patch administration, however, as data from this group did not differ from that of the smoking controls, this group was not included in further analyses. Subjects were administered transdermal nicotine patches (low dose = 7 mg or 14 mg and high dose = 21 mg) in order to manipulate the effect of nicotine on cognitive efficiency. On measures of overall cognitive efficiency, alcohol-dependent individuals were significantly less cognitively efficient than their control counterparts. However, it was aspects of attentional efficiency (composite scores from the digit symbol [Forms A & B], Trails [Forms A&B] and Stroop word and color/word conditions) which showed a dose response in alcoholics but not in smoking controls. Alcoholics, but not controls, receiving a high dose of nicotine showed facilitation in attentional efficiency, whereas differences between high and low doses of nicotine on attentional efficiency were not significant in controls. These data support the hypothesis that nicotine may have a compensatory or normalizing effect on attentional functions in substance abusers.

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RPOS3-48 Beta Power in Resting EEG of Controls and Substance Abusers under Acute Nicotine Administration

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A number of studies have examined the relationship between chronic substance abuse and resting EEG band power. Few studies, however, have examined the interactive effects of nicotine use among these groups. Similar to Bauer and Costa (Bauer & Costa, 1997), the current study examined patterns of low-frequency beta (13.5-19.5 Hz) power in substance-abusing subgroups: alcohol-dependent (AD), stimulant-dependent (SD), and alcohol- and stimulant-dependent (ASD) (n=46, m=42, f=24) and community controls (n=28, m=21, f=7) ages 21-54, all of whom were regular smokers under conditions of acute nicotine exposure. After overnight abstinence, subjects were administered either high (14 or 21mg) or low (7mg) nicotine patches. One hour later, neurocognitive testing commenced. The first task was a simple baseline EEG. Data were collected during a 2 minute eyes open/5 minute eyes closed session. Data used in the current analysis were obtained during the eyes open session. Data were reduced using Neuroscan SCAN EDIT software. Analyses (mixed model ANOVAs) revealed a significant interaction between scalp topography (divided into quadrants) and substance-using group in low-frequency beta power (p=.01). Interestingly, community controls and alcoholic subjects produced similar degrees of spectral power. Stimulant abusers without alcohol dependence produced the highest levels and stimulant abusers who were also alcoholic indicated intermediate levels. There were no main effects for either group or patch condition. The patch by group and the group by quadrant interactions approached significance (p=.10). A preliminary examination of the cell means suggests that stimulant abusers are the most sensitive to the increase in nicotine levels and these changes are most evident in posterior locations. These results suggest nicotine has differential effects on cortical homeostasis (e.g., Rangaswamy, Porjesz, Chorlian et al, 2002) as a result of specific drug use history. If replicated, these data have implications for treatment planning and neurocognitive recovery in substance abusing subgroups.

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RPOS3-49  PALM PILOTS FOR SELF-MONITORING OF SMOKING BEHAVIOR IN INDIVIDUALS WITH SERIOUS MENTAL ILLNESS

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PURPOSE: Self-monitoring has been found to be a useful tool for helping smokers to decrease their smoking frequency and duration (McFall, 1970). The purpose of this study was to evaluate the feasibility and usefulness of Palm Pilots to record smoking behavior in smokers diagnosed with serious mental illness (SMI).

METHOD: Participants were 11 smokers between ages 18-55 with stable SMI who attended 4 assessments over a 3-week period and spent 1 week monitoring smoking behavior using a Palm Pilot (1 practice week and 1 official week). Participants completed a monitoring form (via Palm or Paper) each time they were about to smoke. Participants also completed a daily rating scale on which they reported number of cigarettes smoked the day before, the degree to which they experienced nicotine withdrawal symptoms. Monitoring forms also reminded participants about a behavioral strategy that can be used to cut down on smoking.

RESULTS: Participants made the same number of entries with the Palm Pilot and paper and pencil methods and reported self-monitoring approximately 65% of the time. Of the total number of cigarettes smoked daily, on the daily rating scale, there was significantly less missing data with the Palm method. Consistent with our prediction, participants reported greater satisfaction with the Palm method of recording than with paper and pencil. Training time was approximately 14 minutes greater for the Palm method.

DISCUSSION: The results of this pilot study suggest that smokers with serious mental illness can learn to use a Palm Pilot to track their smoking behavior. Incorporation of Palm Pilots into quit smoking programs for individuals with serious mental illness may enhance clients' satisfaction with self-monitoring and reduce missing data.

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RPOS3-50  FAMILY HISTORY OF NICOTINE USE IN SUBSTANCE ABUSERS: IS PARENTAL GENDER IMPORTANT?

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Recent studies have examined the relationship of parental nicotine use, nicotine dependence and the role of depression in community smokers. The purpose of the current study was to examine the pattern of family history of nicotine use, familial transmission of smoking, current affective state, and history of personal smoking and other drug use in treatment seeking substance abusers (n=233; m=73, f=160) and community participants (n=44, m=23, f=21) ages 18-59 (mean=34.7, SD=9.09) all of whom smoked a minimum of ten (10) cigarettes per day. Using the Beck Depression Inventory-2 (BDI-2), the State-Trait Anxiety Inventory, Form-Y (STAI-Y), and a family-tree for nicotine use, we found that depression scores and anxiety levels were significantly higher in treatment seeking individuals and age of use initiation for nicotine was significantly lower for treatment seeking individuals. Using the family-tree, we divided parental usage into four categories: none, father only, mother only, or both. For treatment seeking males, 91.79% reported a positive family history (FH+) of either 1 or both parents smoking; of these, 34.25% reported a father only and 42.47% reported both parents smoking. For treatment seeking women, 88.13% reported either 1 or both parents; of these, 18.13% reported a father only and 53.75 % reported both parents smoking. These differences in the 'both' and 'father only' categories are provocative and suggest that additional analyses considering alcohol and drug use histories for subjects and their parents should be conducted. These analyses are now underway.

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RPOS3-51  PSYCHIATRIC COMORBIDITY IN TUNISIAN SMOKING CESSATION CLINIC PATIENTS

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INTRODUCTION: the aim of this study was to assess the frequency of psychiatric co-morbidity in patients attending a Tunisian smoking cessation clinic.

METHODS: We followed 250 Tunisian smokers who attempted to quit smoking at smoking cessation clinics at Charles Nicole Hospital at Tunis. The Fagerstrom Test for Nicotine Dependence assessed the nicotine dependence. The psychiatric co-morbidity was determined through interview associated to the HAD test (Hospital Anxiety Depression Scale) and the Mini International Neuro Psychiatric Interview (MINI). Intervention combined pharmacotherapy by Nicotine Replacement Therapy with Cognitive and behavioural approach. Results. Men constitute 79.6 % of the consultants; the average age was 42.7 ± 12 years. Twenty five patients (10 %) are followed by psychiatrists at the time of the first consultation (9 for Major Depressive Disorder (MDD), 11 bipolar disorders (BDP), 3 Schizophrenia, 2 Panic Disorder and 1 obsessive compulsive disorder (OCD). Basing on the interview, 39 % of the consultants reported antecedents of depression with 15 % of which motivated consulting and 2.2 % (5 cases) were hospitalized for their depressions. According HAD, we find that 40 % of patients respond to depressive and/or anxious disorders criteria. These disorders were twice as frequent at women as at men (65 % vs 36 %). According MINI, we find 18 % of the patients who suffered from MDD, 2 from dysthymia, 4 from BPD, 4 from panic disorder, 2 from General Anxiety Disorder and finally 1 patient from Social Phobia. Quit rate at six months for patients with lifetime psychiatric diagnosis was twice less than others (14.1% vs 23.2%). Conclusions: Clinicians need to carefully assess both psychiatric diagnoses and symptoms in dependent smokers to optimize patient-treatment matching.

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RPOS3-52  SPIROMETRY AS A BIOMOTIVATOR TO IMPROVE SMOKING CESSATION RATES: RESULTS FROM RANDOMIZED TRIALS

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OBJECTIVES: Smoking cessation is the most important factor in preventing the development of airflow obstruction and symptomatic chronic obstructive pulmonary disease, and reducing progression of underlying disease. Even relatively small improvements in smoking cessation could have large health benefits. We conducted a systematic review to determine if obtaining and providing smokers with results of their spirometry improves smoking cessation.

METHODS: We searched MEDLINE and the Cochrane Library and consulted experts in the field. Eligible randomized trials enrolled at least 25 smokers per arm, evaluated spirometry alone or in combination with other treatments, followed subjects at least 6 months and provided smoking abstinence rates. Study, patient characteristics and outcomes were extracted by trained abstractors. The primary outcome was biologically validated long-term (> 6 months) sustained abstinence. Additional outcomes included self reported abstinence and point prevalent abstinence. Results: Seven RCT (n=8,052 subjects) were included. Follow-up duration ranged from 9-36 months. In 6 trials, the intervention group received concomitant treatments previously demonstrated to independently increase cessation beyond counseling. The range of abstinence was 3-14% for controls and 7-39% among intervention groups, statistically significant in favor of intervention in 4 studies. The only study that assessed the independent contribution of spirometry in combination with counseling demonstrated a non-significant 1% improvement in patient reported point-prevalent abstinence at 12 months (6.5% vs. 5.5%) in the group that received spirometry plus counseling versus counseling alone. Cessation rates were less then in the control group that also received nicotine replacement therapy (7.5%). There were no data regarding cessation rates according to race, gender, spirometric or symptom status.

CONCLUSIONS: Available evidence is insufficient to determine if spirometry among current smokers improves smoking cessation. Information from observational studies of spirometry and randomized trials of other biomotivators suggests that any effect is likely to be small.

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RPOS3-53 PRE-CESSATION TREATMENT WITH NICOTINE PATCH SIGNIFICANTLY INCREASES ABSTINENCE RATES RELATIVE TO CONVENTIONAL TREATMENT

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Previous studies have reported that initiation of nicotine skin patch treatment prior to the target quit-smoking date increases abstinence rates as compared with conventional treatment beginning on the quit date. We hypothesize that smoking in the presence of continuous levels of nicotine attenuates the reinforcing effects of cigarette smoking and leads to a decline in dependence on inhaled nicotine, thus facilitating cessation. This study involved four groups of smokers (n=100/group) who received either nicotine patch (21 mg/24 h) or placebo patch treatment for 2 weeks before the quit-smoking date, and smoked their usual brands of cigarettes or switched to ‘ultralight’ cigarettes during this period, comprising a 2 (nicotine patch) X 2 (cigarette type) factorial design. From the quit-date on, all groups received standard nicotine patch treatment, consisting of 6 weeks of 21 mg/24 h; 2 weeks of 14 mg/24 h and 2 weeks of 7 mg/24 h. Abstinence was defined as strictly no smoking at all from the quit-date on, confirmed by expired air CO. Based on the results from the first 165 participants, continuous abstinence at 6 weeks post-quit was approximately twice as high in the groups receiving active nicotine patches for the 2 weeks leading up to the quit date, regardless of type of cigarette smoked: 14% in nicotine patch/usual brand condition; 17% in nicotine patch/ultralight cigarette condition; 5% in placebo patch/usual brand condition; and 7% in the placebo patch/ultralight cigarette condition. There was a significant main effect of pre-cessation treatment (p<0.01) and a significant interaction with baseline CO (p=0.05), such that subjects with lower CO values benefited more from pre-cessation patch treatment. All treatments were well tolerated. In view of these findings and similar results from previous studies, current labeling of nicotine patch (and possibly other NRT products), which recommends using NRT only after the quit date, should be re-examined.

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RPOS3-54 THE SAFETY OF VARENICLINE IN CIGARETTE SMOKERS FOLLOWING A 52-WEEK TREATMENT PERIOD

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OBJECTIVE: To obtain long-term safety data on cigarette smokers treated for 52 weeks with varenicline, a novel selective alpha4-beta2 nicotinic receptor partial agonist.

METHODS: Safety data on varenicline 1 mg bid vs placebo were collected in a double-blind, randomized clinical trial. Following a baseline visit where subjects were randomized to varenicline 1 mg or placebo (2:1 ratio), subjects returned weekly to the clinic for evaluation during weeks 1-8, then every 4 weeks through week 52. Subjects who took at least 1 dose of study medication (varenicline, n=251; placebo, n=126) were included in the analysis. Although no efficacy objectives were defined, the CO-confirmed 7-day point prevalence of abstinence was collected and summarized.

RESULTS: 135 varenicline (53.8%) and 59 placebo subjects (46.8%) completed the 52 weeks of treatment. For varenicline, the most frequent AEs (all causes) were nausea, abnormal dreams, and insomnia. Rates of discontinuation from treatment for all-causality AEs were 28.3% for varenicline and 10.3% for placebo. Eighteen subjects (15 [5%] for varenicline, 3 [2.4%] for placebo) had serious AEs. The nausea incidence for varenicline was 40.2% (vs 7.9% placebo) but was mostly mild 24.7% (n=92/101) or moderate 12.7% (n=32/101) in intensity. Treatment discontinuation due to nausea (alone or with other events) was 7.6% for varenicline (0% for placebo). Median changes (from baseline to last observation) in BP and heart rate were small. No adverse effects could be identified on hematology, serum chemistry analytes, or ECG parameters. No deaths occurred during the study. The 7-day point prevalence of abstinence at week 12 was 45.8% for varenicline and 7.9% for placebo and at week 52 was 36.7% for varenicline and 7.9% for placebo.

CONCLUSION: Varenicline 1 mg bid can be taken up to 1 year. AEs were mostly related to nausea, abnormal dreams, or insomnia. Nausea was mostly mild or moderate and infrequently resulted in treatment discontinuation. Seven-day point prevalence of abstinence suggests that varenicline was more effective than placebo in promoting smoking cessation during long-term treatment (up to 52 weeks).

Funding: Pfizer Global Pharmaceuticals.

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RPOS3-55 EVALUATION OF THE EFFECTIVENESS OF NICOTINE REPLACEMENT THERAPY WITH AND WITHOUT ADJUNCTIVE SUPPORTIVE COUNSELLING

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While using nicotine replacement therapy may significantly increase the probability of successfully quitting smoking, there is some evidence that this medication is more effective when used in conjunction with supportive counselling from a health professional. The aim of this study was to directly compare the effectiveness of treatment with NRT alone and in combination with supportive counselling. We recruited 80 current, dependent daily smokers wanting to quit in the next 30 days to participate. All subjects received up to 10-weeks of NRT (nicotine gum or inhaler) free of charge and either alone or in conjunction with 4 intervention therapy from a team of health professionals in a Nicotine Dependence Clinic. Of the 80 subjects, 40 were male (mean age ± SD; 42.8 ± 10.7) and 40 were female (mean age ± SD; 44.3 ± 12.3), and they smoked on average 22.5 cigarettes per day (SD=8.7) (range: 10-80); 28 subjects chose to attend the Nicotine Dependence Clinic, 18 subjects chose to see the cessation counsellor and 34 subjects chose to receive NRT without any supportive counselling. The majority of subjects (59%) used the patch, 17% the inhaler, 5% the gum and 19% used a combination of NRTs. Additional data on subject characteristics, level of tobacco dependence, comorbidity, cessation rates and time to relapse will be presented. This study was funded in part by the Ontario Ministry of Health Promotion and Pfizer Consumer Healthcare.

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RPOS3-56 CAN SMOKERS USE A VALIDATED TOOL TO TRAVERSE THEMSELVES INTO SMOKING CESSATION TREATMENT?

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OBJECTIVE: Brief counseling plus pharmacotherapy may not be the most appropriate population-level approach for helping all types of smokers to quit. Matching smokers to different treatment types and intensities through triage has the potential to enhance cost efficiency and user satisfaction without compromising effectiveness. This study compared the reliability of three modes of self administration of a validated triage tool compared to administration by a trained interviewer.

METHODS: Participants were recruited using random digit-dialing techniques in two regions of Canada. Current adult smokers with English proficiency and with access to the Internet were eligible to participate. Participants completed the triage tool via a trained interviewer over the phone and were randomized to complete one of the three self-administration modes (i.e. pen and paper, web-based, or automated telephone) within 2-10 days (N=406). Trained and self administrations were counterbalanced.

RESULTS: Smokers were able to reliably self-administer the tool in each of the 3 modes: pen and paper [% agreement=77.5%, k=0.68 (0.59-0.77), phone [% agreement=81.7%, k=0.73 (0.64-0.82), and web [% agreement=89.9%, k=0.84 (0.75-0.93)] compared to trained administration. Logistic regression analysis examined predictors of successful self-administration. Factors examined included demographic characteristics, order of completion, and mode of self-administration.

IMPLICATIONS: Smokers are able to reliably self-administer the triage tool. Service providers may consider such forms of self-administration to deliver population-level smoking cessation interventions in a cost-effective manner.

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A DOUBLE-BLIND PLACEBO-CONTROLLED TRIAL OF BUPROPION ADDED TO NICOTINE PATCH AND COGNITIVE BEHAVIORAL THERAPY IN SMOKERS WITH CURRENT OR PAST UNIPOLAR DEPRESSIVE DISORDER

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There is a strong relationship between depression and smoking.1,2 People with depression are more likely than those in the general population to smoke. Smokers have more anxiety and depression than non-smokers, and smoking may reduce negative affect among those with depressive disorders.3 Depressed smokers are less likely to quit smoking, and smoking cessation may worsen depressive symptoms and increase risk for relapse to depression.4 However most smoking cessation treatment trials exclude depressed smokers. Our objective was to determine if bupropion added to nicotine patch (NRT) and group cognitive behavioral therapy (CBT) is more effective than NRT and CBT alone for treatment of nicotine dependence in patients with unipolar depressive disorders (UDD). Active NRT was stratified according to current or past UDD and nicotine dependence and past nicotine dependence treatment (smokers who were randomly assigned to receive bupropion or placebo added to NRT or CBT for 12 weeks. 99 subjects completed the trial. 72% of participants achieved 7-day point prevalence abstinence at least once during the trial. 97% percent had >50% reduction in cigarettes smoked per day at the end of the trial. 34 percent had 7-day point prevalence abstinence at the end of treatment, and 15% achieved continuous abstinence for the last 4 weeks of treatment. Among those with current UDD, 32% were abstinent at end of treatment compared with 34% of those with past UDD. NRT usage was associated with abstinence: OR=1.06 (95% CI: 1.03-1.08, p<0.001). Diagnosis of any anxiety disorder was associated with failure to attain abstinence at the end of treatment. Chi2=6.9, p<0.01. Abstinence was associated with development of new episodes of major depressive disorder (MDD) in those who entered the trial without current UDD, Chi2=5.8, p=0.016.


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RPOS3-60 CONTINGENCY MANAGEMENT AND BRIEF COUNSELING FOR SMOKING CESSATION

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Despite advances in smoking cessation treatment, outcome rates remain modest and effective smoking cessation treatments for treatment refractive smokers are needed. A novel intensive behavioral intervention that augmented evidence based smoking cessation treatment (Fiore et al., 2000) through a frequent brief behavioral intervention (FBBI) was administered to adult smokers, some of whom were also moderate drinkers and/or had depressive symptoms. Relapse prevention and problem solving counseling were delivered in 20 not more than weekly calls, and then thrice weekly for the following three weeks. To further motivate smokers to initiate abstinence, we administered a contingency management (CM) protocol only during the first week following the quit date. The CM protocol used an escalating magnitude schedule with a reset contingency (Roll et al., 1996) to provide progressive monetary reinforcers for CO levels < 10 ppm obtained three times daily and negative urine cotinine levels obtained once daily to confirm abstinence. Participants were 107 adult smokers (51 females, 56 males) seeking smoking cessation treatment. Of the sample, 27% were moderate drinkers (> 20 drinks per month) and 32% reported sub-acute depressive symptoms (16.2 ± 8.5 CES-D scores). Self-reported abstinence rates, confirmed by urine cotinine levels < 50 ng/ml, were 63%, 36%, 28%, and 26% at weeks 1, 2, 3, and 4. At the end of the first week, following administration of CM + FBBI, abstinence rates for moderate drinkers and those with depressive symptoms while not significantly different, were higher in those who reported heavier drinking (72% versus 60%) and for those endorsing depressive symptoms (68% versus 61%) when compared with normal smokers. This high short-term quit rate suggests the utility of this novel behavioral intervention using CM to motivate and initiate abstinence and FBBI to provide problem solving strategies at important clinical moments. This intervention may be valuable as a behavioral platform to initiate abstinence in treatment refractive smokers such as those who also drink or have depressive symptoms.

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RPOS3-61 IMPACT OF NATIONAL ABC PROMOTION OF 1-800-QUIT-NOW ON CALL VOLUME IN THE UNITED STATES

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The National Network of Tobacco Cessation Quitlines is a state/federal partnership that provides tobacco users in every state access to telephone-based smoking cessation via a toll-free number. This number serves as a national portal number that enables smokers to initiate abstinence, we administered a contingency management (CM) protocol only during the first week following the quit date. The CM protocol used an escalating magnitude schedule with a reset contingency (Roll et al., 1996) to provide progressive monetary reinforcers for CO levels < 10 ppm obtained three times daily and negative urine cotinine levels obtained once daily to confirm abstinence.

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Funding: NIDA grant #PSO-DA-13334.

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RPOS3-62 THE AMERICAN CANCER SOCIETY’S QUITLINK: A RANDOMIZED CLINICAL TRIAL EVALUATING INTERNET-BASED SMOKING CESSATION PROGRAMS AND MEDICATION USE

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Smokers (n=6,451) visiting the American Cancer Society’s internet site offering cessation assistance were, after providing consent and meeting eligibility criteria, randomized to receive access to a static internet site with quit smoking advice or to one of five interactive sites provided by the following cooperating research partners: Centre for Addiction and Mental Health, Oregon Center for Applied Science, QuitNet, ProChange, and SmokeClinic. Three-month follow-up surveys were conducted via online survey with email prompts and telephone calls to assess quitting success and 54% provided follow-up data. Results showed no significant overall difference in cessation rates among participants assigned to the interactive or static sites. There were however large differences in the utilization of the five interactive sites. When sites were grouped by level of use, there was a significantly higher reported three-month cessation rate among participants assigned to the more highly utilized sites than among those assigned to the less utilized sites (12.2% vs. 10.2% of all randomized participants, 26.0% vs. 22.1% of followed participants). These findings show that interactive internet sites providing high levels of utilization can increase quitting success among smokers seeking assistance via the internet. Medication use was assessed at follow-up. 40.0% of respondents reported using medications (NRT or bupropion) in their cessation attempt. There were no significant differences among the six sites in the proportion of respondents indicating medication use. Medication use was associated with significantly higher quit rates (30.5% vs. 18.9% of followed participants).

Funding: American Cancer Society.

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RPOS3-63 DISPARITY IN SMOKING CESSATION TREATMENT: RESULTS FROM THE 2001 NATIONAL HEALTH INTERVIEW SURVEY (NHIS)

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CONTEXT: Despite the release of the Public Health Service Clinical Practice Tobacco Use and Dependence Guideline and Healthy People 2010, healthcare providers still may not appropriately counsel patients to quit smoking. As there are disparities evident in other treatment areas, there may be some disparity among smokers who are counseled and assisted to quit smoking by their healthcare provider.

OBJECTIVE: The aims of this study were to test for an association between 1) smoking cessation advice and 2) assistance to quit based on selected sociodemographic and tobacco-related factors.

DESIGN: 2001 National Health Interview Survey, collected by trained employees in a personal household interview Participants: United States civilian, non-institutionalized population, self-reported current (everyday and someday) smokers, who visited a health care provider in the last 12 months, and were 18-50 years old.

Outcome Measure: Self-report by smoker of whether advice to quit smoking was given by a healthcare provider and, among those who received advice, self-report by smoker of whether the healthcare provider offered assistance in quitting.

RESULTS: Sixty-seven percent of current smokers (n=4097) reported advice to quit smoking and 37% received assistance to quit smoking (n=3344). Hispanics were less likely to receive advice to quit smoking (OR=0.54, 95% CI=0.42-0.69). Increased education (some college OR=1.51, 95% CI=1.16-1.96 and college graduate or higher OR=1.55, 95% CI=1.23-2.14) and higher family income (OR=1.46, 95% CI=1.07-2.01) were associated with receiving more assistance to quit smoking. Other significant variables associated with advice to quit smoking were age, marital status, poverty ratio, previous quit attempts, type of healthcare provider, tobacco-related diagnosis, and chronic disease. Assistance to quit was also associated with age, marital status, tobacco-related diagnosis, type of healthcare provider, and previous quit attempts.

CONCLUSION: Smoking cessation advice and assistance is not delivered uniformly to all smokers. Factors responsible for this disparity must be investigated further.

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RPOS3-64 THE FACTORS ASSOCIATED WITH SUCCESSFUL SMOKING CESSION IN KOREA

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OBJECTIVE: To determine the associating factors with successful smoking cessation, longer than 1 year, as compared with current smokers who had made at least one attempt to quit in the past and failed.

DESIGN: Cross-sectional survey. We conducted face-to-face interviews by well trained interviewers. Subjects were former-smokers who had stopped smoking longer than 1 year and 71 current smokers, who had made at least one prior attempt to quit. Main outcome measure: Nicotine dependence, number of the smokers among their 5 closest friends who tried only once.

RESULTS: The subjects who were 55 years of age and over had greater success in smoking cessation than those younger than 35 years old. A high Fagerstrom score (OR=0.827; CI 0.702~0.974) and the number of the smokers among their 5 closest friends (OR=0.727; CI 0.586~0.935) were significantly associated with a relapse in smoking adjusting confounding factors such as smoking amount, alcohol. Those who tried to stop smoking more than 5 times had a greater chance of success than those who tried only once.

CONCLUSIONS: In Asian ex-smokers, age, lower nicotine dependence, higher number of attempts to stop and number of the friends who smoke were associating factors in successful smoking cessation longer than 1 year.

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RPOS3-65 COMPREHENSIVE TOBACCO-CESSATION TREATMENT FOR CANCER PATIENTS: THE CHALLENGE OF IMPLEMENTING THE CLINICAL PRACTICE GUIDELINE

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The University of Texas M. D. Anderson Cancer Center has created a large-scale, multidisciplinary, and comprehensive treatment program for cancer patients using the Systems Strategies from the Clinical Practice Guideline. Practical solutions to the enormous challenges of creating a proactive tobacco-cessation and relapse-prevention program within a medical center are presented in this poster. The budget and resource needs were based on an estimation of the tobacco-cessation intervention needs for M. D. Anderson Cancer Center patients. Over a three-month period, 4942 M. D. Anderson patients (98% completion rate) responded to a Patient Questionnaire. It was found that 17% (N=777) of the patients currently use tobacco, and 7.6% (N=438) quit using tobacco within the last 12 months. The results indicated that the target population for the Tobacco Treatment Program is 24.6% of M. D. Anderson patients. Within this target population, it was also noted that 41% of patients per month displayed risk factors for psychiatric disorders; thus, mental-health counseling is integrated into the program. Treatment intensity ranges from two to four 15-minute telephone follow-up sessions to six to eight 90-minute in-person counseling sessions. Patients with risk factors also receive evaluation and consulta tion with a psychiatrist and physician’s assistant. Once entered into the program, patients are given nicotine-replacement therapy and those at risk for psychiatric disorders may be prescribed tobacco-cessation medications such as bupropion to assist with depressive symptoms. The Tobacco Treatment Program, to our knowledge, is the first to implement all six System Strategies (1. patient identification, 2. provider education, 3. dedicated treatment staff, 4. institution-wide policy changes, 5. & 6. effective counseling and pharmacological therapies at no cost) set forth by the Clinical Practice Guideline on an institution-wide basis at a large cancer center.

The program is funded by the State of Texas Tobacco Settlement Funds.

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RPOS3-66 INPATIENT TOBACCO USE: BURDEN & CONSULT UTILIZATION IN A VETERANS HOSPITAL

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BACKGROUND: A Cochrane review concluded that intensive tobacco interventions for inpatient tobacco users (ITUs) that include > 1 month of post-discharge follow-up were more effective in promoting abstinence than usual care. The LLVAMC has an inpatient tobacco dependence treatment (ITDT) consult service and outpatient follow-up, but the ITU prevalence and ITDT consult service utilization at this medical center was unknown and believed to be underutilized.

METHODS: Using the ITDT consults log, inpatient computerized medical records, a VHA database, and a random sample of 242 inpatient admissions (out of the 5,223 unique patients admitted during fiscal year 2005) we estimated the number of ITUs per year. Then we calculated the proportion that was referred for ITDT consults during that year.

RESULTS: The number of ITUs on all units on one day (12/09/2004) was 67 (out of 225 inpatients; 32% smoking prevalence). We found 74 ITUs among the 242 randomly selected inpatient charts (31% inpatient smoking prevalence). We thus estimated that 1,619 (31%) of the 5,223 inpatients cared for at the LLVAMC during 2005 were ITUs. The number of ITDT consults requested from 12/01/2004-12/31/2005 was 76 (6% of the 1,619 estimated ITUs). Over 90% of the inpatient records documented usual care advice by a provider.

CONCLUSION: This data shows that only a small fraction of ITUs were offered the available consultation, despite the majority having documented usual care advice from their primary inpatient providers. Our quality improvement goal is to set a new benchmark for the VHA by redesigning the referral process and response time in order to identify ITUs early in the admission and offer ITDT consults to all ITUs at the LLVAMC with extended follow-up via the Break the Chains of Nicotine Dependence outpatient treatment program.

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RPOS3-67 PILOT STUDY OF TELEMEDICINE FOR SMOKING CESSATION IN RURAL PRIMARY CARE PRACTICES

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INTRODUCTION: Most smokers see their physician at least once a year, but physicians often fail to address smoking cessation. Telementicine is an effective approach for delivering medical care to distant areas, but has not been tested for smoking cessation. This study assessed feasibility and acceptability of a tobacco cessation intervention in rural primary health care clinics using telementicine delivered behavioral counseling.

METHODS: Medical students recruited smokers from three sites, obtained signed consent, and performed a baseline assessment. Counselors located at a tertiary care facility delivered 4 counseling sessions via webcam and high-bandwidth telecommunication software to participants during scheduled visits to their physician’s office. The intervention was designed to mirror Medicare-reimbursable services. We report here interim findings following the third counseling session.

RESULTS: Our sample consisted of 11 participants (mean age= 44.1 SD±15.4); 60% were female and half had more than a high school education and smoked more than 20 cigarettes per day. Two participants were lost prior to scheduling and another after the first counseling session. Out of 24 appointments scheduled, participants kept 84% of their appointments at the scheduled time. On average, counseling sessions lasted 30 minutes with small variability. Connections between sites were figured twice over four months due to firewall updates. We faced additional technical difficulties delaying starting time, and on three occasions counseling was delivered via telephone. Clinics easily adapted our procedures into their scheduling. Participants were highly satisfied (86%) and only one would not be willing to participate in future telemedicine projects.

CONCLUSION: Final data from the pilot study will be reported. Interim findings suggest the study was feasible and satisfactory from the perspectives of participants and research staff. Nonetheless, a number of technical problems remain for this new methodology. Future research should test the effects of telementicine-delivered intervention in randomized trials.

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CONCLUSION: Smoking cessation treatments applied by non-specialist physicians can be similarly effective as shown under controlled research conditions. The data support the value of any highly structured and continuous smoking cessation intervention in primary care.

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**RPOS3-72**

**A BLINDED FAMILY PRACTICE OUTPATIENT STUDY OF SEMI-QUANTITATIVE DIPSTICK ASSESSMENTS OF SALIVA AND URINARY COTinine COMPARED TO GAS-CROMATOGRAPHY-MASS SPECTROMETRY MEASUREMENTS**


This study evaluated a novel rapid method for verifying smoking status in individuals by measurement of cotinine in saliva and urine samples using an immunochromatographic strip in ‘dipstick’ format. A prospective comparison was made between smoking status as determined by measurement of cotinine in urine by gas chromatography-mass spectrometry (GC-MS), and cotinine in saliva and urine by a semi-quantitative, enzyme-linked, immunosorbent assay-based method (urine and saliva NicAlert). 165 individuals were tested in a family practice and general medical setting after informed consent and institutional review board approval. Saliva and urine NicAlert tests were run by untrained operators who followed written directions. Based on smoking status as determined by urine cotinine measurement by GC-MS and a 50 ng/mL cut-off, the saliva strip test had a sensitivity of 99% and a specificity of 96%. The urine strip had 99.8% sensitivity, and 97.5% specificity. Using GC-MS as the standard, the urine strip and saliva strip had 97.6% concordance. Saliva NicAlert identified as smokers all four and urine NicAlert identified 3 out of 4 of the subjects who reported being non-smokers but were determined to be smokers by GC-MS. On the basis of close agreement with GC-MS, the urine and saliva strips appear to be valid and convenient methods for confirming self-reported smoking status.

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**RPOS3-73**

**NICALERT™COTININE TEST STRIPS: VALIDATION IN SALIVA**

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Abstinence from smoking in cessation research is usually measured by self-report with biochemical verification using cotinine, a nicotine metabolite found in urine and saliva. In trials where participants reside across states or countries it is expensive to collect saliva samples. An alternative is to use self-administered test strips such as NicAlert™ strips, a semi-quantitative immunosassay method for identifying cotinine in urine. Because urine testing can be challenging for participants, we examined the diagnostic accuracy of NicAlert™ strips in saliva, using independent prospective blind comparison, with gas chromatography-nitrogen phosphorus detection as the reference standard. 86 participants, 44 self-reported smokers (at least one cigarette in the last 7 days) and 42 self-reported non-smokers (no cigarettes in the last 7 days) were recruited through three workplaces and a Fitness Centre. Demographic information and data on smoking status, second hand smoke exposure, use of other tobacco products and use of nicotine replacement therapy were collected. Information on nicotine dependence was obtained if a person reported being a smoker. Two saliva samples from each participant were collected using standard collection methods and were tested independently of each other with assessors blind to self-reported smoking status. Sensitivity of the NicAlert™ test method was 100%, specificity 97.7%, positive predictive value 97.7%, and negative predictive value 100%, indicating its potential suitability for use in large-scale trials of smoking cessation interventions. A self-administration feasibility study is currently underway to test how reliably a range of people can follow the instructions and mail back tested strips to study centres.

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**RPOS3-74**

**SMOKING CESSION IN PREGNANCY: WHO QUILTS EARLY?**

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Pregnancy is a time of heightened importance for smoking cessation. We combined data from two randomized clinical trials to examine predictors of early quitting in a large sample of pregnant smokers. The 1,040 women in our combined dataset (mean age = 26.8 yrs) had been smoking for M = 10.2 years. A majority (74%) lived with a partner. Most (82%) were White, with 8% African American, 5% Latina, and 5% other. All were regular smokers at conception; early quitters were those reporting 7-day abstinence at first study contact (which occurred prior to study interventions). Questionnaires were completed prior to 20 weeks gestation (average gestational age = 11.6 weeks, SD = 3.5). Common predictor variables across samples included maternal age, gestational age, race, income, living status, employment, education, duration of smoking, stage of change, partner smoking status, confidence for cessation, and control variables for study site. Using logistic regression, we identified several significant predictors of early pregnancy cessation. The odds of cessation were greater among women who were older (OR = 1.10), further into their pregnancy (OR = 1.07), lived with a partner (OR = 1.84), had a partner who did not smoke (OR = 2.14), smoked for fewer years (OR = .88), and had higher levels of confidence (OR = 4.69). These results help identify characteristics of women who successfully quit early in pregnancy and prior to engaging in organized cessation efforts. Although many characteristics can not be modified (i.e. age, partner status), the ability to characterize smokers who are able to quit early may help healthcare providers to identify the pregnant smokers less likely to quit and who need additional cessation support.

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**RPOS3-75**

**BASELINE WEIGHT CONCERNS, NICOTINE DEPENDENCE AND NEGATIVE AFFECTIVITY AMONG FEMALE SMOKERS ATTEMPTING TO QUIT**

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Nicotine dependence and negative affectivity are well-established barriers to smoking cessation. More recently weight concerns as quitting impediments, particularly among women, have received attention. Women also have unique hormonal challenges that may impact the cessation process and outcome. Data from a clinical cessation trial for female smokers (N = 182) were analyzed to examine the interrelations of these variables at baseline. Borrelli & Merl's (1998) 6-item Weight Concern Scale was used to divide participants into high, moderate, and low weight concern groups, and differences on weight-related variables (BMI, diet), nicotine dependence and smoking behavior (Cigarettes Per Day, FTND, Cotinine level, Reasons for Smoking, Quitting Self-Efficacy), negative affectivity (PANAS, CESD, Perceived Stress) and premenstrual symptoms were examined. Participants reporting strong weight concerns also tended to report high negative affectivity, food substitution with cigarettes, and addiction as reasons for smoking (p<.001). Those reporting strong weight concerns also tended to have a higher BMI, greater perceived stress, and PMS symptoms (p<.02, p<.01, p<.01, respectively). Linear trends were found for nicotine dependence, depression, and negative affect, with those reporting stronger weight concerns scoring higher on each of these measures. We found no relationships between weight concerns and age, race, education, diet, CPD, Cotinine level, or Quitting Self-Efficacy. These findings suggest the possibility that weight concerns may not be a separate entity as a smoking-related variable but rather a part of general negative affectivity-stress-somatization axis.

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RPOS3-76  ECOLOGICAL MOMENTARY ASSESSMENT OF TEEN SMOKING RELAPSE: A PILOT STUDY

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Smoking cessation attempts by adolescents invariably fail. In order to improve interventions for this population, it will be important to identify factors underlying relapse in adolescents. In this study, we examined the feasibility of using ecological momentary assessment (EMA) methods to examine adolescent relapse. EMA may allow for the identification of unique states (e.g., spikes in anger, exposure to smoking cues) that are related to discrete smoking lapses. These contexts can then be targeted in treatment. Six adolescents (ages 14-18) used palm-top computers for 2 weeks (4 days pre-quit, 10 days post-quit) to self-monitor momentary cigarette craving, affect state, and smoking cues when smoking and at regular 2 hour intervals when audibly prompted (nonsmoking assessment). Participants made an entry on the computer upon quitting; all subsequent smoking entries were considered lapses. All 6 participants completed the full 2 weeks of monitoring and reported a quit attempt on the computer on the target quit day. The biggest barrier to self-monitoring was the low volume of the audible prompts, which reduced compliance with the nonsmoking assessments (52% completed). Five participants reported at least one lapse during the quit attempt; a total of 27 lapses were recorded. The average latency to the first lapse was 7 hours. First lapses were primarily associated with increased craving and the presence of other smokers. Negative affect was only modestly related to first lapses. This pilot study suggests that EMA methods can be used to assess relapse among adolescent smokers. However, features such as higher volume audible prompts are needed to increase compliance with the monitoring protocol. This study was conducted while the first author was at Brown University. Supported by a Brown University Research Excellence Award.

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RPOS3-77  SMOKING GOALS INDICATE MOTIVATION

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Motivation to change smoking is typically assessed with either a measure of when one plans to change (e.g., Stage of Change) or a measure of strength of motivation (e.g., Contemplation Ladder). Another possible measure is smoking goal (e.g., abstinence vs. reduction). We recruited 188 smokers in a natural history study in which they reported cigarettes per day daily for 28 days via phone. We selected 37 smokers with a goal to quit abruptly, 43 with a goal to quit gradually, 43 with a goal to reduce only and 65 who planned to not change over the next month. Outcomes were the incidence of quit attempts (> 24 hours of abstinence) and reduction (> 25% from baseline cigarettes per day). Participants with a goal to quit abruptly were most likely to quit or reduce (57%), followed by those with a goal to quit gradually (44%), followed by those with a goal to reduce only (37%), followed by those with a goal to not change (10%) (Bartholomew’s test for trend, p < 0.0001). Similar results occurred when only quit attempts were examined: 43% vs. 21% vs. 14% vs. 5% (p=0.0001). Although half (60%) of smokers who planned to change did quit or reduce, few met their exact goal: 29% of those with a goal to quit abruptly did so, 16% of those with a goal to quit gradually did so and 23% with a goal to reduce only did so. The major differences of the study were a small, volunteer sample and absence of data on long-term success. Our results suggest goals for change indicate strength of motivation to change; i.e., those who planned to quit abruptly appeared to be the most motivated. These results are consistent with the clinical notion that smokers with a goal to reduce first are less motivated to quit. They are also similar to prior studies on ‘commitment’ to abstinence (Hall et al., JCCP 58: 175). These results are consistent with the clinical notion that smokers with a goal to reduce first are less motivated to quit. They are also similar to prior studies on ‘commitment’ to abstinence (Hall et al., JCCP 58: 175).

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RPOS3-78  GENDER, DEPRESSIVE SYMPTOMS, AND PERCEIVED RISKS AND BENEFITS ASSOCIATED WITH QUITTING PREDICT ABILITY TO QUIT

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Expectations concerning anticipated risks and benefits associated with smoking cessation have been shown to be associated with intentions to quit and treatment outcome. The aim of this study was to examine interactions of gender and depressive symptoms on treatment motivation and outcome. We had previously developed the Perceived Risks and Benefits Questionnaire (PRBQ) to consider gender differences in perceived risks (weight gain, increased negative affect, reduced ability to attend to or concentrate, social ostracism, loss of enjoyment, increased craving) and benefits (health, general well-being, self-esteem, finances, physical appeal, social approval) associated with quitting. A sample of 750 treatment seeking smokers (48% female) entering smoking cessation trials completed the PRBQ and the CES-D (to assess depressive symptoms). The association of the PRBQ and CES-D with treatment outcome was assessed in a subsample of 93 participants. Overall, greater likelihood ratings of perceived risks and benefits were associated with female gender, as were decreased treatment intentions. Perceived TTR astro, amongst quitting and were negatively related to motivation to quit across both genders. With regard to treatment outcome, there was a significant interaction between perceived risks associated with quitting, depressive symptoms, and gender. For females, increased risks associated with quitting and increased levels of depressive symptoms predicted a reduced likelihood of cessation. In contrast, smoking cessation was more strongly associated with smoking cessation is critical for public education campaigns and could inform intervention strategies designed to modify sex-specific beliefs that are associated with lowered behavioral intentions to quit smoking.

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RPOS3-79  AGE-RELATED DIFFERENCES IN SMOKING RELAPSE AMONG WOMEN

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The purposes of this secondary analysis were to examine whether pre-cessation and post-quit-day-1 (D1) demographic (education, marital status), biosociopsychosocial (NRT dose, withdrawal, stress, mood, depression, coping, social support, partner smoking), and behavioral (self-efficacy, motivation) factors associated with smoking relapse (SR) differed among younger (< 40) and older (> 40) women, and to examine differences in self-reported reasons for SR. Data were collected from 312 women (mean age 40) using standardized questionnaires. Salivary cotinine was used to confirm smoking abstinence. Chi-square tests, and multivariate time-to-event analyses were performed. Pre-cessation factors significantly associated with time-to-relapse (TTR) were increased depression (p=0.03) among younger women and lower motivation (p= 0.04) and dose (p<0.01) among older women. In a combined model, there was a significant age interaction with depression, and motivation (marginally) but not dose suggesting that depression and motivation affect TTR differently in younger versus older women, D1 factors associated with TTR were increased depression (p=0.05) and lower self-efficacy in negative affective situations (p=0.02) among younger women and lower motivation (p<0.001) among older women. In a combined model, there was a significant age interaction with craving, self-efficacy in negative affective situations, and motivation indicating that TTR differed among younger and older women. Differences in self-reported reasons for early SR showed that 21% of younger women as compared to 10% of older women identified use of alcohol as the reason for early SR (p=0.01). Another 13% of younger women as compared to 24% of older women identified craving tobacco as the reason for early SR (p=0.02). Results from this study suggest that factors associated with SR are age and gender dependent. Future studies are needed to develop and test combined behavioral and pharmacological smoking cessation treatment for women. It appears that behavioral treatments that target negative affect may be beneficial among younger women, whereas behavioral treatments that increase motivation to quit smoking are needed among older women.

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RPOS3-80 RELAPSING IN REAL TIME: A PROSPECTIVE ASSESSMENT OF ABSTINENCE FAILURE

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BACKGROUND: Smoking relapse is a complex process beginning with a first lapse. The course and natural history of progression from an initial lapse to relapse is incompletely understood.

METHODS: We describe the progression from a first lapse (defined as any smoking, even a puff) to full-blown relapse (defined as 3 consecutive days of smoking 5+ cigarettes). We analyzed prospective data from 133 adult smokers who maintained abstinence for at least 9 daily moments, with 2778 daily moments and 874 episodes via Ecological Momentary Assessment (EMA) using an electronic diary.

RESULTS: 37 participants (28%) reported relapsing over 6 weeks of follow up. Following abstinence, the progression from a first lapse to relapse took an average of 27.7 lapse episodes (Median 21, Standard Deviation, 16.7, Range 7-64) over 9.7 days (M 9, SD 6.0, R 2-23) and involved an average of 59.3 cigs (M 47, SD 39.6; range 14-200). 70% of lapsers smoked < 1 cig on the first lapse. The amount of smoking increased over successive lapse episodes at a rate of 2.7 cigs per lapse (M 1.8, SD 2.0, R 0.8-8.0). p = 0.05 for linear time trend from GEE model. The trajectory of progression was intermittent and interrupted by periods of abstinence. On average relapsers reported 1.9 days of abstinence (M 1, SD 2.8, R 0-11) before relapsing.

CONCLUSION: The process of relapse progresses intermittently, underscoring the need for cessation programs to heighten surveillance during the period immediately following a lapse. Further research should focus on factors associated not only with a first lapse, but also with subsequent lapses, in order to identify opportunities for post-lapse intervention.

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RPOS3-81 DIFFERENCES IN SMOKING CHARACTERISTICS AND WHITE FEMALE SMOKERS

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As compared with Whites, African Americans have a higher prevalence of smoking and although reporting smoking fewer cigarettes per day, have higher nicotine dependence, and are at higher risk for most smoking-related diseases. Previous research has also shown African Americans prefer high nicotine, mentholated brands and have higher cotinine levels in proportion to cigarettes smoked per day, which may be attributed to differences in metabolism of nicotine. The purpose of this study is to identify correlates of smoking, which included demographics, perceived stress, anger, and nicotine dependence in African American and White female smokers aged 18-40 in a smoking cessation study. Smoking variables measured in 37 African American and 37 White women include self-reported cigarettes smoked per day, time to first cigarette, nicotine dependence, age, education, income, marital status, 24-hour quit attempts, type of cigarettes (light versus regular and menthol versus non-menthol), salvia nicotine and cotinine levels, and carbon monoxide level. Nicotine dependence was measured with the Fagerstrom dependency scale. African American women in this study smoke less (16.32 +/- 4.93 versus 18.95 +/- 6.36 cigarettes/day, p=.0514), smoke sooner after waking (38% versus 22% smoked within 5 minutes after waking, chi-square = 7.4649, df=3, p=.0585), higher Fagerstrom scores (5.35 +/- 1.62 versus 4.22 +/- 1.86, p=.0065), are older (31.54 +/- 6.04 versus 28.24 +/- 6.93 years, p=.0324), smoke more regular brand cigarettes (76% versus 35% smoke regular cigarettes, chi-square = 12.3060, p=1, p=0.005), smoke more menthol cigarettes (64% versus 19% smoke mentholated cigarettes, chi-square = 31.1579, p<.0001), have less income (chi-square=18.31, p=.0029, df=5), higher nicotine levels (339.77 +/- 401.51 ng/ml versus 160.74 +/- 96.81 ng/ml, p=.0221), and higher cotinine/cigarettes per day ratio (17.63 +/- 10.25 versus 12.06 +/- 6.19, p=.0116). These results confirm differences of smoking characteristics in African American and White women smokers found in previous research. Results also support theories that metabolism of nicotine may be affected by race.

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RPOS3-82 BIDI SMOKING AMONG AMERICAN ADULTS: EVIDENCE FROM THE 2003 NATIONAL SURVEY ON DRUG USE AND HEALTH (NSDUH)

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Previous researches studied bidi smoking among adolescents in the U.S., but no single study investigated the characteristics of bidi using American adults. The 2003 National Survey on Drug Use and Health (NSDUH) was analyzed in this study. A total of 36,984 adults were selected to examine the prevalence of bidi smoking and investigated other demographic characteristics of bidi using American adults. Results show that 3,355 (9.1%) American adults reported having ever smoked bidi and 431 (1.2%) adults reported smoking bidi last year. Study results show a significant gender difference: more males were more likely to smoke bidi than females (60% vs. 40%). It shows that the prevalence rate of bidi use was higher among minority populations. American Africans were more likely to smoke bidi than whites (16% vs. 7.7%). Young adults were more likely to smoke bidi than old adults (nearly 80% of those who reported having ever smoked bidi were between 18 and 25 years of age). Logistic regression model was performed to examine which independent variables were more predictive of bidi smoking. Most independent variables (gender, race, education, risk behaviors, moving in the past 5 years, smoking status) entered were found to be significant in predicting bidi smoking among American adults. More scientific researches are needed to study access to bidi and its long term health effects of bidi.

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RPOS3-83 LOW INCOME AFRICAN AMERICAN WOMEN: DEMOGRAPHIC AND MENTAL HEALTH PREDICTORS OF CIGARETTE SMOKING

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Low income African American women exhibit a high prevalence of cigarette smoking, and suffer disproportionately from associated morbidity and mortality. Few studies have examined psychosocial differences between African American women smokers and non-smokers. The purpose of this study was to identify demographic and mental health predictors for cigarette smoking among African American females. Cross-sectional data from the Women’s Health Project II (N = 247) were analyzed to identify correlates of smoking. Women (16-50 years; M = 29.6) recruited through a community-based organization completed measures of perceived stress, anger, and alcohol use/abuse. The analyses examined smoking using two variables: (1) a continuous measure (number of cigarettes smoked daily), and (2) a categorical classification (smokers >10 cigarettes daily) vs. non-smokers (<10 cigarettes per day). Hierarchical logistic and multiple regression analyses were used to model three blocks of predictors of smoking, which included demographics, psychological, and alcohol use variables. Results indicated that 36% of African American women reported current cigarette smoking. The final logistic regression model revealed greater odds of smoking for older (p <.001), less educated (p <.05), and lower income women (p <.001) with fewer children (p <.001). The model also indicated that greater perceived stress (p <.001) and more frequent heavy alcohol use (p <.05) increased the odds of being a smoker. Finally, greater rates of cigarette consumption predicted similar factors, including older age (p <.001), lower income (p <.001), fewer children (p <.05), and more perceived stress (p <.05). Anger was not a predictor of smoking in either model. Thus, demographic variables, stress, and alcohol use are associated with current smoking behavior among low-income African American women. A more complete understanding of the demographic and psychosocial factors that predict smoking among African American can inform prevention and cessation strategies aimed at this population.

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RPOS3-84 ARE SMOKING CESSATION TREATMENTS EFFICACIOUS FOR AFRICAN AMERICANS? A META-ANALYTIC REVIEW

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African American smokers suffer disproportionately from smoking-related morbidity and mortality, yet it is unclear whether existing treatments are beneficial for this population. A meta-analysis tested the overall efficacy of smoking cessation treatments among African American adults and the conditions associated with optimal effectiveness. Twenty published and unpublished studies through 2005 representing 32 hypothesis tests and 12,743 smokers compared smoking cessation treatments to control conditions. The studies were described as treatments or interventions for smoking cessation targeting African American adults. Given the limited number of outcome studies and the goal of determining the overall efficacy of smoking cessation treatment, the nature of the intervention was allowed to vary. It was hypothesized that treatment in general would be more effective than the control condition. Primary outcomes were cessation at the first assessment following treatment (posttest) and at a subsequent assessment (follow-up). As expected, results indicated that smoking cessation treatments are effective at posttest, yet their effects decline over time. Specifically, there was a statistically significant overall Odds-Ratio effect size of 1.41 (95% CI = 1.16 to 1.71, n = 20), suggesting that the odds of cessation are 1.4 times greater for the treatment condition than the control group. The odds of smoking cessation at the first follow-up assessment were 1.29 times greater for participants who received treatment, reflecting a trend towards greater odds of cessation due to treatment (p = .05). Seven of 10 variables moderated the efficacy of treatment. The combination interventions, family counseling, clinic visits with paraprofessionals, and biochemical verification were particularly associated with smoking cessation. Moreover, treatment was most effective when analyzed at individual or community levels, tested with certain outcome measures, and irrespective of cultural sensitivity. Theoretical and clinical implications are discussed. No funding.

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RPOS3-85 SOCIAL FACTORS AND TOBACCO USE: INFLUENCE OF FRIEND AND PARTNER SMOKING ON INDIVIDUAL SMOKING STATUS

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Social-contextual models for tobacco control interventions suggest numerous factors that influence smoking including neighborhood/community factors, individual factors, and interpersonal factors. Several studies of adolescents have shown that having friends or peers who smoke increases the likelihood of smoking initiation; other studies have shown that partner or spouse smoking is associated with greater difficulty in smoking cessation. This study evaluated the association between smoking status in survey respondents and self-reported density of smoking among friends and smoking by a spouse or partner. Data were obtained from an RRD sample of adults (N=8111) from a Midwestern state in 2003 and a subset of 452 smokers in that sample who were contacted one year later. In the original sample, current smokers, as compared to never-smokers and former smokers, were much more likely to have social networks made up of half or more smokers (58% vs. 12% and 15%, respectively, p<.0001). Likewise current smokers were more likely to have a spouse or partner who smokes (50% vs. 29% for never-smokers and 21% for former smokers, p<.0001). These interpersonal variables (smoking friend density and spouse/partner smoking) were entered into a hierarchical logistic regression analysis predicting smoking status (abstinent vs. smoking) one year later in the subset of smokers who had a spouse or partner (n=373). Age and gender were entered at step 1; FTND at the time of the original survey was entered at step 2; and the two interpersonal variables were entered at step 3. Only the spouse/partner variable predicted smoking status one year later (p<.05; odds ratio=1.96, C1=1.008 to 3.790). Further research with larger sample sizes is needed to determine if this result is robust and whether or not other characteristics of the social-contextual model are also predictive.

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RPOS3-86 UNEMPLOYMENT AND SMOKING: ARE THE RISK FACTORS RELATED?

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PURPOSE: Unemployment and smoking have been associated with poor health outcomes, yet few studies have examined the relationship between these risk factors. This study reviews and summarizes the published literature of the studies that examined the relationship between unemployment and smoking for the purpose of identifying research recommendations and gaps in the literature.

METHODS: Four databases from the National Library of Medicine were used to collect empirical studies published from 1980-2003 that examined unemployment and smoking as independent or dependent variables. Data were collected using the search terms tobacco or smoking and unemployment or joblessness.

RESULTS: Thirty-one papers met the inclusion criteria. Eighty-four percent (n=26) of the studies found a relationship between unemployment and smoking. Majority (87%) of the studies were conducted outside of the United States. Of the studies that compared the unemployed to the employed, 47% found a higher prevalence of smoking, 35% greater odds of smoking, and 12% reported greater daily smoking among the unemployed. Twenty percent of prospective cohort studies found that smokers had greater odds of becoming unemployed and 20% found the unemployed had greater odds of smoking. Studies also found a higher prevalence of smokers among non-smokers among the unemployed, greater odds of current and daily smoking. Those who were long-term unemployed had greater odds of smoking and daily smoking.

CONCLUSION: These results suggest that unemployment is a risk factor for smoking and that smoking is a risk factor for unemployment. Further research is needed to examine morbidity and mortality outcomes associated with these risk factors. Innovative smoking cessation interventions should be developed for the unemployed. Funding is provided by the National Cancer Institute.

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RPOS3-87 SMOKING DURING THE NIGHT: PREVALENCE AND SMOKER CHARACTERISTICS

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Heavy smokers often have difficulty tolerating periods of abstinence longer than a few hours, and sleep is often the longest interval of abstinence. Many smokers smoke very soon after waking, which has been considered a sign of dependence. Yet, researchers have not examined whether smokers interrupt sleep to smoke during the night. We examined the characteristics of smokers who smoke at night. 692 heavy smokers monitored their smoking (day and night) with Electronic Diaries (EDs) for approximately 2 weeks during baseline, prior to cessation. EDs had an alarm clock function, facilitating accurate recording of sleep and wake times. 41% of the sample reported at least one episode of night smoking (NS). In this group, NS occurred on 24% of nights, approximately 2 times per night (range 1-11 separate episodes). NSs also reported night smoking on questionnaire measures. Compared to non-night smokers (NNSs), NSs tended to be female (p<0.09), report lower incomes (p<0.003), and have less education (p<0.02). NSs reported more sleep disturbance during their last quit attempt (p<0.0009). During ad lib smoking, NSs reported higher levels of morning craving (p<0.05), and smoking sooner after waking (p<0.0001). NSs scored higher on the FTND (p<0.0001) and the continuity subscale of the NDSS (p<0.02). Finally, once they quit, NSs were at increased risk for lapsing than NNSs (HR = 1.24, CI = 1.00 - 1.52). Thus, night smoking is common and is associated with greater nicotine dependence. Because night smoking appears to indicate increased risk of cessation failure, NSs trying to quit may benefit from NRT overnight.

This research was funded by NIDA grant DA06084 and SSHRC 752-2002-0161. Dr. Shiffman serves as consultant to GlaxoSmithKline Consumer Healthcare on an exclusive basis regarding matters relating to smoking cessation and also is a partner in a company that is developing a new nicotine medication. Dr. Shiffman is a co-founder of innovidata, inc., which provides electronic diary services for clinical research.

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Hostility is associated with increased nicotine dependence and physical health risks in smokers unassessed for psychiatric disorders. It has been found that individuals with mental health disorders have higher smoking rates and increased levels of hostility traits. However, associations between hostility, nicotine dependence (ND), mental and physical health have been understudied in this group. Women diagnosed with posttraumatic stress disorder (PTSD), major depressive disorder (MDD), or neither groups were evaluated. Five self-report measures of hostility assessed cognitive, behavioral, and affective components of hostility. Principal components analysis revealed three factors (hostile beliefs, overt hostility and covert hostility) that were used to predict smoking behavior and health habits. Participants were categorized by each factor into high and low levels of hostility. Both general linear regression and logistic analysis were conducted to assess continuous and categorical smoking and health variables. After controlling for psychiatric group status, factors of hostility were found to be significantly related to smoking behavior. High hostility significantly predicted lifetime smoking on both hostile beliefs (p<0.01) and covert hostility (p=0.05). In addition, high hostility was associated with being a current smoker on overt hostility (p=0.01). Significant group differences for PTSD versus MDD and control group were found, with the PTSD group being associated with current smoking (p=0.05). Hostility factors were also used to assess health effects in current smokers. On hostile beliefs, high hostility was associated with a higher hip to waist ratio (p=0.05), while lower hostility was associated with higher positive health habits (p=0.05; e.g. eating a balanced diet, exercising regularly and getting enough sleep). Findings from this study suggest a strong relationship between hostility, smoking behaviors and physical health in women with PTSD and MDD. This information contributes to understanding mechanisms of hostility involved in smoking behavior, and provides future directions in smoking cessation intervention.

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RPOS3-91 RECRUITMENT OF ADOLESCENT SMokers

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Challenges faced in recruiting adolescent smokers include low smoking rate, need for parental consent, and accessibility to school-wide screening. Here we evaluate methods used to recruit adolescent smokers into 3 non-treatment research projects. Methods include traditional (flyers; school presentations; advertisement in sporting event program; referral by peer, school counselor or family member) and innovative (recruitment booths at beaches, shopping malls and community events such as festivals and concerts). This investigation explores recruitment of 14-19 year old RI residents between April 2004 and November 2005. A total of 430 adolescents expressed interest in the studies and completed a screening interview, with 246 determined to be eligible and agreeing to participate (recruited) and 89 completing with valid data (completers). Recruitment at school lunches was the most fruitful method, yielding 251 screens with 125 of these recruited and 58 (23.1% of screens) valid completers. Augmenting the lunchtime recruitment with same-day classroom presentations did not increase recruitment rates. In person recruitment at all community sites combined (events, beaches and malls) brought 91 screens with 42 recruited into the studies, but only 7.7% completed. Referrals brought 51 screens (32 recruited) with 29.4% completing. Flyers attracted 33 screens (22 recruits) with 24.2% completing. Flyers posted in schools brought a higher percentage of completers than flyers posted in the community. Least successful, yielding no screens, was a costly advertisement print-ed in the program of a baseball playoff series. Our conclusions are that innovative recruitment methods should be considered secondary to reliance on traditional methods. Consideration should be given to yield of valid completers rather than number of screens for each method.

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RPOS3-92

A QUALITATIVE STUDY OF TOBACCO-CONTROL THEMES FOR 18-24 YEAR-OLDS IN THE AIR FORCE

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The United States (US) Military has a particularly alarming prevalence of cigarette smoking. Currently, 27% of US Air Force (USAF) personnel report having smoked cigarettes in the past 30 days. Of further concern is the fact that the prevalence of cigarette smoking increased from 1998 to 2002 - the first increase since 1980. Troops in the 18-24 age range report the highest tobacco use prevalence at 38.9% and approximately 28% of young troops report they initiated smoking after joining the USAF. Thus, it is critical to learn more about what factors encourage tobacco use among young adults in the USAF. In the summer and fall of 2005, we conducted 12 focus groups on 4 USAF bases with a total of 101 military personnel to examine their perceptions and experiences regarding tobacco use in the military. Focus groups were conducted separately with three groups: 18-24 year-old current smokers, 18-24 year-old current non-smokers, and supervisors of 18 to 24 year-old troops. Focus groups were audio-taped and subsequently transcribed and analyzed by both a team of researchers as well as NVivo, a qualitative data analysis software program. Results of the focus group suggest pressure to use tobacco in the USAF among the 18-24 year old troops. Further, young troops do not believe that ensuring troops are tobacco free was a health priority for USAF leadership. The increased prevalence of smoking among troops while deployed is also an area of concern for troops. Tobacco use in the military is seen as significantly more normative by current tobacco users than their non-using peers. The most powerful tobacco-control message theme discovered during the focus groups was that of social influence. Messages focusing on manipulation and health were not strongly supported by current smokers and despite the well-documented immediate negative effects on health and readiness of troops, supervisors of young troops were reluctant to intervene on their supervisee’s tobacco use. Ambivalence was expressed towards current treatment options; however, ideas were proffered as to how to increase participation. These and other themes will be described more in-depth at the conference.

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RPOS3-93

NICOTINE USE IN FRATERNITY AND SORORITY AFFILIATED COLLEGE FRESHMEN COMPARED TO THEIR NON-GREEK PEERS

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INTRODUCTION: Affiliation with a university fraternity or sorority has long been considered a risk factor for substance use during the college years. However, the primary focus of such research and public attention has been on alcohol use and abuse in this population. Few studies have considered the severe long term consequences associated with nicotine use in Greek organizations. Specifically, while it is common for alcohol use to peak in the early college years and subside as students mature, nicotine use frequently escalates and typically leads to dependence. This is of significant concern as many casual cigarette smokers initiate this unhealthy behavior with no intention of long term use. The present study examined the differences observed among college freshmen with respect to their nicotine use and Greek membership.

METHODS: Participants included 424 college freshmen who completed an online questionnaire during their first semester. Smoking status was established in all students who participated in the study (n=76) as was Greek affiliation (n=91).

RESULTS: A chi-square analysis revealed that a significantly greater proportion of Greek affiliated freshmen used nicotine compared to non-Greek freshmen, c2 (1, N=424) = 20.608, p = .001. Findings from this study suggest that fraternity and sorority affiliated college students have a considerably higher risk for nicotine use than their non-Greek peers. These findings have important implications for prevention and intervention efforts in college populations, especially members of Greek organizations.

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RPOS3-94

COLLEGE SMOKERS WHO BINGE DRINK HAVE DECREASED CONCERN FOR THE NEGATIVE CONSEQUENCES OF SMOKING COMPARED TO THEIR SMOKING PEERS

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INTRODUCTION: Cigarette smoking is a prevalent co-morbid health risk behavior among those with histories of alcohol abuse. Little is known, however, about the initial onset of nicotine use and how it may be related to the onset of problematic drinking among college students. While problematic drinking has been shown to decrease as students mature, the opposite has been observed with smoking behavior. Such data suggests that binge drinking may influence nicotine use among college students and perhaps increase the likelihood that one will become nicotine dependent. One possible explanation of this premise is that students who smoke and also binge drink have skewed views about the consequences of smoking. This study examined the beliefs held about smoking among college students who reported smoking and binge drinking and college students who only reported smoking.

METHODS: Participants were college freshman who completed online questionnaires during their first semester of college. Smoking outcome expectancies were assessed in students who reported both smoking and binge drinking (n=19) and among students who reported only smoking (n=19).

RESULTS: An analysis of variance yielded a significant group difference on the views of the negative consequences of smoking. [F(1,10) = 8.360, p<.05]. Smokers who reported binge drinking showed disproportionately low levels of concern regarding smoking negative consequences when compared to those who only reported smoking. Findings indicate that decreased concern for smoking negative consequences among binge drinking smokers may contribute to long-term nicotine use among this population.

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THE NICOTINE DEPENDENCE SYNDROME SCALE: FACTORIAL AND PREDICTIVE VALIDITY AMONG YOUTH SMOKERS

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Current conceptualizations of nicotine dependence suggest assessing its multidimensional structure, especially in understanding how dependence develops in youth smokers. It is unclear if this structure holds for experimental and more regular smokers. This study examined the factorial and predictive validity of the multidimensional Nicotine Dependence Syndrome Scale (NDSS) among: 1) 273 8th and 10th grade smoking experimenters in a longitudinal natural history study and 2) 351 high school students in smoking cessation programs (‘regular smokers’). NDSS and smoking measures were obtained at baseline and six months later. Principal components analysis supported a single-component solution, NDSS-Total, for both samples (first component eigenvalues between 6.6 and 13.6; subsequent components < 1.8). Confirmatory factor analysis (following Shiffman et al., 2004 factors) revealed five factors (Drive, alpha=.88; Tolerance, alpha=.75; Priority, alpha=.72; Stereotypy, alpha=.57 and Continuity, alpha=.66) in experimenters and four factors (Drive, alpha=.75; Tolerance, alpha=.71 Priority, alpha=.57, and Stereotypy, alpha=.48) in regular smokers. NDSS-Total, Drive and Tolerance predicted follow-up smoking, beyond baseline smoking (p<.001) for experimenters. For regular smokers, Drive predicted number of cigarettes smoked at follow-up, beyond baseline smoking (p<.001). Logistic regression found baseline smoking (not NDSS scales) predicted quitting at follow-up for regular smokers. Findings support Drive and Tolerance as consistent across the samples and suggest they are important for predicting smoking in youth.

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RPOS3-96  THE MICHIGAN NICOTINE REINFORCEMENT QUESTIONNAIRE (MNRQ) IN A YOUNG, LIGHT SMOKER SAMPLE
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The MNRQ was administered to a sample (n=79; 42 women, 37 men) of young (mean age=22 years), light smokers (mean cigarettes per day=15), Coefficients alpha for the positive (.84) and negative (.85) reinforcement scales were good, as were the test-retest reliability coefficients for the positive (.70) and negative (.75) reinforcement scales. The two scales were uncorrelated (.04). Negative reinforcement smoking scale scores were significantly correlated with daily smoking rate (.33), FTND nicotine dependence scores (.33), past nicotine withdrawal severity (.55), physical discomfort upon smoking one's first cigarette (.24), perceived stress (.25), and depression (.28). Marginally significant correlations were found between negative reinforcement smoking scale scores and trait anxiety (.22) and increased smoking while drinking coffee (.25). Positive reinforcement smoking scale scores did not correlate significantly with any criterion variables, but this may have been due to a relative lack of appropriate criterion variables being included in the study. Results and Implications are discussed.

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RPOS3-97  REFINEMENT IN THE ASSESSMENT OF THE APPETITE-WEIGHT CONTROL SMOKING CONSTRUCT
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In an attempt to refine the assessment of the Appetite-Weight Control Smoking Construct, an 8-item Appetite-Weight Control Scale (AWCS) was constructed and tested on a sample of college student smokers (n=166; 94 women, 72 men; mean age=25 years; mean cigarettes per day=19; mean years of smoking=9). Internal consistency (alphas=.96) and test-retest reliability (r=.88) were good. A confirmatory factor analysis yielded a highly correlated two-factor solution (i.e., Appetite Control and Weight Control). AWCS correlated significantly with perceived weight (.39), Cognitive Restraint (.57), Disinhibited Eating (.39), Increased Hunger (.24) and Eating (.27) during past quit attempts, post-cessation weight gain concern (.53), and post-cessation pounds willing to gain (.32). These concurrent validity analyses, when repeated separately for gender, yielded very similar results. AWCS scores prospectively predicted increased Hunger (.42) and Eating (.34) for the females, but predictive validity coefficients for the males were non-significant (.06 and -.03). Results and Implications are discussed.

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RPOS3-98  A MODIFIED FTND: CAN IT IDENTIFY NICOTINE DEPENDENCE IN SMOKELESS TOBACCO USERS?
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The Fagerstrom Test for Nicotine Dependence has been used extensively as an easy and convenient method to assess nicotine dependence in cigarette smokers. The purpose of this study is to build on previous research evaluating a modified questionnaire for use with smokeless tobacco users and confirms several items as useful for determining the degree of nicotine dependence in smokeless tobacco users. Smokeless tobacco users (N=174) were recruited from two tobacco use reduction studies through radio and newspaper advertisements. Subjects attended a baseline visit where they completed tobacco use history forms including 14 questions on current pattern of use and provided a first morning void urine sample for cotinine analysis. Subjects were male snuff users with an average age of 32.6 (SD=8.7) who used an average of 4.1 tins per week (SD=1.7) who had used for 13.3 (SD=5.9) years. The mean urinary cotinine level was 9861.3 ng/ml (SD=8217.4 ng/ml) with a range from 410 to 30,474 ng/ml. Using backward elimination multiple regression for the log-transformed cotinine level as the dependent variable and the 14 adapted scale items as independent variables several items were significant. Five significant independent variables are: 1) Number of tins used per week (F=6.96, P-value=0.0093); 2) How often do you swallow your tobacco juice rather than spit? (F=4.39, P-value=0.0381); 3) Which chew would be the hardest to give up? (F=17.54, P-value<0.0001); 4) Do you keep a dip/chew in your mouth almost all the time? (F=16.60, P-value<0.0001); 5) Do you use smokeless tobacco during the night? (F=4.53, P-value<0.0353). These 5 questions create a dependence score from 0 to 7. The mean total score for this sample is 2.22 (SD=0.88) with a range of 0-4. Assuming higher cotinine levels translates to higher dependence; these 5 questions will provide a quick and easy way for clinicians or researchers to assess nicotine dependence in smokeless tobacco users.

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RPOS3-99  PSYCHOMETRIC PROPERTIES OF A BRIEF SMOKING CONSEQUENCES QUESTIONNAIRE FOR ADULTS (SCQ-A) AMONG AFRICAN AMERICAN LIGHT SMOKERS
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The 55-item Smoking Consequences Questionnaire-Adult (SCQ-A) was designed to assess positive and negative outcome smoking expectancies. Although this measure has been previously validated in college students and adults, the utility of the SCQ-A has not been previously examined among African American (AA) light-smokers (<10 cigarettes per day [CPD]). A brief version (33-item) of the SCQ-A was evaluated among 751 AA light-smokers (66.8% female, M=45.06 years old, M=12.35 education years) enrolled in a randomized, controlled smoking cessation trial. Participants smoked 7.56 CPD, scored an average of 2.89 on the FTND and averaged 3.2 quit attempts in the past year. Factor analyses using varimax-rotation replicating the original 10-factor solution (Copeland et al, 1995). Factors were all significantly correlated (r =-.074-.498, p<.001). Positive smoking expectancies were associated with abstinence at 26-weeks. Results provide initial validation of a brief SCQ-A among AA light-smokers and confirm several items as useful for determining the degree of nicotine dependence in AA light-smokers.

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