SYMPOSIA

SYM1 EMERGING ROLE FOR a6 NICOTINIC RECEPTORS IN DOPAMINERGIC FUNCTION; LINK TO ADDICTION

Chairs: Maryka Quik, Ph.D.[1] and Darlene Brunzell, Ph.D.*[2]
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Strategies to reduce or stop smoking are urgently needed because of the major health problems associated with tobacco use. Nicotine is a major component involved in addictive behavior that exerts its effects by stimulating nicotinic acetylcholine receptors (nAChRs). Therefore, it is important to identify the nAChRs through which nicotine influences reward and addiction. Such knowledge may lead to the development of smoking cessation therapies that specifically target the relevant receptor subtypes. Extensive work has implicated a4 subunit-containing (a4*) nAChRs. In addition, emerging evidence suggests an important role for a6 subunit-containing (a6*) nAChRs. These receptors are selectively expressed in catecholaminergic regions that regulate reward and withdrawal. The goal of this symposium is to explore the potential involvement of a6* nAChRs in nicotine-related behaviors. This will be approached through five presentations. Dr. Sharon Grady will provide a brief overview of a6*, as well as other relevant nAChR subtypes, and describe their role in dopaminergic function. Dr. Michael McIntosh will discuss the dominant functional role of a6* nAChRs in the dopaminergic system, and potential links to addiction. Dr. Maryka Quik will describe the modulating effects of long-term nicotine exposure on a6* nAChR-mediated dopaminergic activity in rodent and nonhuman primates, which may provide a molecular mechanism for nicotine-induced changes. Dr. Imad Damaj will provide critical experimental studies on the role of a6* nAChRs in nicotine reward and withdrawal. Finally, Dr. Marissa Ehringer will detail her work which links the CHRNB3/A6 gene cluster to tobacco-related behaviors in humans. The combined results of these studies underscore the importance of a6* nAChRs in addiction and reward. Such work has the potential to lead to the development of new drugs directed to a6 nAChRs for successful smoking cessation therapies.

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SYM1A NICOTINIC ACETYLCHOLINE RECEPTORS WITH THE ALPHA6 SUBUNIT: RESTRICTED DISTRIBUTION AND ROLE IN MODULATING DOPAMINE RELEASE

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Nicotine in tobacco smoke activates and subsequently desensitizes nicotinic acetylcholine receptors (nAChRs) of the alpha4beta2*subtype (the * indicates possibility of additional subunits). This subtype is widely expressed throughout the brain. Another subtype sensitive to smoked concentrations of nicotine is the alpha6beta2*-nAChR, which has a more restricted distribution and is found mainly expressed in catecholaminergic and visual pathways. The alpha6beta2* subtypes are of interest in nicotine dependence as they appear, along with the alpha4beta2*-nAChRs, to be important in reward in the mesolimbic pathway. They may have a predominant role in self-administration of nicotine (Pons et al., 2008) and in modulating dopamine release in the nucleus accumbens (Exley et al., 2007); the latter function is altered by chronic exposure to nicotine (see Meyer et al., 2008, Perez et al, 2008, We have made use of subunit null mutant mice as well as alpha6L9'S gain-of-function mice to study the subunit composition and biological role of the alpha6beta2*-nAChRs. The beta3 subunit is found in most if not all of these receptors. In addition, the alpha4 subunit is incorporated in about 50% of these nAChRs. The alpha6 gain-of-function mice highlight the role of the alpha6beta2*-nAChRs in locomotor activation and cholinergic control of dopamine release (Drenan et al., 2008). Our recent work, in which the alpha6L9'S gain-of-function mutant was crossed to the alpha4 subunit null mutant, indicates that the subtype containing alpha4, alpha6L9'S, beta2 and beta3 subunits supports large increases in nAChR-mediated dopamine release and may be critical for the increased home-cage activity phenotype. These data demonstrate the critical role played by alpha4 subunits in alpha6beta2* nAChRs in vitro and in vivo.

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SYM1B Alpha6* NACHRS MEDIATE ELECTRICALLY EVOKED DOPAMINE RELEASE IN STRIATAL SLICES AND MODULATE NICOTINE SELF ADMINISTRATION IN-VIVO

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Striatal dopamine plays an essential role in stimulus-response habits associated with nicotine addiction. Tonically active interneurons in striatum release ACh that acts on pre-synaptic nAChRs of dopamine terminals. Fast-scan cyclic voltammetry (FSCV) studies have revealed frequency dependent modulation of evoked dopamine release in striatum. We have used FSCV in combination with selective a-conotoxins and null-mutant mice to identify two populations of dopaminergic fibers in dorsal striatum (caudate-putamen). One population of fibers is characterized by a low action potential threshold and modulation by a6* nAChRs and the other is characterized by a higher action potential threshold and modulation by a4(non-a6)* nAChRs. Dorsal striatum primarily receives projections from the substantia nigra whereas ventral striatum receives projections principally from the ventral tegmental area. Compared to dorsal striatum, a6*nAChRs in the nucleus accumbens dominate the effect of nicotine on dopamine release (Exley et al., 2008). Accordingly, a6* nAChRs in nucleus accumbens represent an enticing target for medications to reduce nicotine use. Direct infusion of the a6 antagonist a-conotoxin MII into the nucleus accumbens shell of conscious rats reduced nicotine self-administration tested under a progressive ratio schedule. Thus, a6*nAChRs are key components of striatal dopaminergic function and a6*nAChRs in the nucleus accumbens shell are specifically implicated in physiological and behavioral indicators of nicotine self-administration.

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SYM1C CHRONIC NICOTINE TREATMENT MODULATES ALPHA6 CONTAINING NACHR ACTIVITY IN RODENTS AND PRIMATES

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Identification of the long-term effects of smoking is important, as tobacco use is generally a chronic behavior in man. Because nicotine is the primary addictive component in tobacco products, we initiated experiments to investigate its long-term effects on brain dopaminergic systems, which have a major role in nicotine reward and reinforcement. To approach this, we investigated changes in the function of alpha6 containing nicotinic receptors (alpha6* nAChRs), a subtype selectively present on catecholaminergic neurons. Fast scan cyclic voltammetry in control rats showed that the extent of stimulated striatal dopamine release mediated through alpha6* nAChRs was dependent on neuronal activity, that is, nonburst versus burst firing. This differential effect was lost with nicotine treatment. Studies done with knockout mice to elucidate how alpha6* nAChR subtypes are affected by chronic nicotine indicated that a6b2* nAChR-evoked dopamine release in nicotine-treated rats is primarily mediated by the a6(nona4)b2* nAChR subtype. This would suggest that the a6a4b2* and/or a4b2* nAChRs contribute to the differential effect of varying firing patterns observed on dopamine release under control conditions. We next performed studies to assess the effect of chronic nicotine exposure on stimulated dopamine release in striatal slices from monkeys. Alpha6* nAChRs regulated a large (>80%) proportion of nAChR-modulated striatal dopamine release. As in rodents, nicotine treatment modulated non-burst and burst-stimulated dopamine release, but only in some striatal regions. These combined data support a predominant role for a6b2* nAChRs in the regulation of evoked dopamine release in striatum. They also show that long-term nicotine treatment selectively modifies nAChR-modulated release in distinct striatal subregions. These alterations may represent a mechanism whereby nicotine exerts its behavioral effects. Overall, these data suggest that a6b2* nAChR subtypes may represent important targets for smoking cessation therapies and/or neurological disorders involving these receptors.

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SYM1D THE ROLE OF ALPHA6-CONTAINING NICOTINIC ACETYLCHOLINE RECEPTORS IN NICOTINE DEPENDENCE

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Expression of alpha 6-containing nAChRs in the brain is largely confined to catecholaminergic nuclei, such as the VTA, substantia nigra, and locus coeruleus, brain areas that have also been implicated as having a role in mediating behaviors associated with drugs of abuse, including nicotine and morphine. In addition, the subunit is involved in nicotine-stimulated dopamine release in the striatum. Using the alpha6-selective antagonist, alpha-conotoxin H9A; L15A (MII[H9A;L15A]), we determined the role of alpha 6-containing nAChRs in the pharmacological and behavioral effects of nicotine. We measured effects of pre-treatment with MII[H9A;L15A] on analgesia, locomotion, and body temperature following a single injection of nicotine. Effects of MII[H9A;L15A] on nicotine reward were measured using the conditioned place preference (CPP) paradigm. We further measured physical (somatic signs, hyperalgesia) and affective [anxiety-related behavior, conditioned place aversion (CPA)] nicotine withdrawal behaviors following extended nicotine exposure. Results showed that MII[H9A;L15A] did not block acute nicotine effects on the behaviors measured. Conversely, MII[H9A:l15A] blocked the expression of nicotine CPP, as well as withdrawal-associated CPA and anxiety-related behavior in the elevated plus maze, but not withdrawal-induced somatic signs or hyperalgesia. These results suggest a role for the alpha6 nAChR subunit in nicotine reward and affective nicotine withdrawal, but not acute nicotine-induced or physical withdrawal behaviors.

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SYM1E THE ROLE OF CHRNA6 AND CHRNB3 GENES IN TOBACCO AND ALCOHOL BEHAVIORS – HUMAN MOLECULAR GENETICS

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Decades of research in animal and pharmacological studies have provided evidence for an important role of nicotinic acetylcholine receptors in mediating responses to nicotine and alcohol. Several years ago, our group began examining the CHRN genes in three separate human samples, which had been assessed for tobacco and alcohol behaviors. One outcome of these studies has revealed important associations between the CHRNA6 and CHRNB3 genes with early subjective response to nicotine (Zeiger et al., 2008; Ehringer et al., in press), nicotine dependence (Bierut et al., 2007; Saccone et al., 2007; Hoft et al., 2009), and alcohol behaviors (Hoft et al., in press). To better characterize the possible functional role of specific associated SNPs, we have performed in vitro assays showing that variations (SNPs) in the promoter region of the human CHRNB3 gene may lead to differences in gene expression (Ehringer et al., in press). Ongoing work is aimed at identifying novel variations in these genes through re-sequencing efforts. Our goal is to collaborate with animal researchers to incorporate information gleaned about human genetic variation in studies, which take advantage of the powerful experimental genetics approaches available in animal models. Such continued cross-talk between human geneticists and basic scientists will provide a strong basis of improved understanding of the underlying mechanisms contributing to the genetic association, and yield important insight about possible prevention and treatment approaches to these disorders.

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SYM2 COGNITIVE NEUROSCIENCE APPROACHES TO THE TREATMENT OF NICOTINE DEPENDENCE: FROM FISH TO MOUSE TO MAN

Presenters: Edward Levin, Ph.D.[1], Thomas Gould, Ph.D.[2], Caryn Lerman Ph.D.[3], David Drobes, Ph.D.[4], and Glen Morgan, Ph.D.*[5]; [1]Duke University; [2]Temple University; [3]University of Pennsylvania; [4]Moffitt Cancer Center and the University of South Florida; [5]National Cancer Institute

Relapse to smoking soon after a quit attempt is increased by cognitive performance deficits. Clarifying the neurobiological and behavioral mechanisms that underlie the effects of nicotine and withdrawal on cognitive function is, therefore, critical to develop more efficacious treatments. This symposium addresses this question across several model systems, including zebrafish, mouse models, human brain imaging, and clinical research. Dr. Levin will present new data on effects of nicotine on learning and memory in zebrafish, providing a novel model for screening nicotinic ligands as potential therapeutic agents for cognitive improvement and understanding the importance of nicotinic effects on cognitive function in development of conditioned reinforcement. Dr. Gould will discuss new data on the effects of nicotine withdrawal in mice across a number of learning paradigms, the neural substrates of these deficits, the role of background genotype in these withdrawal deficits, and the effects of varenicline, a partial α4β2 nicotinic acetylcholine receptor agonist, on the learning deficits. Dr. Lerman will present new findings from functional MRI research concerning the effects of varenicline on cognitive performance and brain function in abstaining smokers, and discuss neuroimaging applications to treatment development. Dr. Drobes will present new data examining the relationships between genetic risk for smoking, neural indices of cognitive function, and the effects of nicotine and withdrawal on cognition. These findings will be discussed in relation to a cognitive self-medication model of nicotine reinforcement. Collectively, these presentations will elucidate the role of cognitive function in nicotine dependence and underlying molecular mechanisms, and thus provide the foundation for an integrated cognitive neuroscience approach to treatment development for nicotine dependence. Finally, the discussant, Dr. Morgan, will comment on the potential clinical implications of these findings and issues in the translation of cognitive neuroscience research to nicotine dependence treatment.

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SYM2A HIPPOCAMPUS-DEPENDENT LEARNING IN MICE IS SUSCEPTIBLE TO THE EFFECTS OF NICOTINE WITHDRAWAL: THE EFFECTS OF BACKGROUND GENETICS AND VARENICLINE ON THESE DEFICITS

Thomas J Gould, Ph.D.* and George Portugal, Department of Psychology, Temple University

Cognitive changes in smokers during periods of abstinence are an important component of nicotine withdrawal that contributes to relapse. However, when examining the literature on animal models of withdrawal, it is clear that there is a dearth of information on the genetic and neural substrates of nicotine withdrawal deficits in cognitive processes. This presentation will discuss new data on the effects of nicotine withdrawal in mice across a number of learning paradigms and the role of background genotype in these withdrawal deficits. Evidence will be presented that these effects are largely mediated by high affinity nicotinic receptors in the hippocampus and that the partial 4β2 nicotinic receptor agonist varenicline ameliorates these deficits. The effects of nicotine withdrawal on contextual conditioning, trace conditioning (a model of working memory), cued conditioning, novel object recognition, and spatial object recognition were examined in C57BL/6 mice. Deficits were confined to tasks that engaged the hippocampus (contextual conditioning, trace conditioning, and spatial object recognition) and direct drug infusion studies confirmed that high affinity hippocampal nicotinic receptors were involved in these effects. Follow-up studies examined withdrawal related changes in C57BL/6J (C57), BALB/cByJ (BALB), CBA/J (CBA), A/J (A), 129S6/SvEvTac (129/SvEv), DBA/2J (DBA2), C3H/HeJ (C3H), and DBA/1J (DBA1) mice and the effects of varenicline on withdrawal deficits. Background genotype greatly impacted sensitivity to the effects of nicotine withdrawal on learning and varenicline reversed withdrawal-associated deficits. These results identifying neurobiological and genetic factors that contribute to the effects of nicotine withdrawal on learning will be discussed in relationship to understanding nicotine addiction and the development of novel treatments that could potentially be tailored by genotype to provide the most effective treatment.

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SYM2B ZEBRAFISH SHOW NICOTINE-INDUCED COGNITIVE IMPROVEMENT: THEIR USE TO DISCOVER NEUROBEHAVIORAL MECHANISMS AND TO SCREEN FOR NOVEL NICOTINIC THERAPEUTICS

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Nicotinic acetylcholine receptors are phylogenetically quite ancient and are used in the nervous systems of a great number of species in broad parts of the animal kingdom. The functional mechanisms by which neuronal nicotinic receptor actions underlie behavior can be usefully studied in a variety of experimental models. Zebrafish provide a useful model in which to study nicotine effects on cognitive function. We have developed a three-chamber apparatus and procedure to determine spatial discrimination learning and spatial alternation memory in zebrafish. They show the same inverted J-shaped dose effect function as mammals of nicotine improving memory at low to moderate doses with the effect trailing of at higher doses to no effect then impairment. The time-effect function of nicotine-induced learning improvement provides clues about the receptor basis of the effect. The nicotine-induced improvement is delayed relative to effects on response latency with a peak effect seen at 20-40 minutes after nicotine administration. Interestingly, when mecamylamine is given with nicotine 20 minutes before testing no attenuation of the learning improvement is seen. However when the same mecamylamine dose is given 15 minutes after nicotine administration shortly before testing there is complete reversal of the nicotine effect. This pattern of mecamylamine not blocking the induction of the nicotine effect but blocking its expression is consistent with the induction of the effect being desensitization of nicotinic receptors and the expression being recovery from that desensitization. In recent neurochemical studies we have found that increased brain dopamine activity is key for nicotine-induced learning improvement. Zebrafish are useful for the study of nicotine effects on learning and memory, determination of critical mechanisms and given the economical aspects of zebrafish could be quite useful for screening novel nicotinic ligands for further development as therapeutic agents for cognitive improvement.

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SYM2C VARENICLINE INCREASES WORKING MEMORY-RELATED BRAIN ACTIVITY DURING NICOTINE ABSTINENCE: IMPLICATIONS FOR MEDICATION DEVELOPMENT USING FMRI

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Cognitive alterations are a core symptom of nicotine withdrawal, contributing to smoking relapse. Recent evidence suggests that such cognitive deficits can be reversed by treatment with the α4β2 nicotinic receptor partial agonist varenicline. This presentation includes new data from a neuroimaging study, which examined the neural mechanisms that underlie varenicline effects on cognitive performance in abstaining smokers. Twenty-five smokers participated in a double-blind crossover study with two fMRI sessions: after 3 days of monitored abstinence while on varenicline, and after 3 days of monitored abstinence while on placebo (counterbalanced randomized order, 2-week washout). BOLD data were acquired during performance of a visual N-back working memory task. Significant effects of treatment on mean percent signal change (varenicline > placebo) were observed in the anterior cingulate cortex (ACC), left dorsolateral prefrontal cortex (DLPFC), and right DLPFC. In a cross-region model, there was a significant interaction of treatment by memory load, indicating significant increases in BOLD signal for varenicline versus placebo at the 2-back and 3-back levels. There was a trend for treatment effects on overall correct response time. These data will be discussed in the context of genetic susceptibility to nicotine dependence as well as emerging evidence for the role of cognitive deficits in smoking relapse. The potential role of BOLD fMRI as an early surrogate marker for response to medications for nicotine dependence will also be explored in this presentation.

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SYM2D NICOTINE, WITHDRAWAL, AND NEUROCOGNITIVE ACTIVITY: GENETIC MODERATION

David J. Drobes, Ph.D.* and David E. Evans, Ph.D., Moffitt Cancer Center and University of South Florida

There is substantial evidence for deleterious effects of nicotine abstinence on attentional control and working memory among nicotine dependent individuals. Increasingly, preclinical and clinical research also supports direct facilitative effects of nicotine on similar domains of cognitive functioning. Individuals with preexisting or acquired cognitive deficits may be especially vulnerable to these cognitive effects as a form of nicotine self-medication, which may elevate both the risk for and severity of nicotine dependence. Indeed, neuropsychiatric disorders that are marked by cognitive deficits (e.g., ADHD, schizophrenia) are associated with elevated smoking rates, and nicotine appears to reduce some of the cognitive symptoms associated with these disorders. Across the spectrum of non-disordered individuals there may be a role for cognitive nicotinic self-medication that varies as a function of baseline cognitive functioning. In this vein, certain genetic predispositions toward smoking may operate through individual differences in cognitive performance. We examined relationships between genetic risk for smoking and neural indices of attentional control following direct administration of nicotine, as well as during nicotine withdrawal. In one study, familial smoking was positively related to autonomic arousal and attentional-cognitive activity (pre-pulse inhibition) following intravenous nicotine administration in both smokers and nonsmokers. More recently, we observed that a frequently studied genetic variant related to dopaminergic receptor activity (DRD2 Taq 1A polymorphism) moderated neurocognitive disruption during nicotine withdrawal, with carriers of the reduced function A1 allele showing greater deficits in the event-related brain potential during attentional tasks. In addition, a more severe neurocognitive decrement was shown among smokers in withdrawal who reported greater state negative affect. Taken together, these findings provide some first steps toward validating a cognitive self-medication model of nicotine reinforcement, and demonstrate the value of lab-based psychopharmacology paradigms for understanding the genetic risk for smoking.

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SYM3 NEW AND EMERGING TOBACCO PRODUCTS AND TOBACCO SUBSTITUTES: ELECTRONIC NICOTINE DELIVERY SYSTEMS ("ENDS"), SNUS, AND LITTLE CIGARS AND CIGARILLOS

Presenters: Nathan Cobb[1], David Abrams*[1], Lois Biener[2], and Jennie Cullen*[3]
[1]Schroeder Institute for Tobacco Research and Policy Studies; [2]Center for Survey Research, University of Massachusetts; [3]American Legacy Foundation

This panel will focus on three new and emerging tobacco products and tobacco substitutes: electronic nicotine delivery systems ("ENDS"), snus and little cigars and cigarillos. The science on health effects and patterns of use in U.S. are weak for these products. Panelists will provide an overview of the existing science on health effects and use, including where the science is headed, and policy implications. A number of electronic nicotine delivery systems ("ENDS") have recently appeared in the US marketplace under a variety of brand names and descriptors (e.g., electronic cigarettes, e-cigarettes). ENDS are advertised as a safer alternative to smoked tobacco. The FDA is beginning to assess the safety of ENDS. Manufacturers have not yet complied with FDA regulatory requirements and have claimed their products are exempt; thus there is no full disclosure of ingredients; there is little data on human exposures or health effects; and marketing claims and uses have not been studied. This raises a number of public health issues and policy questions. Snus is a smokeless tobacco product, which has lower levels of nitrosamines as compared with typical smokeless products. The science on snus is inconsistent, however, and the product has generated controversy within the public health community. This study uses 2008 longitudinal data to assess awareness and use of Snus among adult smokers in the U.S. It reports on demographic and smoking patterns that predict snus trial and provides recommendations on the design of survey questions that will yield accurate population estimates. Little cigars and cigarillos are offshoots of the full-size cigar, but their lower pH may lead to deeper inhalation when smoking, making them potentially more harmful. This study examines six waves of the National Survey on Drug Use and Health to examine time trends in the epidemiology of cigar use among adults aged 18-25 from 2002-2007. There is an emphasis on racial patterns in use of certain brands. A secondary study aim is to examine the demographic and risk profile factors that predict use of these products, alone, as well as use with cigarettes, marijuana or "blunts."

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SYM3A EPIDEMIOLOGY OF LITTLE CIGAR AND CIGARILLO USE AMONG YOUNG ADULTS IN THE UNITED STATES

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National patterns in US cigar consumption demonstrate dramatic increases over the past decade. The reported increase in consumption appears to be largely driven by a rise in small or "little" cigars, as well as products known colloquially as "cigarillos." Popularity of these products may be in part attributable to their lower prices in comparison to cigarettes. Cigars pose significant health risks, contributing to cancer of the mouth, lung, esophagus, and larynx. Prevalence data on use of these products is scant, in part because the Federal Government does not require reporting on cigarillo sales, and in part because surveillance instruments have not kept pace with industry marketing; many consumers know these products by a brand name rather than as little cigars or cigarillos. This study consists of a secondary data analysis of six consecutive, annual cross-sectional waves of the National Survey on Drug Use and Health (NSDUH). The primary aim was to examine time trends in the descriptive epidemiology of cigar use among young adults aged 18-25 in the US between 2002-2007, with an emphasis on racial patterns in use of cigar brands that may be characterized as little or small cigars or cigarillos. The primary hypothesis is that cigar use prevalence among young adults is substantial and racial variation exists such that cigar use is higher among African Americans versus other racial subgroups. Prevalence estimates in 18-25 year olds reveal a sizable proportion of cigar use in the past 30 days. Strong variation in brands preference by race was noted with Black non-Hispanics far more likely to report use of Black and Mild, a brand primarily represented by cigarillos. Strikingly, almost half of Black non-Hispanic (NH) cigar users reported product use on 8-30 days of the last 30 days. In contrast, NH White and Hispanics skewed toward use of cigars for 7 or fewer of the last 30 days. A time trend analysis revealed that among NH White males rates are use increasing; yet prevalence in use for Black and Hispanic males has remained stable or slightly decreased. This study underscores the importance of examining cigar use for demographic subgroups.

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SYM3B WHO IS TRYING THE NEW SNUS PRODUCTS? PREDICTING AND MEASURING CONFIRMED TRIAL

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Since 2006, US cigarette manufacturers have been promoting new, low nitrosamine smokeless tobacco products to smokers. Until last spring when one brand went national, U.S. availability was limited to 18 cities. Given the current controversy regarding snus' potential impact on tobacco related illness, accurate surveillance of population response is essential. Previous attempts at surveillance of PREPs have resulted in likely over-estimates of awareness and trial due to confusion about which product is being designated by survey questions. The current study reports on characteristics of snus triers and provides evidence about the impact of question wording. Respondents to a survey of 4,067 smokers in 8 cities, three of which were designated snus test markets, were asked whether they were aware of "New tobacco products…that come in teabag-like pouches that are put in the mouth under the lip…and do not involve chewing, spitting or smoking." Those responding "yes" were asked if they'd tried it in the past year, and if so to provide the brand name. Results demonstrated that reports of trial were inflated by a factor of 2 in test market cities and 7 in non-test market cities, with most reports being for conventional smokeless tobacco products, medicinal nicotine and even cigarettes. Confirmed trial, i.e., reports of having tried one of the new products and naming a recognized brand, was reported by 10.4% of smokers in the test markets. Multivariate analyses showed that snus trial was more likely in test markets than non-test markets, 4 times as likely among males than females, and nine times as likely among young adult smokers 18 to 24 than among smokers 36 and over. Those with no immediate plans to quit were more than twice as likely to try snus as those reporting an intention to quit in 30 days. Findings demonstrate high receptivity to snus among young adults who are not interested in quitting smoking soon, but interpreting this finding is difficult without carefully designed longitudinal studies. Survey questions requiring brand recall to establish confirmed awareness and trial is recommended in order to produce valid population estimates.

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SYM3C ELECTRONIC NICOTINE DELIVERY SYSTEMS ("ENDS") IN THE USA: IMPLICATIONS FOR POLICY

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A variety of electronic nicotine delivery systems (ENDS) have recently appeared in the US marketplace. ENDS are advertised as an alternative to smoked tobacco, via a battery-powered device that is claimed to provide inhaled doses of nicotine in a vaporized form. ENDS products are marketed under a variety of brand names and descriptors (e.g., electronic cigarettes, e-cigarettes) and generally contain cartridges filled with propylene glycol, nicotine, flavorings and other chemicals. ENDS are available online and in shopping malls. They are also available in different flavors, such as chocolate, which may appeal to young people. ENDS raise a number of public health issues and questions for policy. This presentation will examine the issues raised by the introduction of ENDS into the US Market. Where possible, publicly available data from FDA or other sources will be used to illustrate the problematic issues raised. For example it is now known that less nicotine is contained in some cartridges than advertised by the manufacturers, that there is large variability in the content of cartridges within and across manufacturers; and that little nicotine is being vaporized using an FDA simulated method. Manufacturers have not independently complied with FDA regulatory requirements and have claimed their products are exempt; thus there is no required disclosure of ingredients in ENDS; there are little data on actual human exposures or health effects; and the marketing claims and uses have not been studied. The ENDS products have the potential to be used as cessation aids with unknown safety or efficacy, to undermine public smoking bans, or to undermine smoking cessation efforts by acting as a bridge product when smokers can't smoke. Although marketed to adults over 18, ENDS may undermine tobacco-use prevention among youth or children because of the attractive flavors and being seen as a safer alternative. ENDS will be used as an example of how the FDA will need to structure one part of its recently authorized Center to address the introduction of new products.

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SYM4 IMPROVING NICOTINE DEPENDENCE TREATMENT OUTCOMES USING A PERSONALIZED MEDICINE APPROACH

Presenters: Sean P. David, M.D.[1], Marc Kaufman, Ph.D.[2], A. Eden Evins, M.D., M.P.H.[3], Maurizio Fava, M.D.*[3]; [1]Stanford University; [2]McLean Hospital; [3]Massachusetts General Hospital

Five million people worldwide die annually from smoking-related illnesses, and 1.2 billion people smoke. Unfortunately, smoking rates worldwide are increasing and, while effective treatments are available, they work in a minority of smokers on any given attempt and for those who do quit, smoking relapse rates exceed 90% on any given quit attempt. Thus, better and more personalized cessation and relapse prevention treatments could substantially reduce the public health burden of tobacco smoking. Clinical and translational research in this area is fertile. This panel will discuss recent clinical, statistical, genetic, and imaging research findings aimed at enabling better stratification of smokers into treatment groups that can be targeted more directly and effectively. The findings also have the potential to aid drug discovery efforts for subgroups of smokers. Clinical research will be presented including results from genome-wide association and candidate gene studies, behavioral and cognitive testing studies, functional magnetic resonance imaging studies and biostatistical analytic prediction methods. Results show that genes variants in the serotonin and dopamine pathways modulate likelihood of response to available treatments for tobacco dependence, insula hyperreactivity to smoking-related cues and attentional bias toward smoking cues can differentiate smokers likely to relapse after initial abstinence, and multiple baseline characteristics can be used in a novel statistical modeling paradigm to select the best treatment among effective available treatments to which an individual is most likely to exhibit a response.

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SYM4A INVESTIGATING NOVEL MOLECULAR TARGETS FOR DRUG RESPONSE AND DISCOVERY FOR SMOKING CESSATION: TRIANGULATING DATA FROM PRECLINICAL NEUROIMAGING STUDIES AND CLINICAL TRIALS

Sean P. David, M.D., S.M., D.Phil., Family and Community Medicine, Stanford University School of Medicine

The emerging fields of smoking cessation pharmacogenetics and pharmacogenomics have been informed by pharmacologically-based selection of candidate genes and preclinical investigations of brain function (e.g., receptor expression) and behavioral mechanisms (e.g., neural reward pathways) moderating nicotine dependence. While multiple pharmacological pathways are implicated in nicotine dependence, genetic variants in the dopamine and serotonin pathways have demonstrated robust findings, positive and null, respectively, when examined in smoking cessation clinical trials of bupropion and nicotine replacement therapy. Dr. David will present evidence of triangulation between findings from functional neuroimaging studies (fMRI, PET) and laboratory-based preclinical studies with novel data demonstrating associations between variants in the dopamine pathway (i.e., DAT, DRD4, COMT) and efficacy of bupropion for smoking cessation. In addition, we review extant data on DA and 5-HT genes and from candidate gene and results from genomewide association studies suggesting convergence and replication. Finally, we synthesize the results of these investigations and studies presented in this symposium by Drs. Evins and Kaufman to point toward novel molecular targets for biologics and drug discovery.

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SYM4B BASELINE REACTIVITY TO SMOKING CUES PREDICTS WHICH SMOKERS WILL RELAPSE AFTER INITIAL ABSTINENCE: EVIDENCE FROM FUNCTIONAL MRI AND COGNITIVE NEUROSCIENCE APPROACHES

Marc J. Kaufman, Ph.D.*[1], Amy C. Janes, Ph.D.[1], Diego A. Pizzagalli, Ph.D.[2], Gladys Pachas, M.D.[3], Blaise deB Frederick[1], Sarah Richardt[1], and Melissa A. Culhane, Ph.D.[3]; [1]McLean Hospital Brain Imaging Center; [2]Harvard University; [3]Massachusetts General Hospital

Developing means to identify smokers at high risk for relapse could advance relapse prevention therapy. We used smoking cue reactivity functional MRI (fMRI) in smokers about to begin a smoking cessation clinical trial to determine whether pre-quit fMRI reactivity patterns could differentiate those who would eventually slip (smoke ≥ 1 cigarette after establishing abstinence) from those maintaining abstinence. Prior to quitting smoking and entering the clinical trial, 21 women provided medical histories (≥6 months of smoking ≥10 cigarettes/day, expired carbon monoxide >10 ppm at screening, but otherwise healthy); 19 were screened with an emotional Stroop (ES) task to detect attentional bias to smoking-related words. All underwent fMRI scans on a 3 Tesla MRI scanner. A whole-brain analysis was performed (Brain Voyager 1.10.4) with multiple comparisons corrected to p=0.005. Regions of interest were anatomically defined to extract data for correlation analyses with ES data. ES reaction time (RT) and accuracy interference effects were greater in slip (N=8) versus abstinent (N=11) subjects ($F1,16>9.8$, $p<0.01$). Cue reactivity fMRI activation was greater in slip (N=9) versus abstinent (N=12) subjects in mean bilateral anterior insula (AI), dorsal anterior cingulate cortex (dACC), amygdala, prefrontal cortex, and other areas. In subjects performing both tasks, AI fMRI activation was correlated with ES accuracy ($r=-0.62$, $p<0.01$) and RT ($r=0.5$, $p=0.03$), and dACC fMRI activation was correlated with ES accuracy ($r=-0.53$, $p=0.02$). A discriminant analysis (cross-validation approach) found that ES accuracy, RT, and AI and dACC fMRI reactivity were strong outcome predictors (5 of 8 slip and 10 of 11 abstinent subjects; 79% accuracy; $\chi2(4)=10.4$, $p<0.05$). These data suggest that it may be possible to identify smokers at high risk for relapse before they attempt to quit smoking and triage them to intensive relapse prevention therapy. The fMRI findings are consistent with the known structural and functional connectivity of these regions and with reports implicating the insula and ACC as playing important roles in smoking urges and in maintaining smoking dependence.

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SYM4C NOVEL BIOSTATISTICAL PREDICTIVE MODEL TO IMPROVE OUTCOMES THROUGH PERSONALIZED TOBACCO DEPENDENCE TREATMENT

A. Eden Evins, M.D., M.P.H.*, Rui Wang, Ph.D., and David A. Schoenfeld, Ph.D., Massachusetts General Hospital

Individual clinical predictors of successful smoking cessation have been identified and replicated in the general population and in subgroups of smokers with various treatments. Innovative analytic approaches promise to refine our ability to develop predictive models and biomarkers of interventions for tobacco dependence. As part of a clinical trial program to develop patient-centered therapies for tobacco dependence, we developed an analytic method for modeling treatment response with the goal of predicting the efficacy of interventions with different mechanisms of action in individual patients. A test of this model used a placebo-controlled trial of fluoxetine, behavior therapy and combination treatment for depression in adolescents, the TADS study. In this trial combination treatment was superior to fluoxetine and to behavior therapy and fluoxetine and behavior therapy were superior to placebo. Our hypothesis was that the three active treatments would have different moderators of response, factors measured at baseline that determine response. We were particularly interested in identifying variables whose coefficients were different for each of the treatments. The logistic model to be described formed a predictive equation of how each patient would respond to each treatment. We then calculated, according to each individual's moderators, what would be the probability for each patient of response to each treatment and to placebo. The resulting treatment assignment based on the predictive equation using only baseline data in the test dataset resulted in better outcome than that observed for those assigned to the best treatment in the clinical trial, combination treatment. Thus there is a potential for a gain in efficacy with personalized treatment assignment via predictive modeling over assignment of all patients to the treatment found to be superior in the clinical trial. Prospective validation is warranted. Discussion will include issues such as confidence intervals, significance testing, cross-validation, validation in a second trial, issues such as "over-fitting", and potential clinical implications.

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SYM5 DISENTANGLING THE EFFECTS OF THE CHRNA5/A3/B4 GENE CLUSTER ON VARIOUS DRUG-RELATED BEHAVIORS USING HUMAN, MOLECULAR, AND MOUSE GENETICS

Chairs: Marissa A. Ehringer and Richard Grucza
Presenters: Richard Grucza[2]; Marissa A. Ehringer[3], Ryan M. Smith[4], and Jerry A. Stitzel[3]
Discussant: Robin Lester*[1]
[1]University of Alabama, Birmingham, AL; [2]Washington University, St. Louis, MO; [3]University of Colorado, Boulder, CO; [4]The Ohio State University, Columbus, OH

The CHRNA5/A3/B4 gene cluster region on human chromosome 15 has been associated with smoking-related behaviors and/or smoking-related diseases in multiple studies, including age of initiation, "pleasurable buzz" during early experimentation with smoking, cigarettes per day, age-dependent nicotine dependence, nicotine dependence, and lung cancer. In addition, it has been associated with alcohol dependence, level of response to alcohol, and cocaine dependence. Furthermore, a dense coverage of single nucleotide polymorphisms (SNPs) in all CHRN genes has identified multiple distinct loci (independent signals) in the CHRNA5/A3/B4 cluster. Functional work has provided evidence that the risk allele at rs16969968 which changes an amino acid in CHRNA5 leads to decreased response to a nicotine agonist, but it remains unclear what functional SNP(s) might underlie the other genetic signals, and how these different loci may interact within this cluster and/or across other CHRN genes. Progress toward understanding the molecular complexity of the CHRNA5/A3/B4 region and its contribution toward specific drug-related "endophenotypes" will be presented through four ongoing projects. First, Dr. Richard Grucza will provide human genetic data supporting the hypothesis that the RISK allele of rs16969968 for nicotine dependence is a PROTECTIVE allele for cocaine dependence. Dr. Marissa Ehringer will present human genetic data illustrating a possible role of these genes in general disinhibitory behaviors, and in vitro molecular genetic studies of specific SNPs. Ryan Smith has conducted experiments demonstrating allele-specific mRNA expression of the CHRNA5, providing insight into underlying mechanisms which may regulate gene expression. Finally, Dr. Jerry Stitzel will share exciting new findings from mouse genetic studies which support human genetic evidence for gene-gene interaction between CHRNA5 and CHRNA4. Together, these studies highlight the complexity of nicotinic receptor gene regulation and its role in mediating drug-related behaviors. Continued efforts should lead to the development of improved prevention, diagnostic, and treatment approaches for these diseases.

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SYM5A ASSOCIATIONS OF CHRNA5-A3-B4 POLYMORPHISMS WITH SUBSTANCE DEPENDENCE: SPECIFICITY FOR NICOTINE AND COCAINE

Richard Grucza*[1], Robert Krueger[2], Jaime Derringer[2], Pamela Hipp[2], Arpana Agrawal[2], Michael Lynskey[2], Jay Tishfield[3], John Rice[1], Alison Goate[1], Danielle Dick[4], John Nurnberger[5], Rosalind Neumann[1], Howard Edenberg[5], and Laura Bierut[1]; [1]Department of Psychiatry, Washington University, Saint Louis, MO; [2]Department of Psychology, Washington University, Saint Louis, MO; [3]Rutgers University; [4]Department of Psychiatry, Virginia Commonwealth University; [5]Indiana University School of Medicine, Indianapolis, IN

Single Nucleotide Polymorphisms (SNPs) in the CHRNA5-A3-B4 gene cluster on chromosome 15 have been repeatedly shown to be associated with nicotine dependence, although associations with alcohol and cocaine dependence have also been reported. When multiple substance dependence phenotypes are considered together, are these SNPs specific to nicotine dependence risk, or are they also associated with reduced risk for dependence on other substances? In the present study, we addressed this question using data from an expanded sample of 3,980 European Americans and African-Americans from the "Study of Addiction: Genes and Environment" (SAGE) collaboration. Joint associations between symptoms of nicotine, alcohol, marijuana, and cocaine dependence and CHRNA5-A3-B4 SNPs were analyzed by predicting allele count from the four dependence phenotypes. Both omnibus, 4 df p-values, and substance-specific effect sizes were evaluated. The strongest associations were with rs16969968 and rs578776; other associated SNPs exhibited moderate to strong correlations with these tag SNPs. Associations were specific to nicotine and cocaine dependence symptoms, and exhibited the previously observed bidirectional association, for which the risk allele for nicotine dependence was the protective allele for or cocaine dependence. Analysis of diplotypes formed by the tag SNPs show an overall association with p=1.9 x 10-8, driven by nicotine and cocaine dependence. Similar analyses were performed in a separate sample comprising 2,345 subjects from the Genetic Association Information Network (GAIN) and were generally consistent with SAGE results. These analyses add to the compelling evidence of association between CHRNA5-A3-B4 polymorphisms and nicotine dependence, and demonstrate that the previously reported association with alcohol dependence may be driven by comorbid cocaine dependence. While it is not possible to infer a biological mechanism for the bidirectionality of these associations we note that nicotinic receptors are likely to play a role in modulating cocaine-induced reward, and that this mechanism is quite distinct from their role in transducing nicotine-induced reward.

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SYM5B THE ROLE OF CHRNA5/A3/B4 IN EARLY DISINHIBITORY BEHAVIORS – HUMAN MOLECULAR GENETICS

Marissa A. Ehringer*, Elizabeth M. Funk, Nicole R. Hoft, Jerry A. Stitzel, and Sarah H. Stephens, Institute for Behavioral Genetics and Department of Integrative Physiology, University of Colorado, Boulder, CO

Human genetic studies have identified the cluster of nicotinic receptor genes (CHRNA5/A3/B4) on chromosome 15 as strong candidates for association with drug behaviors, including smoking, alcohol phenotypes, and cocaine dependence. These genes have also been associated with lung cancer, but it remains unclear what aspects of this association may be mediated through smoking behavior. In the current study, we have found evidence that SNPs in this region are associated with more general measures of disinhibitory behavior, including conduct disorder, which is a known risk factor for early initiation of drugs and later problems. Three independent human genetic samples have been examined, including subjects from the Center for Antisocial Drug Dependence, the National Youth Survey Family Study, and the National Longitudinal Study of Adolescent Health. There is supporting evidence from molecular, pharmacological, and animal studies that transcriptional regulation of these genes is likely to be co-regulated and complex, and that the alpha3 and beta4 subunits might be good targets for development of smoking cessation drugs. We have initiated studies to assess the putative functional differences of alleles for SNPs in the intergenic region between CHRNA3 and CHRNB4 that have been implicated in human studies. Results from luciferase-gene assays in immortalized cell culture lines and in primary mouse neuronal embryonic cell cultures provide evidence that at least two SNPs in this region may lead to differences in gene expression.

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SYM5C NICOTINIC ALPHA5 RECEPTOR SUBUNIT mRNA EXPRESSION MODULATED BY DISTANT UPSTREAM POLYMORPHISMS

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The nicotinic receptor alpha5 subunit is expressed at low levels throughout the human brain where it primarily incorporates into alpha4 and beta2 subunit containing nicotinic receptors, affecting ligand-mediated signaling. Genetic association implicates the alpha5 subunit, encoded by CHRNA5, in nicotine addiction and lung cancer. Candidate risk polymorphisms within CHRNA5 include a non-synonymous single nucleotide polymorphism (SNP) (rs16969968) affecting receptor signaling properties, and promoter polymorphisms associated with increased CHRNA5 mRNA expression. By measuring allele-specific mRNA expression of CHRNA5, we identified three SNPs (rs880395, rs905740, and rs7164030), in high linkage disequilibrium (LD) with each other located 13.5 kilobases upstream of the CHRNA5 transcription site, that fully account for a greater than fourfold increase in CHRNA5 mRNA expression compared to their ancestral alleles. Other promoter polymorphisms, such as deletion rs3841324, which is in partial linkage disequilibrium with the enhancer SNPs, accounted only partially for differential allelic expression. We cannot exclude the possibility of additional functional CHRNA5 variants to influence protein expression and function. Implications of the proposed enhancer SNPs will be discussed.

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SYM5D THE EFFECT OF CHRNA5 DELECTION ON NICOTINE CONSUMPTION IN MICE IS DEPENDENT UPON GENETIC BACKGROUND

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A significant number of recent studies have implicated genetic variants in CHRNA5, the gene that encodes the alpha5 subunit of the nicotinic acetylcholine receptor (nAChR), in altering risk for nicotine dependence. To assess whether Chrna5 influences nicotine intake in mice, we tested Chrna5 knockout mice and their heterozygous and wild-type littermates for free-choice oral nicotine consumption. The experiment was done in two different genetic backgrounds, C57BL/6J congenics and a C57BL/6J x C3H/Ibg F2 population. Results indicated that deletion of Chrna5 has no effect on nicotine consumption when assessed on a C57BL/6J background but increased nicotine consumption when tested on the C57 x C3H F2 background. The increased consumption of nicotine in Chrna5 knockout mice on the F2 background appeared to be due to a reduction in avoidance rather than an increase in drug seeking. This finding suggests that deleting Chrna5 decreases sensitivity to the aversive affects of nicotine rather than increases sensitivity to the reinforcing properties of the drug. Moreover, the observation that the effect of Chrna5 manipulation on nicotine consumption is genetic background-dependent indicates that there are strain dependent genetic modifiers that alter the genotype-phenotype relationship. Because the C57BL/6J and C3H/Ibg mouse strains are known to possess naturally occurring polymorphisms in several other nicotinic receptor subunit genes, we currently are examining whether any of these variant alleles modify the relationship between Chrna5 genotype and nicotine consumption. Preliminary results indicate that a non-synonymous polymorphism in Chrna4 affects the relationship between Chrna5 genotype and nicotine consumption. This observation is consistent with recent data from human studies that have described genetic interactions between Chrna4 and Chrna5 in modulating risk for nicotine dependence.

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SYM6 THE ASSOCIATIONS OF TOBACCO OUTLET DENSITY, SALES, AND MARKETING WITH NEIGHBORHOOD DEMOGRAPHICS, AND THEIR IMPACT ON SMOKING CESSATION: NEW DIRECTIONS FOR TOBACCO CONTROL POLICY

Chair: Lorraine R. Reitzel, Ph.D.*[1]
Presenters: John E. Schneider, Ph.D.[2], Cory M. Morton, M.S.W.[3], Mohammad Siahpush, Ph.D.[4]
Discussant: Catherine Cubbin, Ph.D.*[5]
[1]University of Texas, M.D. Anderson Cancer Center; [2]Health Economics Consulting Group and Drew University; [3]Rutgers University; [4]University of Nebraska Medical Center; [5]University of Texas at Austin

With the emergence of advertising restrictions over the last few decades, tobacco companies have had to increasingly rely on product availability and marketing at the point of sale for their revenue. Concurrent with these changes has been the increasing concentration of smoking among individuals with the lowest levels of income, education, and occupational status, and the growing use of tobacco among certain racial/ethnic minority groups. With the relatively unrestricted availability of licenses to sell tobacco and the absence of zoning laws, one way tobacco companies might maintain sales is to increase the availability and marketing of cigarettes in the neighborhoods where their consumers reside via a concentration of tobacco retail outlets. The goals of this symposium are to explore this possibility by investigating the associations of tobacco retail outlet density, tobacco sales in pharmacies, and tobacco marketing with neighborhood characteristics. We will also explore the influence of tobacco retail outlets on smoking cessation. John Schneider will present a statewide analysis of New Jersey showing that higher concentrations of tobacco outlets are found in neighborhoods with lower median incomes and more racial/ethnic minorities. Cory Morton will describe results indicating that pharmacies selling tobacco in Iowa are more likely to be located in neighborhoods with higher proportions of African-American residents. Mohammad Siahpush will report findings that point of sale tobacco marketing in Omaha, Nebraska is greater in neighborhoods with lower median incomes. Finally, Lorraine Reitzel will present data from Houston, Texas indicating that residential proximity to tobacco retail outlets predicted smoking relapse during a specific quit attempt among a racial/ethnically diverse group of low-income smokers, over and above the influence of individual-level sociodemographic and tobacco dependence variables. Each presenter will explore how their results might inform a new generation of tobacco control policies. Catherine Cubbin will serve as the discussant.

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SYM6A TOBACCO OUTLET DENSITY AND DEMOGRAPHICS AT THE TRACT-LEVEL OF ANALYSIS IN NEW JERSEY: A STATEWIDE ANALYSIS

John E. Schneider, Ph.D.*[1], N. Andrew Peterson, Ph.D.[2], Cory M. Morton[2], Robert J. Reid, Ph.D.[3], Megan A. Sheffer, M.P.H., Ph.D.[5], Danlin Yu[6]; [1]Health Economics Consulting Group and Drew University; [2]Rutgers University; [3]Montclair State University; [5]University of Wisconsin, Madison; [6]Montclair State University

Despite decreasing smoking prevalence rates in the United States, the public health community is becoming increasingly concerned with the widening tobacco use and exposure gap among minority populations. For example, smoking rates among African Americans increased from 19.6% in year 2000 to 22.5% in year 2005. An approach that has not been widely discussed or tested in NJ is the application of preventive strategies, such as zoning ordinances, to control the density or location of tobacco selling retail outlets. In this paper, geographic relationships between tobacco outlet density and demographic variables were examined at the tract-level of analysis in New Jersey. Data for 1,938 residential census tracts were analyzed. The 2000 TIGER/Line files were used to geocode the addresses of 13,984 licensed tobacco-selling retail outlets. Median household income, the percent of African American residents, and the percent of Hispanic residents were based on year 2000 census data. Address matching with ArcGIS® resulted in successful geocoding of 13,984 (93.1%) of the 15,037 licensed outlets. Extending previous single-county studies, results showed that tobacco outlet density was significantly related with demographics across the state. Census tracts with greater density of tobacco outlets tended to have lower median household income and higher percentages of African American or Hispanic residents. Cluster analysis of tracts resulted in a three-cluster solution, identifying high, medium, and low areas of disparity across the state. The high-disparity area was characterized by tracts with the highest tobacco outlet density, the highest percentages of African American and Hispanic residents, the lowest percentage of white residents, and the lowest median income. These results may be used to inform strategic planning and policy decisions on a statewide basis. Environmentally based prevention strategies that control the accessibility, availability, and prominence of tobacco products should be further explored.

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SYM6B TOBACCO SALES IN COMMUNITY PHARMACIES: CORPORATE DECISIONS AND DEMOGRAPHIC TARGETS

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This study applied multilevel modeling procedures with data from 678 community pharmacies and 382 residential census tracts in a Midwestern U.S. state to determine if two sets of variables: retail type (e.g., corporate owned, independently owned) and population demographics of the tracts in which outlets were located were associated with retail tobacco availability in community pharmacies. Data were derived from three archival sources: listings of all retailers in Iowa who obtained tobacco licenses in year 2003; all pharmacies registered with the Iowa Board of Pharmacy in 2003; and year 2000 census data. Of the 678 pharmacies included in the analysis, 331 were independently owned (48.8%) and 347 were corporate-owned (51.2%). Of those that were corporate-owned pharmacies, 166 (24.5%) were chain stores; 96 (14.2%) mass merchandise; and 85(12.5%) grocery stores. Refuting previous research, multilevel logistic regression results of this study demonstrate that population demographics, as well as retail type, predict whether a community pharmacy sold tobacco. Pharmacies selling tobacco were more likely to be a large, corporate-owned outlet. Specifically, in our model, chain pharmacies (OR=34.13; 95% CI 18.84-61.82, $p < .001$), mass merchandise pharmacies (OR=40.89; 95% CI 20.56-81.32, $p < .001$), and grocery store pharmacies (OR=476.23; 95% CI 130.55-1737.18, $p < .001$) were all more likely to sell tobacco products than independent pharmacies. Additionally, pharmacies were more likely to be located in areas with higher percentages of African American residents and higher median income, for every 10 percent increase in the number of African American residents in a Census tract, pharmacies were 1.34 times (95% CI 1.02-3.38, $p < .05$) more likely to sell tobacco products and for every $10,000 additional income, pharmacies were 1.21 times (95% CI 1.01-1.44, $p<.05$) more likely to sell tobacco products. The application of environmentally focused prevention initiatives is discussed as a strategy to counteract the targeted marketing of tobacco products in African American communities and to supersede the lack of decision-making power for pharmacists working in chain outlets.

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SYM6C THE ASSOCIATION OF TOBACCO MARKETING WITH SOCIOECONOMIC AND RACIAL/ETHNIC CHARACTERISTICS OF NEIGHBORHOODS

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Tobacco products remain one of the most heavily marketed products in the United States. Little is known about the association of racial/ethnic and socioeconomic characteristics with tobacco marketing. The objective of this study was to examine the association of point-of-sale tobacco marketing with median income and racial/ethnic composition at the neighborhood level in Omaha Metropolitan Area, Nebraska. Fieldworkers collected comprehensive tobacco marketing data from all of the stores that were licensed to sell tobacco in 84 randomly selected neighborhoods in the Omaha Metropolitan Area, Nebraska. Results indicated that an increase of $10,000 in median household income was associated with a decrease of 17.9% in the number of tobacco marketing items per square mile in a neighborhood ($p = 0.006$). There was very little evidence that percent African American and percent Hispanic population in the neighborhoods were related to tobacco marketing. In the post-MSA era, the tobacco industry is continuing to disproportionately target economically disadvantaged individuals, who already suffer from higher smoking prevalence. A comprehensive ban on tobacco marketing, as recommended by the Framework Convention on Tobacco Control, is likely to reduce tobacco use disparities.

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SYM6D THE INFLUENCE OF TOBACCO RETAIL OUTLETS ON SMOKING CESSATION DURING A SPECIFIC QUIT ATTEMPT

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The aim of this study was to examine the influence of tobacco retail outlets on smoking cessation among 393 racially/ethnically diverse, low-income smokers from Houston, Texas (35% Black, 34% non-Latino White, and 31% Latino; 33% with annual household incomes <$20,000) during a specific quit attempt. The locations of tobacco retail outlets in Houston were obtained from the taxation records of the Texas Comptroller of Public Accounts and were geocoded to their locations in space using geographic information systems software. The distance from participant's residences to the closest tobacco retail outlet in meters, and the density of tobacco retail outlets within 500 meters, 1 kilometer, and 3 kilometers of participant's residences was calculated. Logistic regressions adjusted for age, gender, marital status, education, income, employment, race, cigarettes per day, time to first cigarette of the day, and years smoked were used to examine associations of participant's residential proximity to tobacco outlets and the density of tobacco outlets in the neighborhood, respectively, with biochemically verified continuous abstinence at 1 month post-quit. Results indicated that residential proximity to tobacco outlets was associated with smoking cessation ($p = .05$). Participants living within 500 meters of the closest tobacco retail outlet were three times more likely to relapse during a specific quit attempt than those who lived > 1500 meters from the nearest tobacco retail outlet (OR = 3.05). There were no significant associations between tobacco retail outlet density and smoking relapse in these data. Results suggest that the physical availability of tobacco products as indicated by close residential proximity to tobacco retail outlets may derail attempts at smoking cessation. Potential policy implications include licensing and zoning law restrictions on tobacco sales near residential areas.

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SYM7 CESSATION INTERVENTIONS WITH HOSPITALIZED SMOKERS: FROM EFFICACY TO ADOPTION

Presenters: Nancy A. Rigotti[1], Patricia A. Smith[2], Robert D. Reid[3], Scott C. Williams[4], William Weintraub*[5], Jared Jobe*[6], and William T. Riley*[7] [1]Massachusetts General Hospital; [2]Northern Ontario School of Medicine; [3]University of Ottawa Heart Institute; [4]Joint Commission on Accreditation of Health Organizations; [5]Christiana Center for Outcomes Research; [6]National Heart Lung and Blood Institute; [7]National Heart Lung and Blood Institute

Hospitalization provides a unique opportunity for smoking cessation. Smoking-related illnesses often contribute to the reason for hospitalization, providing a salient motivation to quit. Hospitalization also provides a trial of abstinence removed from most environmental smoking cues and the availability of a healthcare team that can assist in cessation efforts. Although the nature of cessation interventions during hospitalization varies widely, interventions appear efficacious when continued cessation support is provided post-discharge. Quality of care standards currently require reporting of the provision of smoking cessation interventions for smokers hospitalized for acute myocardial infarction, congestive heart failure, or pneumonia. This symposium, based on a recent NIH- and CDC-supported workshop, addresses the current research support for smoking cessation interventions in hospitalized smokers, identification of barriers to the wider dissemination and implementation of cessation efforts in hospital systems, and potential strategies to increase the effectiveness and adoption of cessation interventions in these systems. The presentations provide: (1) an update to the recent Cochrane review on cessation in hospitalized smokers; (2) new research on the effectiveness of cessation programs in cardiac and general medical hospital patients; (3) the Ottawa Heart Institute program on disseminating and implementing cessation efforts for hospitalized patients in the Canadian healthcare system; (4) recent data from the current standards of the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) on the provision of cessation services in hospital systems and implications for the future standards; and (5) a discussion of potential dissemination and implementation strategies to increase the effectiveness and adoption of cessation efforts with hospitalized smokers.

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SYM7A INTERVENTIONS FOR HOSPITALIZED SMOKERS: SUMMARY OF EFFICACY AND AN IMPLEMENTATION MODEL FROM MASSACHUSETTS GENERAL HOSPITAL

Nancy A. Rigotti*, Massachusetts General Hospital, Harvard Medical School

This presentation will: (1) outline the rationale for starting smoking cessation interventions in the hospital setting; (2) summarize existing data about the efficacy of hospital-initiated tobacco treatment interventions on smoking, clinical, and health care delivery outcomes; (3) describe an ongoing effort to translate efficacy into effectiveness in a large integrated health care delivery system; and (4) outline research challenges for the field. The presentation will summarize and update the results of a 2008 meta-analysis of over 30 randomized and non-randomized controlled clinical trials that tested hospital-initiated smoking cessation interventions and followed patients for at least 6 months after hospital discharge. It will also summarize the smaller literature on the efficacy of hospital-initiated interventions on clinical and health care delivery outcomes, such as mortality or reduced hospital readmissions. Ongoing work from the past 5 years that attempted to translate this efficacy research into routine evidence-based clinical practice at Massachusetts General Hospital (MGH), a 900-bed urban acute care hospital in Boston, MA, and other hospitals in the Partners HealthCare System of eastern Massachusetts will also be presented. Stimulated by the adoption of a National Hospital Quality Measure on smoking by the Joint Commission on Accreditation of HealthCare Organizations and the Center for Medicare Services, MGH has developed a model, implemented changes in hospital infrastructure and staffing, and experimented with novel communications technologies such as interactive voice response (IVR) to assess outcomes and continue support to smokers after hospital discharge. The results of these ongoing outcomes studies from the MGH model will be described.

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SYM7B RESULTS OF TWO RANDOMIZED CLINICAL TRIALS FOR SMOKING CESSATION WITH HOSPITALIZED SMOKERS IN A UNIVERSAL HEALTHCARE SYSTEM

Patricia A. Smith*, Northern Ontario School of Medicine

The most recent tobacco use and dependence clinical practice guidelines call for additional research on the effectiveness of counseling and medications with hospitalized smokers. Inpatient smoking cessation trials have evidenced high patient uptake and abstinence, and meta-analyses have concluded that intensive interventions are effective. However, most studies have been performed in the privatized medical system of the United States, and a knowledge gap remains for smokers with medical co-morbidities other than cardiovascular-related conditions. This presentation reports on two randomized trials in Canada designed as replications of the Stanford nurse case-managed Staying Free trials with cardiac and general hospital patients in the California Health Maintenance Organizations (HMOs). In the Canadian universal healthcare system, all hospitals serve the full-spectrum of socioeconomic status so it was not clear that the high reach and abstinence rates and intervention effects found in the HMOs would generalize. In the current trials, patients were randomly assigned to receive a minimal or intensive intervention. The minimal intervention included cessation advice and 2 pamphlets. The intensive intervention included the minimal plus 60 minutes of bedside counseling, take-home materials, and 7 nurse-initiated counseling calls for 2 months after discharge. Results showed that the high rates in the HMOs were reproduced in these Canadian hospitals. Confirmed 12-month abstinence was 54% (73/135) for intensive and 35% (48/137) for minimal intervention in the cardiac trial (OR=2.0, 95%CI=1.2-3.1), and 28% (85/301) versus 24% (76/315) in the general patient trial (OR=1.2, 95%CI=0.8-1.8), with abstinence rates among myocardial patients in the general patient trial similar to those in the cardiac trial, 49% versus 36%. In both trials, self-selected pharmacotherapy use versus non-use was related to significantly higher addiction and significantly lower abstinence. Knowledge gaps that can be addressed with these data will be discussed.

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SYM7C AN EVALUATION OF THE "OTTAWA MODEL" FOR SMOKING CESSATION IN HOSPITALIZED SMOKERS

Robert D. Reid*, University of Ottawa Heart Institute

The Ottawa Model for Smoking Cessation (the "Ottawa Model") is an application of the 5A's approach to cessation, customized to the hospital setting. In this presentation, we report results from an evaluation of the impact of implementing the Ottawa Model in 9 hospitals in eastern Ontario. The RE-AIM (Reach, Efficacy, Adoption, Implementation, and Maintenance) framework was used to evaluate the intervention. Trained outreach facilitators assisted 9 hospitals to implement the Ottawa Model; program delivery was then monitored over a 1-year period using administrative data and data from a follow-up database. A before-and-after study was conducted to gauge the effect of the Ottawa Model program on cessation rates 6 months after hospitalization. Self-reports of smoking cessation were biochemically confirmed in a random sample of patients and all cessation rates were corrected for potential misreporting. Sixty nine percent of the expected number of smokers received the Ottawa Model intervention. Controlling for hospital, the confirmed 6-month continuous abstinence rate was higher after, than before, introduction of the Ottawa Model (29.4% vs. 18.3%; OR = 1.71; 95% CI = 1.11, 2.64; Z = 2.43; I2 = 0%; P = 0.02). The intervention was more likely to accomplish counseling for smokers than delivery of medications or post-discharge follow up. Attitudinal, managerial and environmental challenges to program implementation will be discussed. We conclude that trained outreach facilitators can successfully implement the Ottawa Model in hospitals and that this leads to significantly higher long-term cessation rates. The public health implications of systematic cessation programs for hospitalized smokers are profound.

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SYM7D JOINT COMMISSION ACTIVITIES ASSOCIATED WITH HOSPITAL SMOKE-FREE CAMPUS POLICIES AND SMOKING CESSATION MEASUREMENT

Scott C. Williams, Joint Commission on Accreditation of Healthcare Organizations

The Joint Commission recently completed a study to determine the national prevalence of smoke-free hospital campus policies and the relationship between these policies and performance on nationally standardized measures for smoking cessation counseling in U.S. hospitals. Nearly 4,500 Joint Commission-accredited hospitals were invited to complete a web-based questionnaire assessing current smoking policies and future plans. Smoking cessation counseling rates were assessed through nationally standardized measures. The over 1,900 hospitals responding to the survey (43%) were statistically similar to non-responders with respect to performance measure rates, smoking policies, and demographic characteristics. Approximately 45% of responders reported an existing smoke-free hospital campus policy. With respect to demographics, higher proportions of smoke-free campus policies were reported in non-teaching and non-profit hospitals. The rate of smoke-free campus policy adoption has rapidly increased since 2004, with the number of hospitals adopting these policies doubling each year. By the end of 2009, it is likely that the majority of U.S. hospitals will have a smoke-free campus. Smoke-free campus hospitals were also more likely to provide smoking cessation counseling to acute myocardial infarction, heart failure, and pneumonia patients who smoke ($p<0.001$), although these differences were better accounted for by hospital ownership type than smoke-free campus policy. The presentation will provide (1) a detailed summary of study results and (2) on overview of the development of Joint Commission smoking cessation measures that are applicable to the entire population of hospitalized patients.

No funding.

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SYM8 REACH AND EFFECTIVENESS FOR YOUTH SMOKING CESSATION FROM PROACTIVE INTERVENTIONS: LESSONS FROM FOUR RANDOMIZED TRIALS

Presenters: Susan Druker, M.A.[1], Jeffrey Fellows, Ph.D.[2], Robin J. Mermelstein, Ph.D.*[3], and Arthur V. Peterson, Ph.D.*[4]
[1]University of Massachusetts Medical School; [2]Kaiser Permanente Center for Health Research; [3]University of Illinois at Chicago; [4]Fred Hutchinson Cancer Research Center

Over 25% of high school seniors smoke monthly, putting them at risk for a lifetime of smoking and associated health problems and premature death. Most teens that smoke wish they could quit (75%), but few (4%) succeed on their own. Urgently needed are effective interventions that can reach large numbers of teen smokers. Three randomized trials in teen smoking cessation have reported success in both reaching teen smokers and increasing smoking abstinence; a fourth reports varying success reaching teens using multiple recruitment strategies. Hollis et al. (2005) tested an expert system consisting of behavioral counseling that incorporated motivational interviewing (MI) in a trial of 2,526 adolescents (589 smokers) that significantly increased 30-day abstinence rates at the 2-year follow-up (Odds Ratio [OR] 1.23, 95% Confidence Interval [CI] 1.03, 1.47). Their ongoing follow-up trial has used direct outreach, provider referrals, and community sources to recruit 277 of 6379 identified youth smokers to compare proactive quitline coaching and interactive website versus a control. Pbert and colleagues (2008) reported significant increases in 30-day abstinence at the 6 month follow-up (OR=1.59, CI: 1.06, 2.4) in their trial of 2,711 adolescents (262 current smokers) using an intervention based on the 5A model that incorporated MI and cognitive behavioral therapy compared to usual pediatric care. Most recently, Peterson and colleagues (2009) tested telephone delivery of an MI plus cognitive behavioral skills training intervention in a randomized trial of 2,151 smokers and 743 nonsmokers recruited in 50 high schools, achieving significant increases for multiple abstinence endpoints, including 6-month prolonged abstinence among baseline daily smokers (10.1% experimental vs. 5.9% control, difference = 4.1%, 95% CI = 0.8 to 7.1, P = .02) at 12 months post-intervention. This Symposium will present these four trials, emphasizing similarities and differences in strategies for recruitment and for intervention design and delivery. Important messages concerning both reach/recruitment and effectiveness in teen smoking cessation emerge from the findings of these trials.

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SYM8A RECRUITMENT OF ADOLESCENTS INTO A PEDIATRIC PRACTICE-BASED SMOKING PREVENTION AND CESSATION INTERVENTION TRIAL

Lori Pbert, Ph.D.[1], Kenneth E. Fletcher, Ph.D.[1], Martin H. Young, Ph.D.[1], Susan Druker, M.A.*[1], Joseph R. DiFranza, M.D.[1], and Alan J. Flint, M.D.[2]; [1]University of Massachusetts Medical School; [2]Harvard School of Public Health

Recruitment of adolescents into cessation trials and treatment programs remains a major challenge to advancing adolescent tobacco treatment. In the Air it Out trial eight pediatric practices were randomized to either a brief clinician-delivered 5A's intervention plus peer counseling (1 in-person visit and 4 follow-up phone calls by older peer counselors aged 21-25) or usual clinical care. Both smoking and non-smoking adolescents were recruited using on-site recruitment and proactive out-reach strategies. On-site recruitment involved inviting adolescents to the study via posting a notice at clinic registration and approaching teens in the clinic. Proactive out-reach strategies involved sending a letter and calling the adolescent prior to their scheduled visit, and meeting with interested adolescents at the clinic. A total of 2711 adolescents were recruited from 4721 patients approached (recruitment rate of 57%); 273 (10.1%) were smokers. Approximately 90% were recruited from well visits, 10% from acute care visits. Of the 2711 adolescents enrolled, 2700 (99.6%) and 2690 (99.2%) completed 6- and 12-month follow-up assessments, respectively. The two recruitment strategies yielded comparable acceptance rates (78% for the 2 sites using on-site recruitment, 76% for the 5 sites using proactive methods, and 69% for the site using both). Recruitment methods were tailored to the site so it is not possible to compare the relative effectiveness of on-site versus proactive strategies. A statistically significant increase in 30-day abstinence was found in smokers in the intervention compared to control condition at 6-month follow-up (OR 1.59, 95% CI 1.06-2.40) but not at 12-month follow-up, and among nonsmokers at 6-month (OR 2.15, 95% CI 1.12-4.15) and 12-month follow-up (OR 1.64, 95% CI 1.01-2.67). This presentation will highlight features of recruitment and intervention design and implementation that may have contributed to successfully reaching and increasing smoking abstinence in this hard-to-reach population.

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SYM8B PROACTIVE RECRUITMENT FOR TEEN TOBACCO CESSATION: THE POWER OF THE TEACHABLE MOMENT

Jeffrey L. Fellows, Ph.D.*[1], Jack F. Hollis, Ph.D.[1], Dan Laferriere, R.N., M.S.N.[1], Terry Bush, Ph.D.[2], Tim McAfee, M.D., M.P.H.[2], Edward Lichtenstein, Ph.D.[3], and Brian G. Danaher, Ph.D.[3]; [1]Kaiser Permanente Center for Health Research; [2]Free and Clear; [3]Oregon Research Institute

Recruiting youth for tobacco cessation programs is challenging. Our previous Teen Reach study successfully recruited 67% of 3,747 teen smokers and nonsmokers (ages 14-17) approached in primary care waiting rooms. Tobacco prevention and cessation interventions delivered after the visit using a computer intervention (Pathways to Change) and two follow-up calls more than doubled the quit rate for baseline smokers (24% vs. 11%). To expand reach and provide more convenient home access to web- and phone-based cessation support, we are now testing the Quithelper program that includes a brief motivational interview, an interactive web-site, and up to five proactive quitline calls. We tested several methods to confidentially reach out to 6,349 youth smokers, ages 15-24, from an HMO EMR. We first sent a letter and then called 3,173 likely teen smokers: 1,614 (53%) were never reached, 925 (30%) declined to participate, 362 (12%) reported not smoking, 170 (5%) were ineligible, and only 102 (3%) expressed interest and were referred to the website for consent and randomization. A revised letter (n=2,677) that framed the call as providing health education follow-up to their recent visit improved yields; 311 (12%) were referred for consent. Extensive outreach to community groups (schools, clubs, fairs, posters, bus ads, etc.) led to only 76 additional web referrals. The highest yield (72 of 206; 35%) came from calls to interested youth referred to the study by medical providers. Recruitment doubled when we increased the upper age range from 19 to 24. Overall, 277 of 568 (49%) youth smokers referred to the website were randomized; most of the others did not go to the site. Proactive outreach methods to recruit youth to a free and convenient cessation program were inefficient and expensive, and each step in the enrollment process reduced participation. Results support the value of capitalizing on the teachable moment and integrating streamlined recruitment and interventions into the routine delivery of health care.

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SYM8C IMPROVING REACH AND EFFECTIVENESS OF TEEN SMOKING CESSATION INTERVENTIONS: RESULTS FROM A RANDOMIZED TRIAL

Arthur V. Peterson, Ph.D.*[1], Kathleen A. Kealey[1], Sue L. Mann, M.P.H.[1], Patrick M. Marek, M.S.[1], Jingmin Liu, M.S.[1], Jonathan B. Bricker, Ph.D.[1], and Evette J. Ludman, Ph.D.[2], [1]Fred Hutchinson Cancer Research Center; [2]Group Health Center for Health Studies

Involving 2,151 smokers from 50 high schools, the Hutchinson Study of High School Smoking randomized trial was conducted to test innovative strategies to address the dual problems of reaching/recruiting teen smokers, and effectively intervening to promote smoking cessation. The intervention consisted of (1) proactive identification via classroom survey of smokers and nonsmokers among enrolled 11th graders; (2) proactive contact with parents of eligible minor-age teens to request written or verbal permission to invite their teen's participation; (3) proactive recruitment via counselor telephone calls to all identified and eligible (by age or parental consent) teens in experimental schools; and (4) personalized telephone counseling delivered via counselor-initiated calls during the senior year of high school. The intervention, based on social cognitive theory, integrated motivational interviewing to engage teens and build motivation and self-efficacy for quitting, and cognitive behavioral skills training to build skills for quitting and relapse prevention. In the 25 experimental high schools, 1,058 smokers were identified. Of these, 948 (89.6%) were eligible by age or parental consent for counseling, 691 (65.3%) participated in one or more calls and 499 (47.3%) completed all planned calls. All 2,151 smokers were followed to endpoint 12 months post-intervention with 88.9% participation. The intervention produced statistically significant positive treatment effects for multiple endpoints, including 6-month prolonged abstinence among daily smokers (10.1% experimental vs. 5.9% control, difference = 4.1%, 95% CI = 0.8 to 7.1, P = .02). Treatment effects achieved for 30-day and 7-day abstinence at 12 months follow-up were even larger, roughly three times the overall treatment effect reported in a meta-analysis of 48 adolescent smoking cessation trials. This study is the first to show that proactive, personalized telephone counseling implemented in a non-medical setting can help teen smokers to quit. The results and implications of this trial will be discussed in the perspective of this and two other successful proactive teen smoking cessation studies.

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SYM9 NIDA's INTRAMURAL RESEARCH PROGRAM: CUTTING EDGE NICOTINE RESEARCH

Presenters: Teresa Gray, M.S., Steven Goldberg, Ph.D., Elliot Stein, Ph.D., George Uhl, Ph.D., Stephen Heishman, Ph.D.*, and Allison C. Hoffman, Ph.D.*; National Institute on Drug Abuse

NIDA's intramural research program (IRP), located in Baltimore, is dedicated to understanding the causes, consequences and treatment of drug abuse. The overall research program is broad, encompassing basic science to clinical trials. This symposium, with presentations from both junior and senior scientists, seeks to highlight a subset of work that exemplifies the range and breadth of NIDA's research in basic science, human laboratory studies, and human genetics. Teresa Gray will discuss work from Dr. Marilyn Huestis's group on tobacco biomarker detection in biological matrices, particularly prenatal tobacco exposure identification by meconium analysis. Dr. Steven Goldberg will discuss the endocannabinoid system as a potential target for tobacco pharmacotherapies. Dr. Elliot Stein will discuss human imaging as it relates to neuropharmacology and cognition. Dr. George Uhl will discuss smoking cessation genetics. Dr. Stephen Heishman will provide a discussion and wrap-up.

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SYM9A PEROXISOME PROLIFERATOR-ACTIVATED RECEPTOR ALPHA (PPAR-ALPHA) MODULATES NICOTINE SELF-ADMINISTRATION AND NICOTINE-INDUCED ACTIVATION OF THE MESOLIMBIC DOPAMINE BRAIN REWARD SYSTEM IN RATS AND MONKEYS

Paola Mascia, Ph.D.[1], Zuzana Justinova, M.D., Ph.D.[1], Leigh V. Panlilio, Ph.D.[1], Gigi Tanda, Ph.D.[1], Steven R. Goldberg, Ph.D.*[1], Maria Scherma, Ph.D.[2], Antonio Luchicchi, Ph.D.[2], Salvatore Lecca, Ph.D.[2], Marco Pistis, Ph.D.[2], Sevil Yasar, M.D., Ph.D.[3], and Daniele Piomelli, Ph.D.[4]; [1]National Institute on Drug Abuse; [2]University of Cagliari; [3]Johns Hopkins University School of Medicine; [4]University of California, Irvine

We recently found that nicotine's rewarding effects in rats and monkeys and its dopamine activating effects in the mesolimbic brain reward system of rats are suppressed by inhibiting fatty acid amide hydrolase (FAAH), the enzyme that degrades the endocannabinoid anandamide and the non-cannabinoid lipid amides N-oleoylethanolamide (OEA) and N-palmitoylethanolamide (PEA). FAAH inhibition indirectly increases levels of OEA and PEA, which are endogenous ligands for peroxisome proliferator-activated receptors alpha (PPAR-alpha), a family of nuclear receptors involved in lipid utilization, fatty acid oxidation and inflammation. The effects of direct activation of PPAR-alpha on nicotine's rewarding effects has not been studied, so we investigated whether PPAR-alpha activation can modulate nicotine self-administration, nicotine-induced increases in firing of ventral tegmental area (VTA) dopamine neurons, and nicotine-induced dopamine elevations in the nucleus accumbens shell in Sprague Dawley rats. Using in-vivo electrophysiological and microdialysis techniques, we found that the synthetic PPAR-alpha agonists meth-OEA (a stable analog of OEA) and WY14643 decreased nicotine-induced increases in VTA dopamine neuron firing and elevations in extracellular dopamine levels in the nucleus accumbens shell in rats, and these effects were reversed by the PPAR-alpha antagonist MK 886. Using fixed-ratio intravenous nicotine self-administration procedures in rats and squirrel monkeys, we found that WY14643 decreased the number of nicotine injections self-administered over three consecutive sessions. Nicotine self-administration behavior rapidly recovered upon discontinuing WY14643 pretreatment. These results show that PPAR-alpha nuclear receptor activity modulates nicotine's reinforcing and dopamine-activating effects and suggest PPAR-alpha as a promising new target for the treatment of nicotine dependence.

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SYM9B MOLECULAR GENETICS OF SUCCESS IN SMOKING CESSATION: CONVERGENT RESULTS FROM RETROSPECTIVE AND PROSPECTIVE STUDIES

George Uhl, M.D., Ph.D.*[1], Donna Walther, M.A.[1], Catherine Johnson, M.A.[1], Tomas Drgon, Ph.D.[1], Jed Rose, Ph.D.[2], and F. Behm, M.A.[2], [1]National Institute on Drug Abuse; [2]Duke University

Classical genetic studies support ca 50% heritability for individual differences in abilities to quit smoking. To identify genomic regions likely to contain gene variants that influence abilities to quit smoking, we have used genome wide association in seven samples of smokers who have succeeded or failed in cessation efforts in clinical trial, general practice or community settings. When we apply a "nontemplate" approach that seeks chromosomal regions identified by clusters of SNPs with p values < 10-2 in multiple independent samples, we find such regions at rates much greater than we would expect by chance. Genes identified by this work overlap to modest extents with those identified in similarly designed GWA studies of vulnerability to substance dependence. SNPs that display nominally significant associations with quit success in at least three such studies lie close to two SNPs for which Caparoso and colleagues have recently reported the strongest association with a phenotype that compares current to former smokers. Based on results from the first three of these studies, we developed a v1.0 genetic quit success score, comprised of weighted values based on genotypes from the 12,000 SNPs that displayed nominally significant differences between quitters and nonquitters. We applied this score to individuals in a new trial of quit success based on 21 or 42 mg NRT initiated 2 weeks prior to a target quit date. There was a significant interaction between v1.0 quit success scores, FTND and NRT dose when each was categorized as "high" or "low" for each participant. These results, and the failure to identify "genome-wide significance" in replicated studies, support polygenic influences on ability to quit smoking. Initial results for nausea experienced during this trial may support genetic influences as well. Taken together with appropriate clinical features, genotypes should be able to help us to predict outcomes and even side effects. This information could add to the power of clinical trials.

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SYM9C NICOTINE, COGNITION AND ADDICTION: A PERSPECTIVE FROM FMRI

Elliot Stein, Ph.D.*[1], Thomas Ross, Ph.D.[1], Britta Hahn, Ph.D.[1], Elliot Hong, M.D.[2], Matthew Sutherland, Ph.D.[3], Betty Jo Salmeron, Ph.D.[3], and Emma Rose, Ph.D.[3], [1]National Institute on Drug Abuse; [2]Maryland Psychiatric Research Center; [3]Trinity College

Nicotine transiently improves performance on a wide range of cognitive tasks in humans, including attention, visual information processing, computational abilities, vigilance and working memory. In contrast, acute nicotine withdrawal can induce opposite effects. Like other psychostimulants, it is also capable of producing tolerance and physical dependence. What remains unclear is how to explain nicotine's effect on such diverse behavioral and cognitive activities, which are mediated, at least in part, by different brain circuits. The seemingly pervasive behavioral effect of nicotine and the localization of nicotinic receptors on neurons of different neurotransmitter systems suggest the interesting possibility that nicotine may exert a modifying effect on multiple functional brain circuits independent to the performance of specific tasks. New approaches to identify functional connectivity present the opportunity to test this hypothesis in human subjects. Experiments are performed on experienced cigarette smokers who are scanned on two occasions, each two hours after either a placebo or a 21 mg nicotine patch. While in the scanner they performed tasks that probe attentional processes: selective/divided, sustained and switching within working memory. Resting state, anatomical and DTI data are also acquired. We have identified a series of brain regions modulated by nicotine that appears specific to alerting and orienting aspects of attention (including frontal, striatal, parietal and thalamic), which may be manifest via modulating the default mode resting state network. In contrast, nicotine's actions do not seem to generalize to executive control operations. Several resting state functional connectivity circuits have also been identified that are enhanced by nicotine (all cingulate-cortical) and a unique circuit (cingulate-striatal) that is related to nicotine addiction (FTND) but not modified by acute nicotine, and which appears to be genetically biased. Altered prefrontal white matter tracts in smokers suggest an anatomical bases of these drug effects. Non-invasive brain imaging may provide unique biomarkers to improve nicotine addiction therapy.

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SYM9D PRENATAL TOBACCO EXPOSURE, MECONIUM NICOTINE BIOMARKERS AND INFANT OUTCOMES

Teresa R. Gray, M.S.*[1], Marilyn A. Huestis, Ph.D.[1], Rina D. Eiden, Ph.D.[2], and Raquel Magri, Ph.D.[3]; [1]National Institute on Drug Abuse; [2]University of Buffalo; [3]Hospital Pereira Rossell

NIDA's research goals are reduction of toxicological, societal, economic and criminal drug abuse consequences and drug prevention and treatment improvement. Chemistry and Drug Metabolism's clinical research program addresses drug abuse and addiction with chemical and toxicological tools, focusing on mechanisms of drug action and pathological consequences. We developed analytical methods to identify and quantify tobacco biomarkers in plasma and urine, as well as informative alternative biological matrices including oral fluid, meconium and fetal brain. We correlate a drug's pharmacokinetics with self-reported tobacco use, cognitive function, brain activity and physiological response. Because self-reported tobacco use by pregnant women is often inaccurate, we evaluated the disposition of tobacco biomarkers in meconium, the first neonatal feces, as objective evidence of nicotine exposure. Previously, only cotinine was monitored in meconium by immunoassay, despite knowing nicotine readily crosses the placenta. We developed a more sensitive and specific liquid chromatography tandem mass spectrometric assay and identified 25% more tobacco-exposed infants through inclusion of nicotine and trans-3'-hydroxycotinine (OHCOT), in addition to cotinine. Children of active smokers are differentiated from non-exposed children by nicotine, cotinine or OHCOT meconium concentrations greater than 10 ng/g; a second, independent neonatal cohort validated this cutoff, with 74.6% sensitivity and 100% specificity. Timing and quantity of cigarettes smoked also dramatically impacted presence and concentrations of biomarkers. First and second trimester exposure was poorly reflected in meconium, while cigarettes per day in the third trimester significantly correlated with meconium nicotine, cotinine and OHCOT concentrations. We also found that presence of a tobacco biomarker in meconium was associated with decreased head circumference in two independent cohorts; however, no significant relationships were observed for meconium biomarker concentrations and neonatal birth parameters, such as birth weight, length, or gestational age.

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SYM10 NEW TREATMENTS DURING PREGNANCY

Chair: David W. Wetter[1]
Presenters: Paul M. Cinciripini[1], Thomas H. Brandon[2], and Nancy A. Rigotti*[3]
[1]University of Texas M.D. Anderson Cancer Center, [2]University of South Florida and the H. Lee Moffitt Cancer Center & Research Institute, [3]Harvard Medical School

Smoking during pregnancy and postpartum is associated with a host of long-term adverse health consequences for the fetus and infant. Nevertheless, the prevalence of smoking during pregnancy remains over 10%, and postpartum relapse rates are up to 80% by one year postpartum. Moreover, there is a paucity of intervention studies that specifically target vulnerable pregnant women such as those living in poverty or suffering from comorbid mental disorders, and a recent review concluded that postpartum relapse prevention interventions were generally ineffective. This symposium will present the results from three recently completed randomized clinical trials addressing these gaps. Dr. Cinciripini will present the results from BABY STEPS (N=257), a randomized clinical trial testing the efficacy of a depression-focused treatment (Cognitive Behavioral Analysis System of Psychotherapy; CBASP) for increasing cessation during pregnancy. Results indicated that depressed pregnant smokers fared better with CBASP, while non-depressed women fared better with the comparison condition. Dr. Wetter will present the results from Project MOM (N=251), a randomized clinical trial evaluating the efficacy of a Motivation And Problem-Solving (MAPS) approach for reducing postpartum relapse among diverse, low income women. Although the main effect of MAPS relative to usual care only approached significance, MAPS was significantly more efficacious than usual care among women who smoked more cigarettes per day pre-pregnancy, compared to among women who smoked fewer cigarettes per day. Dr. Brandon will present the results of a randomized clinical trial examining the efficacy of Forever Free for Baby and Me (FFB) relapse prevention booklets (N=532). FFB significantly improved abstinence rates at 8, but not 12, months postpartum compared to usual care. However, women with high baseline partner support significantly benefited from FFB, whereas women with low baseline partner support did not. Dr. Rigotti will review the findings from the three trials and place them in the context of the current state of the science with respect to smoking cessation during pregnancy and postpartum relapse prevention.

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SYM10A A RANDOMIZED CLINICAL TRIAL OF AN INTENSIVE DEPRESSION-FOCUSED INTERVENTION FOR SMOKING CESSATION IN PREGNANCY VERSUS A HEALTH AND WELLNESS-FOCUSED CONTROL

Paul M. Cinciripini*, Janice A. Blalock, Jennifer A. Minnix, Jason D. Robinson, Victoria L. Brown, Cho Lam, David W. Wetter, Lisa Schreindorfer, Maher Karem-Hage, James P. McCullough, Patricia Dolan-Mullen, and Angela L. Stotts

Smoking during pregnancy increases the risk of infant mortality and morbidity. While overall smoking rates are relatively low during pregnancy (~12%), substantially higher rates have been observed among women with less education and lower income. A substantial number of women who fail to quit during pregnancy may be highly nicotine dependent and have high levels of current and past psychiatric comorbidity, which may contribute both to initial failure to quit as well as post-treatment relapse. In the current, study pregnant smokers (N=257) were randomly assigned to an intensive depression-focused intervention (Cognitive Behavioral Analysis System of Psychotherapy-CBASP) or to a time/contact control focused on health and wellness (HW); both included equivalent amounts of behavioral and motivational smoking cessation counseling. Treatment was delivered weekly for 10 weeks. Prolonged abstinence was assessed following treatment and through 6 months postpartum. The results showed that at 6 months post-treatment, women with higher levels of baseline depressive symptoms treated with CBASP had a higher probability of abstinence and more improved depression than those treated with HW, whereas those with low baseline depression fared better in HW. Treatment differences in abstinence were not retained at 6 months postpartum.

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SYM10B PREVENTING POSTPARTUM SMOKING RELAPSE AMONG DIVERSE, LOW INCOME WOMEN: A RANDOMIZED CLINICAL TRIAL

David W. Wetter*, Lorraine R. Reitzel, Michael S. Businelle, Jennifer Irvin Vidrine, Darla E. Kendzor, Yisheng Li, Patricia Dolan Mullen, Mary M. Velasquez, Paul M. Cinciripini, and Ludmila Cofta-Woerpel, Department of Health Disparities Research and the Department of Behavioral Science, University of Texas M.D. Anderson Cancer Center, Houston, TX

Postpartum relapse rates are high among women who spontaneously quit smoking during pregnancy. This randomized clinical trial tested a Motivation And Problem-Solving (MAPS) treatment for reducing postpartum relapse among diverse, low income women who quit smoking during pregnancy (N=251; 32% African American, 30% Latino, 36% White; 55% <$30,000/year household income). Pregnant women were randomly assigned to MAPS/MAPS+ or Usual Care (UC). Continuation ratio logit models were used to examine differences in biochemically confirmed, continuous abstinence at weeks 8 and 26 postpartum by treatment group, and moderators of the treatment effect. The main effect of treatment approached significance ($p = .07$) and there was a significant interaction between treatment and pre-quit cigarettes smoked per day ($p = .05$). MAPS/MAPS+ was more efficacious than UC among women who smoked more cigarettes per day than among women who smoked fewer cigarettes per day. MAPS, a holistic and dynamic approach to changing behavior using a combined motivational enhancement and social cognitive approach, is a promising intervention for postpartum smoking relapse prevention among low income women, with particular relevance for women with higher pre-quit smoking rates.

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SYM10C SELF-HELP FOR PREVENTING POSTPARTUM SMOKING RELAPSE: THE ROLE OF PARTNER SUPPORT

Thomas H. Brandon*, Vani Nath Simmons, Elena Lopez Khoury, Gwendolyn P. Quinn, Cathy D. Meade, Marina Unrod, Ji-Hyun Lee, and Gang Han, University of South Florida and H. Lee Moffitt Cancer Center, Tampa, FL

Although a growing proportion of women quit smoking during pregnancy, the majority relapse soon after delivery. To date, efforts to prevent postpartum smoking have been largely unsuccessful. We had previously demonstrated the efficacy and cost-effectiveness of a series of "Forever Free" relapse-prevention booklets for smokers in general (Brandon et al., 2000, 2004). We adapted these booklets for pregnant women and tested them in a randomized clinical trial. The "Forever Free for Baby and Me" (FFB) booklets were compared to a usual care condition (UCC) of standard smoking and pregnancy materials from NCI and ACS. The FFB intervention included 10 booklets, distributed over time through 8 months postpartum. Because previous research had identified low partner support as a potent predictor of postpartum relapse, we added a booklet instructing partners on providing social support. Women (N=532) were recruited proactively in their 4th–8th month of pregnancy and followed through 12 months postpartum. Follow-up rates ranged from 77-85%. Overall relapse rates were identical between conditions at 1-month postpartum (26%); however, lower relapse rates for the FFB condition compared to UCC were found at 8 months postpartum (31% vs. 41%, p = .03). Differences were no longer significant at the 12-month follow-up (36% vs. 41%). As expected, participants in the FFB condition reported significantly higher partner support at follow-up than those in the UCC condition (p = .005). Moreover, baseline perceived positive partner support was a significant moderator of outcome (p = .03). Low partner support was associated with no group differences, whereas high partner support was associated with superior outcomes of FFB compared to UCC (e.g., 30% vs. 47% relapse rates by 12 months postpartum, p = .02). Findings suggest that baseline partner support is necessary but not sufficient for preventing relapse, and that a self-help intervention that includes instructions on providing support can enhance the maintenance of pregnancy-motivated smoking abstinence.

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SYM10D DISCUSSION

Discussant: Nancy A. Rigotti, M.D.*

Pregnancy represents an extraordinarily unique opportunity in the life trajectory of a female smoker to facilitate long-term abstinence from tobacco. However, specific subgroups of women such as those with low socioeconomic status or depression are at higher risk to both smoke during pregnancy and to relapse following the birth of their child. Thus, given the tremendous adverse health consequences of smoking to the fetus, child, and mother, there is a strong need to develop innovative treatments to facilitate smoking cessation during pregnancy and reduce postpartum relapse, and particularly so for vulnerable subgroups of women. The three randomized clinical trials presented in this symposium reflect innovative efforts to both develop new intervention approaches (Motivation And Problem-Solving; MAPS) and to adapt proven, evidence-based intervention approaches (Cognitive Behavioral Analysis System of Psychotherapy, CBASP; Forever Free for Baby and Me booklets, FBB) for use during pregnancy and the postpartum period. Vulnerable populations (i.e., those women most at risk and in need of help) were a specific focus of two of these trials. The fact that all three trials found the interventions to be efficacious only among subpopulations of pregnant smokers and recent quitters highlights both the difficulty of intervening effectively with vulnerable populations including pregnant women more generally (e.g., depressed pregnant smokers, low income pregnant recent quitters), as well as the need to carefully consider how to best target and tailor interventions. A major strength of both the FFB booklets and MAPS are their potential for widespread dissemination. For example, both approaches could be easily adopted, implemented, and maintained by Quitlines around the country. Further, CBASP, could be disseminated widely to health care systems to address the needs of their depressed pregnant smokers. In sum, these trials highlight the critical need for continued efforts to develop and evaluate innovative approaches to reducing the harm due to smoking during pregnancy and postpartum, with a particular focus on the needs of those women who are most vulnerable.

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SYM11 LOOKING BACK: USING RECALLED INFORMATION EFFECTIVELY IN TOBACCO RESEARCH

Chair: Janet Brigham, Ph.D.*[1]
Presenters: Gary E. Swan, Ph.D.[1], Suzanne Colby, Ph.D.[2], Edmond Shenassa, Sc.D.[3], Christina Lessov-Schlaggar, Ph.D.[4]
Discussant: Ann Malarcher, Ph.D.*[5]
[1]SRI International; [2]Brown University; [3]University of Maryland; [4]Washington University; [5]Centers for Disease Control and Prevention

Gathering accurate retrospectively recalled information is a critical part of epidemiology, genetic, policy, clinical, and public health research. Longitudinal, prospective, and real-time research cannot capture all informative and meaningful events in any period of an individual's life. Many aspects of tobacco use and risk can be studied no other way in numbers sufficient for analysis. Limitations of retrospective collection of information are well known: lapse in memory, inaccessible information, and biased recollections influenced by more current experiences and events. Even if reliability and validity are high for many questions about tobacco use, the success of studying tobacco-related life-history events appears to depend largely on whether the events were salient when they occurred. Additionally, the salience of historical personal events can help override the bias of current interpretation. This symposium presents four applications of retrospective recall, examined for psychometric properties: (1) Reliability and validity studies of the Lifetime Tobacco Use Questionnaire (LTUQ) examined the role of salience in reliability and validity of lifespan tobacco-use questions; (2) Examination of psychometric properties of the Lifetime Interview on Smoking History (LIST) supported the reliability of recall data, particularly for recording the timing of discrete important milestones in smoking history; (3) The validity of 40-year recall of maternal smoking was fairly valid, but was associated with demographic characteristics and recall cues; and (4) A one-time retrospective data collection showed validity, but was not adequate for establishing valid trajectories of tobacco use. The symposium discusses methods for designing research tools to strengthen effective recall, as well as psychometric tools for evaluating the reliability, validity, and utility of recalled information. Future research should examine and address the effective use of recalled information. Work should assess the entire spectrum of cessation, and use survey technology tools to enhance the accuracy of recall.

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SYM11A VALIDITY OF RECALL OF FEATURES OF LIFETIME TOBACCO USE: A TWO-STUDY EXAMINATION

Janet Brigham, Ph.D.[1], Christina Lessov-Schlaggar, Ph.D.[2], Marie D. Cornelius, Ph.D.[3], Nancy L. Day, Ph.D.[3], Elizabeth Tildesley, Ph.D.[4], Harold S. Javitz, Ph.D.[1], Ruth Krasnow, M.A.[1], and Gary E. Swan, Ph.D.[1]; [1]SRI International; [2]Washington University; [3]University of Pittsburgh; [4]Oregon Research Institute

Longitudinal and prospective research can measure behavior within close temporal proximity but cannot capture all informative and meaningful events in an individual's life. Retrospective recall research provides an efficient, cost-effective alternative for gathering historical information about tobacco use and life events. While reliability is high for many questions about tobacco use, the overall salience of the recalled events is critical. This project examined the validity of recalled information compared with longitudinally collected data in separate studies at the Oregon Research Institute (N=346) and the University of Pittsburgh (N=294). Retrospective data were collected with the Lifetime Tobacco Use Questionnaire, a Web-based tool administered by interview. Oregon and Pittsburgh subjects' self-report of age of first cigarette, number of cigarettes used per day, quitting history, and abstinence symptoms were all statistically valid (Spearman's r or polychoric correlation, all $p < .01$). Pittsburgh subjects' responses were valid also for age at first weekly smoking, cigarettes/week, age at first daily smoking, cigarettes/day, time to first cigarette of the day, and subjective responses to first tobacco use. The mean years between longitudinal testing and LTUQ administration was 19.5 years (SD=0.6; range 17.3 to 21.3) for Oregon and 3.9 years (0.8, range 1.5 to 5.8) for Pittsburgh subjects. These findings reflect the utility of using retrospective recall measures to investigate lifetime events that could not be or were not captured in close temporal proximity, or whose importance may not have been obvious at the time the events occurred.

Psychometric work on the LTUQ was funded by NIH grant DA018019 to Gary E. Swan. Early development of the LTUQ was under subcontract to University of Michigan, NIH grant CA75581 to Ovide F. Pomerleau and was based on a questionnaire funded by NIH grant DA11795 to Janet Brigham. Longitudinal SMOFAM data were collected under NIH grant DA003706 to Hyman Hops. Longitudinal Pittsburgh data were collected under NIH grants DA009275 to Marie D. Cornelius; and AA06390, DA03874, and HD036890 to Nancy L. Day.

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SYM11B TEST-RETEST RELIABILITY OF KEY VARIABLES FROM THE LIFETIME INTERVIEW ON SMOKING HISTORY (LIST)

Suzanne M. Colby*[1,2], Michelle L. Rogers[3], Xiaozhong Wen[3], Melissa Clark[3], Christopher W. Kahler[1,3], Susan Ramsey[2], Julie Boergers[2], George D. Papandonatos[3], Amanda L. Graham[4], Raymond S. Niaura[4], Stephen Buka[3], and David B. Abrams[4]; [1]Brown University, Center for Alcohol and Addiction Studies; [2]Brown University, Department of Psychiatry and Human Behavior; [3]Brown University, Department of Community Health; [4]The Schroeder Institute for Tobacco Research and Policy Studies

Despite its limitations, retrospective recall data can be an important source for determining lifetime history of various health behaviors. This study of 220 adult ever-smokers (63% female; 85% white; 84% greater than 12 years education; ages 36 to 44, mean age = 39.8 years) examined the test-retest reliability of key lifetime smoking history variables collected at baseline and again 4 to 8 weeks later. Data were collected using the Lifetime Interview on Smoking History (LIST), a highly structured interviewer-administered questionnaire that queries information about distinct phases in an individual's smoking history (e.g., initial, first daily, heaviest, current or most recent phases, and periods of smoking offset longer than 3 months in duration). Results demonstrate that reliability of reporting ever smoking, ever-weekly smoking, and ever-daily smoking was excellent, with concordance and Kappa > .90. Ages of onset for key milestones (e.g., first puff, progression to weekly and daily smoking, quit smoking for good) were also reliably reported (r's .75-.94, p's < .0001; ICC's .74 - .94). Across the various smoking phases, recall data for cigarettes per day (r's .54-.76, p's < .0001; ICC's .54-.77) and minutes to first cigarette (r's .51-.83, p's < .001; ICC's .46-.84) tended to be moderately reliable. Finally, ages of onset and offset for less discrete events (e.g., age of onset of current phase and heaviest phase) were less reliably reported (r's .41-.49, p's < .005; ICC's .39 - .46). These findings support the reliability of recall data, particularly for recording the timing of discrete important milestones in smoking history.

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SYM11C VALIDITY OF ADULTS' 40-YEAR RECALL OF EXPOSURE TO MATERNAL SMOKING DURING EARLY CHILDHOOD

Edmond Shenassa, Sc.D.*[1], Xiaozhong Wen, M.D., M.Sc.[2], Angela Paradis, Sc.D.[2], and Stephen Buka, Sc.D.[2]; [1]University of Maryland; [2]Brown University

Accumulating evidence has linked exposure to secondhand smoke during childhood to adverse health outcomes during adulthood. Although adults' retrospective self-report of secondhand smoke exposure during childhood has been used often in these investigations, the validity of such recall remains unexamined. We report on the validity of adults' 40-year recall of their mother's smoking during early childhood. Participants (N=721) were adult offspring of women enrolled in the Collaborative Prenatal Project (CPP) between 1959 and 1966. Starting in 1999, participants were located and interviewed as part of the Transdisciplinary Tobacco Use Research Centers New England Family Study (TTURC-NEFS). The validity of participants' recall of exposure to maternal smoking during early childhood was assessed against their mothers' report of their smoking, which was collected prospectively as part of the CPP. For binary classification (Yes/No) of maternal smoking, we estimated the sensitivity (0.86), specificity (0.86), Predictive Positive value (PPV=0.86), Predictive Negative Value (NPV=0.87), and Kappa (kappa = 0.71 - 95% CI, 0.64-0.76) of adult retrospective reports compared to maternal prospective reports. We also estimated the Kappa for ordinal classifications with 3 categories (no exposure, 1 pack/day or less, and >1 pack/day) (kappa = 0.59 - 95% CI, 0.53-0.64), and 5 categories (no exposure, 1/2 pack/day or less, 1 pack/day, 1 1/2 packs/day, and 2+ packs/day) (kappa = 0.57- 95% CI, 0.54-0.61). Demographic predictors of valid recall were relatively higher socioeconomic status at birth, better than high school education, and greater amount of smoking as reported by the respondents' mother. Respondents who reported having seen family photographs showing their mother smoking or having recalled specific situations of their mother smoking (during meal, after meal, while playing, while reading or watching TV, and while driving) evinced more accurate recall than others. In sum, 40-year recall of maternal smoking during early childhood is fairly valid. Validity of this recall is associated with respondents' demographic characteristics and availability of recall cues.

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SYM11D VALIDITY OF ESTIMATING DEVELOPMENTAL SMOKING TRAJECTORIES USING ONE-TIME RETROSPECTIVE ASSESSMENT

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This study investigated the feasibility and validity of estimating lifetime smoking trajectories using one-time retrospective data collection. We developed the Lifetime Tobacco Use Questionnaire (LTUQ) that assesses the frequency and quantity of use of any form of tobacco or nicotine across the lifetime and that can be self-administered via the Web or through an interview. The LTUQ was administered via telephone interview to individuals aged 30 to 36 who participated previously in a longitudinal study of substance use behavior (n=137). Smoking trajectories were estimated separately from the longitudinal data and the retrospective LTUQ data in the same individuals, using a multinomial mixture modeling procedure in SAS. A five-group solution fit the longitudinal data best, while a three-group solution fit the retrospective LTUQ data best. Cross-classification of smoking trajectories across data collection modalities suggested convergence of classification for the light smoking trajectory only. These results suggest lack of validity of a single retrospective assessment for estimation of developmental smoking trajectories. Individuals classified into early onset or heavy smoking trajectories using longitudinal data, compared with those classified in later onset or experimenter trajectories, were more likely to persist in their smoking and to be lifetime daily and heavier smokers. These results suggest validity of one-time retrospective data collection on lifetime quantity and frequency of smoking behavior. Overall, these results are consistent with the common observation that retrospective data do not adequately capture developmental variability in smoking behavior.

Psychometric work on the LTUQ was funded by NIH grant DA018019 to Gary E. Swan. Early development of the LTUQ was under subcontract to University of Michigan, NIH grant CA75581 to Ovide F. Pomerleau and was based on a questionnaire funded by NIH grant DA11795 to Janet Brigham. Longitudinal SMOFAM data were collected under NIH grant DA003706 to Hyman Hops.

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SYM11E MEASURES OF LIFETIME TOBACCO USE AND RELATED-BEHAVIORS: ASSESSMENT, UTILITY AND FUTURE DIRECTIONS

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The five studies presented in this session demonstrate the ability of researchers to utilize standardized questionnaires to assess a variety of tobacco use, cessation and other related behaviors including age of onset, patterns of use (frequency and quantity), cessation patterns, withdrawal symptoms, and exposure to secondhand smoke through interviews and the web. As presented, assessments of the validity of these questionnaires have demonstrated that respondents' ability to recall many of these behaviors are relatively good and appear to be influenced by the context and salience of particular tobacco-use events and demographic characteristics of the tobacco user. Continued research into the validity of retrospective assessments of tobacco use and cessation will be needed as tobacco use declines further in the U.S. and the behavior becomes more concentrated in populations which may have lower levels of recall (i.e., person with lower levels of education, mental health issues, and substance abuse). Future research should also address (1) how to best assess the entire spectrum of cessation including the processes tobacco users use to quit (including quitting without assistance and use of effective tobacco cessation treatments) and (2) opportunities for enhancing recall through web-based questionnaires or other emerging technologies. Valid assessment of lifetime tobacco use, cessation and other related-behaviors is critical in determining the effect of tobacco control programs, policies and interventions on the tobacco epidemic including patterns of initiation, smoking trajectories, and health risks.

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SYM12 INTERNATIONAL EVIDENCE ON THE IMPACT OF TOBACCO PACKAGING AND "PLAIN" OR "STANDARDIZED" PACKAGING REGULATIONS

Presenters: David Hammond, Ph.D., Juliana Doxey, B.A., M.S.W.[1], Maansi Bansal-Travers, Ph.D.[2], James Thrasher, Ph.D.[3], Matthew Rousu, Ph.D.[4], Crawford Moodie, Ph.D.[5], Karine Gallopel-Morvan, Ph.D.[6], Emmanuelle Béguinot[7], Yves Martine[7], and Figen Eker[7]
[1]University of Waterloo; [2]Roswell Park Cancer Institute; [3]University of South Carolina; [4]Susquehanna University; [5]University of Stirling; [6]University of Rennes, France; [7]French National Committee against Tobacco, France

Tobacco packaging regulations have emerged as one of the most prominent areas of tobacco control policy, largely due to the proliferation of comprehensive health warnings labels. However, restrictions on the type of information that tobacco companies print on packages have evolved more slowly. More than 50 countries have prohibited the descriptors "light," "mild," and "low tar" from packs, although research suggests that these restrictions are insufficient to significantly reduce either false beliefs about the risks of certain brands or brand appeal. This symposium will present new research findings on the impact of cigarette packaging, industry innovation, as well as the potential impact of "plain" or "standardized" packaging regulations. First, Dr. Crawford Moodie will present findings on recent trends in industry design based on a study that monitored the retail trade press in the United Kingdom between 2002 and 2005 to examine the impact of new marketing restrictions on pack design, including "value" packaging, pack imagery, and innovations in shape. Dr. Maansi Bansal-Travers will report findings from a US study examining the association between perceptions of health risks and packaging elements including color shading, descriptor terms, as well as health warning label format (i.e., label size, style, framing, and source attribution). Dr. Karine Gallopel-Morvan will present the results from two studies conducted in France on the impact of plain packaging, including the impact of plain packaging in the presence of large pictorial warnings. Dr. James Thrasher will present findings from an "auction" study on the impact of different health warning formats on demand and cognitive impact among US smokers, including the effect of "plain" packaging on demand. Finally, Juliana Doxey will present Canadian research on the impact of female-oriented pack designs, such as the use of pink colors, on brand appeal and beliefs about smoking among young women. The research presented in this symposium has important implications for regulatory developments in several countries, including in the U.S. where new legislation provides a broad mandate for new packaging regulations.

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SYM12A THE IMPACT OF PLAIN PACKAGING ON FRENCH PEOPLE: RESULTS FROM 2 SURVEYS

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According to internal tobacco industry documents, cigarette packaging is a promotional vehicle to attract young smokers and drive brand imagery. Thus, plain packaging, which consists of the removal of colours, imagery and logos, has been recommended in Article 11 of the FCTC. We tested the impact of plain packaging in 2 quantitative studies conducted in 2008. In Study 1, an experimental study was conducted with 905 smokers and non-smokers aged 15 to 45. They were shown one of 6 real cigarette packs: a current Marlboro pack with only textual warnings or with combined warnings (visual and textual), a grey Marlboro plain pack with only textual warnings or with combined warnings (visual and textual), a white Marlboro plain pack with only textual warnings or with combined warnings (visual and textual). In Study 2, a survey was conducted with 836 smokers and non-smokers aged 18 and more (representative sample). They were shown 3 packs of cigarettes (a collector pack, a current pack and a grey plain pack) of 3 different brands: Camel, Lucky Strike and Gauloises (a French brand). The from Study 1 indicated that, compared to the 2 plain packs with pictorial warnings, the current Marlboro pack was more likely to be perceived as a fashion accessory, as a Marlboro ads, and as a pack that creates a desire to smoke for teenagers. In contrast, the 2 plain packs with pictorial warnings were more likely to be perceived as packs that makes people think of the dangers of tobacco, motivates smokers to quit smoking, reduces consumption, and reduces the desire to smoke a cigarette. The findings from Study 2 indicated that the collector pack and the current pack were perceived as more effective than the grey plain pack to get attention, to be attractive, to create a desire to buy cigarettes among young people, and less effective than the grey plain pack to motivate smokers to quit smoking. In conclusion, while the research body on the effects of plain packaging in Europe is very limited, our studies reveal that generic packaging is a real opportunity to reduce the impact of cigarettes advertising, to motivate smokers to quit smoking and to prevent young people from starting smoking.

National Committee against Tobacco and the French National Cancer Institute.

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SYM12B DEADLY IN PINK: THE IMPACT OF FEMALE ORIENTED PACKAGING AMONG YOUNG WOMEN

Juliana Doxey, B.A., M.Sc.* and David Hammond, Ph.D., University of Waterloo, Canada

Industry documents and anecdotal evidence suggest that cigarette packaging can target women by enhancing brand appeal and targeting important beliefs about smoking. This study sought to examine the impact of female-oriented packaging on young women, including the impact of "plain" or "standardized" packaging. A between-subjects experiment was conducted in Waterloo, Canada with 512 participants between the ages of 18-25 years. Participants completed an online survey in which they viewed a series of 8 packs designed according to one of four conditions: "normal" fully branded female-oriented brands (n = 141); female-oriented brands with descriptors (e.g. "slims") removed (n = 125); female-oriented brands without brand imagery or descriptors ("plain" packs; n = 122); and "normal" non-female oriented brands (n = 124). Participants rated each of the 8 cigarette packs on perceptions of appeal, taste, tar, and health risks, and completed additional survey measures on psychosocial predictors of smoking. Results of the study indicated that women rated the "normal" fully branded female-oriented packs as significantly more appealing than the packs with the descriptors and colours removed, as well as the male-oriented packages. The fully branded packs were also significantly more likely be associated with positive attributes such as glamour, being slim, and sophisticated compared to brands without descriptors and colors. The study also found that women who viewed the normal fully branded female packs were more likely to believe that smoking helps people control their appetites compared to women who viewed the non-female oriented packs or the female oriented packs without descriptors or colors. Overall, this study demonstrates that cigarette packaging helps to promote brand appeal and influences important predictors of smoking among young women. The study also adds to the growing evidence on the impact of plain packaging—removing colors and design elements—as well as the impact of potentially misleading brand descriptors, such as the word "slims."

This research was supported by funding from the Canadian Tobacco Control Research Initiative, the Ontario Tobacco Research Unite, and the Centre for Behavioural Research and Program Evaluation, National Cancer Institute of Canada/Canadian Cancer Society.

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SYM12C TOBACCO PACKAGING IN THE UK

Crawford Moodie, Ph.D., University of Stirling, UK

In the UK the Tobacco Advertising and Promotion Act (TAPA), introduced in five phases between 2003 and 2005, prohibits most tobacco advertising, promotion and sponsorship. Packaging, however, is not covered in the Act. To examine the industry use of packaging before, during, and after, the implementation of the TAPA we have monitored the retail trade press since 2002. Based upon tobacco industry marketing documents in the UK in the mid-1990s, we consider three dimensions of packaging: value (altered pack size or price marked packaging), image (altered pack design) and innovation (pack additions or modifications) packaging. Examples of value, image and innovation based packaging are reported in the trade press from 2002 to 2004, but mention of all three increases markedly from 2005 onwards, as other marketing channels were restricted. The pack has clearly become an increasingly important promotional tool for the tobacco industry since the TAPA, highlighting the need for standardised packaging.

Not applicable.

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SYM12D ESTIMATES OF REDUCTION IN DEMAND ASSOCIATED WITH DIFFERENT CIGARETTE PACKAGE WARNING LABEL FORMATS: AN EXPERIMENTAL AUCTION STUDY AMONG ADULT SMOKERS IN THE U.S.

James Thrasher, Ph.D.*[1], Matthew Rousu[2], and David Hammond, Ph.D.[3], [1]University of South Carolina; [2]Susquehanna University; [3]University of Waterloo

This study sought to estimate the differences in demand and cognitive impact of cigarette packages with different health warning label formats. We designed four health warning labels with the same text message (Smoking causes mouth cancer): (a) text on 50% of one side of the pack; (b) text on 50% of the front and back of the pack; (c) text with picture illustrating mouth cancer on 50% of the front and back of the pack; and (d) same as previous format, but on a "plain" pack without brand imagery except brand font and descriptors (e.g., light, menthol). 500 adult smokers were recruited from supermarkets in four states (South Carolina, Pennsylvania, Florida, California) to participate in an experimental auction of packs, in which participant bids reflect product demand. Sociodemographic and smoking behavior data were first collected. Then, in two sequential rounds, participants bid on the most popular pack within their preferred product class (i.e., Marlboro Red, Marlboro Light, or Newport), with two of the four possible warning label conditions randomly selected for each round. Once the bidding ended, participants were asked specific questions on their reactions to each warning label on which they bid. In preliminary analyses of half of the sample, the mean price for each pack was significantly different across all four conditions: (a) small text only ($3.71); (b) large text only ($3.43); (c) large text with picture ($3.26); (d) large text with picture on plain pack ($3.02). Statistically significant differences between conditions were maintained in multivariate models. Mean reactions of perceived risk and desire to quit showed similar statistically significant differences across packages, except for the comparison between (c) and (d). Overall, the results indicate that larger, more prominent areas dedicated to health warnings and gruesome pictures reduce cigarette demand. These features accompanied by plain packaging had the most significant reduction on demand. Regulators should consider gruesome imagery along with plain packaging as the most powerful demand-reducing warning label policy.

Robert Wood Johnson Foundation.

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SYM12E STUDY TO EVALUATE THE INFLUENCE OF CIGARETTE PACK DESIGN ON U.S. ADULTS

Maansi Bansal-Travers, Ph.D.*[1] and David Hammond, Ph.D.[1]; [1]Roswell Park Cancer Institute, NY; [2]University of Waterloo, ON

Cigarette manufacturers use colors, images, and words such as light, and mild to communicate specific product features to consumers. This study examined smokers' and nonsmokers' perceptions of health risks based on the systematic manipulation of two main features of cigarette pack design: pack characteristics (i.e., shading, descriptor term, plain pack) and warning label format (i.e., label size, style, framing, and source attribution), while keeping other factors constant. 397 adults (200 non-smokers and 197 smokers) were recruited from Western New York through a within-participant design mall-intercept survey to complete a 15-minute session in exchange for a $10 gift card. All participants were presented with 12 sets of packs in random order; each set varied according to a particular design feature and asked a series of questions. Despite demographic differences between smokers and non-smokers, patterns of responses to each set of pack design manipulations was similar. 68% never or rarely noticed the warning labels on packs in the last month, 11% attempted to avoid the labels, and 53% said that the warning labels made them think little or not at all about health risks. A significantly greater number of participants were likely to choose the pack that had the lighter color shading, descriptor term that implied less risk, or pack that had the less overt warning label style (text warning, gain framing) when asked which pack had the smoothest taste or which they would buy to reduce health risks; however, more participants chose the "full flavor" pack when asked which they expect would deliver the most tar. Participants also chose the graphic, larger, loss-framed warning label when asked which would attract attention, make them think about health risks, motivate quitting, and overall most effective. Overall, the findings suggest that large, graphic health warnings that convey a loss-framed message would be the most effective. The results also suggest that cigarette pack design variations communicate subtle but important messages about inferred risk from product use and that plain packaging should be considered to eliminate this type of subliminal communication.

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PAPER SESSIONS

Paper Session 1: Tobacco Control with Special Populations

PA1-1 LONGITUDINAL PATTERNS OF CIGARETTE SMOKING AMONG LESBIAN, GAY, BISEXUAL, MOSTLY HETEROSEXUAL, AND HETEROSEXUAL ADOLESCENTS

Brianna M. Wadler, Sc.M.*[1], S. Bryn Austin, Sc.D.[2,3], Hee-Jin Jun, Sc.D., M.P.H.[4], Margaret Rosario, Ph.D.[5], David Wypij, Ph.D.[6,7,8], A. Lindsay Frazier, M.D., Sc.M.[4,9], and Heather L. Corliss, M.P.H., Ph.D.[2,7]; [1]Division of Public Health Practice, Harvard School of Public Health; [2]Division of Adolescent/Young Adult Medicine, Children's Hospital Boston; [3]Department of Society, Human Development, & Health, Harvard School of Public Health; [4]Channing Laboratory, Department of Medicine, Brigham & Women's Hospital/Harvard Medical School; [5]City University of New York, City College and Graduate Center; [6]Department of Biostatistics, Harvard School of Public Health; [7]Department of Pediatrics, Harvard Medical School; [8]Department of Cardiology, Children's Hospital, Boston; [9]Dana-Farber Cancer Institute

Lesbian, gay and bisexual adults have higher rates of tobacco smoking compared to heterosexual adults. Among adolescents, few longitudinal studies have compared smoking behaviors across sexual orientation groups. With more than 8 years (1996-2005) of follow-up data from participants in the Growing Up Today Study (a prospective cohort study of 16,882 U.S. adolescents ages 9-14 years at enrollment), we examined longitudinal patterns of smoking across ages 12-23 years comparing youth describing themselves as "mostly heterosexual," bisexual, or lesbian/gay to those describing themselves as completely heterosexual. Outcome variables were age at smoking initiation, past-month smoking, frequency of smoking, and number of cigarettes smoked per day. Cox proportional hazards were used to estimate hazards ratios for age at smoking initiation. Generalized estimating equation (GEE) analysis of repeated measures was conducted to estimate risk ratios [RR] for past-month smoking (modified Poisson regression), odds ratios [OR] for frequency of smoking (ordinal logistic regression), and beta coefficients for number of cigarettes smoked per day (linear regression). Analyses were stratified on gender and adjusted for confounders. Lesbians and bisexual and mostly heterosexual boys and girls reported younger ages of smoking initiation compared to heterosexual peers of the same gender (all p<.01). Gay/lesbian (boys, girls, respectively) (RR: 1.8, 1.8), bisexual (RR: 1.5, 2.2), and mostly heterosexual (RR: 1.4, 1.7) adolescents were also more likely to report smoking in the past month (all p<.02). Gay/lesbian (OR: 2.2, 4.0), bisexual (OR: 2.7, 6.0), and mostly heterosexual (OR: 2.1, 2.8) adolescents reported more frequent smoking (all p<.0001). Among smokers, number of cigarettes smoked per day was higher among lesbian, bisexual, and mostly heterosexual girls (all p≤.02). Findings are discussed with implications for prevention and treatment of cigarette smoking in sexual minority youth.

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PA1-2 PREDICTORS OF SMOKING REDUCTION AMONG AFRICAN AMERICAN LIGHT SMOKERS ENROLLED IN A CESSATION TRIAL

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African American smokers have increased tobacco-related health risks, despite smoking fewer cigarettes per day (CPD) than Caucasians. Cessation decreases several of these risks. Smoking reduction may also reduce health risks and may be important in the cessation process. Because little is known about factors associated with smoking reduction, we investigated factors predicting reduction among African American light smokers (<10 CPD) enrolled in a 26-week trial comparing motivational interviewing to health education and nicotine gum to placebo. We compared (1) reducers (reduced smoking by ≥1 cigarette per day) to non-reducers, and (2) reducers to quitters. Baseline demographic, smoking-related, and psychosocial variables were collected, and week-26 smoking status was assessed. Among 541 participants, 58.0% (n=314) reduced their smoking, 17.4% (n=94) quit, and 24.6% (n=133) did not reduce their smoking. After controlling for treatment condition, gender, and age, baseline predictors of smoking reduction vs. no reduction included smoking the first cigarette within 30 minutes of waking (OR=0.47, 95% CI 0.28, 0.80), higher baseline smoking level (OR=1.19, CI 1.08, 1.31), living with other smokers (OR=1.88, CI 1.19, 2.95), and lower Smoking Consequences Questionnaire (SCQ) scores on stimulation/state enhancement (OR=0.98, CI 0.95, 1.00) and negative social impression (OR=0.96, CI 0.94, 0.99). Baseline predictors of reduction vs. cessation included higher smoking level (OR=1.15, CI 1.03, 1.29), higher cotinine levels (OR=1.01, CI 1.00, 1.01), living with other smokers (OR=1.69, CI 0.97, 2.93), and lower SCQ scores on health risk concerns (OR=0.90, CI 0.80, 1.00) and negative social impression (OR=0.97, CI 0.94, 0.99). Thus, the influence of baseline CPD and salivary cotinine level on smoking behavior change deserves further examination, as our results indicate that they are not synonymous in terms of predicting reduction vs. cessation vs. no reduction. Expectancies, motivation, and confidence also differentially predict smoking behavior change. Thus, understanding and intervening on these variables may be important in aiding smokers to reduce or quit smoking.

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PA1-3 BARRIERS TO EFFECTIVE TOBACCO DEPENDENCE TREATMENT FOR THE VERY POOR

Bruce A. Christiansen, Ph.D.*[1], Stephany Pruitt, D.C.C., M.S.[2], Maureen C. Hill, M.S., M.P.H.[3], John A. Christiansen[4], and Michael C. Fiore, M.D., M.P.H., M.B.A.[1], [1]University of Wisconsin School of Medicine and Public Health; [2]Vincent Family Resource Center; [3]Salvation Army of Wisconsin and Upper Michigan; [4]Knox College

Since the Surgeon General linked tobacco use with disease in 1964, significant population disparities in tobacco use and tobacco-related diseases have developed. Smokers living in poverty are one such disparate population. They have a high rate of tobacco use and are less likely to try to quit, to use evidenced-based treatment and to successfully quit. Members of this population have specific beliefs that may be barriers to quit attempts using evidenced based treatments. These include the smoking as normative; "willpower" is both necessary and sufficient for successful quitting; poor differentiation between relative effective and ineffective methods of quitting; and cessation medications are dangerous, ineffective and/or addicting. Unfortunately, little is known about the treatment beliefs held by the very poor as they tend to be unrepresented in telephone and Internet surveys. This study reports on the results of an in-person household survey targeting the very poor in two impoverished zip codes in Milwaukee, Wisconsin, undertaken as part of a broader community based research project. From randomly selected addresses, 78.3% of eligible people (adult smokers) completed the 20-minute survey. The resulting sample (N= 654) was very impoverished: 68.1% reported annual household income below $15,000. Self-reported smoking prevalence was 42.1%. Surprisingly, 37.7% have never tried to quit. Beliefs that could be barriers to effective treatment were evident: respondents thought that, on the average, 73% of people in their neighborhood smoked; 64.7% agreed that it was OK to smoke a little or some of the time; 84.7% thought that quitting was just a matter of will power; quitting using willpower was thought to be more effective than either medicines or counseling (44.2% quit vs. 33.4% and 28.4%, respectively); and 48.5% thought that medicines to help you stop can be more dangerous than continued smoking. These beliefs were studied relative to variables such as intention to quit. Results indicate the probable importance of addressing these beliefs in order to increase the number of quit attempts.

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PA1-4 CORRELATES OF SMOKING ABSTINENCE AMONG AMERICAN INDIAN SMOKERS

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Background: Cigarette smoking is normative in American Indian communities, which likely contributes to the observed high rates of current smoking in this population. We examined predictors of smoking cessation among a population-based sample of American Indians during a quit attempt aided with nicotine replacement therapy (NRT).

Methods: This study used the subsample of American Indian (AI) adults (n=291), AI survey response rate=55.4% from a cohort study of smokers engaging in an aided quit attempt using NRT. Eligible participants had filled a prescription for NRT between July 2005 and September 2006 through the Minnesota HealthCare Programs (e.g., Medicaid). A mixed mode follow-up survey assessed outcomes approximately 8 months after their NRT fill date.

Results: In the final model, significant correlates of 7-day smoking abstinence included reporting a complete home smoking ban, greater perceived advantages of NRT, and older age. Only 33% of AI respondents who were trying to quit smoking had a complete home smoking ban. Having a history of anxiety was associated with a lesser likelihood of 7-day smoking abstinence in the unadjusted analysis but was not significantly associated with abstinence after adjustment for confounders.

Conclusions and Implications: Results of this analysis suggest a few potential modifiable targets of intervention to help American Indian adults to quit smoking: (1) promotion and adoption of complete home smoking bans in American Indian households; (2) education and increased awareness of the advantages and benefits of nicotine replacement therapy; and (3) addressing or treating anxiety during attempts to quit smoking by American Indian smokers.

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PA1-5 GENERALIZING GROUP COGNITIVE BEHAVIORAL THERAPY TO AFRICAN AMERICAN SMOKERS: A RANDOMIZED CONTROLLED TRIAL

Monica S. Webb, Ph.D.*[1], Denise Rodriguez de Ybarra, M.A.[1], Elizabeth A. Baker, B.S.[1], Isildinha M. Reis, Ph.D.[1], and Michael P. Carey, Ph.D.[2]; [1]Department of Psychology, Sylvester Comprehensive Cancer Center, University of Miami; [2]Syracuse University

The health consequences of tobacco smoking disproportionately affect African Americans; yet research on whether efficacious interventions can be generalized to this population is limited. This study examined the efficacy of group cognitive-behavioral therapy (CBT) for smoking cessation among African Americans. Participants (N = 154; 65% female; M = 44 years old; M cigarettes/day = 13) were randomly assigned to either (a) group CBT or (b) group general health education (GHE). Participants in both conditions received six sessions of counseling and 8-weeks of transdermal nicotine patches. The primary outcome variable was 7-day point prevalence abstinence (ppa), assessed at the end-of-counseling (2 weeks), and at 3- and 6-month follow-ups. Secondary outcomes included 24-hour ppa and 28-day continuous abstinence (assessed at 3 and 6-months). Intent-to-treat analyses demonstrated the hypothesized effects, such that 7-day ppa was significantly greater in the CBT condition compared to GHE at the end of counseling (51% vs. 27%), and at the 3-month (34% vs. 20%), and 6-month (31% vs. 14%) follow-ups. Results of a generalized linear mixed model demonstrated a significant effect of CBT versus GHE on 7-day ppa (OR = 2.57, 95% CI = 1.40 - 4.71) and also an effect of time ($p < .002$). The condition-by-time interaction was not significant. Similar patterns of results emerged for 24-hour ppa and 28-day continuous abstinence. Among participants who completed the study per protocol (60% of those randomized), 7-day ppa was significantly greater in the CBT condition compared to GHE at the end of counseling (74% vs. 33%), and at the 3-month (52% vs. 29%), and 6-month (46% vs. 21%) follow-ups. Results of a per protocol generalized linear mixed model demonstrated a significant effect of CBT versus GHE on 7-day ppa (OR = 5.69, 95% CI = 2.31 - 14.01) and also an effect of time ($p < .01$). The condition-by-time interaction was not significant. These results demonstrate that intensive, group cognitive-behavioral smoking cessation interventions are efficacious among African American smokers.

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Paper Session 2: Anti-Tobacco Messaging

PA2-1 IMMEDIATE EFFECTS OF CULTURALLY SPECIFIC VERSUS STANDARD HEALTH EDUCATION MESSAGES AMONG LOW-INCOME AFRICAN AMERICAN SMOKERS

Monica S. Webb, Ph.D.*, Elizabeth A. Baker, B.S., and Denise Rodriguez de Ybarra, M.A., Department of Psychology and Sylvester Comprehensive Cancer Center, University of Miami

Previous research has highlighted the importance of cultural relevance in health risk communications, including tobacco interventions. However, few studies have examined the active components of smoking cessation messages targeting low-income African American smokers. This study tested the influence of message content and culturally specific framing in a sample of adult smokers. In a 2 x 2 factorial experiment, 243 African American smokers (mean = 19 cigarettes/day) recruited from the community (55% female; mean age = 43 years) were randomly assigned to one of four conditions: culturally specific smoking messages; standard smoking messages; culturally specific exercise/weight messages; or standard exercise/weight messages. The primary outcome measures were theoretical antecedents to behavior change, including risk perceptions (general, personal, and culturally specific), readiness to quit smoking, and smoking-related knowledge. We hypothesized that irrespective of cultural specificity, the smoking messages would produce greater risk perceptions, readiness to quit, and smoking-related knowledge compared to the control conditions (i.e., the exercise/weight messages). We also expected to find a message content x message framing interaction effect, such that participants in the culturally specific smoking messages condition would demonstrate greater risk perceptions, readiness to quit, and smoking-related knowledge compared to each of the other conditions. The results showed that the smoking messages produced greater culturally specific risk perceptions, readiness to quit smoking, and smoking-related knowledge. The culturally specific messages produced greater personal risk perceptions and intentions to quit. Culturally specific risk perceptions were most affected by culturally specific smoking messages. Findings supported the roles of message content and culturally specific framing in the efficacy of brief written interventions for smoking cessation in this population. Future research is needed to examine the influence of these constructs on behavior change.

This study was funded by Syracuse University.

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PA2-2 EVALUATING EX: A NATIONAL, BRANDED MEDIA CAMPAIGN TO ENCOURAGE SMOKING CESSATION

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In 2006, the American Legacy Foundation developed and pilot tested a branded media campaign called “EX” to determine whether it could effectively increase demand for consumer cessation services and change key beliefs associated with successful quitting. An evaluation of a pilot campaign showed that, 4.5 months after the campaign launched, 62% of the target audience had confirmed awareness of the campaign, and that confirmed awareness was associated with statistically significant change in a subset of campaign-related beliefs. Based on these findings, the National Alliance for Tobacco Cessation (NATC) – a partnership of states, national public health organizations and other foundations and corporations – launched EX at the national level in the spring of 2008. This study uses a longitudinal cohort of adult smokers (18-49) to examine the association between confirmed awareness of the national EX campaign and cessation outcomes after 6 months. Respondents were drawn from the eight U.S. Designated Market Areas. Markets were selected to ensure variation with respect to the quantity of EX media message delivery, as well as demographic characteristics, strength of tobacco control (e.g., policy and expenditures), smoking prevalence and U.S. geographic location. A total of 5,616 respondents completed the baseline, and 4,067 completed the follow-up survey. Confirmed awareness of EX was positively and statistically significantly associated with the cessation beliefs index as well as four of the nine individual belief items measured. Multivariable models demonstrated that confirmed awareness of EX was significantly associated with having made one or more quit attempts between baseline and follow-up interviews. This study demonstrates that EX ¬– a national, branded, mass media smoking cessation campaign – can be used to increase quit attempts among adult smokers in the U.S. The campaign was fairly brief and it aired at media levels that are lower than CDC recommendations. This suggests that a similar campaign of longer duration, or one that ran at a greater media weight, could make a larger impact in terms of increasing quit behavior.

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PA2-3 SOCIAL MARKETING TO PROMOTE COMPREHENSIVE SMOKE-FREE POLICIES: EVALUATION OF A SOCIAL NORMING CAMPAIGN IN MEXICO CITY

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Objective: Assess the impact of a social marketing campaign to support comprehensive smoke-free policy in Mexico City.

Methods: A social marketing campaign using television, radio, and print materials was developed, pre-tested and aired over a three month period, with the aim of reinforce the benefits and the new social norm of smoke-free areas. A population-based, representative cohort of Mexico City inhabitants was established after the law was implemented but before the campaign start, of whom 84% (786/961) were successfully followed up as the campaign ended. Self-reported exposure to each of five campaign materials was assessed, as well as key psychosocial outcomes related to campaign content. Ordinal regression models were used to assess whether campaign exposure predicted changes in psychosocial outcomes, while controlling for baseline levels of these outcomes and self-reported exposure to a bogus ad that had not been used.

Results: Campaign exposure was generally high, with exposure ranging from 15% (one of two print ads) to 49% (one of two radio ads). Although 31% of the sample reported no exposure, 27%, 25% and 18% had been exposed to one, two and three or more campaign materials, respectively. Exposure was unassociated with sociodemographics or other potential confounding variables, including smoking status. These four exposure levels were strongly correlated with campaign content; such as knowledge of cigarette smoke components (i.e., arsenic 27%, 32%, 41%, 59%). Campaign exposure also predicted increases in support for smoke-free bars (B=0.22, p=0.02) and smoke-free hotels (B=0.22, p=0.02); stronger perceptions that the smoke-free law improves the health of people like them (B=0.19, p=0.03) and their family (B=0.18, p=0.03), and that workers have a right to work in a smoke-free workplace (B=0.24, p=0.03); and with weakening of the belief that it is up to the other person to leave if they are bothered by cigarette smoke (B=-0.29, p=0.006).

Conclusions: This campaign achieved its goal of supporting smoke-free policy in Mexico City. Such campaigns may be critical to ensuring compliance.

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PA2-4 WHAT DO CIGARETTE PACK COLORS COMMUNICATE TO SMOKERS IN THE U.S.?

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Cigarette manufacturers utilize colors, images and descriptors such as full flavored, light, and smooth to communicate specific product features to consumers. This study is relevant in that several countries (e.g., US, Australia) have moved to ban misleading descriptors. However, little change has been made to packaging, making the value of eliminating descriptors questionable. The main purpose of this study was to show that consumers have ingrained emotions and perceptions regarding pack color, and removal of descriptive terms will not effectively eliminate deceptive health claims made by the tobacco industry regarding the risks of smoking. An ad in newspapers in Buffalo, NY, in February-March 2008 directed interested respondents to a Web site where a brief screening survey determined their eligibility for participation (18 years or older, not colorblind). Participants were asked to link pack images with descriptor terms for 3 brands of cigarettes and complete word associations for a set of 10 descriptor terms. A total of 185 every day or some day smokers were eligible for and completed the Web-based survey. More than 65% correctly matched 5 of the 6 Marlboro packs to the descriptor term based solely on package color, with 49% able to correctly match the sixth pack (Marlboro Smooth). However, fewer US smokers were able to correctly match descriptor term to Peter Jackson cigarettes, an Australian brand. More participants were able to correctly match descriptor term to American Spirit cigarettes, a brand that advertises its reliance on pack color to distinguish between cigarette types. In response to questions regarding which pack smokers would pick with specific concerns, the Marlboro Ultralight image was selected by more than 65% concerned about their health, tar, or nicotine. However, if concerned about taste, most selected the Marlboro Medium pack. Overall, this study found that smokers in the US recognize brand variants by color; therefore, removal of descriptor terms but not the associated colors will be insufficient in eliminating deceptions about the risks from smoking that are communicated through packaging.

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PA2-5 SMOKER RESPONSES TO NEW GRAPHIC HEALTH WARNINGS ON TOBACCO PACKAGING IN NEW ZEALAND BY ETHNICITY AND DEPRIVATION

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AIM: We aimed to assess the impact on smokers of a change from text-based health warnings on tobacco packaging to graphic health warnings (GHWs). The setting was New Zealand (NZ), a country with substantial ethnic diversity and notable health inequalities.

METHODS: The NZ arm of the International Tobacco Control Policy Evaluation Project (ITC Project) uses as its sampling frame the NZ Health Survey (a representative national sample with boosted sampling of Maori). We surveyed by telephone adult smokers in two survey waves (n=1376 and n=926) with those in wave 1 exposed to text warnings and those in wave 2 to GHWs. Only those who participated in both survey waves were included in this analysis. The impact of warnings was assessed using two measures of warning salience, two measures of cognitive response and two behavioural measures using standard ITC Project measures.

RESULTS: Between waves there were statistically significant increases in all measures of warning salience and cognitive response. For the behavioural measures: (i) foregoing cigarettes as a result of the warnings, increased from 13.7% to 19.4% ($p<0.001$); and (ii) for any of four avoidance behaviours, increased from 17.0% to 40.9% ($p<0.001$). Maori smokers reported stronger responses than the European/Other ethnic group for all six measures in both waves. This gap widened significantly for one salience measure, one cognitive measure and both behavioural measures (e.g., for foregoing cigarettes an increase of 8.4% points vs. 2.7%, $p<0.001$). Similarly, those in the most deprived five deciles of the population reported stronger responses than the less deprived group for all six measures in both waves. But in terms of change between waves it was the less deprived group in which gains were more likely (statistically significant in 4 of 6 measures).

CONCLUSIONS: The findings add to the evidence for the impact of GHWs on influencing salience, cognitive responses and behaviours. This is the first study to investigate the impact among indigenous peoples. The findings suggest that GHWs are as or more effective in Maori in NZ, and may contribute to reductions in disparities in smoking prevalence.

Health Research Council of New Zealand.

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Paper Session 3: Psychiatric Comorbidity

PA3-1 FREQUENT BRIEF BEHAVIORAL INTERVENTION PLUS CONTINGENCY MANAGEMENT VS.COGNITIVE BEHAVIORAL TREATMENT FOR SMOKING CESSATION FOR ALCOHOLIC SMOKERS DURING INTENSIVE ALCOHOL TREATMENT

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USDHHS clinical practice guidelines have suggested that alcoholic smokers should be offered tobacco treatment within substance abuse clinics but studies of concurrent treatment have yielded low smoking quit rates. Contingency Management (CM) has been used in combination with a daily-administered frequent brief behavioral smoking counseling (FBBI) to enhance short-term quit rates in moderate drinkers (Liss et al., 2004). The current study examined the short-term efficacy of using FBBI+CM to enhance smoking cessation treatment in alcohol dependent individuals. 83 alcoholic smokers enrolled in a 15-day substance abuse intensive day program were randomized to FBBI+CM vs. a conventional Cognitive Behavioral (CBT) smoking cessation intervention administered concurrent with substance abuse treatment. CBT treatments were delivered in three 40 minute weekly sessions, while FBBI treatments were delivered in twelve 10 minute daily sessions. CBT and FBBI treatments were identical for total time and content. Subjects in the FBBI condition also received CM where CO-confirmed cigarette abstinence was reinforced. Breath CO was assessed twice daily for 8 post quit date treatment days, and CO-confirmed abstinence (≤5 ppm) was reinforced on a progressive schedule starting at $5 and progressing to $12.50, with a potential maximum of $140. CM payments were reset to $5 for CO readings >5ppm or if the subject reported smoking. All subjects received 8 weeks of nicotine patch treatment. Smoking outcome was assessed at end of behavioral treatment (EOT) and at 1 and 6 months after quit date. CO-verified 7-day point prevalence smoking abstinence was significantly greater in the FBBI+CM condition (59.5%) compared with the CBT condition (29.3%) at EOT (chi square= 7.69, $p < .01$). Tobacco outcome differences were not significant at 1 month (FBBI+CM–40.5%, CBT–26.8%, chi square=1.73, ns) or 6-month assessments (FBBI+CM–11.9%, CBT–4.9%, chi square=1.33, ns). These findings suggest that FBBI+CM may enhance initiation of smoking cessation for alcoholic smokers enrolled in a substance abuse program. However, as in other CM trials, effects are not maintained following active treatment.

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PA3-2 A PILOT STUDY OF VARENICLINE FOR TOBACCO DEPENDENCE TREATMENT IN RECOVERING ALCOHOLIC SMOKERS

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Background: Smokers who are recovering from alcohol abuse or dependence are more nicotine dependent than the general population and may be more resistant to treatment for tobacco use and dependence.

Objective: To obtain preliminary evidence of the effect of a 12-week course of varenicline on end-of-treatment 7-day point prevalence smoking abstinence rates in recovering alcoholic smokers.

Methods: A total of 32 smokers in recovery from alcohol abuse and dependence were enrolled between 04/14/08 and 07/08/08 in this pilot clinical trial All subjects received open-label varenicline 1 mg twice daily for 12 weeks. Brief behavioral counseling was provided at study visits occurring weekly for the first 4 weeks then biweekly for 8 weeks. The primary efficacy end-point was 7-day point prevalence smoking abstinence confirmed by expired air carbon monoxide ≤10 parts per million at the end of treatment.

Results: Study participants were 69% male; 94% Caucasian; average age 42.9±10.5 years; 28% married; and smoked an average of 20.3±5.0 cigarettes per day. At the end of study treatment (12 weeks) 31% of subjects were biochemically confirmed 7-day point prevalence abstinent from smoking and 28% had prolonged smoking abstinence (since target quit day). Adverse effects reported included mild to moderate nausea in 28%; mild to moderate sleep disturbance in 19%; mild to moderate abnormal dreams in 16%; moderate to severe depression/anxiety in 16% (6% moderate and 9% severe). There were no reports of suicidal ideation or behavior and no serious adverse events.

Conclusion: Varenicline may be a useful aid for treating tobacco dependence among smokers who are in recovery from alcohol abuse and dependence. Additional studies of varenicline in this population of smokers are warranted.

Mayo Foundation for Medical Education and Research.

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PA3-3 EFFICACY OF A STAGE-TAILORED TOBACCO CESSATION TREATMENT INITIATED IN INPATIENT PSYCHIATRY

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Persons with mental illness face serious tobacco-related consequences. Smoke-free psychiatric hospitalizations provide an ideal opportunity to reach, initiate, and support individuals with mental illness in quitting smoking. In a randomized clinical trial, we evaluated a stage-tailored tobacco cessation treatment initiated in inpatient psychiatry relative to usual care. The intervention combined a computer-delivered, stage-tailored expert system intervention; a manual; a brief counseling session; and nicotine replacement during hospitalization with access to 10 wk of nicotine patch post-hospitalization. The usual care group received nicotine replacement during hospitalization and brief advice to quit smoking. The sample (N=224, 79% recruitment rate, 60% male, 64% Caucasian, 60% incomes < $20,000/year) represented a range of psychiatric diagnoses, with major groups being unipolar depression (48.7%), bipolar depression (26.8%), and schizophrenia spectrum disorders (16.5%); 74% reported problematic alcohol or illicit drug use. At baseline, participants averaged 19 (SD=13) cigarettes per day prior to hospitalization with a moderate level of nicotine dependence (FTND: M=4.7, SD=2.5). Only 17% reported intention to quit smoking in the next 30 days. Among intervention participants, 96% completed the computer and counseling sessions during their acute stay, and 49% accessed nicotine patch from the study for use after hospitalization. Biochemically verified 7-day point prevalence abstinence at 3-, 6-, and 12-months follow-up was 14.0%, 15.8%, and 21.3% for intervention participants versus 4.4%, 6.6%, and 13.4% for control participants. Follow-up rates exceeded 80% at all time points. In a generalized linear regression model, the comparison of treatment conditions was significant (Score chi-square (df)=6.14 (1), p=0.0132) as was the change over time (Score chi-square (df)=7.06 (1), p=0.0079). The 12-month quit rate of 21% and the pattern of increasing abstinence rates over time are consistent with evaluations of the expert system in the general population. The findings support the efficacy of a stage-tailored tobacco cessation treatment initiated in inpatient psychiatry.

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PA3-4 THE ROLE OF COMORBIDITIES IN QUITTING SMOKING: A PROSPECTIVE ANALYSIS OF DATA FROM THE ALPHA-TOCOPHEROL BETA-CAROTENE CANCER PREVENTION STUDY

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Despite marked reductions in United States smoking prevalence since the first Surgeon General's report, smoking rates have not declined in over a decade. One approach to increasing cessation rates in the population is to identify factors associated with relapse to smoking and thereby improve targeted treatments aimed at sustaining cessation. Behavioral and psychological comorbidities are known markers of relapse, but how these factors act to influence cessation outcomes over the natural history of a single quit attempt remains unclear. The current study used a nested case-control design to (1) prospectively explore the association between comorbid factors and the ability to sustain cessation, and (2) describe fluctuations in comorbid factors around the quit attempt interval. Data were drawn from the Alpha-Tocopherol Beta-Carotene (ATBC) study, a longitudinal nutritional intervention study of heavy smoking Finnish men. The sample consisted of the ~30% of participants who made a quit attempt during the trial. Cases were defined as those men who made a quit attempt followed by a relapse within less than 4 months (n=2308). Controls were men who sustained a quit attempt for 4 months or longer (n=619). Independent variables included measures of comorbid conditions (i.e., mood symptoms, alcohol use), smoking behavior, and demographics. Bivariate and logistic regression analyses were used to compare the cases vs. controls for differences in comorbid conditions at three time points over the natural history of the quit attempt (pre-quit, quit, and post-quit intervals). A higher proportion of relapsers experienced comorbid symptoms over the quit attempt, relative to sustainers. Heavier alcohol use and the presence of mood symptoms (i.e., depression, anxiety) consistently differentiated relapsers vs. sustainers across all intervals. Comorbid symptoms were most pronounced during the quit attempt interval than pre- or post- quit attempt. Results suggest that mood fluctuations around the quit attempt may derail many smokers' efforts to achieve sustained cessation. From a clinical perspective, this represents a potentially important opportunity for targeted relapse prevention.

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PA3-5 A BEHAVIORAL APPROACH TO SMOKING CESSATION AMONG OPIOID-MAINTAINED PATIENTS

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Cigarette smoking is one of the leading causes of preventable death among the substance abusing population (Hurt et al., 1996). In the methadone-maintained (MM) population, 80-100% of patients endorse smoking cigarettes (vs. 25% in the general population) (Berger & Schweiger, 1972; Chait & Griffiths, 1984; Clemmey et al., 1997; Richter et al., 2001). Many MM smokers report an interest in quitting smoking, but few clinics offer treatment (Clark, Stein, McGarry, & Gogineni, 2001; Clemmey et al., 1997, Nahvi et al., 2006). There have been limited scientific efforts thus far to develop and test smoking-cessation interventions in opioid-maintained patients. Behavioral approaches (e.g., contingency management) represent the most promising efforts thus far. We examined the efficacy of a CM intervention to promote smoking abstinence in a sample of methadone- or buprenorphine-maintained smokers across two studies. Study 1 examined the efficacy of an intensive 2-week CM intervention to promote smoking abstinence in this population and found that participants receiving vouchers contingent on smoking abstinence provided significantly greater percentage smoking-negative samples (55% vs. 17% respectively; $p < 0.01$) and had longer durations of continuous abstinence (7.7 vs. 2.4 days respectively; $p = 0.01$) than participants receiving vouchers independent of smoking abstinence. These results demonstrated the efficacy of a brief, voucher-based CM intervention in promoting initial smoking abstinence among opioid-maintained patients. Study 2 examined the efficacy of an intensive 2-week intervention, followed by a less-intensive 10-week intervention, with the aim of promoting and maintaining the smoking abstinence achieved initially. Extended contingent participants appear to be maintaining more smoking abstinence than extended noncontingent participants during Weeks 3-12.

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Paper Session 4: Improving Pharmacotherapy Efficacy

PA4-1 EFFICACY OF FRONT-LOADED VS. WEEKLY COUNSELING ON CESSATION OUTCOMES AT 1-YEAR POST-CESSATION

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Most smokers who try to quit relapse very rapidly, with 60-70% smoking by 2 weeks post-cessation. Those who can remain abstinent for 2 weeks or more have a 50% likelihood of remaining abstinent at 1-year post-cessation. If early relapse could be prevented, long-term success rates should be much higher. We designed a study whose aim was to increase the likelihood of successful early abstinence and subsequent long-term abstinence. We randomized 283 adult smokers (Mean age = 43 years; SD = 9, range 18-70) to either a front-loaded (FL) or standard weekly behavioral counseling condition. While the counseling content and total number of counseling sessions were the same for the two treatment groups, those assigned to the FL condition received 6 counseling sessions in the first two weeks post-cessation (versus 2 counseling sessions for those in the standard weekly condition). Subjects in both groups also received standard nicotine-patch treatment. In the first two weeks of follow-up, there were trends for those in the FL condition to have higher abstinence rates; at the end of nicotine patch treatment (3 months), FL participants had better outcomes on 2 of the 3 indices of abstinence used [continuous ($p = .006$); point prevalence ($p = .03$)], and there was a trend towards abstinence favoring the FL condition using the National Heart, Lung, and Blood Institute (NHLBI) definition of abstinence (7 or more consecutive days of smoking) ($p = .23$). At 1-year post-cessation, there was either a significant effect, or a trend, for the FL participants to have better outcomes on 2 of the 3 definitions of abstinence used [continuous ($p = .007$); NHLBI ($p = .20$)]. We conclude that FL counseling is a very promising treatment option that should be evaluated further, and perhaps considered for implementation in venues where such counseling is possible.

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PA4-2 IMPACT OF GENETIC FEEDBACK ON ADHERENCE TO NICOTINE REPLACEMENT THERAPY: THE PERSONALISED EXTRA TREATMENT (PET) TRIAL

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Despite growing interest in pharmacogenetics to tailor cessation treatment, the behavioural impact of genetic feedback is untested. Communicating genetic information may increase medication adherence, but may also negatively impact motivation to quit if the initial attempt fails. We investigated the impact of genetic feedback on medication adherence and motivation to quit. We tested (1) whether adherence to NRT is greater following genetic (OPRM1 genotype) compared to phenotypic (heaviness of smoking) feedback, and (2) whether smokers who relapsed showed lower motivation to make another attempt following genetic compared to phenotypic feedback. The study was an open label, parallel group randomised trial (ISRCTN: 14352545) conducted in primary care. Adult smokers (n = 633) were prescribed NRT patch, randomised to a top-up dose of NRT based explicitly either on OPRM1 genotype or heaviness of smoking and followed for 6 months. Outcomes measures were: (1) proportion of prescribed NRT consumed in the first 28 days, and (2) motivation to make another quit attempt among those not abstinent at 6-month follow-up. There was a significant effect of genetic feedback compared to phenotypic feedback on adherence at 7-day follow-up (75% vs. 69%, $p = 0.040$), and a marginally non-significant effect at 28-day follow-up (69% vs. 64%, $p = 0.098$). There were similar effects on abstinence at six-month follow-up (14% vs. 8%, $p = 0.018$). Amongst those not abstinent at 6-month follow-up, there was no significant difference in motivation to make another quit attempt between trial arms ($p = 0.23$). This is the first test of the behavioural impact of pharmacogenetic feedback. Genetic feedback had a measurable impact on short-term medication adherence and abstinence at 6-month follow-up compared to phenotypic feedback, and appears to offer modest improvements to medication adherence to medication, and NRT effectiveness. This suggests potential for an important population impact. Cost-effectiveness calculations of genetic tailoring and feedback may need to incorporate effects of feedback on adherence and cessation, as well as any enhancement of treatment effectiveness by genetic tailoring.

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PA4-3 BENEFICIAL EFFECTS OF TOBACCO LONGITUDINAL CARE FOR CESSATION: A RANDOMIZED CONTROLLED TRIAL

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Typical tobacco dependence intervention is delivered in discrete episodes of care and yields disappointing long-term quit rates in the 5-25% range. Tobacco dependence disorder is a chronic relapsing condition and smokers who fail to quit remain interested in quitting. We conducted a clinical trial to compare the efficacy of a longitudinal care model intervention to standard evidence-based (combined behavioral and pharmacological) tobacco treatment. After a 21-day run-in phase we randomized 443 smokers age 18-80 who were interested in quitting to Usual Care (UC) or Longitudinal Care (LC). UC participants received six telephone counseling calls over 8 weeks and nicotine replacement therapy (NRT) including patch, gum, lozenge or combination therapy. LC received the same treatment for the first 4 weeks but counseling and NRT were extended to 1 year. The LC behavioral treatment targeted relapse prevention for quitters, and repeat quit attempts and interim smoking reduction for those who relapsed. Data was collected at 3, 6, 12 and 18M. The primary outcome was 6M of prolonged abstinence at 18M. 91% of participants were reached for 18M follow-ups. The mean age of participants was 42 years and they smoked an average of 17 cigarettes per day (CPD) at baseline. At 18M 30.2% of LC participants vs. 23.5% of UC participants reported 6M prolonged abstinence (unadjusted, $p=0.133$) Logistic regression showed longitudinal care (OR 1.75, $p=0.021$), quit attempts in the past year (OR 1.82, $p=0.019$), baseline CPD (OR 0.62, $p=0.012$) and smoking in the 14-21 day interval after quitting (OR 0.23, $p<0.001$) significantly predicted prolonged abstinence at 18M. Results from 7-day point prevalent abstinence and repeated measures analyses were consistent. LC participants showed more smoking reduction at, 6, 12 and 18M (not significant). The LC group received more counseling calls (median 16 vs. 6, $p<0.001$), a longer total duration of counseling (245 minutes vs. 120, $p<0.001$) and more NRT (e.g. 4.7 boxes patches vs. 2.4, $p<0.001$) than the UC group. We conclude that LC significantly increases short and long-term abstinence.

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PA4-4 VALIDATION OF A NEW PROCEDURE FOR EARLY HUMAN SCREENING OF SMOKING CESSATION MEDICATIONS

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This ongoing project seeks to develop an inexpensive and efficient procedure to evaluate medication efficacy by combining the best features of lab studies (e.g., cross-over design) with those of clinical trials (e.g., abstinence as the dependent measure). To simulate the abstinence motivation of smokers in clinical trials, our first study manipulated both intrinsic (high vs. low current quit interest) and extrinsic (monetary reinforcement) quit motivation, showing that clinical effects of nicotine vs. placebo patch were sensitive to the former but not the latter. The present study determined whether these findings generalize to another cessation medication, varenicline (ChantixR). Subjects (to date) were 101 adult smokers who either intended to quit permanently within the next 2 months (high quit interest, n=44) or to not quit within the next 6 months (low quit interest, n=57). In addition, half of each group was randomly assigned to receive monetary reinforcement for abstinence ($12/day) or no reinforcement. All smoked ad lib during weeks 1 (baseline) and 4 (washout), began run-up of varenicline (up to 1.0 mg b.i.d.) or placebo during weeks 2 and 5, and were instructed to try and quit during weeks 3 and 6, with order of medication conditions counter-balanced between subjects. Abstinence was verified daily by CO<5 ppm. Consistent with our nicotine patch study, results showed an interaction of varenicline x quit interest ($p<.05$). A larger effect of varenicline (vs. placebo) on increased days of abstinence was seen in those with high than in those with low quit interest. Monetary reinforcement had a main effect on abstinence ($p<.02$) but did not interact with varenicline. These data confirm that a small sample of smokers high in current quit interest can provide a sensitive test of the clinical efficacy of cessation medications in a brief simulated quit trial, suggesting that this procedure will be useful for testing the efficacy of novel compounds for cessation.

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PA4-5 TREATMENT OF DEPENDENT SMOKERS WITH EXTENDED COGNITIVE BEHAVIORAL AND MEDICATION INTERVENTIONS

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Objectives: The goals of the present study were to evaluate an extended course of pharmacological treatment (sustained release bupropion; bupropion SR) and an extended cognitive behavioral treatment (CBT). The latter had shown promise in an earlier study.

Methods: 406 smokers of 10 cigarettes per day or more, and who reported smoking within 30 minutes of arising, completed a 12-week smoking cessation treatment that included group counseling, nicotine replacement therapy (NRT), and bupropion SR. Participants were then randomly assigned to one of five conditions: (1) No further treatment (ST); (2) Active bupropion SR for 40 weeks with medical management only (A-MM); (3) Placebo bupropion for 40 weeks with medical management only (P-MM); (4) Active bupropion SR and 11 sessions of CBT over 40 weeks (A-CBT); or (5) Placebo bupropion SR and 11 sessions of CBT over 40 weeks (P-CBT). Participants were assessed at baseline, and at weeks 12 (end of standard treatment), 24, 52 (end of extended treatment), 64 and 104.

Results: From weeks 12 to 104, all four extended treatment conditions were superior to ST, but the extended treatment conditions were not significantly different from one another. During weeks 52 to 104, the two CBT treatment conditions produced significantly higher abstinence rates than those observed in A-MM, P-MM, and ST. The A-CBT condition produced high abstinence rates at all assessments (49.4% at week 24, 40.5% at week 52, 40.6% at week 64 and 47.6% at week 104) in this population of dependent smokers.

Conclusions: Brief contacts with providers can increase abstinence rates while they are in effect. However, CBT, especially when combined with selected medication may better maintain long-term abstinence after extended treatment is terminated. As smoking becomes concentrated in increasingly difficult populations, the chronic disease aspects of the disorder are becoming more salient. As a result, a stronger focus on interventions that produce sustainable effects after treatment ends are increasingly important and worthy of further study.

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Paper Session 5: Mechanisms of Tobacco Addiction: Neuro-Imaging Studies

PA5-1 Beta2* NICOTINIC ACETYLCHOLINE RECEPTOR AVAILABILITY IS LOWER IN SMOKERS WITH SCHIZOPHRENIA COMPARED TO HEALTHY SMOKERS

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Schizophrenic patients have elevated rates of tobacco smoking, and nicotine is thought to alleviate some of the symptoms associated with schizophrenia. Chronic nicotine exposure upregulates nicotinic agonist binding to brain nicotinic acetylcholine receptors (nAChR). A prior post-mortem study found region-specific increases in high affinity nAChR binding in tissue from human tobacco smokers without schizophrenia, but not in schizophrenic smokers. We hypothesized that ß2*-nAChR availability would be lower in smokers with schizophrenia versus healthy smokers in frontal, parietal, and occipital cortices, which play a role in cognition and have been compromised in this illness. To date, eleven men smokers with schizophrenia (41±13yo) and eleven age and sex-matched control smokers (40±12yo) participated in one MRI and one [I-123]5-IA-85380 SPECT imaging study after 5-9 days of smoking abstinence. Patients reported slightly greater nicotine dependence (FTND; 6±2 vs. 4±3) and smoked a greater number of cigarettes/day than controls (22±2 vs.17±2) at intake. On the SPECT scan day, craving for cigarettes was significantly greater for patients vs. controls. Preliminary data indicate significantly lower ß2*-nAChR availability in smokers with schizophrenia as compared to healthy smokers in the parietal (21%, F=4.4; p=.05) and frontal (26%, F=8.8, p=.01) cortices and thalamus (21%, F=5.0, p=.04); with a trend toward significance in the anterior cingulate (18%, F=3.7, p=.07), temporal (18%, F=3.7, p=.07), and occipital (19%, F=4.1, p=.06) cortices. These findings may reflect a failure to upregulate beta2-nAChR in schizophrenic smokers.

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PA5-2 BETA2*-NICOTINIC ACETYLCHOLINE RECEPTORS ARE INVOLVED IN NOCICEPTION IN ACUTELY ABSTINENT TOBACCO SMOKERS

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Nicotine and tobacco smoking administration have demonstrated antinociceptive effects that are mediated by the nicotinic acetylcholine receptor containing the beta2*-subunit (beta2*-nAChR). The purpose of this study was to examine the relationship between beta2*-nAChR availability and nociception during acute withdrawal in living human tobacco smokers using [123I]5-IA-85380 (5-IA) and SPECT brain imaging. Human tobacco smokers participated in the cold pressor task during acute withdrawal (up to 3 hrs) and then a second cold pressor task following 7-13 days of smoking abstinence on the day they were imaged with 5-IA SPECT. The cold pressor task is used to measure pain sensitivity (when subjects first feel pain) and pain tolerance (when subjects cannot withstand pain). Subjects (n=24, aged 34+11) had smoked 18 + 6 cigarettes/day for 15+9 years. All subjects also completed 1 MRI. Following 7-13 days of tobacco smoking abstinence, increased pain sensitivity was associated with higher beta2*-nAChR availability in the in the thalamus (r=-.43, p=.035), parietal (r=-.50, p=.013), frontal (r=-.55, p=.005), anterior cingulate (r=-.44, p=.032), temporal (r=-.43, p=.037), and occipital (r=-.48, p=.018) cortices. Additionally, the percent change in pain sensitivity from the first to second cold pressor task correlated negatively with ß2*-nAChR availability in the thalamus (r=-.57, p=.004), cerebellum (r=-.50, p=.013), striatum (r=-.57, p=.004), and parietal (r=-.46, p=.025), anterior cingulate (r=-.48, p=.017), temporal (r=-.55, p=.005), and occipital (r=-.57, p=.004) cortices. Similar associations were not observed with pain tolerance. There were no significant correlations between the change in craving, depression, or withdrawal scores and the change in pain sensitivity or pain tolerance between the first and second cold pressor task days. These data suggest that beta2*-nAChR play a role in pain sensitivity but not pain tolerance during acute tobacco smoking withdrawal. If individuals are more likely to relapse in response to painful stimuli, this suggests a lower beta2*-nAChR availability during acute abstinence may be protective.

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PA5-3 HIPPOCAMPAL AND STRIATAL GREY MATTER VOLUME ARE ASSOCIATED WITH A SMOKING CESSATION TREATMENT OUTCOME: RESULTS OF AN EXPLORATORY VOXEL-BASED MORPHOMETRIC ANALYSIS

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Compared to nonsmokers, smokers exhibit a number of potentially important differences in regional brain structure including reduced grey matter (GM) volume and/or density in areas including frontal and cingulate cortices, thalamus and insula. However, associations between brain structure and smoking cessation treatment outcomes have not been evaluated. Objectives. In the present analysis we sought to identify associations between regional GM volume – as measured by voxel-based morphometry (VBM) ¬– and a smoking cessation treatment outcome (point prevalence abstinence at 4 weeks). Methods. Adult smokers underwent high-resolution anatomical MRI scanning prior to an open label smoking cessation treatment trial. VBM was conducted in SPM5 using the DARTEL algorithm and relapser vs. quitter groups were compared using independent sample t-tests (p<.001, uncorrected). Analyses controlled for potentially confounding factors including years smoked, cigarettes per day, total intracranial volume (TIV) and sex. Results. Eight of eighteen smokers achieved four-week point prevalence abstinence, confirmed by CO level (<8 ppm). After controlling for all covariates, compared to relapsers, quitters exhibited significantly greater GM volume in left putamen and right occipital lobe. Compared to quitters, relapsers had significantly greater GM volume in bilateral hippocampus and right cuneus. Conclusions. These preliminary results suggest smoking cessation outcomes are associated with pre-quit brain volume in regions that subserve memory, habit learning and visual information processing functions. Future, large-scale studies can determine whether brain structure variables can serve as clinically useful predictors of smoking cessation treatment outcome.

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PA5-4 LIMBIC RESPONSES ELICITED BY CIGARETTE CUES AND MODULATION BY DAT GENOTYPE: CONFIRMATION IN A NEW COHORT OF SMOKERS

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Background: The dopamine transporter (DAT) rapidly removes DA from the synapse after its phasic release in response to rewarding substances and cues that predict them. Evidence suggests that 9-repeats may possess fewer or less-efficient DATs, which may result in greater or prolonged synaptic DA. Previously, we reported that increased cerebral blood flow (perfusion) to reward-related circuitry was modulated by genetic variation in the DAT (SLC6A3) gene when smokers were exposed to smoking cues. Probands who were carriers of a 9 variable number of tandem repeats (VNTR, i.e., 9-repeats) exhibited enhanced perfusion to the ventral striatum and interconnected medial orbitofrontal cortex (VS/mOFC) whereas 10 VNTR (10/10-repeats) demonstrated decreased perfusion in these regions. Given the small sample size in our initial study, confirmation of the results is important before they can be considered a valuable and valid contribution to the addictions-related neuroimaging literature in particular, and to the study of drug addiction in general.

Methods: Perfusion fMR images were acquired during smoking cue exposure in 26 nicotine dependent smokers genotyped for the 40bp VNTR polymorphism in the DAT gene. Neural responses to smoking cues versus nonsmoking cues were compared across allelic groups.

Results: Among all subjects, perfusion during smoking cue exposure was enhanced in the VS/mOFC. Contrasts between allelic groups revealed increased perfusion in the VS/mOFC for 9-repeats relative to 10/10-repeats. All brain data are reported at T values >3.5, and p≤0.0001 uncorrected.

Conclusions: These results confirm our earlier studies demonstrating that genetic variation in the DAT gene modulates the neural responses elicited by smoking cues. Increased perfusion in 9-repeats relative to 10/10 repeats may reflect greater DA availability and enhanced vulnerability in the presence of smoking cues in this group. These data provide evidence that neurogenetics can be used to identify a smoking-cue vulnerable endophenotype, which may be an important predictor of medication response.

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PA5-5 IDENTIFICATION OF BRAIN ACTIVATION PATTERNS UTILIZED TO RESIST CUE-INDUCED CRAVING IN TREATMENT-SEEKING SMOKERS

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Introduction: Craving is a significant factor leading to relapse during smoking quit attempts. In this ongoing study, we aim to characterize the brain activation patterns correlated with resisting cue-induced craving.

Methods: Eight treatment-seeking, nicotine-dependent participants have completed fMRI scanning. Participants viewed blocks of smoking and neutral cues during MRI scanning in a 3T Siemens scanner, in a design also including rest periods. While viewing similar cues or control images, participants were instructed either to "allow yourself to crave" during one scan or "resist craving" in a following scan. Preliminary data was analyzed with FSL 4.1.4, and focused on the smoking cues versus neutral cues contrast, using cluster thresholding (Z>2.3 and corrected cluster threshold of p=0.05) at the individual and group levels.

Results: Viewing cue compared to control images resulted in prominent activation in the anterior cingulate and left caudate. Using a paired group analysis, significantly greater activation was found during the "resist" scan than the "crave" scan. Prominent brain regions that were activated more while resisting than allowing oneself to crave include the prefrontal and orbital frontal cortex, anterior cingulate, and the angular gyrus. No regions were more active in the "crave" scan compared to the "resist" scan. Many subjects self-reported that they used distraction to resist craving.

Discussion: We have identified brain regions unique to resisting strategies, and will refine this characterization with a larger sample. Future work will explore whether medications or real-time fMRI feedback might modify or enhance resistance to craving.

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Paper Session 6: Characterizing Age-Dependent Vulnerability to Addiction

PA6-1 EARLY ADOLESCENT NICOTINE EXPOSURE HAS LONG-LASTING EFFECTS ON NICOTINE- AND COCAINE-INDUCED DEPENDENCE BEHAVIORS

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Human studies show that those who begin smoking during early ages are more likely to progress to more illicit drugs of abuse than those who do not smoke. We therefore tested these epidemiological findings in a mouse model to explore if adolescent nicotine. To test this hypothesis, we have examined whether low-dose nicotine pretreatment during early adolescence (P28) alters cocaine dependence behaviors in male mice which represent different aspects of cocaine dependence: reward using the conditioned place preference test (CPP), locomotor sensitization and locomotor activation in adolescents more than in adults. Male mice, aged postnatal day (P) 28 or P70, were given two daily intravenous injections of nicotine (0.1 or 0.5 mg/kg) or saline for seven days. At P35 and P77, mice were tested for the various behaviors. Early adolescent mice pretreated with nicotine exhibited significantly greater cocaine-induced rewarding effects as compared to saline controls or adults ($p < 0.05$). This drug pretreatment effect did not generalize to all rewards, since nicotine did not increase responding for food pellets. Furthermore, nicotine pretreatment enhances behavioral plasticity after repeated cocaine, as expressed in cocaine-induced locomotor sensitization, whereas controls do not. No significant changes were noted for the acute effects of cocaine. The enhancement of nicotine disappeared when mice were pre-exposed to the drug during late adolescence. Similarly, nicotine's rewarding effects were enhanced when early adolescent mice were exposed to the drug using the same protocol. These findings provide evidence that the adolescent brain is uniquely vulnerable to the effects of nicotine on subsequent drug reward.

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PA6-2 CHRNA4 T529A KNOCKIN MICE: A MODEL FOR UNDERSTANDING THE ROLE OF NATURALLY OCCURRING POLYMORPHISMS IN MODULATING BRAIN FUNCTION, NICOTINE SENSITIVITY AND GENE BY AGE INTERACTIONS

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Both genetics and age of initiation play critical roles in who does and does not become addicted to nicotine. However, few studies have addressed the interaction between these two important factors. Moreover, there is scant experimental evidence to demonstrate that a single naturally occurring polymorphism is sufficient to measurably alter sensitivity to nicotine. To address whether a single natural polymorphism is sufficient to alter sensitivity to nicotine and to determine whether any detected effect of the polymorphism is age dependent, we developed a knockin mouse for the naturally occurring T529A polymorphism in mouse Chrna4. Experiments with adult knockin mice revealed that the single polymorphism significantly affects oral nicotine consumption and conditioned place preference. The polymorphism also alters the function of alpha4beta2 nAChRs in midbrain. Subsequent experiments examined whether age influences the effect of the T529A polymorphism on oral nicotine consumption. Results indicate that the effect of the polymorphism is, in fact, age dependent; the polymorphism influenced nicotine consumption in early adolescent (age 24-35 days) and adult mice (age greater than 60 days but less than 90 days) but not in middle adolescent mice (ages 36-47 days). Interestingly, nicotine consumption in general was found to be much higher in middle adolescence than either early adolescence or adults suggesting that the greater acceptance of nicotine during this period may override the effect of the polymorphism. Data from late adolescence (ages 48-59 days) are currently being analyzed. Overall, these findings demonstrate that single polymorphisms can produce measurable effects on nicotine sensitivity and that age should be considered when assessing the relationship between a polymorphism and nicotine sensitivity.

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PA6-3 NEW INSIGHTS INTO NICOTINIC RECEPTOR ALPHA7 EXPRESSION IN DEVELOPMENT

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Multiple physiological and behavioral disorders are related to dysfunction of nicotinic receptor subtype, alpha7 (Chrna7). However, characterization and measurement of the expression of this important nicotinic receptor is difficult and in many cases has proven to be unreliable. We have overcome this by using a targeted recombination (knock-in) strategy to modify the Chrna7 locus in the mouse. To this end, we introduced a HA-epitope tag to the C-terminus and an IRES-initiated cassette to provide bi-cistronic co-expression of a tau-green fluorescent fusion protein. Together this provides a direct means to easily visualize receptor expression and neuronal efferents with previously unattainable cellular resolution. In mice of defined strain backgrounds, Chrna7 expression is highly dynamic throughout development. First, there is localized but transient expression of Chrna7 in the mesenchyme of initiating stages of ectodermal patterning. Second, a phase of neuronal cell migration and patterning correlates with Chrna7 expression that includes CNS neuronal precursors (as in the cortex) and in developing ganglia of the PNS. Finally, after birth Chrna7 expression changes again and is primarily found in inhibitory interneurons of substructures in the basal ganglia, limbic system and prefrontal cortex. Also observed is expression by both neuronal and non-neuronal cells in other tissues including sensory systems, skin and subpopulations of cells of hematopoietic origin. Our results suggests that interfering with Chrna7 expression will have a variety of impacts on the organism that will reflect a combination of the timing, duration, metabolic susceptibly to the insult, and redundancy of nicotinic receptor expression. These results will aid the interpretation of the substantial diversity of nicotine's effect on multiple tissue and organs systems during fetal and early adult development.

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PA6-4 DEVELOPMENTAL EXPOSURE TO NICOTINE DECREASES NICOTINE-EVOKED STRIATAL DOPAMINE RELEASE AND INCREASES NICOTINE-EVOKED HIPPOCAMPAL NOREPINEPHRINE RELEASE IN ADULT MICE

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Nicotine (NIC) exposure during pregnancy has numerous adverse consequences on the developing fetus, some of which persist into adulthood. In mice, developmental NIC exposure produces long-term, gender dependent changes in patterns of locomotor activity and sensitivity to NIC. The current study assessed potential underlying neurochemical effects mediating the behavioral changes in response to NIC exposure during development. Female C57/Bl mice received NIC (200 μg/ml) in drinking water for 28 days prior to inception, throughout pregnancy and until weaning of the offspring (PND 21). The taste of the NIC solution was masked by inclusion of saccharin (2%). Control animals received solution containing only saccharin over the same time period. Effects of developmental NIC exposure on NIC-evoked [3H]dopamine (DA) and [3H]norepinephrine (NE) release from striatal and hippocampal slices, respectively, were determined in the offspring from PND 60-70. Different nicotinic acetylcholine receptor (nAChR) subtypes mediate these responses. Slices were superfused for 60 min in Kreb's buffer, and basal [3H]DA and [3H]NE release determined, followed by superfusion with buffer containing NIC (0.01-100 μM), and evoked release determined. Developmental NIC exposure did not alter basal [3H]DA or [3H]NE release, but decreased (23-53%) NIC-evoked [3H]DA release and increased (59-124%) NIC-evoked [3H]NE release ($p<0.05$). In a separate study employing a similar NIC-exposure paradigm, non-±7 nAChR binding density was assessed in PND 60 mice using [3H]epibatidine autoradiography. Developmental NIC exposure did not alter [3H]epibatidine binding in striatum or accumbens, but increased ($p<0.05$) binding in substantia nigra and ventral tegmental area. Thus, developmental NIC exposure differentially altered NIC-evoked striatal DA and hippocampal NE release and upregulated non-±7 nAChRs. The current findings suggest that neurotransmitter systems differ in their long-term adaptation to NIC exposure during development, and that modifications in the pattern of nAChR subtype expression and function may underlie altered behavioral responsiveness to NIC in adulthood.

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PA6-5 DEVELOPMENTAL PROFILE OF RAT HEPATIC CYP2B EXPRESSION, IN VITRO AND IN VIVO NICOTINE METABOLISM

Zhe Jason Cui*, Fariba Baghai Wadji, Bin Zhao, Sharon Miksys, and Rachel F. Tyndale

INTRODUCTION: Initiation of smoking typically occurs during adolescence often followed by a rapid progression to tobacco dependence and a reduced probability of quitting. Some studies have shown that adolescent rats have an enhanced preference for nicotine and an attenuated physical and affective withdrawal. In addition, adolescent rats develop self-administration and conditioned place preference at higher nicotine doses. One contributing factor may be differences in nicotine metabolism as they have lower plasma nicotine levels compared to adults following the same nicotine dose. Thus, we examined the differences in nicotine metabolism in vivo and in vitro between adolescent and adult rats.

HYPOTHESIS: Adolescent rats will have higher hepatic CYP2B levels (the main nicotine metabolizing enzyme in rats) as well as in vitro and in vivo nicotine metabolism.

METHODS: Liver microsomal samples were prepared from animals sacrificed from postnatal days (PND) 1 to 60. Hepatic CYP2B was assessed by Western blotting. In vitro nicotine C-oxidation to cotinine was analyzed by HPLC. For the in vivo pharmacokinetic study, blood samples were collected from 0.5 to 4 hrs after a single nicotine s.c. injection.

RESULTS & CONCLUSION: Adolescent CYP2B protein levels peak at PND24, and are significantly elevated compared to neonatal pups and adult rats ($p<0.001$). However, early-adolescent rats have significantly lower in vitro nicotine to cotinine metabolism than adults ($p<0.05$), suggesting that the prominent form of CYP2B observed in early-adolescence does not metabolize nicotine. The lower molecular weight form of CYP2B found in adult liver correlates with in vitro nicotine to cotinine metabolism ($r=0.95$, $p<0.05$). Despite this slower in vitro metabolism, adolescents have lower in vivo plasma nicotine and cotinine levels, indicating faster removal of nicotine in vivo compared to adult rats. We found that this is likely via higher N-glucuronidation rates in adolescents than adults ($p<0.01$). These data suggest that adolescent rats may metabolize nicotine via glucuronidation at a faster rate than adults, requiring higher doses for equivalent plasma levels and responses.

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Paper Session 7: Smoking and Negative Affect

PA7-1 ACUTE NEGATIVE AFFECT RELIEF FROM SMOKING DEPENDS ON THE SITUATION AND AFFECT MEASURE, BUT NOT ON NICOTINE

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Smoking acutely relieves negative affect (NA) during smoking abstinence (i.e., withdrawal) but it may not relieve NA from other sources, such as situational stressors. To examine this, dependent smokers (N=103) were randomly assigned to one of three smoking conditions (nicotine cigarettes, denic cigarettes, or no smoking) and completed four negative mood induction procedures (one per session) including: (1) withdrawal (overnight abstinence), (2) challenging computer task, (3) public speech preparation, and (4) negative mood slides (e.g., gruesome wounds). A fifth session involved a neutral mood induction control. Each session began with baseline rest followed by the mood induction procedure. Individuals in the two smoking groups first took 4 puffs on their assigned cigarette (i.e., nicotine or denic), and then smoked those cigarettes ad lib during continued mood induction. Individuals in the no smoking condition engaged in all aspects of each session without ever smoking. All subjects intermittently rated their level of NA on four self-report measures (Mood form, PANAS, Stress-Arousal Checklist, and STAI-state), as well as their positive affect (PA) on the first two measures. Results showed that NA relief from smoking depended on the NA source (i.e., mood induction procedure) and the NA measure. Smoking very significantly relieved NA due to withdrawal assessed by all 4 measures, but relieved NA due to computer challenge and negative mood slides on only some measures. Smoking did not relieve NA due to the speech on any measure. PA was not affected by smoking. NA, PA, and the amount of ad lib smoking did not differ between the nicotine and denic smoking groups. These findings indicate that the act of smoking acutely relieves NA in only limited situations, depends on the NA measure used, and may do so regardless of nicotine intake, challenging the common assumption that smoking, and nicotine in particular, broadly alleviates NA.

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PA7-2 INFLUENCE OF ACUTE STRESS UPON EMOTIONAL AND PHYSIOLOGICAL RESPONSIVITY TO SMOKING CUES

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There are complex relationships between stress and cigarette smoking. Evidence suggests that emotional and physiological responses to acute stress increase cigarette craving and smoking behaviour and contribute to relapse to smoking. However, acute stress may also increase cigarette craving and smoking by increasing reactivity to smoking cues. In this study we investigated the influence of psychosocial stress upon physiological and emotional responsivity to smoking cues. Using a mixed within- and between-subjects design, healthy male and female daily cigarette smokers participated in two experimental sessions; one involving a stressful task, the Trier Social Stress Test, and another involving a non-stressful control task. After performing the tasks, participants viewed a series of images (cues) presented on a computer: one group of participants viewed smoking-related pictures (SRP), while the other group viewed neutral pictures (NP). We collected physiological measurements (heart rate, blood pressure) and subjective ratings of mood and cigarette craving before and at repeated times following the tasks and cue presentations. In line with previous findings, the TSST elevated heart rate and blood pressure, and increased ratings of negative mood and cigarette craving. As expected, smoking-related pictures increased cigarette craving, however, preliminary analyses indicate that stress does not further increase physiological or subjective reactivity to the smoking cues presented immediately after stress. These findings suggest that stress does not enhance physiological and subjective responsivity to smoking cues, immediately after the stressful event. However, it remains possible that stress may increase cue sensitivity if there is a longer delay between stress and cue exposure.

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PA7-3 NOVEL INDICATORS OF SYMPATHETIC AND PARASYMPATHETIC REACTIVITY TO STRESS-PRECIPITATED SMOKING LAPSE BEHAVIOR

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Stress is a primary mechanism involved in the maintenance of, and relapse to, smoking. Although stress is counteracted by a complex array of adaptive process, much of the research examining mechanisms underlying the relationship between stress and smoking has focused on the HPA axis. For the current study, we wanted to expand this work to examine sympathetic and parasympathetic activity as potential mechanisms underlying the relationship between stress and smoking. To this end we examined high-frequency heart rate variability (HRV), a measure of beat-to-beat variation in heart rate previously demonstrated to reflect parasympathetic activity. Catecholamines (epinephrine, norepinephrine) were assessed as a reflection of sympathetic activity. Using a human laboratory paradigm designed to model smoking lapse behavior (McKee, 2009), we modeled the effect of stress on smoking lapse behavior. In a within-subject design, daily smokers (n=37) who were nicotine deprived overnight received an imagery induction (stress or positive/neutral), and then had the option of initiating a tobacco self-administration session or delaying initiation for up to 50 minutes in exchange for monetary reinforcement. Subsequently, the tobacco self-administration session entailed a 1-hour period in which subjects could choose to smoke using a smoking topography system. HRV was monitored continuously throughout the laboratory session, and catecholamines were collected prior to, and at regular intervals following the imagery manipulation (up to +60 min). As predicted, results demonstrated that the stress imagery and ad-lib smoking additively decreased HRV, whereas catecholamine levels were increased following the stress imagery. Decreased HRV and increased catecholamine levels were significantly associated with the inability to resist smoking following stress, with results differing by gender. Understanding how stress undermines the ability to resist smoking will advance our ability to develop treatments designed to target stress-related relapse.

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PA7-4 DYNAMIC ASSOCIATIONS BETWEEN CHANGES IN SMOKING AND AFFECT OVER TIME AMONG ADOLESCENT SMOKERS

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Although much theory and research has linked negative affect with smoking initiation and maintenance among both adolescents and adults, little work has been able to address the longitudinal and dynamic relationships between smoking escalation and mood change. This study examined the questions of whether: (1) negative affect predicts smoking escalation among a sample of adolescents who are experimenting with cigarette smoking; and (2) whether the escalations in smoking then lead to reductions in negative affect. Participants were 196 adolescents (53.6% female; mean age 15.6 years at baseline) who provided longitudinal ecological momentary assessment data on smoking events over two years. Adolescents recorded both smoking events and random prompts during 7 days of data collection at baseline, 6-, 15-, and 24-month assessments. Across all data collection waves, more than 38,649 events were analyzed. At each event (smoking or random), both positive affect (PA) and negative affect (NA) were assessed. Location scale models were run at each time point to obtain both means and estimated variances for PA and NA, and then a mixed effects model approach was used to examine both the means and variance components for examining the effects of smoking rates on both the intercepts and slopes for NA and PA over time. Results indicated that high initial levels of negative affect were associated with increased smoking over time (Estimate = 0.17, $p < .02$), and importantly, as smoking increased over time, negative affect decreased (slope estimate = -0.18, $p < .01$). There was also a significant gender effect, such that the relationship between smoking and change in negative affect was significantly stronger for boys than girls. There was no significant relationship between change in smoking and change in PA over time for these adolescents. These data provide some of the only longitudinal evidence of dynamic links between negative affect and smoking escalation among adolescents.

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PA7-5 DECLINING ALTERNATIVE REWARDS LINK DEPRESSION TO YOUNG ADULT SMOKING

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The mechanisms that account for the comorbidity between smoking and depression have received little investigation. Depression has been associated with fewer pleasant events/rewards, while the availability of nonsubstance reinforcers plays a role in the acquisition and maintenance of substance use. Depression may increase the likelihood of smoking uptake or increases in smoking rate through its impact on alternative rewards. The present study sought to clarify whether non-smoking related alternative rewards helps explain the link between smoking and depression in young adulthood. The sample was composed of 834 young adults who participated in a longitudinal study of smoking adoption (age 18 – 22 years old). Smoking, depression and other covariates were measured annually from emerging adulthood (age 18) to young adulthood (age 22). Results of a Parallel Processes Latent Growth Curve Model indicated that depression symptoms level (baseline age 18) had a significant negative effect on substitute reinforcers trend (β = -.01, z=-3.17, p=.002), indicating that the greater the depression symptoms at baseline, the greater the decline in substitute reinforcers over time. Substitute reinforcers trend had a significant negative effect on smoking trend (β = -.62, z=-2.99, p=.003), indicating that increases in substitute reinforcers over time was associated with a decrease in the rate of change (deceleration) in smoking over time; greater substitute reinforcers was associated with less smoking over time. We tested indirect effects, which showed depression symptoms level had a significant positive indirect effect on smoking trend through substitute reinforcers trend (B = .01, z = 2.09, p=.04, 99% CI = .001, .02). This indicates that greater depression symptoms at baseline predicted decreases in substitute reinforcers across time, which in turn predicted increases in smoking uptake/rate from emerging to young adulthood. These findings highlight affective vunerability in emerging adulthood that impacts subsequent smoking behavior and suggests that promoting greater alternative rewards may prevent uptake and further increases in smoking rate in young adults.

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Paper Session 8: Cost-Effectiveness and Tobacco Interventions

PA8-1 COST AND COST-EFFECTIVENESS OF AN EFFECTIVE, PROACTIVE TELEPHONE COUNSELING INTERVENTION FOR ADOLESCENT SMOKING CESSATION

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Effective, accessible, and cost-effective interventions are greatly needed to reduce smoking prevalence among adolescents. This study uses the Hutchinson Study of High School Smoking (HS) randomized trial to evaluate cost and cost-effectiveness of an effective intervention for adolescent smoking cessation. The HS trial proactively identified and recruited smokers in 25 experimental high schools to a telephone counseling intervention that incorporated motivational interviewing (MI) and cognitive behavioral skills training (CBST). Results demonstrated statistically significant increases in multiple abstinence outcomes, including 6-month prolonged abstinence among baseline daily smokers (p = .02). Overall costs of delivering the intervention were totaled and divided by the number of smokers in the experimental cohort (N = 1058) to determine the cost per targeted smoker. The cost of each incremental quit was then estimated by dividing the average intervention cost per targeted smoker by the difference in cessation fraction between the experimental and control groups. Because intervention costs may differ in real world dissemination compared to a research setting, intervention costs were also estimated for national dissemination. The cost of implementing the HS intervention per targeted smoker was approximately $226 in a proactively recruited population of teen smokers. The cost per incremental quit (prolonged abstinence of six months or longer) was $5,659. Costs in dissemination were estimated to be $94 per targeted smoker and $2,348 per incremental quit of 6 months or longer. Cigarette smoking costs the nation $4,447 per smoker every year. This study shows that a personalized telephone counseling intervention incorporating MI and CBST is cost effective for increasing quitting in a population of proactively identified and recruited teen smokers. Investing in effective smoking cessation interventions can significantly contribute to reducing the health and economic burden of cigarette smoking.

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PA8-2 RANDOMIZED TRIAL TO ASSESS THE COST-EFFECTIVENESS OF PROVIDING 2, 4 OR 6 WEEKS OF FREE NRT TO QUITLINE CALLERS

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Objective: A non-randomized study in the New York State Smokers Quitline recently found no difference in quit rates between clients who received 2, 4, or 6 weeks of free NRT. This study compares nicotine usage patterns and quit outcomes in adult smokers who were randomized to either 2, 4, or 6 weeks of free NRT along with a stop smoking guide and brief telephone counseling.

Methods: Eligible participants were adults who smoked 10+ CPD who were interested in using the nicotine patch to help them stop smoking within 2 weeks and with no known contraindications for using the nicotine patch. N=2,806 agreed to join the study and were randomized to receive 2, 4 or 6 weeks of NRT. N=1,682 (60%) were successfully re-interviewed 7-months later. Outcomes assessed at follow-up were nicotine patch usage, 7-day point prevalence quit rate, and the cost per NRT-attributable quit, which were compared between the three study arms.

Results: 88% of all participants used at least some of the NRT provided to them, and the amount used increased with an increasing amount of free NRT delivered. No differences were observed in the frequency of buying additional NRT beyond what was provided by group. The quit rates were 25.5% in the 2 week NRT arm, 27.7% in the 4-week NRT arm, and 29.1% in the 6-week NRT arm (chi-square p=0.40, trend test p=0.18). The cost per NRT attributable quit was also comparable between the three groups; the point estimate was lowest in the 2 week group, but the variability was greatest in this group.

Conclusion: These data indicate that 2 weeks of free NRT is as cost effective as providing longer durations of free NRT. Providing smaller amounts of NRT means that treatment can be provided to more callers under a fixed budget.

New York State Department of Health.

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PA8-3 RANDOMIZED TRIAL TO ASSESS THE COST-EFFECTIVENESS OF PROVIDING 2 OR 4 PROACTIVE CALLBACKS TO MEDICAID AND UNINSURED QUITLINE CALLERS

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Objective: The purpose of this study is to investigate the cost-effectiveness of providing 2 vs. 4 proactive counseling callbacks in terms of quit rates in Medicaid/uninsured callers to the New York State Smokers' Quitline (NYSSQL).

Methods: This is a randomized 2-group design. The eligible study population included adult smokers who were willing to quit smoking, called the NYSSQL, were eligible for free NRT, and who had Medicaid insurance or were uninsured. N=1,923 participants who consented to participate in the study were randomized to receive 2 or 4 proactive callbacks after their initial contact with the NYSSQL. N=901 (47%) were successfully re-interviewed 3 months later. The primary outcome was the self-reported 7-day point prevalence quit rate from the achieved sample, and the intent to treat quit rates were calculated as well. The cost per quitter was compared between treatment arms.

Results: No statistical differences in quit rates were observed between the two groups. Based on the achieved sample, the 7-day point prevalence quit rate in the 2-call group was 31.2% compared with 29.5% in the 4-call group (p>0.05). Intent to treat quit rates were 13.3% and 13.4% in the 2 and 4 callback groups, respectively (p>0.05). No statistical difference was observed in the cost per quitter between groups under either definition of smoking cessation. All eligible participants reported smoking 10 cigarettes per day or more. We utilized standard New York State Smokers' Quitline recommendations for NRT dosage.

Conclusion: Evidence from this study was not sufficient to claim that quit rates were greater in the 4-callback group; however, the cost per quitter was comparable between groups.

Funding was provided by the NYS Department of Health.

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PA8-4 COST-EFFECTIVENESS OF VARENICLINE AND THREE DIFFERENT BEHAVIORAL TREATMENT FORMATS FOR SMOKING CESSATION: A SOCIETAL PERSPECTIVE

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Objective: To determine the differential cost-effectiveness of three modalities of a behavioral smoking cessation program in conjunction with varenicline treatment.

Design: Open-label, randomized trial (clinicaltrials.gov NCT00301145), with 6-month follow-up, conducted among smokers from a large health system (Group Health) based in Seattle, WA. Participants: Current smokers (n = 1202) who were ready to quit and sought treatment.

Methods: Eligible participants were randomized to one of three smoking cessation interventions: Web-based counseling (n=401), proactive telephone-based counseling (PTC; n=402), or combined PTC and Web counseling (n=399). All participants received a standard 12-week course of varenicline.

Measurements: The primary outcome was 7-day point prevalent non-smoking at 6-month follow-up. Treatment utilization was also examined.

Results: The Web intervention was the least expensive followed by the PTC and PTC-Web groups. Cost per additional 6-month nonsmoker (based on 6-month non-smoking rates of 30.7%, 34.3%, and 33.8% for the Web, PTC, and PCT-Web groups, respectively, and subtracting the non-smoking rate expected for placebo) and per additional lifetime quitter (based on expected relapse rates after 6 months) were $1,850 and $3,765 for the Web group, $1,785 and $3,633 for the PTC group, and $1,929 and $3,926 for the PTC-Web group. Cost per life-year (LY) and quality-adjusted life-year (QALY) saved were $1,685 and $1,659 for the Web group, $1,629 and $1,601 for the PTC group, and $1,760 and $1,729 for the PTC-Web group.

Conclusion: Cost per LY and QALY saved were sufficiently low for all treatments to rate any of these smoking cessation interventions as among the most cost-effective life saving medical treatments.

Limitations: Findings for the Web-based behavioral counseling program may not generalize to other online programs. Key words: smoking cessation, varenicline, cost-effectiveness, life-years saved, quality of life, treatment outcome, and health care setting.

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PA8-5 COST-EFFECTIVENESS OF FIVE DIFFERENT SMOKING CESSATION MEDICATION TREATMENTS EVALUATED IN A COMPARATIVE EFFICACY TRIAL

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Context: Little direct evidence exists for the relative cost-effectiveness of monotherapy versus combination pharmacotherapy for smoking cessation. Such evidence is needed to make more informed decisions about their use.

Objective: The primary objective of this research was to examine the relative cost-effectiveness of three single and two combination pharmacotherapies using data from a randomized, placebo-controlled, head-to-head smoking cessation trial.

Methods: This research utilized efficacy data obtained from a randomized double-blind, placebo-controlled smoking cessation clinical trial conducted from 2005-2008. Costs were determined for both cash-paying patients and for third-party payers. Cost-effectiveness, defined as cost per quit, was determined at 8 weeks and 6 months post-quit.

Results: For the full course of pharmacotherapy, costs varied from $152 to $490 per patient for cash-paying patients and from $54 to $278 per patient for third-party payers. The 6-month cost per quit ranged from $1,246 for the nicotine patch to $4,451 for the combination of bupropion SR and the nicotine lozenge for cash-paying patients and from $561 for bupropion SR to $2,229 for the combination of bupropion SR and the nicotine lozenge for third-party payers.

Conclusions: While the combination of the nicotine patch and the nicotine lozenge yielded the highest abstinence rates, monotherapy with the nicotine patch or bupropion SR provides the most cost-effective means of smoking cessation for cash-paying patients and third-party payers, respectively. This research provides clinicians, smokers and third-party payers with additional information regarding cost-effectiveness to use when deciding how to treat tobacco dependence. Both monotherapies and combination therapies for smoking cessation significantly increase abstinence rates and do so at a reasonable cost per quitter.

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Paper Session 9: Interventions in the Healthcare Context

PA9-1 SCREENING FOR TOBACCO USE AMONG COLLEGE STUDENTS BY HEALTH CARE PROVIDERS AT STUDENT HEALTH CENTERS

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The United Stated Public Health Service clinical practice guideline, Treating Tobacco Use and Dependence, recommends that clinicians identify and document tobacco use status of all patients seen in healthcare settings at every clinic visit. Student health centers on college campuses offer a variety of services and provide the majority of healthcare needs for students. Included in these services are prevention and intervention efforts, placing student health centers in a unique position to target tobacco use. The goals of this study were to assess screening of college students who visited a student health center and to identify individual- and school-level correlates associated with screening for tobacco use. In fall 2007, 3,813 students from eight colleges in North Carolina completed a web-survey. Students were 62% female, 81% White, and approximately equally divided by class year. Seventy-four percent of students were non-smokers, 18% were non-daily smokers, and 7% were daily smokers. Just over half (53%) reported at least one visit to their student health center. Of those, 62% reported being screened for tobacco use. Screening rates varied by college (48%-75%). Logistic regression analysis for clustered data using generalized estimating equations (GEE) was used to assess individual-level (race, gender, year in school, smoking status) and school-level (institutional smoking rate, clinic volume) correlates of screening. Screening was higher among females (AOR=1.48, $p<.05$). Those who reported smoking daily (AOR=2.23, $p<.05$) and non-daily (AOR=1.35, $p<.05$) were more likely to be screened than non-smokers. Screening was less likely among freshman than all other classes ($p<.05$). Screening was also less likely at clinics with higher volume ($p<.05$). Screening was not associated with race or institutional smoking rate. Results revealed that among those who visited their student health center, almost a third were not screened for tobacco use at their last visit and rates of screening differed based on individual- and school-level factors, highlighting a need to encourage college health providers to screen every patient for tobacco use at every visit.

This study was supported by the National Institute of Alcohol Abuse and Alcoholism (NIAAA) Grant #R01 AA14007 and by funds from the Division of Mental Health, Developmental Disabilities and Substance Abuse Service of the North Carolina Department of Health and Human Services, the U.S. Office of Juvenile Justice and Delinquency Prevention through the Enforcing Underage Drinking Laws program, and Wake Forest University Interim Funding.

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PA9-2 CHANGING DENTISTS' TOBACCO CONTROL ATTITUDES AND BEHAVIORS

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Objective: To determine the effect of training intensity and third-party reimbursement on dentists' tobacco control attitudes and behaviors.

Methods: Among 265 randomly selected dental practices, 65 were randomly assigned to Usual Care (UC); the remainder were randomly assigned to one of 4 groups: low-intensity training (LIT); high intensity training (HIT); low-intensity training plus reimbursement (LITR); and high-intensity training plus reimbursement (HITR). After dentist baseline assessment, dentist and patient-reported outcomes were questionnaire-assessed 12 months post intervention by mail. Positive change scores in dentists' attitudes and behaviors were compared between UC vs. any intervention group; HIT vs. LIT groups; and reimbursement (R) vs. no-R groups using the Mann Whitney Test or Chi Square. Patient reported tobacco control behaviors of dentists were compared for the same 3 comparisons.

Results: Dentist participation was 17% in the intervention groups and 32% in the UC group. Assess, Assist, and Arrange behaviors of all intervention dentists significantly improved from baseline to follow-up compared to UC dentists, and in the HIT group compared to the LIT group (all P< 0.03). Significant mediators of positive change for "Assessing" were "feeling well prepared" and "feeling effective" and for "Assisting" were "feeling effective" and "feeling that one had knowledge of pharmaceutical products" (P<0.01). Patient participation rate was 38% (8,435/22,085). Accuracy of patient recall, validated by claims data, was 72%. Patients of intervention group dentists reported higher dentist tobacco control behavior scores compared to patients of UC group dentists (OR 1.7, 95% CI: 1.1-2.6). Patients of dentists who submitted claims compared to patients of dentists in the non-reimbursement groups were significantly more likely to report that they cut down their tobacco use; read information provided on the benefits of quitting; and sought help from family and friends with the quitting process (all P<0.01).

Conclusion: Feeling prepared and effective are important for dentist behavior change, but patients of dentists who submitted claims had the best outcomes.

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PA9-3 DOES THE FREQUENCY OF TOBACCO DEPENDENCE TREATMENT VARY BY STATE? A SURVEY OF NURSES IN CALIFORNIA, INDIANA, AND WEST VIRGINIA

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Background: States differ in smoking prevalence and quit rates. However, it is unclear how or if states differ on healthcare provider interventions, including Quitline referrals. Nurses can help patients quit smoking but state differences in the frequency (always, usually, sometimes, rarely/never) of their performance of the 5As (Ask, Advise, Assess, Assist, Arrange), as recommended by the PHS Guideline for tobacco dependence treatment, is unknown.

Method: A web-based survey of hospital-based nurses from 33 randomly selected hospitals in one low prevalence (California, n= 651) and two high tobacco prevalence (Indiana, n= 720, West Virginia, n= 419) states was used to assess self-reported frequency of 5As intervention and referral to the Quitline. State location was examined as a predictor for "always/usually" delivering each of the 5As and Quitline referrals, using bivariate analyses and multiple logistic regressions with mixed effects that controlled for nurse characteristics (personal, professional and workplace).

Results: In bivariate analyses, all interventions except "always/usually" Asking about smoking status significantly differed by state (p<0.05). Nurses in CA were more likely to Advise (52%), Assess (51%), Assist (37%), Arrange (16%) and refer to the Quitline (16%). Nurse interventions in IN (Advise: 40%, Assess: 41%, Assist: 23%, Arrange: 9%, refer to Quitline: 4%) and WV (Advise: 40%, Assess: 41%, Assist: 24%, Arrange: 10%, refer to Quitline: 4%) were similar. In multiple regression analyses, nurses in IN (OR = 0.51, CI, 0.34-0.78) and WV (OR = 0.59, 0.37-0.95) were less likely than nurses in CA to "always/ usually" refer to the Quitline. Otherwise, multiple regression showed no differences by states in the 5As.

Conclusions: Interventions to help smokers to quit varied by state. Overall, use of the 5As and Quitline referrals were low. Nurses in IN and WV were more than 50% less likely to report Quitline referrals as compared to nurses in CA. Efforts are needed to increase implementation of the Guideline into clinical nursing practice, particularly increasing referrals to the Quitline.

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PA9-4 TOBACCO CESSATION VIA PUBLIC DENTAL CLINICS: RESULTS OF A RANDOMIZED TRIAL

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Objectives: To compare the effectiveness of a dental practitioner advice and brief counseling intervention to quit tobacco versus usual care for public health patients on tobacco cessation, reduction in tobacco use, number of quit attempts, and change in readiness to quit.

Methods: In this clinical trial, 14 federally funded community health center dental clinics that serve diverse racial/ethnic groups in three states (Oregon, Mississippi, and New York) were randomized to Intervention or Usual Care.

Results: 2,549 smokers were enrolled. Using a generalized linear model, participants in the Intervention Condition reported significantly higher abstinence rates at the 7.5-month follow-up, for both point prevalence (F (1, 12) = 6.84, p. <.05) and prolonged abstinence (F (1, 12) = 14.62, p. <.01) than those in Usual Care.

Discussion: These results suggest the viability and effectiveness of tobacco cessation services delivered to low-income smokers via their dental health care practitioner in a public health setting. Tobacco cessation services delivered in public dental clinics have the potential to improve the health and well being of millions of Americans.

This research was funded by a grant from the National Institutes of Health, National Cancer Institute, R01-CA107442.

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PA9-5 FEASIBILITY AND SHORT-TERM EFFICACY OF A CONTROLLED PILOT STUDY TO INTEGRATE A SMOKING CESSATION INTERVENTION INTO THORACIC CLINIC SETTINGS

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Background: Continued smoking after diagnosis adversely affects the survival of patients with thoracic cancer. Many patients want to quit smoking at diagnosis but are unable to do so. Since cessation motivation and benefits are greatest at diagnosis, it is important to offer smoking cessation treatment to patients with a suspected thoracic malignancy. However, a feasible, effective program has not been demonstrated.

Methods: A controlled study tested the feasibility of a behavioral and pharmacological intervention for smokers with a suspected thoracic malignancy and compared its efficacy to a historical control group. Patients were recruited at their initial visit to a thoracic surgeon or oncologist if they: (1) smoked a cigarette in the past week, (2) spoke English, (3) were medically and psychiatrically stable, and (4) had not taken varenicline or bupropion for >3 weeks. Intervention participants received 12 weeks of treatment with varenicline and repeated in-person and telephone counseling. Smoking status was assessed by self-report with cotinine verification at 12-weeks end of treatment.

Results: From January 2008 through August 2009, 1,142 patients were screened; 16% had smoked in the past week. Of these, 62% were eligible, and 42% of eligibles enrolled. Metastatic disease was the most common reason for ineligibility (20%). Common reasons for refusal were did not want to take varenicline (31%) and prefer to quit independently (16%). Of the 49 participants, 59% were female, 88% were non-Hispanic Whites and average age=57.7 years. Two-thirds were diagnosed with cancer by study end. Intervention participants completed an average of 9 counseling contacts; 63% took varenicline for 10-12 weeks. Using ITT analyses (loss to follow-up was 22%) for the 13 control and 23 intervention completers to date, 12-week cotinine-validated 7-day point-prevalence abstinence rates are 15% in the control group vs. 57% in the intervention group (p<.05).

Conclusion: A combined behavioral and varenicline smoking cessation treatment was feasible to integrate into thoracic oncology and surgical care and produced promising preliminary results at end of treatment.

National Cancer Institute. Pfizer Inc.

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Paper Session 10: Adolescent Smoking Cessation

PA10-1 WHEN WILL YOUTH SMOKERS MAKE A QUIT ATTEMPT AND RESUME SMOKING AFTER RECEIVING TELEPHONE COUNSELING? A LONGITUDINAL STUDY

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Objective: To examine the pattern of youth smokers who received telephone smoking cessation intervention and who would initiate a quit attempt and subsequently resume smoking.

Methods: We collected data from a toll-free smoking cessation hotline "Youth Quitline" in Hong Kong from September 2005 to December 2007. The Youth Quitline is a peer-led hotline with multiple telephone counseling sessions at baseline, 1-week and 1-month and successive telephone follow-ups at 3- and 6-months, to help youth smokers aged 12 – 25 quit smoking. We applied non-parametric Kaplan-Meier method to explore the time trend prior to initiating a quit attempt as well as smoking resumption.

Results: The study included 408 youth callers, and 282 started quitting within the follow-up period. About 30% of the youth smokers (95%CI = 26 ¬– 35%) would initiate a quit attempt within 7 days after receiving the baseline telephone intervention. For the 282 callers who quit within the follow-up period, two-thirds (67%, 95%CI = 44 – 56%) resumed smoking within the first 7 days after their quit attempt.

Conclusions: This is the first study using survival analysis techniques to evaluate how soon youth smokers initiate their quit attempts and resume smoking, after receiving telephone counseling. Youth smokers who intend to quit initiate a quit attempt shortly after receiving the telephone intervention. Smoking cessation counselors should provide subsequent follow-ups promptly after the baseline intervention to capitalize on the quitting intentions of the smokers.

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PA10-2 ADOLESCENT SMOKING CESSATION WITH BUPROPION: THE ROLE OF ADHERENCE

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Nearly 4,000 adolescents try their first cigarette every day, and of those, an estimated 1,140 will become regular smokers. While these estimates highlight the urgent need for effective tobacco cessation approaches for youth, to date, few studies have demonstrated efficacy. Further, among those studies, only two medication trials have observed significant short-term treatment effects. One study, by Moolchan et al., compared nicotine patch and gum, and found that (1) nicotine patch resulted in higher quit rates than gum and (2) that adherence to patch use was much higher than adherence to gum treatment. The other -completed by our group- assessed the efficacy of two doses of bupropion, and found that bupropion can increase quit rates at the end of 6 weeks of medication treatment, though relapse is common post-treatment. However, we did not analyze medication adherence at that time. Medication adherence has emerged as a key mechanism of treatment effect for conditions in adolescent populations such as depression, ADHD, asthma and HIV. However adherence has remained largely understudied and underreported in the adolescent tobacco cessation literature, though there is some indication it may make a difference for cessation treatment. In this analysis, we examined of the role of medication adherence in youth randomly assigned to use placebo, 150mg or 300mg of bupropion daily for smoking cessation. Preliminary findings indicate that on average, across conditions, participants took just under 70 of the 95 (73.68%) prescribed doses of bupropion. There were no significant mean differences between study groups in the number of prescribed doses taken, $F(2, 299)=.289$, $p=.750$, nor in the proportion of participants in each group who were considered "highly adherent," (having taken at least 80% of prescribed doses) $\chi2(2)= .245$, $p=.885$. These results likely impacted our positive quit rates. Analysis of potential factors influencing adherence (e.g. experiences of adverse events, baseline smoking and withdrawal) as well as the relationship between adherence and cessation outcomes will be discussed.

Support for this study was provided by the National Cancer Institute, grant# RO1 CA77081 (financial support), The Robert Wood Johnson Foundation (financial support) and GlaxoSmithKline (study medication and placebo; financial support for cotinine analyses, participant screening, data cleaning, review of draft manuscript). All data was maintained by University of Arizona.

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PA10-3 BEHAVIORAL UNDERCONTROL MODERATES POST-INITIATION CHANGE IN SMOKING EXPECTANCIES

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Expectancies, or beliefs about the effects of smoking, have been linked to smoking behaviors, including initiation and cessation. Most research has used cross-sectional designs under the assumption that expectancies are stable over time. However, recent studies suggest that expectancies vary due to internal and external stimuli, personality characteristics (e.g., behavioral undercontrol), and patterns of use. Although initiation of smoking would seem to be particularly important in the formation of expectancies, we were unable to identify any studies that directly tested this hypothesis. The present study was designed to assess change in positive reinforcement (PRE) and negative reinforcement (NRE) expectancies from pre- to post-initiation of smoking, and to determine whether expectancy change over time was moderated by behavioral undercontrol (BU). College student baseline never-smokers were interviewed annually. Smoking expectancies were assessed using the short form of the Smoking Consequences Questionnaire at the interviews immediately preceding to and following smoking initiation. Mixed linear modeling showed that among those who initiated smoking after freshman year ($n = 74$), there was a significant post-initiation increase in PRE [$z = 3.37$, $p = .001$] and a marginally significant increase in NRE [$z = 1.91$, $p = .056$]. BU moderated the relationship between time and NRE [$z = 2.23$, $p = .026$], such that NRE increased after initiation for high BU subjects [$z = 2.74$, $p = .006$] but was unchanged for low BU subjects. These data suggest that initial experience with cigarettes is associated with heightened smoking expectancies, particularly PRE. Additionally, the findings indicate that high BU individuals may perceive smoking as more negatively reinforcing than others, which may increase the risk of progression toward nicotine dependence.

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PA10-4 MOTIVATIONAL INTERVIEWING FOR SMOKING CESSATION IN COLLEGE STUDENTS: FINDINGS FROM A GROUP RANDOMIZED CONTROLLED TRIAL

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Prior studies of smoking interventions designed for college students show mixed results. This study examines the efficacy of four individually delivered counseling sessions based on Motivational Interviewing for smoking cessation versus a matched intensity condition focused on health. College students smoking on at least 1 out of 30 days were recruited regardless of their interest in quitting. 30 fraternities and sororities were randomized, resulting in 452 participants (45% female, 95% white, 87% non-daily smokers). Analyses for cessation classified subjects missing at end of treatment (EOT) and 6-month follow-up (FU) as smokers and accounted for clustering effects as necessary. No significant differences were found for 30-day cessation between treatment and control at EOT (31.4% vs. 28%, OR=1.20, 95% CI .72, 1.99) or at FU (20.4% vs. 24.6%, OR=.78, 95% CI .50, 1.22). Predictors of cession at FU, regardless of condition, included greater number of sessions attended (OR 1.2, 95% CI 1.1, 1.8) and higher baseline level of smoking (OR 4.7, 95% CI 2.5, 8.9). At EOT, the odds of making at least one quit attempt were significantly greater for those in the treatment versus the control group (45.5% vs. 32.2%, p=.016). At FU, the trend continued, but was not significant. Displays of Zero-inflated Poisson Mixed Models showed reduction in days smoked from baseline for both groups at EOT and FU, with more reduction apparent for students smoking more at baseline. At EOT only, those in the treatment condition had greater reductions in days smoked, but this pattern was not evident for very infrequent smokers. MI for smoking cessation is effective for increasing cessation attempts and reducing days smoked for more frequent smokers in the short run. Since students were not necessarily interested in quitting, cessation rates at follow-up were relatively high. Because the control condition focused on healthily eating and attending more sessions predicted cessation, it is possible that both conditions prompted cessation. The greater benefit of MI for smoking among more frequent smokers suggests that very infrequent smokers may benefit from interventions more focused on general health.

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PA10-5 QUIT N' FIT: THE INFLUENCE OF PHYSICAL ACTIVITY ON TEEN SMOKING CESSATION

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Emerging evidence suggest that physical activity may serve as a mediator of cessation among adults. Although we know that teen smokers are highly sedentary, little is known about the potential influence of physical activity on youth smoking cessation. We propose to present the results from a 3-group randomized teen smoking cessation trial. Using the American Lung Association's multi-session Not On Tobacco (N-O-T) program, our 5-year study compares the effects of Brief Advice (BA) vs. N-O-T vs. N-O-T+Fitness Module (N-O-T+Fit) on the following factors: (a) biochemically validated intent-to-treat smoking quit rates; (b) smoking reduction rates; (c) physical activity levels; (d) Stage of Change; and (e) social/coping skills. Hypotheses are that (1) youth who receive the N-O-T+Fit will show significantly higher smoking quit and reduction rates than youth in N-O-T or BA 6 months post baseline; (2) youth who receive the N-O-T+Fit will show significantly greater improvement in physical activity than youth in BA or N-O-T 6 months post baseline; and (3) smoking quit and reduction rates will positively correlate with physical activity levels over time. Our sample is drawn from 17 West Virginia public High Schools and includes approximately N=300 teen smokers. Among enrolled teens to date, 57.7% are female; mean age is 16; 86% are non-Hispanic white. Teens report smoking 10 cpd on weekdays, and 15 cpd on weekends; 71% have tried previously to quit; and 60% are highly addicted to nicotine. About 40% are obese or overweight and 70% report <10 min of physical activity per day; 32% have no intention of changing their activity levels in next 6 mos. Final data collection remains underway at the time of this submission, however, at 3-month follow up, preliminary analyses suggests that that our N-O-T+Fit and N-O-T teens have higher Intent-to-treat quit rates than BA teens. Teens in the N-O-T+Fit group also showed positive stage movement in terms of physical activity. Final follow up observations will determine the significance of our findings and will be reported for the first time in this presentation. [All data are preliminary until our data collection and analyses are completed.]

Centers for Disease Control and Prevention, #CDC U48/CCU310821.

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Paper Session 11:
Mechanisms of Nicotine Addiction: Animal Biobehavioral Models

PA11-1 INHIBITING CYP2B, A NICOTINE METABOLIZING ENZYME, SPECIFICALLY IN BRAIN INCREASES NICOTINE WITHDRAWAL IN RATS

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During human smoking, or chronic nicotine treatment in animals, the brain undergoes extensive neuroadaptation. Abrupt cessation of smoking or nicotine exposure causes withdrawal symptoms that can be quantitatively assessed using established behavioral measures. CYP2B is a genetically variable enzyme that metabolizes nicotine and is expressed in human and rat brain and liver. CYP2B expression levels vary greatly among humans, and those with genetically slow CYP2B have lower smoking cessation rates compared to normal metabolizers. Peripheral/hepatic nicotine metabolism (mediated by CYP2A6) does not differ between slow and normal CYP2B6 metabolizers, suggesting that this behavior may involve differences in brain CYP2B activity. To investigate this, we inhibited rat brain CYP2B with C8xanthate (a specific irreversible inhibitor) while leaving peripheral nicotine metabolism unchanged, in a rat model of nicotine withdrawal. We hypothesized that inhibiting rat brain CYP2B would increase withdrawal, likely through decreased brain nicotine metabolism and increased chronic brain exposure to nicotine. Rats received 6 mg/kg/day nicotine base by sc minipumps, and 0, 5, 10 and 20 microg/day C8xanthate by icv pump infusion. Nicotine pumps were removed on day 7, and somatic withdrawal was assessed for 6 days in the continued presence of the CNS CYP2B inhibitor C8xanthate. Compared to animals without brain CYP2B inhibition, the time to peak withdrawal was substantially later (3-4 days vs. 6 hours, $p<0.001$) and the extent of withdrawal (AUC) was about 4 fold greater ($p=0.04$). C8xanthate treatment had no effect on in vivo plasma nicotine and cotinine levels or on ex vivo hepatic metabolism of nicotine, indicating no effect of the CNS inhibition on peripheral nicotine metabolism. CYP2B protein levels in liver and brain, assessed by immunoblotting, were also unchanged by C8xanthate. These data suggest that having lower brain CYP2B activity may contribute to increased nicotine withdrawal symptoms, and lower quit rates in smokers. This may occur through reduced local brain nicotine metabolism, prolonging nicotine exposure thereby altering neuronal and receptor adaptation.

CIHR MOP 97751, CAMH, CRC (to RFT.RFT holds shares and is CSO for Nicogen Res Inc, a smoking cessation company.

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PA11-2 INDIVIDUAL DIFFERENCES IN THE REINFORCEMENT ENHANCING EFFECT OF NICOTINE ARE PREDICTED BY NON-IMPULSIVE ACTION, BUT NOT NOVELTY-SEEKING IN RATS

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High reactivity to an inescapable novel environment (novelty-seeking or NS) and high impulsiveness are behavioral phenotypes that have previously been related to the reinforcing effects of nicotine (NIC) in rodent models. However, NIC has complex reinforcing effects in rodents: it serves as a primary reinforcer by strengthening operant behaviors that lead to nicotine delivery, but can also increase operant responding for other, non-NIC reinforcers. These 'reinforcement enhancing effects' may play an important role in the motivation to self-administer NIC in humans as well as non-human animals. Therefore, the present studies investigated whether high NS and impulsive action (IA) were related to the reinforcement enhancing effects of NIC. NS was measured as the distance traveled in a novel environment during a 90 min screen. In Experiment 1, rats (n=8) were screened for NS and then shaped to respond for a reinforcing visual stimulus (VS). After stable performance was established, all rats were pretreated with NIC (0.4 mg/kg base, sc) 15 min before experimental sessions. Linear regression analyses determined that more NS was related to higher rates of responding for the VS during shaping ($r2=0.59$, slope=94.13, $p<0.03$); however, NS was unrelated to responding for VS during NIC tests ($p=0.5$). In Experiment 2, rats (n=19) were screened for NS and then shaped to press a lever for 20% sucrose (w/v). IA was measured as the ratio of responses per sucrose reinforcer obtained under a differential reinforcement of low-rate (DRL) 30 s schedule. Under this schedule more frequent responses delay reinforcement, thus higher response/reinforcer ratios indicate more IA. Subsequent testing with VS and NIC was identical to Experiment 1. IA was negatively related to responding for the VS during the NIC tests ($r2=0.34$, slope=-0.02, $p<0.01$). Rats that were more efficient under the DRL schedule tended to respond more for the VS after NIC pretreatment. The results suggest that stronger reinforcement enhancing effects of NIC are evident in less impulsive rats. Further studies will investigate whether intervening variables, such as reward sensitivity, can explain the present findings.

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PA11-3 THE ROLE OF METABOTROPIC GLUTAMATE 5 RECEPTORS IN NICOTINE REINFORCEMENT AND MESOLIMBIC DOPAMINE RESPONSES TO NICOTINE

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The dopamine projections from VTA to nucleus accumbens (Nac) play an important role in the mechanisms underlying nicotine dependence [Di Chiara (2000) *Eur J Pharmacology* 393, 295-314]. The stimulatory effects of nicotine on dopamine (DA) release in the Nac are partly mediated by increased glutamate release acting through metabotropic (mGlu) and ionotropic receptors [Wonnacott et al (2005) *Curr Opin Pharmacol.* 5, 53-59]. In this study, the mGluR5 antagonist MPEP (2-methyl-6-(phenylethynyl)-pyridine) was used to investigate the putative role of mGluR5 in nicotine reinforcement, nicotine- stimulated locomotor activity (LMA) and conditioned locomotor stimulation in male Sprague-Dawley rats. In agreement with studies previously reported to the Society [poster 4-70, SRNT Dublin], MPEP (2.5 & 5.0mg/kg ip) significantly reduced ($p<0.001$) intravenous) nicotine self-administration (FR3, 0.03mg/kg) and attenuated ($p<0.01$) the increase in DA overflow evoked by acute nicotine (0.4mg/kg sc) in the Nac shell. MPEP had no affects on the increase in LMA induced by acute or repeated nicotine measured as entries into the arms of a 4-arm maze. By contrast, pretreatment with MPEP significantly dose-dependently reduced ($p<0.01$) nicotine-induced conditioned LMA stimulation in this apparatus. MPEP had no significant effects on operant responding a sweetened food reward. Nicotine (0.4mg/kg sc) administered 10 minutes prior the trial enhanced acquisition and maintenance of responding in rats trained to extinguish the house light in an operant chamber ($p<0.01$). In this paradigm MPEP reduced responding in saline-treated rats and abolished the facilitatory effects of nicotine on responding for this weak reinforcer ($p<0.01$). The results support the hypothesis that mGluR5 receptors are implicated in the reinforcing proprieties of nicotine when measured directly using self-administration or a reward-enhancing paradigm. The results also suggest that these responses may be associated with the increase in DA overflow evoked in the Nac shell by nicotine.

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PA11-4 ALPHA6 SUBUNIT CONTAINING NICOTINIC ACETYLCHOLINE RECEPTORS IN THE NUCLEUS ACCUMBENS SHELL REGULATE MOTIVATION TO SELF ADMINISTER NICOTINE BUT NOT NICOTINE LOCOMOTOR ACTIVATION

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Beta2 subunit containing nicotinic acetylcholine receptors (b2*nAChRs; *denotes assembly with other subunits) are critical for nicotine self-administration and nicotine-associated dopamine (DA) release that supports nicotine reinforcement. The alpha6 subunit assembles with beta2 on DA neuron terminals where a6b2*nAChRs regulate nicotine-stimulated DA release. Using local infusion of alpha-conotoxin MII (MII), an antagonist with selectivity for a6b2*nAChRs, the purpose of these experiments was to determine if a6b2*nAChRs in the nucleus accumbens (NAc) shell are required for motivation to self-administer nicotine. Long Evans Rats were first trained to lever press reinforced with i.v. deliveries of 0.03 mg/kg nicotine base accompanied by light/tone cues (NIC, n = 12) according to an FR 1 reinforcement schedule during 2-h sessions. Depressions of a second "inactive" lever were without scheduled consequences. A separate group of rats (n = 7) received light/tone but no nicotine (CUEonly) to control for effects of MII on any primary reinforcing effects of the cues. Following 14 days of training, the schedule was changed to progressive ratio (PR), requiring the rats to emit an increasing number of presses to obtain each infusion or cue delivery. Immediately prior to each PR session, rats received micro-infusions of MII (0, 1, 5, or 10 pmols/side) into the NAc shell or overlying cingulate cortex. MII dose-dependently decreased break points and number of infusions earned by NIC rats following infusion into the NAc shell but not the cingulate cortex. MII infusions had no effect on lever pressing in CUEonly subjects. A separate group of rats received infusions of MII or vehicle into the NAc shell prior to locomotor testing. Following 15 min of habituation, animals received injections of saline or a locomotor stimulating dose of nicotine. Concentrations of MII that were capable of attenuating nicotine self-administration did not disrupt basal locomotor activity or distance traveled following nicotine injection. These data suggest that a6b2*nAChRs in the NAc shell regulate motivational aspects of nicotine reinforcement but not the locomotor stimulating effects of nicotine.

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PA11-5 ALPHA 5-CONTAINING NICOTINIC ACETYLCHOLINE RECEPTORS REGULATE NICOTINE INTAKE: ROLE OF THE MEDIAL HABENULA AND INTERPEDUNCULAR NUCLEUS

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Genetic polymorphism in the gene encoding the alpha 5 nicotinic acetylcholine receptor (nAChR) subunit (CHRNA5) is associated with increased risk of tobacco addiction in humans. The alpha 5 subunit demonstrates a restricted brain distribution, with dense expression in the medial habenula (MHb) and interpeduncular nucleus (IPN). Here, we investigated the role for alpha 5 nAChR subunits in regulating consumption of nicotine, the major addictive component of tobacco. We first developed an intravenous nicotine self-administration procedure for mice and then tested mice with a null mutation in CHRNA5 (alpha 5 KO) and their wildtype (WT) littermates. The alpha 5 KO mice exhibited dramatically increased intake compared to WT mice when higher doses of nicotine were available for self-administration. This behavioral phenotype was 'rescued' when a lentiviral vector expressing CHRNA5 was injected into the MHb and the 'rescued' alpha 5 KO mice exhibited intake similar to WT mice. These findings were extended into rats by showing that RNA interference-mediated knockdown of the alpha 5 subunit in the MHb resulted in increased nicotine intake similar to that observed in the alpha 5 KO mice. Knockdown of alpha 5 in the MHb did not alter the reward-enhancing effects of nicotine, but abolished the inhibitory effects of higher nicotine doses on brain reward systems, as measured by brain-stimulation reward thresholds. Finally, lidocaine-induced lesions or injection of the NMDA antagonist LY235959 into the IPN similarly increased nicotine intake in rats, suggesting that the glutamatergic pathway from the MHb to the IPN is essential in regulating these effects. Together, these findings reveal fundamental insights into the mechanisms of nicotine reinforcement that are likely to have considerable clinical and therapeutic implications.

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Paper Session 12: Sex and Tobacco Use

PA12-1 SEX AND SMOKING STATUS MEDIATE GABA-A-BENZODIAZEPINE RECEPTOR AVAILABILITY

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Women report greater levels of anxiety and depression than men, which have been associated with reduced levels of the neurotransmitter GABA. Smoking may induce or exacerbate these symptoms. The GABA-A-benzodiazepine receptor (GABA-A-BZR) is the initial site of action of anti-anxiety drugs in brain; and chronic nicotine treatment in rodents upregulates GABA-A-BZRs. The purpose of this study was to examine sex differences in GABA-A-BZR availability in smokers and nonsmokers. Thirty-two smokers (16men, 34±12yo; 18women, 35±9yo) and 16 age-matched nonsmokers (8men, 38±14yo; 8women, 36±14yo) were imaged using [I-123]iomazenil and SPECT. Smokers were imaged 7h after the last cigarette. There was no significant effect of sex or smoking status on depression or anxiety symptoms on scan day, and men and women smokers had similar levels of nicotine dependence and cigarette craving. We observed a significant effect of smoking status and sex across all brain regions ($p<.05$). Nonsmokers had higher receptor availability than smokers and women had higher receptor availability than men. In addition, women nonsmokers had higher receptor availability (14% in cortex; 30% in striatum) than the other three groups. Consistent with our previous study, in the overall sample there was a negative association between subsyndromal depression and anxiety symptoms and GABA-A-BZR availability in the anterior cingulate (r dep=-.31, $p=.04$ and r anx=-.32, $p=.04$) and occipital (r dep=-.29, $p=.05$) cortices, and striatum (r dep=-.32, $p=.04$ and r anx=-.36, $p=.02$) with trends toward significance in other regions. When stratifying by sex, this association was present in men but not women. In smokers, we observed significant negative correlations between desire for cigarette and GABA-A-BZR availability in women (cortex r=-.57, $p=.01$, striatum r=-.53, $p=.02$, and thalamus r=-.54, $p=.02$) but not men. Importantly, this study implicates sex-specific regulation of the GABA-A-BZR in smokers and nonsmokers suggesting treatments for smoking cessation and mood regulation may be targeted by sex.

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PA12-2 BLUNTED OPIATE MODULATION OF PROLACTIN RESPONSE IN SMOKING MEN AND WOMEN

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Endogenous opioids are integral in modulating drug reward, but it is believed these may act through several mechanisms including hypothalamic-pituitary-adrenocortical (HPA) and dopamine pathways. This study was developed to examine how nicotine dependence alters endogenous opioid regulation of prolactin response, a peripheral marker of dopaminergic activity. Smokers and nonsmokers completed two sessions during which placebo or 50 mg of naltrexone was administered, using a double-blind, counterbalanced design. Blood samples and mood measures were obtained during a resting absorption period, after exposure to two noxious stimuli (cold pressor and thermal pain), and during an extended recovery period. Opioid blockade increased prolactin response ($p<0.0001$), indicating an inhibitory effect of the endogenous opioid system on prolactin, possibly mediated by reduced stimulatory effects of dopamine on this hormone. These responses were attenuated in smokers relative to nonsmokers ($p<0.01$). There was also gender disparity in prolactin response ($p<0.01$), with women showing a stronger response to endogenous opioid blockade than men regardless of smoking status. The attenuated effects of opioid blockade may reflect dysregulated opiodergic and dopaminergic effects. Results extend previous reports showing blunted opioid regulation of the HPA response in dependent smokers.

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PA12-3 PROGESTERONE EFFECTS ON TOBACCO WITHDRAWAL AND SMOKING BEHAVIOR IN MALE AND FEMALE SMOKERS

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Progesterone, a steroid hormone, has been implicated in many CNS functions including reward, cognition, and neuroprotection. The goal of this study was to examine the dose-dependent effects of progesterone on cognitive performance, smoking urges and smoking behavior in smokers. Thirty female and thirty-four male smokers participated in a double-blind, placebo-controlled study. Female smokers were in the early follicular phase of their menstrual cycle during study participation. Smokers were randomly assigned to either 200 or 400 mg/day of progesterone or placebo, given in two separate doses, and abstained from smoking for the first 3 days of the treatment period. This was followed by an experimental session on day 4 where measures of smoking behavior were obtained. Progesterone treatment, 200 mg/day, significantly improved cognitive performance in the Stroop and the Digit Symbol Substitution Test. Progesterone at 400 mg/day was associated with reduced urges for smoking in female smokers but did not change ad lib smoking behavior. These findings suggest the therapeutic value of progesterone for smoking cessation, especially in female smokers. Further clinical studies testing the efficacy of progesterone treatment for smoking cessation are warranted.

The study was conducted while the first author was at Yale University. Supported by a grant from National Institute on Drug Abuse, R01-DA 14537.

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PA12-4 NALTREXONE EFFECTS ON SMOKING CESSATION QUIT RATES, URGES, AND WEIGHT GAIN: AN EXAMINATION OF SEX DIFFERENCES

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It is unclear whether the opioid antagonist naltrexone (NTX) is efficacious in smoking cessation. Recent studies suggest that NTX may be more beneficial in women smokers, and may reduce amount of weight gain, which has been posited as hampering women's cessation success. This study was a double-blinded, randomized, placebo-controlled trial examining the effects of 50 mg oral NTX on smoking quit rates, subjective effects, and weight gain during treatment. Participants were adult smokers aged 41.9 ± 0.6 and smoking 19.7 ± 0.3 cigarettes daily, randomized to naltrexone (n=162) or identical placebo (PLA; n=154). Medication dosing was titrated during the pre-quit week and maintained at 50 mg for 12 weeks after the quit date. All subjects received six weekly counseling sessions and nicotine patch (2 weeks @ 21 mg, 1 week @ 14mg, 1 week @ 7mg) both of which ended 4 weeks after the quit date. Study measures, including compliance, smoking levels, expired air CO, weight, and subjective measures were obtained at each weekly visit. The groups did not differ on pill-taking compliance (pills taken: 83% NTX vs. 85% PLA). For quit rate, a significant sex difference was observed: for women, NTX (vs. PLA) significantly increased CO-verified quit rates during the first month of treatment, however at end of treatment at 12 weeks, only men exhibited an advantage of NLX vs. PLA (GEE: sex x med x time, p<.001). Controlling for nausea did not alter these results. Further, NTX (vs. PLA) reduced weight gain (in absolute pounds or % of baseline weight) only in women but not men (sex x med x time, p<.001). NTX also reduced smoking urges (p<.05) and withdrawal symptoms (ps<.05), and women tended to be more sensitive to these effects earlier in treatment. In sum, NTX, in the context of standard smoking cessation treatment, significantly improved smoking cessation quit rates and reduced weight gain, craving, and withdrawal symptoms. The sexes appear to exhibit differential sensitivity to these effects during the course of 12 weeks of active treatment.

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PA12-5 SEX DIFFERENCES IN MOTIVES TO MAINTAIN SMOKING AND RISK FACTORS FOR EARLY RELAPSE

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Accumulated evidence indicates that men and women smoke for different reasons. Female smokers report more urges to smoke and report more distress after being exposed to stressful situation and to smoking-specific stimuli than male smokers. Women who smoke are also more likely to use smoking as a method of coping against negative affect. These differences may lead to different pattern of relapse prediction. This study was conducted to examine sex differences in the extent to which motives for smoking predict relapse. Seventy-two smokers (33 women and 39 men) interested in cessation were recruited in the study. They completed Reasons for Smoking scale (RFS; Horn & Waingrow, 1966) and Center for Epidemiologic Studies-Depression (CES-D). They also completed a laboratory session and attended a weekly assessment session for four weeks after their quit date. Analysis of variance revealed that, before smoking cessation, women had a higher score than men on the Relaxation subscale of the RFS (use smoking to reduce negative affect) ($p < .01$). Regression analyses were conducted in men and women separately. In women, Pleasure subscale of the RFS (use smoking to induce enjoyment) was related to relapse during the first week follow-up ($p < .05$), and Relaxation was associated with relapse during the second, third, and fourth week (ps < .05). Although not significant, depression as measured by CES-D was also associated with relapse during the follow-up sessions. In men, the Craving subscale of the RFS (use smoking to eliminate craving) predicted smoking relapse throughout the 4-week follow-up period (ps < .05). This sex differences are consistent with our previous finding indicating that stress and negative affect may be more potent risk factors for smoking relapse in women than in men. They further demonstrate sex differences in motivators for cigarette smoking. Smoking cessation treatment should be tailored to address these sex differences.

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Paper Session 13: Children and Secondhand Smoke

PA13-1 WHAT'S THE BEST QUESTION? SCREENING PREGNANT WOMEN FOR SECONDHAND SMOKE (SHS) EXPOSURE

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SHS exposure during pregnancy has been shown to cause effects similar to smoking during pregnancy. While many obstetric practices ask about maternal smoking during pregnancy, little is known about the best way to screen for SHS exposure. We report relationships between serum cotinine level and 3 questions used to screen pregnant women for SHS exposure: "Does anyone smoke cigarettes in your home? (Q1); "Regardless of whether they smoke in the home or not, how many cigarette smokers live in your home now?" (Q2); and "Where are you exposed to secondhand smoke?" (Q3). Data were collected as part of a randomized trial of an intervention to reduce SHS exposure of nonsmoking low-income pregnant women. Women were eligible to participate if they were nonsmokers, age 18-49 years, and receiving prenatal care at the participating clinic. During enrollment women completed questionnaires about their pregnancy and SHS exposure and provided a blood sample. Samples were tested for cotinine using a chemiluminescent test (Immulite). STATA was used for analyses. 105 women were enrolled. Mean participant age was 24 years (range 18-40); 92% were African American. Mean cotinine level of blood samples was 4.3 ng/mL (range <1 to 179). Cotinine levels did not differ by response to Q1 ("yes" vs. "no," 4.5 vs. 4.2 ng mL, p=0.93). Cotinine levels rose in proportion to the number of smokers in the home: 0 smokers: <1 ng/mL (N=47), 1 smoker: 5.9 ng/mL (N=41), 2 or more smokers: 12.1 ng/mL (N=17) (p<0.01). Women who responded "nowhere" or a location other than home or work to Q3 had the lowest mean cotinine level (<1 ng/mL, N=56); the mean cotinine level of women who reported exposure at home and/or work (N=49) was 9.1 ng/mL (p=0.05). The question "Does anyone smoke cigarettes in your home?" did not predict cotinine levels as well as the question about the number of smokers living in the home or the question asking where SHS exposure occurred. We hypothesize that the question "Does anyone smoke cigarettes in your home?" has lost sensitivity because of the decreased social acceptability of smoking and recommend that pregnant women be screened for SHS exposure using one of the alternatives.

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PA13-2 SECONDHAND SMOKE (SHS) EXPOSURE IS ASSOCIATED WITH REDUCED ANTIOXIDANT LEVELS IN CHILDREN

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Background: Antioxidants are the body's primary defense against oxidative stress, including that due to SHS exposure. Relationships between SHS exposure and decreased levels of vitamin C and ß-carotene have been described in children, but the effect of SHS exposure on other micronutrient levels is incompletely understood. We sought to determine the relationship, between SHS exposure and micronutrient levels in children.

Methods: Data from the 2003-2004 National Health and Nutrition Examination Survey (NHANES) were analyzed. Serum cotinine levels were used to categorize children into no (<.015 ng/mL), moderate (.015-2.0 ng/mL), and high (2.0-15.0 ng/mL) exposure groups. T-tests determined associations between exposure groups and micronutrient levels. Significant T-test associations were tested using linear regression. STATA was used for analyses.

Results: Data from 2,210 children age 6-18 years were analyzed. Based on cotinine levels, 39% had no, 54% moderate, and 7% high SHS exposure. Children in the no exposure group had higher levels of vitamin A, C, E, cis- and trans-ß-carotene and folate than those in the high exposure group; levels of the non-antioxidant vitamins B6, B12, and D did not differ between groups. Linear regression showed that higher cotinine levels were negatively associated with levels of vitamin C (ß= -0.03; p<.01), cis-ß-carotene (ß= -0.04; p<.01), trans-ß-carotene (ß= -0.7; p<.01), folate (ß=-0.5;p<.001) and vitamin A (ß= -0.6; p<.01).

Conclusions: Over 60% of US children are exposed to SHS. These children have lower serum levels of antioxidant micronutrients, even after controlling for dietary and supplement intake. SHS exposure-associated antioxidant depletion may increase systemic inflammation and sensitivity to other oxidant stresses. Eating a diet rich in fruits and vegetables is important for all children, but potentially more so for those exposed. The utility of antioxidant supplementation is not clear. These results support the importance of completely eliminating children's exposure to SHS.

AAP/Julius B. Richmond Center of Excellence, Flight Attendant Medical Research Institute, and NRSA T32.

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PA13-3 MEDICAID EXPENDITURES AMONG CHILDREN LIVING WITH SMOKERS

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BACKGROUND: Secondhand tobacco smoke (SHS) exposure has a negative effect on children's health. Understanding the relationship between SHS exposure and children's health expenditures is essential for prioritizing resource use and motivating policy makers to take corrective action. We examine children's SHS exposure and its relationship to Medicaid spending.

METHODS: Our sample consists of 66,256 person-years of observation on children 0-17 years old who were included in the 2000-2006 Medical Expenditures Panel Surveys. Expenditures for children on Medicaid and those with private insurance were modeled as a function of living with a smoker, children's demographic and socioeconomic characteristics, geography, and parents' propensity to seek medical care for their children and themselves. Regression and matching methods were used to control for differences between children who did and did not live with smokers.

RESULTS: Over the study period, 43% of all children with Medicaid lived with at least one smoker, compared to 25% of children with private insurance. In unadjusted analyses, children living with at least one smoker had higher Medicaid expenditures than children who did not live with smokers ($1,020/year vs. $810/year) while those living with at least one smoker had lower private insurer expenditures than other children ($882/year vs. $975/year). The adjusted difference in Medicaid spending was smaller ($701/year with smoker vs. $650/year with no smokers) and not statistically significant. The adjusted difference for private insurer spending was also smaller, still reversed ($788/year with smoker vs. $815/year with no smokers), and not statistically significant. We observed a statistically significant difference in Medicaid emergency room expenditures ($48 with a smoker vs. $40 with no smokers; p=0.01).

CONCLUSION: Our results gibe with current literature finding small effects of SHS exposure on children's short-term health expenditures. Living with a smoker leads to $80 million/year in excess Medicaid spending on children's health. Most of the difference in expenditures for children living with and without smokers is explained by factors other than SHS exposure.

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PA13-4 CHILD EXPOSURE TO HOME ETS: LEVELS OF CARCINOGENS, COTININE, AND AIR QUALITY

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Exposure to environmental tobacco smoke (ETS) is a recognized cause of cardiovascular disease and cancer in adults and respiratory disease in children. In spite of this, approximately one-third of children in the United States live in a home where cigarette smoking is permitted. Children exposed to ETS are at a higher risk of respiratory illnesses, SIDS and viral infections. ETS exposure is also associated with ADHD, learning disabilities and conduct disorder. However, few limitations have been enacted on the primary source of ETS exposure in children: in-home exposure. A novel approach to encourage the adoption of home-smoking restrictions is to provide parents with biomarker feedback documenting child exposure to tobacco-specific carcinogens (NNAL, metabolite of NNK), cotinine, and home air pollutants (particulate matter<2.5 microns (PM 2.5)). The aim of this abstract is to describe baseline demographic and tobacco-related characteristics of female smokers (N=40), recruited at WIC clinics from an ongoing study. We also describe tobacco biomarker levels associated with child exposure to ETS using validated measures of exposure (urine, cotinine, and NNAL). The mean age was 34.1(SD 8.8) years, 74% were unemployed, 80% were female, 62% African American and 78% had a monthly family income under $1,800. Average number of cigarettes smoked per day (CPD) was 9.9(SD 5.5;3.0-20.0); 94% smoked daily, and 54% lived with another smoker. The average CO level of the smoker was 11.4(SD 7.3) ppm. The mean age of the child enrolled was 3.7(SD 2.6; 1 month-10 years) years and 42% were male. The average NNAL level of the child enrolled was 30.6(SD 21.7;2.0-87.0) pg/mL and the average cotinine level was 25.0(SD 28.9;1.0-111.0) ng/mL, demonstrating significant exposure to ETS. Average home air quality index values were 104.7(SD 126.9;101.0-150.0) ppm, indicating the "unhealthy for sensitive groups" risk level, set by the EPA. Our results indicate that children living with a smoking parent are exposed to detectable levels of carcinogens, cotinine and unhealthy levels of particulate matter. Interventions need to be designed to dramatically lower or eliminate exposure to home ETS.

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PA13-5 SEQUENTIAL APPLICATION OF TWO TOBACCO BIOMARKERS TO OPTIMIZE DISCRIMINATION OF ACTIVE VS PASSIVE SMOKING

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Objectives: Cotinine is the most widely used biomarker to distinguish active vs. passive smoking. However, there is an overlap in cotinine levels when comparing light or occasional smokers vs. heavily exposed passive smokers. 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL) is a tobacco-specific nitrosamine present in relatively high concentration in passive smokers. A multi-biomarker approach might be a way to decrease both false positive and false negative results when classifying people as a smokers or passive-smokers.

Methods: Cotinine and NNAL were measured in urine of 184 active and 120 passive smokers.

Results: Average cotinine levels were 22±59 for passive and 2,103±1,871 ng/mg creatinine for active smokers and average NNAL levels were 15±18 and 250±264 pg/mg creatinine, respectively. ROC analysis showed an optimal cotinine cut point of 450 ng/mg resulting in a sensitivity of 85.9% and a specificity of 100% for discriminating active vs. passive smokers. In a first step all subjects with cotinine higher than 450 ng/mg were classified as smokers. In a second step we used a NNAL cut-off point of 50 pg/mg. Subjects with cotinine ≤450 ng/mg and NNAL ≤50 pg/mg were classified as passive smokers and subjects with cotinine ≤450 ng/mg but with NNAL >50 pg/mg were classified as active smokers. The two-biomarker approach resulted in an overall sensitivity of 91.3% and specificity of 96.7%.

Conclusions: Application of two-biomarker approach is a highly sensitive and specific way to determine the source of tobacco smoke exposure. Compared to the use of cotinine alone this approach increases sensitivity for discriminating active vs. passive smoking, resulting in a higher number of true smokers correctly qualified as smokers.

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Paper Session 14: Varenicline for Nicotine Dependence

PA14-1 INTERACTIONS AMONG INDICATORS OF PHARMACOLOGICAL AND BEHAVIORAL TREATMENT UTILIZATION: VARENICLINE AND BEHAVIORAL COUNSELING FOR SMOKING CESSATION

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We conducted a randomized trial to compare the effectiveness of three modes of behavioral counseling (proactive telephone, Web-based, and telephone plus Web-based) for smoking cessation among 1,202 participants using varenicline. All three forms of treatment resulted in abstinence rates at 6-months comparable to those seen in the Phase III RCTs of varenicline. Little is known however, about how the utilization of both pharmacological and behavioral components interact to influence abstinence rates: an important aspect of real-world use of multi-component treatments. In this study, a number of critical indicators of treatment utilization were measured including: (1) varenicline use- the number of days and pills taken; (2) number of counseling calls and total call minutes; and (3) number of Web logins and total Web minutes. For each of the three treatment groups, classification and regression tree analysis (CART) was used to identify internally cross-validated interactions between utilization indicators. Following identification of the classification structures, each one was tested for classification beyond the level of chance alone and nested multiple logistic regression (NMLR) was used to confirm the significance of the various CART interactions. Across the three treatment conditions four to six node trees resulted in rates of classification of treatment outcomes significantly beyond chance with all interactions being confirmed by NMLR. The duration of varenicline use and the number of minutes and total number of times engaged with behavioral intervention (both Web and telephone) were indicators of utilization that interacted with each other differently in each of the three groups. For example, the number of days taken varenicline interacted with the total call minutes (phone only), the number of minutes spent on the website (Web only), and with number of calls made and minutes spent on the website (phone plus Web). These results reveal how different components of biobehavioral treatment utilization interact with each other to result in differential abstinence outcomes.

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PA14-2 THE EFFECTS OF VARENICLINE ON RELAPSE TO SMOKING FOLLOWING EXPERIMENTAL LAPSE EXPOSURE

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Retrospective data collected during clinical trials along with anecdotal reports suggest that one mechanism by which varenicline aids in smoking cessation is by reducing the likelihood of relapse following a slip or lapse episode during a quit attempt. The current study investigated this effect in a prospective laboratory model. Smokers were randomly assigned to receive varenicline or placebo during a practice quit attempt in which an experimentally induced lapse occurred after a supervised period of brief abstinence. Smoking behavior was then assessed for four weeks following the programmed lapse. Thirteen participants have completed the study. Smoking decreased during the quit attempt for both placebo (n=8) and varenicline (n=5) groups, but was lower upon completion of the study for those receiving varenicline compared with placebo. Specifically, mean urinary cotinine levels were 526 ng/mL vs. 1507 ng/mL, breath CO levels were 5 ppm vs. 11 ppm, and self-reported cigarettes smoked per day were 2 vs. 7 in the varenicline and placebo groups respectively. These results confirm the efficacy of varenicline in preventing relapse over four weeks following a programmed lapse in the laboratory. Reductions in smoking behavior were found, however, complete abstinence from smoking in either group was rare. Both groups received financial incentives contingent upon abstinence during the first week of the quit attempt, which most likely contributed to decreases in smoking behavior. While incentives along with behavioral counseling were successful in decreasing smoking behavior in the placebo group, they were not as powerful as the combination of incentives, counseling, and varenicline treatment.

Pfizer, Inc.

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PA14-3 COMPARATIVE ABSTINENCE AND MOOD EFFECTS FOR VARENICLINE AND COMBINATION PHARMACOTHERAPY IN A TOBACCO TREATMENT CLINIC

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Although effective in clinical trials, recent concerns regarding adverse mood effects with varenicline have limited its use. Most of the clinical trials for varenicline excluded smokers with concurrent medical and psychiatric illness and none compared varenicline with combination pharmacotherapy. This study evaluated the effectiveness and adverse events of various treatments including varenicline, NRT, bupropion, and combination medications among a sample of 730 smokers treated at the UMDNJ-Tobacco Dependence Clinic from 2006-2008. Baseline variables included demographics, tobacco use, dependence, and quit history, and medical and psychiatric illnesses. In addition, a validated instrument measuring recent psychological distress (Kessler-K6) was administered to all subjects at baseline and follow-up. The primary outcome was 7-day point abstinence at 6 months after target quit date. Subjects were 59% white, 53% female, had mean age of 46 years, and had 6 previous quit attempts on average. 54% of subjects had previous treatment for behavioral health problems and nearly half had active medical issues. There were no significant differences in baseline K-6 scores among medication treatment groups. The overall 6 month abstinence rate was 23.2%, with higher abstinence seen in older, more educated, less dependent, and less co-morbid smokers. Combination pharmacotherapy was most commonly used (283 subjects; 39%) followed by single NRT or bupropion (209; 29%), and varenicline (168; 23%). In full-model, logistic regression, 6-month abstinence rates were significantly higher with varenicline (31%) (Adjusted Odds Ratio 2.7; 95% Confidence Interval 1.1-6.6), and combination medications (32%)(AOR 3.2; 1.4-7.4) compared with subjects using no medications (14%). K-6 scores were lower 1 and 6-months after quit date and were not significantly different among medication treatment groups. These data demonstrate that in a sample of smokers with co-morbidities, both varenicline and combination pharmacotherapy were effective. Additionally, varenicline use did not result in any significant increase in psychological distress for up to 6 months.

New Jersey Department of Health and Senior Services - Comprehensive Tobacco Control Program.

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PA14-4 VARENICLINE ATTENUATES SOME OF THE SUBJECTIVE AND PHYSIOLOGICAL EFFECTS OF INTRAVENOUS NICOTINE IN HUMANS

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Varenicline, a partial nicotinic acetylcholine receptor (nAChR) agonist, is approved for smoking cessation. A few preclinical studies examined the pharmacological effects of varenicline, alone or in combination with nicotine. How varenicline affects the pharmacological effects of pure nicotine has not been examined in humans. The goal of this study was to characterize varenicline's actions on nicotine's dose-dependent effects in abstinent smokers. Six male and 6 female smokers participated in a double-blind, placebo-controlled, crossover study. Smokers had two, 4-day treatment periods, assigned in random sequence, to varenicline (1 mg/day) or placebo treatment. On day 4 of each treatment phase, smokers had an experimental session, where they received 3 escalating doses of intravenous (IV) nicotine (0.1, 0.4, and 0.7 mg/70 kg), in 30-minute intervals. Varenicline's effects were assessed through subjective, physiological and cognitive performance outcomes to nicotine administered via IV route. In response to IV nicotine, varenicline treatment attenuated the rating of drug strength, high, head rush, and stimulated. Varenicline also attenuated nicotine-induced increases in heart rate. Varenicline had mixed effects on cognitive performance. Smokers under varenicline treatment, compared with placebo, reported enhanced positive mood measured with the Positive and Negative Affect Schedule (PANAS). These findings provide new insights into the mechanisms of action of varenicline in smoking cessation.

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PA14-5 INTERVENTIONS FOR SMOKELESS TOBACCO (ST) IN SWEDEN AND NORWAY AND RESULTS FROM A RANDOMIZED CONTROLLED EFFICACY TRIAL OF VARENICLINE IN CESSATION OF ST

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Background: Smokeless tobacco (ST) is the main form of tobacco use among certain populations in Scandinavia. No randomised controlled trials (RCTs) with bupropion or NRT have demonstrated a statistically significant benefit in long term abstinence from ST. Varenicline (VAR), an alpha4beta2 acetylcholine receptor partial agonist is a licensed smoking cessation aid, which has been tested here for the first time for quitting ST.

Method: A double-blind, placebo-controlled multicentre RCT carried out in Norway and Sweden tested the efficacy of VAR versus placebo (PLA) for cessation of ST in men and women aged ≥18 years, who used ST ≥8 occasions per day, on average with no period of abstinence within 3 months before screening. Subjects received either VAR 1mg BID (titrated during the first week) or PLA for 12 weeks, with 14 weeks post-treatment follow-up. The primary endpoint was the cotinine-confirmed 4-week continuous abstinence rate (CAR) at end of treatment (Weeks 9-12). A secondary endpoint was CAR for Weeks 9-26. Safety and tolerability were also evaluated. Results: 431 subjects (213 VAR; 218 PLA) were randomized and treated with ≥1 dose of study drug. Subject demographics and baseline ST use were similar between groups (mostly male, 89.3%; mean age, 43.9 years; mean modified Fagerström score for ST, 7.6; ST use ≥13 occasions per day, 60.7%). Week 9-12 CAR was higher for VAR than PLA (58.69% vs. 38.99%; odds ratio [OR]: 2.39; 95% confidence interval [CI]: 1.59, 3.58; P<0.0001. The superiority of VAR over PLA persisted through 14 weeks of follow-up (CAR Weeks 9-26: 44.60% vs. 33.49% OR: 1.70; 95% CI: 1.12, 2.58; P=0.0118). The most frequent adverse events (AEs) in the VAR group were nausea (34.7%), fatigue (10.3%), headache (10.3%) and sleep disorder (10.3%). Few AEs led to treatment discontinuation (varenicline: 11.7% and placebo: 8.3%). Serious AEs occurred in 2 (0.9%) of VAR and 3 (1.4%) of PLA subjects.

Conclusion: Varenicline 1mg BID demonstrated significant efficacy as an aid to the cessation of smokeless tobacco and had an acceptable safety profile among this population of subjects who used ST at least 8 times per day prior to quitting.

This study is funded by Pfizer.

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Paper Session 15: Alcohol and Nicotine

PA15-1 THE RELATIONSHIP BETWEEN SMOKING STATUS CLASSIFICATION AND HEAVY DRINKING EPISODES

C. Amanda Schweizer*[1], Mark G. Myers[2,3], and Neal Doran[2], [1]SDSU/UCSD Joint Doctoral Program in Clinical Psychology; [2]University of California, San Diego; [3]VA San Diego Healthcare System

Research consistently indicates that cigarette smokers consume alcohol in greater quantity and frequency than nonsmokers. Within smokers, recent studies have found that occasional smokers engage in heavier drinking than daily smokers. This issue is of concern in that less frequent smokers may be at greater risk for alcohol-related problems. The present study examined which of three classifications of smoking status was most associated with the occurrence of heavy drinking episodes (HDE). Past 30-day alcohol and cigarette use of undergraduate college student smokers (N=140) was assessed using the timeline follow back procedure. Smoking status was classified in three ways: non-daily (N=110) or daily smokers (N=30); experimenters (N= 55) or established smokers (N=84); and self-definition as only smoking "once in a while" (N=42), "party" smokers (N=32), and regular or addicted smokers (N=47). Separate logistic regression analyses were conducted to identify which classification best predicted the likelihood of a past 30-day HDE. Ethnicity, age, and self-reported importance of parties were included as covariates. Non-daily smokers were over three times more likely than daily smokers to report an HDE (85% vs. 67%, OR=3.36, p=.036). However, experimenters did not differ from established smokers (84% vs. 79%). Finally, "party" smokers were nearly twelve times more likely than "regular or addicted" smokers to have had a past 30-day HDE (97% vs. 77%, OR=11.78, p=.031), but "once in a while" smokers (78% HDE) did not differ from "regular or addicted" or "party" smokers. These findings are consistent with previous studies in demonstrating that frequency of smoking predicts current alcohol use, regardless of lifetime smoking experience. The current study sought to increase understanding of the relationship between occasional smoking and heavy drinking by including self-description as a classification of smoking status. Those who are currently infrequent smokers but whose self-description encompasses a link between the two substances may be at increased risk for both progression toward nicotine dependence and alcohol use disorders.

This research was supported by grants from the California Tobacco Related Disease Research Program (TRDRP 12RT-0004), the National Institute on Drug Abuse (K02- DA017652) and a University of California, San Diego Academic Senate Research Grant.

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PA15-2 NALTREXONE REDUCES CIGARETTE SMOKING, ALCOHOL DRINKING, AND SWEET FOOD CONSUMPTION IN SMOKERS PREPARING TO QUIT

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There is mixed evidence for the role of opioid antagonists, such as naltrexone (NTX), in altering cigarette smoking and other appetitive behaviors. Acute effects of NTX on smoking indices have largely been examined in the context of laboratory settings and in non-treatment seeking smokers, which may reduce translation to clinical settings. In this randomized, placebo-controlled study, we examined the acute effects of NTX in smokers desiring to quit during their first week of medication dose titration, i.e., one week prior to the designated quit date. Participants were N=296 smokers (152 NTX; 144 PLA) with a mean age of 41.9 ± 0.7 yrs and average daily smoking of 19.6 ± 0.3 cigarettes. They were instructed to take one pill each morning during the six days prior to the quit date, on the following dose schedule: day 1 at 12.5mg, days 2-3 at 25mg and days 4-6 at 50mg. They also completed a 17-item questionnaire each night to assess pill compliance, cigarette, alcohol and sweet food consumption, smoking urges and pleasure, side effects, anxiety, and depression. Data for the first 3 days of sub-threshold dosing and those for the last 3 days of full dosing were averaged for analyses. Pill compliance did not differ between the groups (90% NTX vs. 94% PLA). Results revealed that NTX (vs. PLA) reduced the number of cigarettes smoked (p<.05), smoking urge and cigarette pleasure (ps<.01), food pleasure (p<.01), sweet food consumption (p<.01) and heavy drinking rates (p<.05). NTX produced these main effects at both dose intervals except for reduction in sweet food consumption, which was only observed at the full dose. NTX also increased ratings of nausea (p<.001), dizziness (p<.001), and sedation (p<.001), but these side effects did not mediate NTX reduction in smoking, food consumption, and drinking. NTX did not affect cigarette taste, overall appetite, sleep, anxiety, depression, and number of caffeinated drinks. In sum, these data provide strong support for opioid antagonism reducing cigarette smoking and other related behaviors in smokers preparing to quit, and these effects may underlie its clinical utility.

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PA15-3 NICOTINE AND ETHANOL INDUCE BUPROPION AND ETHANOL METABOLIZING ENZYMES, CYP2B AND CYP2E1, IN MONKEY BRAIN

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CYP2B and CYP2E1 are enzymes responsible for the metabolism of bupropion and ethanol respectively, as well as other clinical drugs, drugs of abuse and toxins. We have detected higher levels of CYP2B and CYP2E1 in certain brain regions of human smokers and alcoholics compared to non-smoking non-alcoholics. These regional increases in the brain may have wide ranging effects, such as altering neurotoxicity, increasing metabolic tolerance and changing drug efficacy. In this study, we used a monkey model to investigate the effects of ethanol and nicotine on brain CYP2B and CYP2E1 levels. Monkeys offer a good representation of human neuroanatomy and CYP specificity and metabolism. Thus, induction of CYP2B and CYP2E1 by ethanol and/or nicotine in monkeys will provide strong support for a similar neuroadaptive drug response in humans. Forty monkeys were randomized into four groups: an ethanol group, a nicotine group, an ethanol + nicotine group and a control (no drug) group. Monkeys in the ethanol and ethanol + nicotine groups were allowed to self-administer 10% alcohol in sucrose solution for 4 hours a day while the other groups consumed sucrose solution on the same schedule. Monkeys in the nicotine and ethanol + nicotine groups were injected with 0.5 mg/kg nicotine twice daily whereas the other groups were injected with saline on the same schedule. After 21 days on this schedule, the animals were sacrificed and tissue was collected from 8 brain regions. CYP2B and CYP2E1 protein levels were measured by Western blotting. Monkeys allowed to self-administer ethanol had induced levels of CYP2B protein in the caudate and putamen and CYP2E1 in the caudate and thalamus. Monkeys treated with nicotine had induction of CYP2B in the frontal cortex and CYP2E1 in the putamen and cerebellum. There were no apparent nicotine and ethanol interactions. We demonstrate for the first time in a primate brain that ethanol and nicotine can induce CYP2B and CYP2E1 in unique regional and inducer-specific patterns as part of a neuroadaptation to drug exposure. This suggests that people consuming nicotine and/or alcohol may respond differently to CYPB and CYP2E1 substrates.

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PA15-4 EFFECTS OF COMBINED ALCOHOL AND NICOTINE INTAKE ON RATINGS OF SUBSTANCE LIKING AND SIMILARITY

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Research has demonstrated positive relationships between indices of alcohol and tobacco consumption across the full range of dependent and non-dependent users. In the current study we examined the relationship between alcohol and nicotine intake and subjective ratings of the likeability of and perceived similarity to usual substance for study-supplied alcohol and cigarettes, as well as alcohol and nicotine cross-substance effects. These data are part of a larger study examining effects of substance intake on alcohol and cigarette craving. Participants were 71 smokers ages 21-55 (mean=31) with a range of alcohol and tobacco use patterns. Participants completed four counterbalanced laboratory sessions in a fully crossed 2 x 2 within subjects design where they consumed either a standardized amount of vodka (target BAC = 30 mg/100 ml) or a placebo mixed drink and then smoked either a nicotinized or de-nicotinized cigarette. Following substance intake, participants rated how much they liked or disliked the drink and cigarette, and how similar the substances were to their usual substance. Analyses indicated that participants liked the alcohol and placebo drinks similarly, however they reported a greater liking of the nicotine cigarette. In terms of cross-substance effects, when participants consumed nicotine they reported a greater liking of the drink (regardless of alcohol content) and when participants consumed alcohol they reported a greater liking of the cigarette (regardless of the nicotine content). When rating the similarity of the cigarette to usual cigarette, there was a significant alcohol and nicotine interaction effect such that when participants consumed nicotine they rated that as more similar to their usual cigarettes, regardless of alcohol consumption. However, when consuming the de-nicotinized cigarette, participants rated it as more similar to their usual cigarette only after they consumed alcohol. Overall, these findings add to the growing body of literature indicating the important role that cross-substance effects may play in promoting ongoing use of nicotine and/or alcohol. Implications for further research and treatment will be discussed.

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PA15-5 ALCOHOL CONSUMPTION IN MEN AND WOMEN DIFFERENTIALLY REINFORCES THE RELATIVE VALUE OF CIGARETTES IN HEAVY DRINKING, NON-DEPENDENT SMOKERS

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While many studies have demonstrated a strong relationship between alcohol drinking and cigarette smoking in those with nicotine dependence, less is known about co-use behaviors in non-dependent men and women smokers. Alcohol has been shown to increase smoking urge and behavior yet alcohol's effects on the reinforcing value of smoking, which may play a role in liability for continued heavy use, remain unclear. The current study examined the effects of acute alcohol consumption on smoking urge and choice for a varying monetary amount versus a cigarette (i.e., the crossover point) and whether the sexes differed on the association of this crossover point to subsequent choice smoking behavior. Participants were 42 (20 female) young heavy social drinking, nondependent smokers [M=16.8(±8.8 SD) alcohol drinks/wk, 15.6 (±12.6) cigarettes/wk). Participants were randomized to either alcohol (0.8 g/kg; n=29) or placebo (n=13) beverage groups. At baseline, 30 and 60 minutes after beverage consumption, a Monetary Choice Procedure (MCP) and the Brief Questionnaire of Smoking Urges (BQSU) were administered. Following this, participants were given the choice of smoking up to five cigarettes via a smoking topography device for 2½ hours. Results showed that alcohol (vs. placebo) produced significant increases in both MCP crossover points and BQSU scores (ps<.05), and these ratings were positively correlated (rs > 0.42, ps<.05). However, in women, but not in men, alcohol-induced increases in MCP crossover points negatively correlated with subsequent smoking behavior (rs< -0.61, ps<.05). These data reveal that an intoxicating dose of alcohol increased the reinforcing value of cigarettes, but this was not related to increases in subsequent smoking behavior. More research is needed in nondependent samples to further explicate the role of alcohol in smoking reinforcement and behavior, and potential sex differences in these responses.

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Paper Session 16:
Subunit Contributions to Biological Consequences of Nicotine

PA16-1 CHRONIC NICOTINE TREATMENT RESULTS IN SIMILAR CHANGES IN NICOTINIC BINDING SITES AND ALPHA4 AND BETA2 NICOTINIC RECEPTOR SUBUNIT PROTEINS

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Chronic exposure to nicotine increases nicotinic binding sites in mouse, rat, monkey and human brain, as well as in cell lines expressing nicotinic acetylcholine receptors (nAChR). The drug-induced increase in nicotinic binding sites, which has been termed upregulation, has been most extensively studied for alpha4beta2-nAChR. It had been assumed that upregulation of binding sites corresponds to increased receptor protein. However, alternate interpretations have been advanced. In order to examine the effects of chronic nicotine treatment on alpha4beta2*-nAChR, we treated C57BL/6 mice with nicotine (0, 0.125, 0.25, 0.5, 1.0, 2.0 or 4.0 mg/kg/hr) by continuous infusion through jugular cannulas. After ten days of nicotine treatment, brains were frozen and sectioned. Samples from each treatment group were incubated with either A85380 to label beta2*-nAChR sites, mAb270 to label beta2 nAChR subunits or mAb299 to label alpha4 nAChR subunits. Signal intensity of autoradiograms was quantitated in 38 brain regions. Consistent with previous results differences in A85380 binding were observed among brain regions following chronic nicotine treatment. Significant increases in A85380 binding were observed in most brain areas, but relatively little upregulation was observed in thalamic nuclei, geniculate nuclei, medial habenula or intrapeduncular nucleus. The effects of chronic nicotine treatment on mAb270 and mAb299 binding were very similar to those on A85380 binding, although upregulation mAb299 binding (alpha4 protein) was somewhat greater in some brain regions than was upregulation of mAb270 binding (beta2 protein) specifically in regions known to express other alpha subunits. The nicotine dose-dependence for upregulation of all three probes was similar and increases were saturable. The average nicotine dose that elicited half-maximal upregulation was 0.45 mg/kg/hr (plasma concentration approximately 25 ng/ml). These results indicate that the increases in nicotinic binding sites occurring with chronic nicotine treatment reflect increases in both alpha4 and beta2 nAChR protein and that these changes occur at nicotine concentrations comparable to those attained by smokers.

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PA16-2 DIVERSITY OF FUNCTIONAL NICOTINIC RECEPTORS IN THE MEDIAL HABENULA

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While the physiological role of nicotinic acetylcholine receptors (nAChRs) in the brain is unclear, their contribution to tobacco addiction is better understood. nAChRs in the medial habenula (MHb) have been implicated in both drug-seeking and withdrawal from nicotine. The presence of high levels of multiple types of subunit mRNAs predicts that the MHb should express a diversity of functional nAChRs. Electrophysiological studies report that receptors with a minimal subunit composition of alpha3beta4 form the major MHb population of nAChRs. We examined the contribution of alpha4 receptors to functional nAChRs in the MHb. Alpha4 subunit protein was localized to the ventrolateral MHb using a fluorescently tagged knock-in strain of mice expressing alpha4YFP, precisely mirroring alpha4 mRNA measured in situ. A second strain of knock-in mice expressing a mutated hypersensitive alpha4L9'A subunit was used to assess the functionality of these subunits. Unlike wild-type alpha4-containing nAChRs, receptors incorporating alpha4L9'A are particularly sensitive to low levels of nicotine. The spatial distribution of functional alpha4-containing nAChRs was assessed in vivo from nicotine-induced c-fos expression, and in vitro from nicotine-evoked current amplitudes in patch clamp recordings. In both cases hypersensitive neurons were localized to the ventrolateral aspect of the MHb. The additional high sensitivity of alpha4L9'A MHb receptors to the beta4 preferring ligand, cytisine, implies that alpha4beta4 nAChRs may exist in this region.

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PA16-3 THE MEDIAL HABENULA AND THE MECHANISMS OF NICOTINE WITHDRAWAL

Mariella De Biasi*, Ph.D., Ramiro Salas, Ph.D., Renea H. Sturm, M.D., Erika E. Perez, B.S., Michael A. Paolini, B.S., Dang Dao, B.S., and David A. Gangitano, Ph.D., Department of Neuroscience, Baylor College of Medicine

A detailed understanding of the nicotinic cholinergic system is critical for the development of therapies directed toward the treatment and prevention of nicotine addiction. The habenular complex is emerging as an important modulatory relay between the limbic forebrain structures and the midbrain. Divided into the medial nucleus and the two divisions of the lateral nucleus, the habenula is a source of negative reward signals and participates in a wide array of behaviors, including anxiety and stress. The medial nucleus of the habenula (MHb) expresses mRNA for various neuronal nicotinic acetylcholine receptor (nAChR) subunits but the majority of the receptors is thought to comprise the alpha3 and beta4 subunits. This presentation will cover recent experiments underscoring the importance of the alpha3, alpha5, and beta4 nAChR subunits in anxiety-related behavior, the behavioral effects of nicotine, and the manifestations of nicotine withdrawal. Data will be presented to support the notion that the MHb and the nAChRs therein have a crucial role in the mechanisms underlying nicotine addiction.

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PA16-4 NICOTINIC RECEPTOR ALPHA7 REGULATES RECRUITMENT OF INFLAMMATORY CELLS

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Smoking adversely affects the generation of inflammatory responses with the ultimate result often being immunosuppression. The expression of neuronal nicotinic acetylcholine receptors (nAChRs) on immune and inflammatory cells suggests that nicotine interacts directly with nAChRs to impart these responses. In a previous report we demonstrated through the use of nAChR alpha 7 (nAChRa7) knock-out mice that in the skin this nicotinic receptor participates in regulating the production of inflammatory cytokines (Osborne et al., J. Neuroimmunology, 193(1-2):130-9. 2008). Further investigations have revealed that this increase in inflammatory cytokine production results from alterations in the number of cells recruited to sites of peripheral inflammation. Applying methods of cell sorting and flow cytometry, we have found that the majority of nAChR mediated changes in skin-associated inflammation involve increases in neutrophil (Ly6G positive cells) recruitment to the site of the inflammatory assault. The enhanced inflammatory state in the nAChRa7 mouse is transient, with the major effect being observed at 6 hours post-inflammatory assault. We have also demonstrated using RNA array analysis that in the nAChRa7 knock-out mouse signaling by chemokine production in the skin is altered which affects the recruitment of cells expressing the targeted chemokine receptors. These results extend the role of nAChRa7 in inflammatory events beyond vagal innervated tissues and suggest an important role of nicotine in modifying the number of cells recruited to a site of inflammation.

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PA16-5 THE ROLE OF ALPHA-7 NICOTINIC ACETYLCHOLINE RECEPTORS IN ANGIOGENESIS IN THE ADULT MALE ZEBRA FINCH HEART AFTER IN VIVO NICOTINE ADMINISTRATION

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In the central and peripheral nervous systems, the alpha-7 nicotinic acetylcholine receptor (alpha-7 nAChR) is widely expressed. In addition, this receptor is found in several non-neuronal tissues, such as endothelial cells (ECs). ECs are necessary for the course of angiogenesis, which is a critical physiological process for cell survival and development. Non-selective cholinergic agonists such as nicotine, been shown to induce angiogenesis. There are indications that alpha-7 nAChRs on ECs may be an endothelium target for revascularization in therapeutic angiogenesis of ischemic heart disease. However, the intracellular mechanism by which alpha-7 nAChR activation mediates the process of angiogenesis is unknown. Coinciding with the increased activity of ECs, increased expression of heat shock protein 70 (HSP70) has been reported. Our previous work showed that in vivo administration of nicotine dose-dependently affected morphology of collagen in the zebra finch heart. This pointed toward an increased activity of ECs, resulting in remodeling of the collagen matrix. In addition, other work in our laboratory showed increased expression of HSP70 in brain areas related to cognition. The aim of this work was to identify the role of alpha-7 nAChRs and HSP70 in the process of angiogenesis in the adult male zebra finch heart tissue as a function of nicotine exposure. Adult male zebra finches (n=16) were treated for 1 or 7 days with saline or nicotine (0.18mg/kg, sc) and were sacrificed 30min after the last injection. Immunocytochemistry was used to detect the expression of alpha-7 nAChRs and HSP70 expression in heart sections (5um thickness). Evidence shows that nicotine induces expression of alpha-7 nAChR and HSP70 in a synergistic manner, further research is necessary to examine the long-term effects on collagen matrix remodeling and the benefit of non-selective vs. selective cholinergic agonists in the process of angiogenesis.

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Paper Session 17: Genetic Contributions to Nicotine Dependence

PA17-1 ACYL-COA SYNTHETASE LONG-CHAIN FAMILY MEMBER 6 (ACSL6) AND NICOTINE DEPENDENCE

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Schizophrenia is highly comorbid with tobacco smoking and nicotine dependence; however, the underlying mechanism for this is not clear. One hypothesis is that schizophrenia and nicotine dependence share some common liability genes. These studies were designed to test this hypothesis using the acyl-CoA synthetase long-chain family member 6 (ACSL6) gene that was reported to be associated with schizophrenia in our previous studies. In human association studies (n = 2139), we tested 9 tagged SNPs in the ACSL6 region. Two SNPs in the ACSL6 gene, rs667437 and rs477086, were significantly associated with nicotine dependence (p = 0.0022 and 0.0066 respectively) and the risk alleles were the same as shown for schizophrenia. We verified the association with samples from the Genetic Association Information Network (GAIN) organization. In the GAIN samples (n = 2641), both markers were significantly associated with FTND scores (rs667437, p = 0.0501; rs477086, p = 0.0554) and number of cigarettes smoked daily (rs667437, p = 0.0002; rs477086, p = 0.0002). We next used in vivo and in vitro assays to test whether nicotine regulates ACSL6 expression. Real-time PCR and Western blot experiments revealed a dose-dependent increase in ACSL6 mRNA and protein levels in rat primary cortical cultures following 5 days exposure to nicotine (0, 10, or 100 μM). Two weeks of in vivo exposure to nicotine (osmotic mini pump infusion at 36 mg/kg/day flow rate) also increased total protein levels of ACSL6 expression in the hippocampus and ventral tegmental area of mice. These in vivo changes in ACSL6 expression were suppressed by the administration of the nicotinic antagonist, mecamylamine, suggesting that nicotine-associated increases of ACSL6 protein depend on activation of nicotinic acetylcholine receptors. Together these data show that ACSL6 is associated with nicotine dependence and its expression is altered by nicotine in brain areas that regulate tobacco addiction. The fact that the same alleles at ACSL6 were associated with increased risk for both schizophrenia and nicotine dependence suggests that ACSL6 may be a shared liability gene for schizophrenia and nicotine dependence.

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PA17-2 COMMON AND UNIQUE BIOLOGICAL PATHWAYS ASSOCIATED WITH SMOKING INITIATION/ PROGRESSION, NICOTINE DEPENDENCE, AND SMOKING CESSATION

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Twin and family studies reveal a significant genetic contribution to the risk of smoking initiation and progression (SI/P), nicotine dependence (ND), and smoking cessation (SC). Further, numerous genes have been implicated in these smoking-related behaviors, especially for ND. However, no study has presented a comprehensive and systematic view of the genetic factors associated with these important smoking-related phenotypes. By reviewing the literature on these behaviors, we identified 16, 99, and 75 genes that have been associated with SI/P, ND, and SC, respectively. We then determined whether these genes were enriched in pathways important in the neuronal and brain functions underlying addiction. We identified 9, 21, and 13 pathways enriched in the genes associated with SI/P, ND, and SC, respectively. Among these pathways, four were common to all of the three phenotypes; i.e., calcium signaling, cAMP-mediated signaling, dopamine receptor signaling, and G-protein-coupled receptor signaling. Further, we found that serotonin receptor signaling and tryptophan metabolism pathways were shared by SI/P and ND, tight junction signaling pathway was shared by SI/P and SC, and gap junction, neurotrophin/TRK signaling, synaptic long-term potentiation, and tyrosine metabolism were shared between ND and SC. Together, these findings demonstrate significant genetic overlap among these three related phenotypes. Although identification of susceptibility genes for smoking-related behaviors is still in an early stage, the approach utilized in this study has potential to overcome the hurdles caused by factors such as genetic heterogeneity and small sample size, and thus should yield greater insights into the genetic mechanisms underlying these complex phenotypes.

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PA17-3 GENETIC ASSOCIATIONS WITH PLASMA COTININE AND CIGARETTES PER DAY IN TREATMENT-SEEKING SMOKERS

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Recent studies have found strong associations between nicotine dependence, lung cancer, chronic obstructive lung disease and nitrosamine exposure in smokers with genes in the nicotinic receptor CHRNA5/A3/B4 complex. In addition, a population-based study recently found an association between this gene cluster and plasma cotinine and cigarettes per day (CPD). To confirm these findings and to investigate other potential mechanisms, we performed a candidate gene association study using 1,295 SNPs in 58 candidate genes from the nicotinic receptor, nicotine metabolism, dopaminergic and other nicotine reward pathway genes. Significant associations were observed between plasma cotinine and SNPs within the CHRNA5/A3/B4 region (rs2036527 and rs1317286), as well as SNPs in EPB41, DBH, GNAZ, GNAS and POMC genes (all $P < 0.05$, adjusted for multiple comparisons). The strength of these associations was not altered after adjustment for CYP2A6 (a nicotine metabolizing enzyme gene). SNPs in EPB41, CREB1, CHRNA6, ADCYAP1 and CNR1 were also significantly associated with CPD after adjusting for multiple comparisons. The association between variation in the CHRNA5 gene complex and plasma cotinine in treatment-seeking smokers supports previously reported associations of this gene complex with dependence, greater intake of tobacco smoke and increased risk of smoking-related disease. A role of other gene products functioning to regulate neurotransmission of dopamine and several neuropeptides in determining exposure to nicotine and other tobacco smoke toxins is also suggested.

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PA17-4 PREDICTORS OF RELAPSE IN A BUPROPION TRIAL FOR SMOKING CESSATION IN ALCOHOLICS

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Rates of smoking in the U.S. population have decreased overall, but smoking rates in some groups, including alcoholic smokers, remain high. Many newly sober alcoholics are concerned about their smoking and some attempt to quit. However, quit rates in this population are low. Prior studies suggest that risk for relapse in this population may be influenced by genetic factors. In addition, studies suggest that genetic factors may moderate response to treatment. In this exploratory study, we had two specific aims: (1) to investigate the association between genetic risk and outcome; (2) to investigate whether genetic risk moderates the efficacy of a medication intervention. Data are from a clinical trial of smoking cessation treatment for smokers with between 2 and 12 months of alcohol abstinence. Subjects were randomly assigned to bupropion or placebo. All subjects received counseling and the nicotine patch. To examine the possibility that bupropion may have been efficacious in participants with a specific genetic profile (i.e., utilizing a pharmacogenetic approach), an aggregate genetic risk score was created by combining risk genotypes previously identified as important in bupropion treatment studies. Although no moderation of bupropion response by the aggregate genetic risk score was found, a model including level of nicotine dependence, the aggregate risk score, and their interaction significantly predicted smoking abstinence rates at the end of treatment (10 weeks). These results suggest that an aggregate genetic risk score approach may have utility in treatment trials of alcoholics who smoke. Additionally these findings may suggest a strategy to understand and interpret conflicting results for single genetic markers examined as moderators of smoking cessation treatment.

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PA17-5 ADOLESCENTS' POSITIVE REACTIONS TO CIGARETTES ARE ASSOCIATED WITH DRD2 AND SLC12A4 GENES IN THE PRESENCE OF ADHD SYMPTOMS

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Introduction: Attention-deficit hyperactivity disorder (ADHD) and smoking are frequently comorbid disorders. Both are highly heritable and candidate gene studies have identified a number of genetic markers associated with both ADHD and smoking phenotypes, suggesting that the two disorders share common risk factors. This study examined functional polymorphisms in candidate genes previously associated with psychiatric conditions for association with positive and negative initial reactions to cigarettes and ADHD symptoms in a large population-based adolescent sample.

Methods: This study used epidemiological data from the National Longitudinal Study of Adolescent Health to test the association between adolescents' (n=1900) self reported initial reaction to cigarettes (9 items reflecting pleasant or unpleasant reactions), 6 candidate genes (DAT1, SLC, DRD2, DRD4, MAOA, and CYP2A6), and ADHD symptoms. Regression analyses were conducted to test associations between positive and negative initial reactions and variation in each of the candidate genes, and the interaction with inattentive and hyperactive/impulsive ADHD symptoms. All models were tested controlling for comorbid CD and socioeconomic variables.

Results: No genetic variant was significantly associated with pleasant or unpleasant initial smoking reactions. Moderation analysis resulted in two significant gene by symptom interactions. For DRD2, individuals with A2/A2 genotype and at least 6 hyperactive/impulsive symptoms were more likely to report pleasant initial smoking experiences (p=.02). For SLC12A4, individuals with s/s genotype and at least 6 hyperactive/impulsive symptoms were more likely to report pleasant initial smoking experiences (p=.02).

Discussion: These results suggest that DRD2 and SLC12A4 variants are associated with positive initial reactions to cigarettes in the presence of hyperactive/impulsive ADHD symptoms. Given that an initial pleasant reaction to cigarettes is thought to increase risk for lifetime smoking, these results add to a growing body of literature that suggests ADHD symptoms increase risk for smoking and should be accounted for in genetic studies of smoking.

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Paper Session 18: Rapid Response Papers

PA18-1 ASSOCIATION OF GREATER CUE-SPECIFIC CRAVING WITH INITIATION OF SHORT-TERM ABSTINENCE

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Although cue-induced craving has been widely studied in smokers, little work has focused directly on the relationship between cue-induced craving and a smoker's ability to quit. The goal of the present study was to examine the association between smokers' cue-related craving and their subsequent ability to initiate short-term abstinence. Seventy-four smokers, who were either treatment seeking (n=31) or non-treatment seeking (n=43), completed a one-session cue-reactivity session prior to participating in a larger study examining predictors of short-term ability to quit on nicotine or placebo patch, in a within-subjects cross-over design. Subjects attempted to quit during two 5-day periods while using nicotine or placebo patch (double-blind), each preceded by a week of ad lib smoking. Separate logistic regressions for each patch condition were employed to examine the association of smokers' cue reactivity with successful initiation of abstinence (i.e., quit for at least 1 day, confirmed by CO<5 ppm) under each patch condition. Predictor variables included treatment seeking status and self-reported craving in response to smoking cues and nonsmoking cues. Results showed that greater self-reported craving during smoking cues, but not non-smoking cues, was associated with an increased likelihood of initiating abstinence, regardless of patch condition (B(SE)=.412(.173), p = .018, OR: 1.51 for placebo patch, and B(SE)=.311(.146), p = .033, OR: 1.37 for nicotine patch, respectively). That is, smokers exhibiting greater craving during exposure to smoking cues had a higher probability of successfully initiating a short-term quit attempt. A significant interaction of treatment status X smoking-cue craving during the placebo patch condition was also found (B(SE)=.901(.434), p = .038, OR: 2.46). Treatment seekers who reported greater craving to smoking cues were more likely to quit while on placebo patch than non-treatment seekers on the placebo patch. Possible explanations for heightened cue-specific craving prior to initiating a quit attempt are discussed.

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PA18-2 ROLE OF SMOKELESS TOBACCO USE IN SMOKING INITIATION AND CESSATION AMONG SOUTH AFRICAN ADOLESCENTS: A 4-YEAR LONGITUDINAL STUDY

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CONTEXT: Study findings on whether smokeless tobacco (ST) use is a gateway in or way out of smoking remain inconsistent. However, only limited information is available on the role of ST in smoking initiation and cessation in low- and middle-income countries, where most current ST users live.

OBJECTIVES: To determine the association between ST use and smoking initiation and cessation among a population of South African adolescents.

METHOD: This 4-year longitudinal study involved a baseline population of 8th graders (n=2,119) who provided at least one follow-up data by 12th grade. Data was obtained through an annual questionnaire survey. Information obtained over the follow-up period (2005-2009) included socio-demographic characteristics, tobacco use and other health risk behaviours. Following a principal component analysis, a 'smoking risk' score was derived from responses to questions related to past-month binge-drinking, marijuana use, close friends smoking, smoking intention, past violent act and cigarette-offer refusal self-efficacy (scale □=0.70). Also recorded among others, were household member smoking and a measure of depression vulnerability.

OUTCOME MEASURES: Past-week smoking among those who had never experimented with smoking (n=1,545) and 30-day smoking abstinence among baseline smokers (n=311). Considering the repeated measures obtained and in order to limit the impact of missing follow-up data, generalized estimating equation (GEE) model was used in estimating effect sizes.

RESULTS: At baseline, 3.5% of never smokers used ST, while 38.9% of smokers used ST. At 4-year follow-up, in a multivariable adjusted GEE model that included risk factors for initiation, past-week ST use at baseline remained a significant predictor of smoking initiation (OR=1.81; 95% CI=1.03-3.17) among never smokers. In contrast, ST use was not associated with smoking abstinence (OR=0.83; 95% CI = 0.58-1.18) among baseline smokers.

CONCLUSIONS: ST use appears to be an important predictor of smoking initiation, but not cessation among South African adolescents. This study's findings highlight the need to prioritize the prevention of ST use among adolescents.

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PA18-3 PULMONARY DELIVERY OF NICOTINE PYRUVATE: SENSORY AND PHARMACOKINETIC CHARACTERISTICS

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An initial evaluation of a prototype nicotine pyruvate (NP) aerosol generation system compared plasma nicotine levels and subjective responses after NP inhalation to responses after placebo (room air) and after inhalations from the Nicotrol/Nicorette nicotine vapor inhaler cartridge (NV). Nine healthy adult daily cigarette smokers, overnight abstinent from nicotine, were exposed to 5 conditions in 5½ hours. In each condition, participants inhaled 10 puffs of 35 mL volume, comprising either NP, in ascending dose from 10 to 20 to 30 μg/puff, NV (10 μg/puff) or room air (placebo). The latter two conditions were presented in random sequence. Participants and study technicians were blinded as to medication sequences. In each condition, blood for plasma nicotine assay was withdrawn 5 minutes before inhalation, and at 0, 1, 2, 5, 10, 20 and 30 minutes after the 10th puff. Smoking withdrawal symptoms were first recorded before the puffs, and then again 5 to 10 minutes after the 10th puff, along with an inhaler evaluation questionnaire. Plasma nicotine concentrations were maximal when first measured on completing ten inhalations of 20 μg/puff or 30 μg/puff nicotine pyruvate (5.0 and 8.3 ng/mL increase in plasma nicotine, respectively), with concomitant decreases in craving for cigarettes relative to placebo. Satisfaction ratings were higher than for placebo. Acceptability, assessed by ratings of harshness/irritation, was higher for the NP 20 condition than the NV control condition. Safety indices showed no adverse changes following use. This double-blind, randomized, cross-over study demonstrates that nicotine pyruvate inhalations produce rapid increases in plasma nicotine concentrations. Moreover, nicotine pyruvate inhalation was well tolerated, and at the 20 μg/puff dose, significantly alleviated craving for cigarettes compared with placebo. At this dose, peak nicotine concentrations were higher and harshness/irritation rated lower than with the Nicotrol/Nicorette nicotine vapor inhaler cartridge. Further trials of this promising nicotine inhalation technology are warranted to assess its safety and efficacy in smoking cessation treatment or harm reduction approaches.

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PA18-4 THE ACUTE EFFECTS OF CIGARETTE SMOKING ON NEGATIVE AFFECT MODERATES NICOTINE DEPENDENCE OVER TIME IN ADOLESCENTS

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It is well established that individuals smoke cigarettes, in part, to regulate affect. Burgeoning research is revealing that adolescents smoke cigarettes for similar purposes, and to alleviate negative affect in particular. In fact, simply holding the expectation that smoking will reduce negative affect has been found to confer significant risk for increased smoking behavior and nicotine dependence in adolescents. Given the health consequences associated with tobacco use, it is important to understand how emotional benefits derived from smoking can influence developmental trajectories of nicotine dependence. As such, we examined whether magnitude of adolescents' change in negative affect following the smoking of a single cigarette moderated progression of nicotine dependence over time. Ninety-seven adolescents attended two laboratory sessions, separated by 6 – 8 weeks, and were randomized to a smoking session at one of the two sessions. Negative affect was measured with the Positive and Negative Affect Schedule before and after smoking. Nicotine dependence, as indexed by the Nicotine Dependence Syndrome Scale, was assessed at four time points over the course of two years. Results indicated that change in negative affect following smoking moderated nicotine dependence over time. More specifically, individuals who reported greater negative affect reduction after smoking were significantly more likely to report higher levels of nicotine dependence over time. This effect held even after controlling for depressive and anxiety symptoms. The current study is the first to suggest that the acute effects of cigarette smoking on emotional response in adolescent smokers can influence cigarette use over a developmentally critical period of time. In sum, findings suggest a reciprocally determined relationship between smoking-derived affective benefits and long-term cigarette use and highlight an important motivational processes subserving smoking that warrants further study in this high-risk population.

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PA18-5 NORADRENERGIC ALPHA 1 RECEPTORS AS A NOVEL TARGET FOR THE TREATMENT OF NICOTINE ADDICTION

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Background: Although dopamine has been extensively implicated in the rewarding effects of nicotine, noradrenergic systems may play a larger role than previously suspected. The present study evaluated the role of noradrenergic α1 receptors in animal models.

Methods: After acquisition of nicotine (0.03 mg/kg/injection) self-administration behavior by Long-Evans rats under a fixed ratio 5 (5 lever presses required to obtain each nicotine injection, each injection associated with a cue), the effects of acute or repeated administration of the noradrenergic alpha 1 receptor antagonist prazosin (0.25-1 mg/kg) were studied. In other experiments, rats that had learned to self-administer nicotine were studied during extinction sessions. After extinction behavior was stable, effects of prazosin on cue- and drug- (0.15 mg/kg nicotine, s.c.) induced reinstatement of nicotine seeking (relapse) were studied. Effects of prazosin were also tested in rats trained to discriminate saline from nicotine and on nicotine-induced dopamine release in the nucleus accumbens shell using microdialysis in awake rats.

Results: The noradrenergic alpha 1 receptor antagonist prazosin (0.25-1 mg/kg) dose-dependently reduced self-administration of nicotine (0.03 mg/kg) ($F_{4,52} = 14.4$, $p<0.0001$), an effect that was maintained over consecutive daily sessions. ($p<0.05$). Prazosin also decreased reinstatement of extinguished nicotine seeking induced by either a nicotine prime (0.15 mg/kg; $F_{4,36}=6.9$, $p<0.001$) or nicotine-associated cues ($F_{4,59}=9.2$, $p<0.0001$), and decreased nicotine-induced (0.15 mg/kg) dopamine release in the nucleus accumbens shell ($p < 0.05$). However, prazosin did not have nicotine-like discriminative effects and did not alter the dose-response curve for nicotine discrimination (NS).

Discussion: These findings suggest that stimulation of noradrenergic alpha 1 receptors is involved in nicotine self-administration and relapse, possibly via facilitation of nicotine-induced activation of the mesolimbic dopaminergic system. The findings point to alpha 1 adrenoceptor blockade as a novel and potentially effective new approach to the treatment of tobacco smoking and relapse in humans.

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NEW INVESTIGATORS

New Investigator Award Paper Session

NIPA-1 SECOND-HAND TOBACCO SMOKE EXPOSURE AMONG CHILDREN LIVING IN APARTMENTS

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Background: There is no safe level of tobacco smoke exposure. Although a majority of children have biochemical evidence of exposure, only a minority live with a smoker, suggesting other sources of second-hand tobacco smoke exposure (SHS), such as shared ventilation. No prior studies have explored multi-unit housing as a potential contributor.

Objective: To examine the link between apartments and cotinine levels among children.

Methods: We analyzed data from 5,877 children ages 6 to 18 in the 2001-2006 National Health and Nutrition Examination Survey (NHANES). Housing type was defined as detached house (including mobile homes), attached house, or apartment. The SHS exposure variable was defined as cotinine > .05 ng/mL; children with a smoker in the home were analyzed separately. Chi-square, t-tests, and Tobit regression models were analyzed using Stata. All analyses controlled for the complex survey design.

Results: Among children who did not live with a smoker, 73% had cotinine levels indicating SHS exposure. 84% of children in apartments were exposed to SHS, compared to 70% in houses, and 80% in attached houses ($p<.001$). In a regression model predicting % change of cotinine, controlling for demographics and race/housing interaction, apartments were associated with a 207% increase in cotinine levels (CI 49-537%) for White adolescents, while African American race had a 45% increase (CI 5.3-100%). There were no significant associations between housing type and cotinine level for children of Hispanic or other ethnicity, or for children living with a smoker.

Discussion: 9 of 10 White and African American children who live in apartments without an adult smoker in the home have evidence of SHS exposure; these children have higher mean cotinine levels than children who live in detached houses. Potential causes for this increased exposure could be seepage through walls, shared ventilation systems, or increased exposure to smokers in contexts outside the home. Smoking bans in multi-unit housing may reduce the component due to seepage or shared ventilation; additional work is needed to quantify and eliminate sources of childhood tobacco smoke exposure.

AAP/Julius B. Richmond Center of Excellence; Flight Attendant Medical Research Institute, and NRSA T32.

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NIPA-2 SPECIFIC MOOD ALTERATION INDUCED BY LOCALIZED GENETIC DOWN-REGULATION OF beta2-CONTAINING NICOTINIC RECEPTORS IN THE AMYGDALA-PREFRONTAL CORTEX AXIS

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The prevalence of smoking in people with affective disorders is twice that of the average population. While it is believed that depressed patients are using tobacco and nicotine as a way to self-medicate, the mechanisms underlying this co-morbidity remain poorly understood. Recent pre-clinical studies and drug trials suggest that nicotine may affect mood through desensitization of high affinity nicotinic receptors (nAChRs), and that blockade of these receptors has antidepressant properties. Further, we have demonstrated that nicotinic-based antidepressant-like compounds have significant effects on amygdalar c-fos expression, suggesting that nAChR modulation in the amygdala could alter mood. We therefore investigated the effects of mecamylamine (a broad nicotinic antagonist) and viral-mediated down-regulation of ß2-containing (ß2*) nAChRs in the amygdala and how these could affect depression-like behavior in mice. Additionally, because adaptation to stress is believed to require the integrated activity of both the amygdala and the prefrontal cortex, we used the same experimental strategy in the prefrontal cortex. Our results suggest that global nAChR blockade or specific ß2 nAChR down-regulation in the amygdala lead to robust antidepressant – like effects in different mouse models. Given that maladaptive behaviors in response to stress are often correlated with hyperactivity of the amygdala, this suggests that limiting ß2-related cholinergic transmission is likely to dampen amygdalar firing under stressful conditions. When ß2* nAChRs were down-regulated in the PFC, however, results were inconsistent and test-dependent. This suggests that ß2-related alteration of cholinergic neurotransmission in the PFC has a more nuanced and state-dependent role in the regulation of mood. Altogether, these results confirm that blockade of ß2* nAChRs is antidepressant and further indicate that limiting high affinity cholinergic transmission in the amygdala could limit maladapative behavior and the precipitation of depressive symptoms. These data also suggest that cholinergic variation may represent a marker and/or risk factor for mood disorders.

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NIPA-3 THE EFFECT OF FIVE SMOKING CESSATION TREATMENTS ON SMOKING CESSATION MILESTONES

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Most smoking cessation studies use long-term 7-day point-prevalence abstinence as their primary outcome measure. Recent research suggests that long-term point-prevalence abstinence may be an insensitive index of important features of the smoking cessation process. The current study aims to replicate and extend Shiffman et al.'s (2006) approach for examining the effect of smoking cessation medications on three smoking cessation milestones: (a) achieving initial abstinence (24 hours without smoking), (b) lapsing (smoking for the first time following initial abstinence), and (c) transitioning from lapse to relapse (returning to regular smoking following a lapse). The current study uses data from a placebo-controlled smoking cessation trial (Piper et al., in press; N = 1504, 58% female, 84% Caucasian) to examine differences between five smoking cessation pharmacotherapy conditions (Bupropion, Nicotine Lozenge, Nicotine Patch, Bupropion + Lozenge, Patch + Lozenge) and placebo in the occurrence of the three smoking cessation milestones. Analyses were conducted using daily smoking calendar data collected through 8 weeks post-quit (using time-line follow-back). Rates of initial abstinence, lapse and relapse respectively were: Placebo (70%, 83%, 69%), Bupropion (81%, 74%, 63%), Lozenge (81%, 73%, 62%), Bupropion + Lozenge (86%, 71%, 64%), and Patch + Lozenge (92%, 70%, 61%). Results show that, relative to placebo, all five medication conditions increased initial abstinence rates (ORs = 1.8-6.0) and all but the Lozenge condition decreased lapse risk (HRs = .57-.74). Only the Patch and Bupropion + Lozenge conditions significantly decreased the risk of a lapse-relapse transition (HRs = .52-.59) relative to Placebo. In general, the combination therapies were the most effective at promoting initial abstinence and preventing lapse. There were no differences amongst the medications in predicting risk of a lapse-relapse transition. These results shed light on smoking cessation processes by indicating that medications work by promoting initial abstinence and preventing lapses.

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POSTER SESSION 1

POS1-1 SMOKE-FREE LEGISLATION: IMPACT ON QUIT ATTEMPTS AND IMPLICATIONS FOR ENGLISH NHS STOP SMOKING SERVICES

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Introduction: Despite smoke-free legislation (SF) being introduced and evaluated previously elsewhere, it was only with the introduction of SF in England in 2007 that the impact of such policies upon quitting was rigorously examined. Additionally, England has a free at point of delivery national stop smoking service (SSS) offering behavioural support and medication to assist smokers to quit; the effects of SF upon cessation services were also unknown. The aim of the current research was to explore the impact of SF for quitters in England and the implications of this for NHS SSSs.

Methods:

• National household surveys were conducted between January 2007 and December 2008. The sample (10,560 adults aged 16 or over) was weighted to match census data and included those who reported having smoked within the past year. Data was collected on quit attempts made in the past 12 months and future intentions to quit.

• Surveys of SSS managers were conducted in England between March - May 2007 (pre-SF; n=125) and between May - June 2008 (post-SF; n=86). Data explored preparation for SF, anticipated and actual impact of SF.

• Selected data from the national surveys of SSS managers were compared with standardised routine data collected quarterly for the Department of Health from all English SSSs.

Results: A greater percentage of smokers reported making a quit attempt in July and August 2007 (8.6%, n=82) compared with July and August 2008 (5.7%, n=48) (Fisher's Exact =0.022). In the five months following SF 19% (n=75) of smokers making a quit attempt reported that they had done so in response to SF. The mean percentage increase in smokers attending SSSs in the run up to SF (16.2%, CI=13.2-19.2) was lower than the mean anticipated demand prior to SF (42.5%, CI=37.4-47.8) (Wald chi-squared = 73.35, $p < .0001$).

Conclusions: SF in England was associated with a significant temporary increase in the percentage of smokers attempting to stop, this resulted in an increase in demand for NHS SSSs, however the actual increase was not as large as had been initially predicted. Current research is exploring to what extent this increase has been sustained in the long term.

This study was conducted while the first author was at the University of Bath, undertaking a Ph.D. funded by Cancer Research UK.

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POS1-2 TALKING TO IRAQ AND AFGHANISTAN WAR VETERANS ABOUT TOBACCO USE

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Introduction: The recent Institute of Medicine report, Combating Tobacco Use in Military and Veteran Populations, concluded that tobacco use continues to threaten the health of people who serve in the military. Tobacco-use rates are particularly high among those who served in the US operations in Afghanistan and Iraq, Operations Enduring and Iraqi Freedom (OEF/OIF).

Methods: We conducted five semi-structured focus group (n=17) interviews with recently returned veterans of OEF/OIF who had reported using tobacco while they served in OEF/OIF. Participants were recruited through Minnesota Army National Guard reintegration events. Discussions focused on reasons for using tobacco both during service and at home, as well as barriers to cessation. Transcripts were transcribed and coded by two members of the study team using a grounded theory approach.

Results: Participants reported that it was common for soldiers to initiate or escalate their tobacco use in OEF/OIF. Tobacco use in OEF/OIF was a way to deal with boredom (e.g., long days, restrictions on entertainment options) and stress (e.g., frustration, anger). Participants also described how tobacco use was deeply ingrained in military culture. Being granted breaks from duties to smoke was a key benefit of being a tobacco user. Several participants described adopting a tobacco-use pattern while not on active military duty where they would only use tobacco when they attended their monthly drill exercises. Participants were not able to offer many benefits to not using tobacco at either at home or in OEF/OIF. The veterans we spoke to perceived a lack of access to cessation aids and saw this as a barrier to quitting. They also felt that tobacco taxes and smoke-free bar policies were helpful for cessation.

Conclusions: The structural factors in the military that reinforce tobacco use, such as breaks for tobacco users and the general acceptance of tobacco use in the military contribute to tobacco use. For some, monthly drill exercises provoke tobacco use. Innovative strategies and policies are needed to promote quitting tobacco use among military members and veterans.

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POS1-3 EFFECTIVENESS OF A NURSE-MANAGED LAY-LED TOBACCO CESSATION INTERVENTION AMONG OHIO APPALACHIAN WOMEN

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Objectives: The purpose of this study was to evaluate a nurse-managed lay-led tobacco cessation intervention delivered to adult women in Ohio Appalachia.

Methods: A randomized controlled experimental design included intervention participants (n=147) enrolled in a nurse-managed lay-led protocol that incorporated nicotine replacement and behavioral counseling. Control participants (n=155) received a personalized letter from their clinic physician who advised them to quit smoking and requested they schedule a clinic appointment to discuss cessation.

Results: Self-reported and cotinine-validated quit rates were significantly different between the intervention and control groups at 3 and 6 months follow-up ($p<0.02$). At 12 months, self-reported abstinence was 19.1% (intervention group) and 9.0% (control group), with cotinine-validated rates of 12.2% and 7.1%, respectively ($p=0.13$). Prolonged abstinence rates were significantly different between groups at 3, 6, and 12 months ($p<0.02$). Logistic regression analyses indicated adjusted odds of cotinine-validated quitting was associated with cigarette consumption per day (OR=0.94; 95% CI, 0.89-0.99) and CES-D score ≥ 16 (OR=0.39; 95% CI, 0.17-0.90).

Conclusions: A lay-led approach that is managed by a nurse may serve as an effective cessation strategy among this high-risk population. Additional efforts are needed to sustain long-term abstinence, even after intensive intervention.

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POS1-4 EFFECTIVENESS OF AN EDUCATIONAL MEDIA CAMPAIGN FOR TOBACCO CESSATION IN 18-24 YEAR OLD COLLEGE STUDENTS

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Research suggests that the fastest growing sub-set of tobacco users in the United States is young adults aged 18-24. During the college years many students experiment with tobacco and are in danger of developing lifelong nicotine dependence. Most young adult smokers want to quit; however, few achieve sustained abstinence. One main barrier to college students' success in quitting tobacco is that they typically do not employ evidence-based pharmacological interventions. They may also have misconceptions about smoking and cessation such as whether or not nicotine causes cancer, the effects of smoking on brainpower, and the benefits of NRT or cessation counseling. If young adults do not comprehend the addictive nature of nicotine, they may have an inaccurate perception of the risks of tobacco and underestimate the difficulty of quitting tobacco. This study assessed the effectiveness of an educational media campaign for tobacco cessation in 18-24 year-old college students. A 21-item survey to assess students' knowledge of and attitudes toward smoking, tobacco cessation, nicotine replacement therapy, and smoking cessation counseling was developed, piloted, and distributed by e-mail to 2000 randomly selected full-time IUPUI students aged 18-24. Subsequently, an educational media campaign was developed and distributed via e-mail to the same students; the campaign was also posted at well-trafficked campus sites. After exposure to the educational media campaign, the original survey was redistributed to the subject group; survey data were collected and analyzed to determine differences in pre- and post media campaign responses. The majority of respondents described themselves as Caucasian, female, 20-21 years old, and non-smoking. Significant differences were noted in pre- and post media campaign responses with respect to student perception of the relationship of nicotine and cancer, the cost and available forms of NRT, and the utility of cessation counseling. The results of this study suggest that the use of a brief educational media campaign may have improved students' perception of the NRT and behavioral counseling for tobacco cessation.

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POS1-5 TOBACCO USE AND TOBACCO-RELATED RISK FACTORS IN TWO ACADEMIC DENTAL CLINIC PATIENT POPULATIONS

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Indiana University School of Dentistry serves as the primary university-based dental clinic in the state, operating several clinics including the Emergency Clinic (EC) and the Dental Hygiene Clinic (DHC). To develop cessation interventions targeted to these different population groups, this study compared the tobacco use and related health risks of patients in the two clinics. The EC treats primarily indigent patients; nearly all services provided are tooth extractions. The DHC serves a comprehensive care population with a higher socioeconomic status. We hypothesized that the EC would contain more tobacco users and have a higher incidence of related health risks. Electronic health records of 500 patients from each clinic seen from July 2005 - January 2007 were randomly selected for review. Demographics, tobacco use and systemic health conditions were recorded and statistically analyzed.

Results: EC patients were primarily African-American and 25-44 yrs old; DHC patients were primarily Caucasian and over age 65. Tobacco use was significantly higher in the EC (49%) than in the DHC (9%). Nearly all tobacco use was in the form of cigarettes. Within the EC, tobacco use was positively correlated with a history of psych disorders, infectious disease, alcohol and drug use. Higher amounts of tobacco use were correlated with increased incidence of pulmonary disease, musculoskeletal disorders, and alcohol use. Psych disorders, alcohol and drug use were correlated with length of tobacco use. The age-related risk for cardiovascular disease was higher for tobacco users than non-users. Within the DHC, compared to non-users, tobacco users were younger, male and divorced. Tobacco use was significantly correlated with gastrointestinal and infectious disease, alcohol use, and poorer dental health. Markers of poor dental health increased with duration and quantity of tobacco use. The age-related increase in risk for cardiovascular disease and infectious disease was higher for tobacco users than non-users.

Conclusion: Tobacco use was greater in the EC clinic. Tobacco use was correlated with the presence of systemic disease and poorer dental health.

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POS1-6 ALTERING IMPLICIT AND EXPLICIT ADVERTISING INFORMATION AFFECTS HARM BELIEFS OF LOW-NICOTINE CIGARETTES

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Smokers who switch to lower nicotine and tar cigarettes often believe that the cigarettes are safer or healthier than regular cigarettes, and misinterpret the information regarding risk. Product advertising often contributes to these incorrect beliefs about harmfulness. The current study was designed to examine whether integrating accurate, explicit information, and altering implicit message characteristics affects smokers' false perceptions. Participants were randomized to one of four advertisement conditions, manipulating the information each conveys: accurate explicit and accurate implicit; accurate explicit and misleading implicit; misleading explicit and accurate implicit; and misleading explicit and misleading implicit. Participants (n=200) attended a single, laboratory-based session where demographic and smoking history preceded viewing one of four advertisement conditions while having eye-tracking patterns assessed. After viewing the advertisement, participants completed recall and belief items about the PREP they had viewed. The participant sample was on average 30.0 (SD=7.6) years old and predominantly male (62%), smoked 16.4 (SD=5.7) daily cigarettes, had been smoking for approximately 12.4 (SD=6.5) years, and were moderately nicotine dependent [FTND mean 5.7 (SD=1.2)]. Results indicate that adding accurate explicit information in the body of the advertisement had a significant effect (F=4.16, p= .04) on smokers correctly understanding the tar levels and health risks of smoking. In contrast, participants had difficulty identifying the content of the warning labels (41-44% correct), regardless of advertisement condition. Further, eye-tracking patterns indicate participants spent significantly less time viewing the warning label (12%) compared to central image (35%) and heading text (47%). Results suggest that cigarette-advertising regulation might be most effective if focused on advertisement content rather than warning label regulation, as smokers spend relatively little time viewing warning labels but appear to correctly recall explicit information presented within advertisements.

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POS1-7 AN ANALYSIS OF 871 COMMERCIAL NOVELTY ANTIQUE POSTCARDS (1901-1934) FROM 25 COUNTRIES PORTRAYING CHILDREN AS TOBACCO SMOKERS

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Through a Congressional Act passed in 1898, private mailing cards, as we know them today, became a legal and popular means of communication, which could be illustrated, issued and sold by individual printers. Although societal injunctions were strong during the early 20th century, one relatively common theme portrayed in antique novelty postcards was the depiction of youngsters smoking pipes, cigarettes or cigars. Methods: We have analyzed 871 distinct, commercial, child-focused, tobacco-related novelty postcards issued from 1901-1934. Results: Sixty percent of this collection is actual photographs and 40% are drawings. These cards, printed in 25 countries are listed here by production percentage: Germany (23.7%); United States (17.1%); France (15.9%); England (15.7%); Holland and Belgium (4.8% each); Sweden (4.2%); Italy (3.5%); Austria (2.9%); and Switzerland (1.3%). Algeria, Canada, Ceylon, Czechoslovakia, Denmark, Finland, Philippines, Poland, Portugal, Russia, South Africa, Spain, Tunisia, Turkey and Yugoslavia each yielded less than 1%. Between 1905-1912, the most prolific production years of postcards, 50% of these cards were manufactured. Of this sample, 76% of the children shown smoking are boys while 24% are girls. They are pictured holding: pipes (43.7%); cigarettes (40.6%); and cigars (15.6%). Only 6.7% of the children are portrayed as suffering any ill effects from their smoking. These adorable children are depicted as playing house; dressing up like mommy and daddy, and imitating everyday adult routines. Many of these subjects were infants, toddlers or pre-schoolers. Certainly, these long-ago images of tobacco using children can never be socially, physically or morally condoned through the lens of today's scientific knowledge.

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POS1-8 ASSOCIATION OF HISTIDINE-TRIAD NUCLEOTIDE BINDING 1(HINT1) VARAINTS WITH NICOTINE DEPENDENCE

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The histidine triad nucleotide binding protein (HINT1) is widely expressed in mesocortical and mesostriatal brain regions; however, little is known about the physiological function of this protein. Recent expression and association studies indicate that the HINT1 gene is associated with schizophrenia. Additionally, HINT1 knockout mice display altered responses to morphine and amphetamine. Nicotine dependence (ND) is highly comorbid with schizophrenia and other substance abuse; yet, no available studies have assessed this gene in ND. Thus, using association and expression studies, this study aimed to examine the involvement of the HINT1 gene in ND. Association analyses revealed that variants in the HINT1 gene previously found to be associated with schizophrenia are also associated with ND. Further, human mRNA expression data revealed that smoking status and genotype influence HINT1 expression in the brain. Additionally, western blot analysis of HINT1 protein level in the mouse prefrontal cortex (PFc), hippocampus, nucleus accumbens (NAc), and ventral tegmental area (VTA) were assessed following acute or chronic nicotine, and after nicotine withdrawal. Results show no change in protein level after acute nicotine; however, there was a significant increase in HINT1 protein level in the NAc after chronic nicotine exposure, which was reduced after precipitated and spontaneous nicotine withdrawal. These results demonstrate a genetic association between variants in HINT1 and ND, and indicate that nicotine-induced modulation of HINT1 level may be involved in mechanisms of excess smoking in patients with schizophrenia. Future studies will further examine the role of this gene in nicotine dependence by testing HINT1 knockout mice in established nicotine reward and withdrawal behavioral models.

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POS1-9 INADEQUATE COMMUNICATION SKILLS ARE THE PRIMARY BARRIER TO SMOKING CESSATION COUNSELING PROVIDED BY PHYSICAL THERAPY STUDENTS

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Smoking impacts the optimal resolution of many medical conditions that are frequently managed by physical therapists, however, physical therapists rarely engage in active smoking cessation counseling with their patients. Physical therapists are ideally positioned to provide smoking cessation counseling because, unlike other health care professionals that see patients once or twice per year, physical therapists have frequent contact with patients during an episode of care. This repeated interaction provides an opportunity for support, close monitoring, and follow-up during a smoking cessation attempt. One approach to increase the provision of smoking cessation counseling by physical therapists may be to address the barriers to providing counseling during their academic preparation. Therefore, the objective of this study was to identify the barriers to smoking cessation counseling indicated by physical therapy students. Physical therapy students (n=42) were surveyed to assess their attitudes and opinions regarding barriers to providing smoking cessation counseling. The most commonly identified barrier was a lack of a sufficient communication skill set to engage comfortably in smoking cessation counseling (56%), particularly when providing motivation for increasing the patient's desire to stop smoking and when addressing issues related to an enabling spouse. Fear of irritating the patient and/or disrupting the therapeutic alliance was the main concern for 22% of students. Other barriers identified included a lack of sufficient factual knowledge regarding smoking cessation (18%), inability to provide culturally sensitive counseling (4%), and concern that patients would not perceive physical therapists as credible smoking cessation counselors (4%). These findings suggest that smoking cessation-counseling education in physical therapy academic programs may benefit from educational and experiential opportunities that enhance the students' competence and confidence in counseling skills.

No funding was provided for this study.

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POS1-10 PERCEIVED BENEFIT OF USING PATIENT NAVIGATION TO ASSIST PRIMARY CARE PROVIDERS IN DELIVERING TOBACCO CESSATION TREATMENT TO LOW-INCOME, RACIAL/ETHNIC MINORITY PATIENTS

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Evidence-based tobacco cessation treatments in primary care are effective but underutilized, especially among low-income, racial/ethnic minority smokers, for which large disparities in tobacco cessation persist. As part of an ongoing study examining Patient Navigation for increasing tobacco treatment utilization, we surveyed primary care providers' attitudes regarding clinic-based delivery of brief tobacco cessation treatment (5A's). Surveys were mailed to a sample of family practitioners, internists, and obstetricians/gynecologists serving an urban, Medicaid population. Of 289 eligible providers, 75 returned surveys (26% response rate). Most providers were female (70%) and nearly half of all patients were estimated to be Spanish speakers. Asking about smoking was standard practice for 90% of providers, whereas only 34.8% assisted with treatment strategies and 22% arranged for follow up contacts regarding tobacco cessation treatment. The majority of providers stated that a Patient Navigator would be helpful in following up with patients advised to quit smoking (89% agreement), discussing barriers to adhering to cessation treatment (88%), and increasing patient motivation to quit (80%). The majority of providers (58%) affirmed interest in having a Patient Navigator available in their practice to provide these services. Our findings reveal that primary care providers recognize the need for specialized assistance and see the potential benefit of Patient Navigation for connecting their patient population with evidence-based cessation services.

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POS1-11 A SURVEY OF MENTAL HEALTH ADMINISTRATORS' AND PROVIDERS' KNOWLEDGE, ATTITUDES AND BEHAVIORS ABOUT TOBACCO CESSATION FOR BEHAVIORAL HEALTH CLIENTS

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Persons with behavioral health disorders smoke at rates over two times the general population (45% vs. 19%) and suffer from increased associated morbidity and mortality. In public behavioral health settings, nicotine dependence is documented in only 2% of health records, and only 1.5% of persons treated by a psychiatrist receive treatment for smoking cessation. Furthermore, behavioral health providers themselves smoke at higher rates (30-35%). There is a dearth of research regarding behavioral health provider and administrator knowledge, attitudes and behaviors around smoking cessation interventions with their clients. Information is needed to determine what strategies might be most effective in decreasing the tobacco-related health disparities these individuals face. Considering this knowledge gap, the Behavioral Health and Wellness Program developed a 117-item survey collecting behavioral health administrators' and providers' ratings of current knowledge, provision, and perceived effectiveness of tobacco control strategies. The survey was disseminated via a web-based tool to 20 behavioral health centers and organizations in Colorado. Responses were collected from 462 providers and administrators. The Kruskal-Wallis test and Mann-Whitney U were used to determine significant differences in survey ratings by provider/administrator smoking status as well as occupational role. Providers that are current smokers report higher knowledge regarding nicotine replacement therapy than non-smokers. Non-smoking providers believe motivational interviewing to be more effective than current smokers. Additionally, non-smokers provide cognitive behavioral therapy and motivational interviewing for tobacco cessation more often than current smokers. Administrators demonstrate higher knowledge and greater perceived effectiveness of the evidence-based cessation interventions compared to clinical, operations, and support staff. The findings from these surveys could be informative in terms of provider/administrator education regarding provision of tobacco cessation interventions for behavioral health clients and behavioral health system change.

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POS1-12 ADVANCING THE DYNAMICS OF NETWORKING IN THE PASO DEL NORTE REGION

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Networks are useful in promoting health behavior change, and the growing El Paso Tobacco Network intends to improve regional health through more effective tobacco control. The network aims to enhance knowledge, cohesion, and collaboration among members who represent various sectors, such as healthcare, education, media, government, and enforcement. To better understand the nature and dynamics of the network and change over time, participants (at baseline N=30 and follow-up N=33) completed measures to assess collaboration perceptions, knowledge (using CDC's Best Practices for Comprehensive Tobacco Control Programs, 2007), and Internal Coalition Effectiveness (training, relationships, social vision, and adequacy of the network). Only 7 individuals completed both assessments. As a result, intra-individual change over time assessments were not feasible, and follow-up responses were used for those who completed measures at both time points. Descriptive results indicate attendance to monthly meetings was moderate (median = 5.5 meetings per year), members engaged in tobacco control activities minimally at work (Baseline Median = 10%; Follow-up Median = 15%), knowledge was low at baseline (Median = 20%) and follow-up (Median = 30%), yet members report satisfaction with Network activities at baseline (Median = 88%) and follow-up (Median = 88%). Inferential analyses (i.e., MANOVA) assessing differences between those satisfied and those not entirely satisfied with the Network on subscales of Internal Coalition Effectiveness indicated no significant differences in social vision, ability to provide efficient tobacco control practices, and strength of relationships with other network members (all ps > .05). However, more satisfied Network members reported greater importance of perceived knowledge gained and training attained from the network ($F(1, 51) = 10.69$, $p < .01$) relative to those not entirely satisfied. These findings suggest the need to increase tobacco control knowledge through increased attendance. Increasing perceived knowledge and training and their importance might be one way to promote satisfaction.

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POS1-13 EFFECT OF TRUE PUFF PROFILE REPLICATION ON MACHINE-GENERATED SMOKE CONSTITUENTS

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In human testing of conventional cigarettes and potential reduced exposure tobacco products (PREPs), puff topography is measured, programmed into a smoking machine, and the resulting smoke emissions are tested for relative levels of harmful constituents. Historically, the puff topography profile is averaged, i.e., the total puff volume is divided by the number of puffs to yield an average puff volume. The smoking machine is programmed to reproduce the average puff, with smooth, parabolic waveform, and an average puff frequency, volume, and duration. Because humans smoke differently as the rod is consumed, human puffing behavior is rarely symmetrical, and combustion chemistry is highly non-linear. Thus, representing smoking behavior with a smoothed periodic waveform may result in a tobacco smoke aerosol with different chemical composition and physical properties than that actually inhaled by the smoker and a smoker's exposure to harmful smoke constituents may be over- or underestimated when relying on machine smoking with averaged smooth puffs. Using a topography-driven smoking machine capable of faithfully reproducing a human smoking session, we investigated if replicating the true puff profile resulted in differences in fine and ultrafine particle size distribution and select volatile and semi-volatile compounds in mainstream smoke emissions compared to machine smoking using averaged smooth topography profiles. Using smokers' puff topography profiles collected from an ongoing crossover study comparing PREPs to conventional cigarettes, machine smoking was conducted in both modes, true and averaged replication, and emissions were evaluated for a total of 24 different topography profiles. Particle size distribution was measured using an electrical low-pressure impactor (ELPI). The mass of collected fine and ultrafine particles was determined gravimetrically, and particles were extracted and analyzed for nicotine, cotinine, TSNAs, and select PAHs. Volatiles were measured continuously in real time. Results obtained were used to determine whether the true puff profile provides a better measure of exposure than the averaged smooth profile.

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POS1-14 BEHAVIOR AND BELIEF CHANGES IN ULTRA LIGHT CIGARETTE SMOKERS AFTER VIEWING EDUCATIONAL MATERIALS

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Many smokers select "Light" and "Ultra Light" cigarettes believing that they can reduce their health risks without quitting smoking. However, many people cover filter vent holes in lighter cigarettes with their fingers and lips, allowing the smoker to inhale more tar and nicotine than they may assume they are taking in, creating the deception that lighter cigarettes are "healthier" compared to full flavor cigarettes. Smokers who select less popular, more heavily ventilated "Ultra Light" brands are understudied. This pilot study was designed to explore how users of Ultra Light cigarettes (N=26) react to information regarding vent blocking's effects on tar and nicotine exposures. Eligible participants smoked at least five Ultra Light cigarettes per day, were currently not trying to quit, and had no history of heart or lung disease. Structured interviews and questionnaires examined reasons why some smokers choose Ultra Light cigarettes and what people believe about the cigarettes they smoke. Smoker's typical filter vent blocking behaviors were determined using a digital imaging technique. Sixteen participants were determined to be non-blockers of vent holes, while eight were considered blockers; only one participant changed blocking status after the intervention. Fifty-four percent of smokers had ever seen or heard that one or more rings of small holes were on the filters of some cigarettes. Trends towards positive changes in knowledge about the design of Ultra Light cigarettes were found in the filter vent hole intervention group. No statistically significant changes were found in questions answered about Ultra Light benefits before and after the intervention ($p \leq 0.22$) or by blocking status ($p \leq 0.311$). Since neither blocking status nor answers to the intervention changed significantly after giving the educational intervention, telling people once about vent holes in lighter cigarettes may not be the best way to inform low tar cigarettes smokers about the dangers of their cigarettes. Complete cessation, as opposed to smoking cigarettes falsely advertised as "lighter," may still remain the best approach to reducing health effects from smoking.

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POS1-15 INTERNET-BASED INVESTIGATION OF E-CIGARETTE ABUSE POTENTIAL

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Electronic cigarettes are nicotine-delivering devices containing no tobacco. They are a new and emerging issue in tobacco control because e-cigarette companies are advertising them as safe alternatives to cigarettes, a way to quit smoking and/or deal with restrictions imposed by indoor smoking bans. However, little research has been done on product characteristics, human exposures, or abuse potential. The products have been banned in a number of countries as unapproved drug delivery devices. A key concern with drug delivery systems is their potential for abuse, and this extends to e-cigarettes. No formal study examining the consumer driven abuse currently exists. However, as the e-cigarettes are a largely internet driven product, many users of the e-cigarette also participate in online forums such as the e-cigarette forum to talk about, and share their experiences. We have identified specific discussion threads where users may talk about modifications to the e-cigarette, including manipulating flavors and nicotine concentrations. Previous studies which looked at prescription drug tampering have utilized the internet as the prime source to gather their data [cf. EJ Cone, Drug Alc Depend 2006, 83(Suppl1:S31-9)]. User postings on forums enable us to get a snapshot of the type of consumer-driven abuse that is currently taking place with the e-cigarettes. As the number of people using the e-cigarettes increases, there is a need for better comprehension of the abuse potential of this product. The purpose of this study is to examine and document consumer abuse, which is currently taking place with e-cigarettes. This study documents cases of consumer tampering occurring with the e-cigarettes, with particular attention to cases, which could pose a significant health risk to the user. Presently, the e-cigarette's design appears to be vulnerable to tampering by users that could create additional health risks not accounted for in laboratory testing. If this product is allowed to be sold, manufacturers must address these tampering issues.

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POS1-16 HAZARDOUS ALCOHOL USE IS COMMON IN NEW ZEALAND SMOKERS: NATIONAL SURVEY DATA

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Aims: To describe hazardous alcohol use in a national cohort of smokers and the relationship between alcohol misuse and quitting smoking.

Methods: The New Zealand (NZ) arm of the International Tobacco Control Policy Evaluation Survey (ITC Project) uses as its sampling frame a national survey: the NZ Health Survey (NZHS). From this sample we surveyed adult smokers and used the AUDIT as a measure of hazardous drinking. We assessed the association between hazardous drinking and past and recent quitting in two survey waves (n=1376 and n=926).

Results: In this sample of smokers, 33.1% had a hazardous drinking pattern (AUDIT score ≥ 8), which is much higher than the adult population of NZ (at 17.7%). Hazardous drinking patterns were significantly more common among: younger smokers (e.g., 59.0% in 18-24 year olds); men (40.7%); Maori (42.1%) and Pacific (52.1%), (compared to European/Others at 29.2%); those with some level of individual deprivation (37.5% vs. 28.7% with no deprivation); and those with a measure of financial stress at 47.2%. There was no statistically significant association between hazardous drinking patterns and either quitting intention or occurrence of past quit attempts. Nevertheless, the pattern was suggestive that recent quitters were less likely to have an AUDIT score of ≥ 8 (i.e., 24.3% vs. 33.9%, age-sex adjusted odds ratio = 0.59, 95%CI=0.32 - 1.09).

Conclusions: These findings indicate that hazardous drinking patterns are elevated in NZ smokers overall and particularly in some groups (e.g., Maori and Pacific). Hazardous drinking was associated with reduced likelihood of recent quitting, but this was not at a statistically significant level. Nevertheless, when considering the evidence in the international literature around alcohol misuse impeding smoking cessation, policy makers could take a precautionary approach and enhance alcohol control measures that impact on smokers. This could benefit cancer control (given synergies between alcohol and smoking in cancer causation) and contribute to reducing the substantive ethnic inequalities in health, which exist in countries like New Zealand.

Health Research Council of New Zealand.

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POS1-17 EVALUATION OF A LARGE-SCALE NICOTINE REPLACEMENT THERAPY GIVEAWAY PROGRAM IN NEW YORK CITY

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Since 2003, the New York City (NYC) Health Department has offered nicotine replacement therapy (NRT) to NYC smokers through an annual time-limited giveaway. The giveaways are conducted in collaboration with 3-1-1, NYC's non-emergency information line. An evaluation of the 2008 Nicotine Patch and Gum Program (NPGP) conducted at six-month follow-up assessed quit rates among those reached. NPGP applicants are surveyed upon calling 3-1-1. Enrollees are mailed NRT and receive a counseling call. The 2008 evaluation was conducted among a random sample of 8,000 enrollees and completed by phone or online. Seven-day quit rates were assessed among enrollees in treatment and control groups (i.e., smokers who received NRT vs. those who did not due to incorrect mailing information). Quit rates were also assessed by treatment type (patch and gum vs. gum only). Treatment type was determined by cigarettes per day (cpd): light smokers (1-9 cpd) received gum; moderate (10-20 cpd) and heavy (>20 cpd) smokers received patches and gum. Data were weighted for non-response and by demographics of enrollees. In 2008, 29,781 smokers enrolled in the NPGP, comprising 3% of smokers in NYC. A total of 3,252 respondents completed the evaluation, for a 39% response rate. The quit rate among those reached at follow-up was 28%. Among patch and gum recipients, the quit rate was 28% for the treatment and 10% for the control group. Among gum recipients, the quit rate was 32% for the treatment and 16% for the control group. Quit rates were consistent with results from previous evaluations: 33% and 30% quit rates in 2003 and 2006, respectively. Evaluation findings indicate that gum recipients had a significantly higher quit rate compared to patch and gum recipients. The 32% quit rate provides evidence of the effectiveness of gum-only treatment among light smokers, which is currently limited in the literature. Results were consistent with findings from previous evaluations, demonstrating continued success across years. The 2008 program helped about 8,500 smokers quit, preventing 2,800 smoking-related deaths. The giveaways may be generalizable to other urban areas.

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POS1-18 CHANGES IN U.S. QUITLINES, 2006-2008: FINDINGS FROM THE NORTH AMERICAN QUITLINE CONSORTIUM

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Over time, tobacco cessation quitlines in the United States have grown rapidly in number and have also changed in terms of services offered and technologies used to reach tobacco users. A growing number of states are also working with health care delivery systems, insurers, and other partners to integrate quitline services more seamlessly into ongoing health care delivery. This poster will present data from the 2006 and 2008 North American Quitline Consortium Surveys of State Quitlines. Survey response rates were 100% in both 2006 and 2008. A key finding is the growth in the percentage of quitlines offering free medications to callers [46.2% (2006), 69.8% (2008)]. A second area of innovation is increased use of web-based technologies to engage smokers. Median per capita funding for quitline services has fluctuated modestly [$0.15 (2006), $0.19 (2008)]; greater changes were seen in median per capita funding for quitline promotion [$0.05 (2006), $0.13 (2008)]. Median reach (defined as total calls to the quitline/number of adult smokers) increased from 1.12% in 2006 to 1.66% in 2008. Median utilization reach (defined as total calls from smokers or users of other tobacco products to the quitline/number of adult smokers) increased from 0.58% in 2006 to 0.71% in 2008. Additional data on quitline operations, services, and utilization will also be presented. These results demonstrate how U.S. quitlines have changed over time in terms of services and funding. In part, these changes may be due to the influence of the National Network of Tobacco Cessation Quitlines implemented by the U.S. Department of Health and Human Services in 2004; other potential influences include a growing state support for tobacco control endeavors and changes in state fiscal circumstances. Further research is required to monitor these changes and to determine whether other external factors may affect state quitlines.

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POS1-19 BUILDING A NATIONAL SURVEILLANCE INFRASTRUCTURE FOR NEW SMOKELESS TOBACCO AND NICOTINE PRODUCTS

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New smokeless tobacco and nicotine products have been introduced on an unprecedented scale in the United States. Several varieties of Swedish-style "snus" have been test marketed, and one brand (Camel Snus) is now available nationwide. Electronic cigarettes are widely marketed in malls and on the Internet. In order to provide more comprehensive and timely identification of newly emerging products, a network of observers was proposed to all U.S. state tobacco control agencies. The project was designed to minimize staff and time requirements. Through regular internet-based questionnaires, observers report visits to retail tobacco outlets within their coverage areas, noting which products are for sale and how they are marketed and in some cases purchasing products for analysis of product constituents. Results are summarized and made available to observers and agency staff at a secure website. The network does not yet provide representative population data, but it will provide minimum estimates of product availability across a wide area. As a first step in creating the network, agency directors in each state were contacted by email and asked to complete a questionnaire about their agency's needs, interest in participation, and perceived value of the network. Data collection was completed in September 2009. The questionnaire was completed by 36 of 51 agencies (71%). Of these, most (n=28) indicated they would be willing to ask partners to act as local monitors, and the remaining 7 were undecided. Although half (n=16) reported some data collection about new products, only 2 reported that their data collection was systematic. Less than half (n=19) indicated that their agency received funding for inspections of tobacco retailers. The most common products were Camel Snus and e-cigarettes (n=24 each). The results indicate strong interest among tobacco control agencies in the monitoring of new products. Additional results will be reported concerning product availability and the informational needs of agencies.

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POS1-20 ADOLESCENTS' SOURCES OF CIGARETTES AND FUTURE SMOKING BEHAVIOR

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This paper examined whether adolescents' cigarette sources predicted smoking behavior 24 months later. Participants were 1036 9th and 10th grade adolescents (56.1% female; 55.8% white) who had ever smoked at baseline. Both number of days smoked and number of cigarettes smoked per day in the past 30 days were assessed at baseline and 24 months. Nine potential sources of cigarettes assessed (yes/no) at each time point were grouped into 4 categories: (1) Commercial (cigarettes from a store, vending machine, gives money for someone else to buy cigarettes); (2) Social (bums cigarettes, gets cigarettes from someone over 18, gets cigarettes from a friend); (3) Familial (gets cigarettes from parents, gets cigarettes from brother or sister); and (4) Stealing (steals cigarettes). For each category, cigarette source was coded either 0 (never endorsed) or 1 (any in category endorsed). Correlations among sources were low (r's < .09). Social sources were most commonly endorsed (72.8%), followed by commercial (32.8%), stealing (16.3%), and family (9.8%). Hierarchical regressions, controlling for baseline smoking, gender, and age, were used to predict escalation in smoking at 24 months. Only endorsing commercial sources predicted increases in the number of days smoked ($p < .01$) and the number of cigarettes per day ($p < .01$) 24 months later. Chi-Square tests were used to examine the relation between baseline sources of cigarettes and not smoking at 24 months. Only commercial sources of cigarettes differentiated between adolescents who smoked at 24 months and those who did not ($\chi^2(1, N = 897) = 34.95$, $p < .001$); adolescents who did not endorse commercial sources at baseline were 2.4 times more likely not to smoke at 24 months than those who got cigarettes commercially. These results suggest that purchasing cigarettes is a strong marker of future escalation and smoking. Adolescents who did not directly purchase cigarettes were more likely to refrain from future smoking. Obtaining cigarettes through social means, family, and stealing were not associated future smoking behaviors. These results support the need for strong enforcement of cigarette access restrictions for adolescents.

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POS1-21 PREDICTORS OF SMOKING IN CARS WITH NON-SMOKERS IN THE UNITED STATES, CANADA, THE UNITED KINGDOM, AND AUSTRALIA: FINDINGS FROM THE 2007 WAVE OF THE INTERNATIONAL TOBACCO CONTROL FOUR COUNTRY SURVEY

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Although numerous jurisdictions have banned smoking in public places, non-smokers, including children, continue to be exposed to cigarette smoke in private spaces, including homes and cars. A number of studies have now shown that smoking in cars produces dangerously high levels of cigarette smoke, exceeding the typical level of exposure in a smoky bar. However, to date, very few studies have examined the proportion and characteristics of smokers that smoke in cars with non-smokers, and the correlates of this behaviour that could be modified through public health policy legislation. We conducted such a study among 6,775 current smokers from the 2007 Wave (September 2007 - February 2008) of the International Tobacco Control Four Country Survey (ITC-4), a random digit-dial telephone survey of nationally representative samples of adult smokers in Australia, the United Kingdom, Canada, and the United States. Reports of smoking in cars with non-smokers varied considerably across the four countries, from a high of 44% in the United States, to 34% in Canada, to a low of 29% in Australia and the United Kingdom. We found that smokers who were from the United States, who were male, younger, and who were heavier smokers with weaker intentions to quit were the most likely to smoke in cars with non-smokers. Further analyses showed that when controlling for demographics and smoking behaviour, several modifiable factors were found to be related to smoking in cars with non-smokers, including: not believing that cigarette smoke is dangerous to non-smokers, living in a home where smoking is allowed indoors, and living in a province/state with no comprehensive smoke-free law. These findings suggest that smoking in cars with non-smokers may be reduced by educating smokers about the dangerous of exposing non-smokers to cigarette smoke, promoting the need for 100% smoke-free private spaces to protect non-smokers, and implementing comprehensive smoke-free laws where they do not yet exist. Various policy options to ban smoking in cars could also be considered.

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POS1-22 SECONDHAND SMOKE EXPOSURE IN HOSPITALS AND UNIVERSITIES IN ARMENIA

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Armenia has a remarkably high tobacco-smoking prevalence of 59.6% among men and only 2.1% in women. As a result, a large fraction of the population is likely to be exposed to high concentrations of secondhand smoke (SHS). Armenia's law restricting smoking in public places has not yet been implemented; however voluntary smoking restrictions have been implemented in some establishments. The specific aim of this project was to conduct environmental monitoring to assess SHS exposure levels in public buildings in Armenia with and without policies. Sampling was conducted in 2 universities and 2 hospitals, using TSI SidePak AM510 for particulate matter (PM2.5) and filter badges to capture vapor-phase nicotine. Various locales within a building were monitored. PM2.5 was measured at 1-min intervals for 30 minutes in each location and 20 filter badges per building were exposed for 5-7 days and analyzed using gas-chromatography. Observational data was also collected. Hsp1 and Uni1 had implemented smoke-free policies. Smokers were observed in Hsp1, Hsp2 and Uni2; cigarette smoke odor was present in all buildings. Cigarette butts were found outside all buildings except Uni2 where they were found in stairwells and lobby. PM2.5 was elevated in Hsp1, Hsp2 and Uni2 and was as high as that observed in bars in other countries. The highest PM2.5 levels in hospitals were in cafeterias with ranges of 9.5-281.6 ug/m3 in Hsp1 and 6.7-656.7 ug/m3 in Hsp2. In Uni2, elevated PM2.5 levels were found in the cafeteria (8.6-433.5 ug/m3), student lounge (11.8-305.3ug/m3) and lobby (9.3-201.3ug/m3). Lower levels were observed in Uni1 (9.7-43.6 ug/m3 across all rooms). Each building had detectable levels of air nicotine (98% of monitors). The median air nicotine values across each building were Hsp1=0.65ug/m3, Hsp2=0.92ug/m3, Uni1=0.29ug/m3 and Uni2=1.4 ug/m3. The elevated levels of SHS in hospitals and universities remain a health concern. Compliance with worksite smoke-free policies appears to be low. Creation and enforcement of policies targeting areas where smoking occurs is needed to establish a 100% smoke-free environment. Follow-up data is needed to assess implementation effectiveness.

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POS1-23 UPDATING THE MINIMAL DATA SET FOR QUITLINES: OPPORTUNITIES FOR COLLABORATIVE RESEARCH

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The North American Quitline Consortium (NAQC) is the only member organization for tobacco cessation quitline operators, administrators, funders, researchers, evaluators, and other stakeholders. In 2005 NAQC, in collaboration with its members, developed a Minimal Data Set (MDS) for Quitlines–standard intake and follow-up items asked of all callers to tobacco cessation quitlines. Asking questions of all callers in a standardized way allows for comparison across quitlines, creates the ability to pool data for research and evaluation purposes on a larger scale, helps to develop service benchmarks, provides scientific rigor in a relatively new field of cessation services, and provides a foundation for data collection with other cessation programs in states/provinces. In 2007 NAQC assessed the implementation of the MDS to identify methodological challenges associated with use of the MDS in practice. Using the results of the Assessment as a starting point, NAQC's MDS Update workgroup revised the MDS with the goals of clarifying inconsistencies within the MDS itself, increasing standardization across the MDS, and improving fidelity of implementation across quitlines. One additional goal was to align the MDS with new and emerging standards for data collection, such as the NAQC calculations for reach and quit rates, and the Institute of Medicine's report on Race, Ethnicity and Language Data. The final recommended updates were released in November 2009, and are available at http://www.naquitline.org/?page=technical. This presentation will identify the changes that were made to the MDS and their rationale, and review the materials developed to assist quitlines with implementation of the revisions, including side-by-side comparisons of the original and updated MDS items, FAQs, and information about the MDS targeted for different audiences. The majority of the presentation will engage participants in a discussion about using the MDS as an entry point for conducting collaborative tobacco cessation research on a scale much larger than any single quitline could contemplate alone. Use of the MDS by other organizations and collaborations will also be discussed.

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POS1-24 DIFFERENCES IN SMOKING PATTERNS, ATTITUDES, AND MOTIVES AMONG TWO-YEAR COLLEGE AND FOUR-YEAR UNIVERSITY STUDENTS

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Two-year college students have higher rates of smoking compared to four-year university students. However, little is known about differences in smoking patterns, attitudes, and motives among these students. We contacted 8,834 undergraduate students at a two-year college and a four-year university in 2008, with 2,700 completing the 108-item online survey (30.6% response rate). Our current analyses focused on the 2,265 undergraduate students aged 18-25. Current (past 30-day) smoking was reported by 43.5% of two-year and 31.9% of four-year college students, and daily smoking was reported by 19.9% of two-year and 8.3% of four-year college students. Among those reporting smoking in the past 30 days, two-year college students were less likely to report being "social smokers" than four-year college students (46.6% vs. 60.4%). Also, among current smokers, two-year students were also less likely to report being ready to quit smoking in the next 30 days (27.1% vs. 34.7%) and were less confident in their ability to quit (M=5.98, SD=3.79 vs. M=7.03, SD=3.44) despite no differences in motivation to quit smoking. In multivariate analyses controlling for age, gender, ethnicity, and highest parental education, attending a two-year college was associated with higher rates of current smoking (OR=1.66, 95% CI=1.37, 2.01) and daily smoking (OR=2.74, CI=2.09, 3.58), and with less negative attitudes regarding smoking (F(5, 2148) = 17.75, p<.001). Also, compared to four-year college student smokers, two-year college smokers were less likely to smoke for social reasons (F(5, 773) = 7.79, p<.001), but more likely to smoke for affect regulation (F(5, 773) = 3.21, p<.001), after controlling for age, gender, ethnicity, and parental education. Given these results, two-year and four-year college students differ in their smoking patterns, attitudes, and motives. These distinctions should inform tobacco control messages and interventions targeting young adult smoking.

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POS1-25 POPULATION USE OF POTENTIALLY REDUCED EXPOSURE PRODUCTS IN THE UNITED STATES

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Background: Alternative strategies for reducing tobacco-related morbidity and mortality include harm reduction, with potential reduced exposure products (PREPs), or reduction of tobacco use through strategies intended to discourage initiation, promote cessation, and discourage relapse.

Aim: This study examines use in the U.S. of PREPs and the demand for them in comparison with existing FDA-approved nicotine replacement products (NRPs).

Methods: Total U.S. annual volume sales and dollar sales of PREPs and NRPs in years 2003-2007 were computed from ACNielsen ScanTrak market data. Temporal trends in consumption were assessed by linear regression. Use of PREPs in the U.S. adult population in 2006-2007 was examined with Tobacco Use Supplement to the Current Population Survey (TUS-CPS) data. Characteristics of PREPs users among current smokers were analyzed using contingency-table analysis and the $\chi 2$ statistic and multivariate logistic regression.

Results: Annual dollar sales averaged 1.9 million for PREPs and 471 million for NRPs. Volume sales of NRPs were increasing over this time period (r2=0.886, p=0.017) while decreasing for PREPs (r2= .776, p=0.048). Only 6.2% of current smokers reported ever having tried a PREP. Women current smokers were more likely than male current smokers to have tried a PREP (6.7% vs. 5.8%; $\chi 2$ =12.5, p<0.001). Current smokers who had made a quit attempt in the past year were more likely to have tried a PREP than those who had not made a quit attempt [OR=1.20; 95%CI (1.02, 1.40)]. Current smokers who reported planning to quit in the next six months were more likely to have tried a PREP than those who reported not planning to quit [OR=1.19; 95%CI (1.03, 1.38)].

Conclusions: Nation-wide market data reflect minimal sales of reduced harm tobacco products such as PREPs compared with NRPs, while nationally representative survey data indicate low interest PREPs among current smokers. Current smokers interested in quitting are more likely than others to be interested in trying a PREP, although use of these products has not been shown to promote cessation.

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POS1-26 STUDY DESIGN AND BASELINE CHARACTERISTICS OF HOMELESS SMOKERS ENROLLED IN A SMOKING-CESSATION CLINICAL TRIAL

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The prevalence of cigarette smoking in homeless populations is an alarming 70%; more than three times the national average. Despite a very high smoking prevalence and disease burden in this population, our knowledge about cigarette smoking and cessation is limited. This abstract describes the design and baseline characteristics of an ongoing smoking cessation clinical trial among 428 homeless smokers. The primary aim of the study was is to assess the effects of adherence-focused motivational interviewing (MI) counseling for smoking cessation among homeless smokers. Participants are randomized to receive either five individual sessions of MI or one-time brief advice to quit smoking using the 5As model. All participants also receive 21mg nicotine patch for eight weeks. The primary outcome is cotinine-verified 7-day point prevalence abstinence at 6 months follow-up. Other outcomes include adherence to nicotine patch and the moderating effects of substance abuse and psychiatric co-morbidities on the efficacy of MI among homeless smokers. The 74 participants enrolled so far, had mean age (SD) of 46.5 (8.8), majority were male (78%), 65% African American, 3% were employed, 77% had at least a high school education, and 73% had a monthly income of less than $400. Participants smoked an average (SD) of 22.1 (17.7) cigarettes per day (CPD), 96% were daily smokers, 87.8% smoked their first cigarette within 30 minutes of awakening, and they spent an average of $26.60 dollars per week on cigarettes. They reported high motivation (9.1 on 1-10 scale) and modest confidence (7.5) to quit smoking and have made 2.4 serious quit attempts that lasted 24 hours or more in the past year. Thirty-eight percent considered themselves to be alcoholic or chemically dependent and 37% had received drug treatment in the past 2 years. Results show that homeless smokers in general are heavy smokers, highly nicotine dependent, and spend a high proportion of their income on cigarettes. It is critical to sustain efforts to reduce the high rates of cigarette smoking and associated morbidity in homeless populations.

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POS1-27 DEVELOPMENT AND VALIDATION OF A SUBJECTIVE EXPECTED UTILITY MEASURE OF ADOLESCENT SMOKING

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The behavioral economics theory of subjective expected utility (SEU) suggests that individuals make decisions between competing behaviors based on an intuitive formula by which the behavior that has the greatest subjective utility is selected — regardless of the objective value of the alternative behavior. That is, the outcome that provides the perceived maximum benefit with the minimum cost is deemed to have the greatest subjective utility. With regard to smoking, and in particular smoking cessation, the SEU theory suggests that those individuals who continue to smoke have given greater weight to the benefits of continued smoking than to the benefits of cessation. For example, if a smoker believes that continuing to smoke provides the maximum benefit because of a particular function that smoking serves in his/her life (e.g., social benefits, avoidance of physiological withdrawal), he/she will continue to smoke — despite a knowledge of the benefits of quitting. The present study presents the development and validation of a 30-item measure of SEU of smoking behavior in an adolescent sample. A sample of 400 teens from five states completed a series of questionnaires prior to beginning a cessation intervention and again at the end of the program. Initial exploratory analyses were followed by confirmatory factor analyses. Results suggest the utility of two broad dimensions: (1) current subjective expected utility for ongoing smoking and (2) general expectancies about smoking. The first dimension reflects utilities smokers garner from current smoking. For example, smoking for "relaxation," or the process of smoking (e.g., holding a cigarette). The second dimension reflects utility to be gained from future smoking (e.g., people who smoke have more fun or are more popular). Each of these broad dimensions was comprised of several distinct factors. Result will highlight each of these factors, detail psychometric properties, and provide initial evidence for internal and external reliability and validity. Finally, evidence will be presented for the usefulness of the measure in predicting cessation outcome.

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POS1-28 GENDER DIFFERENCES IN THE IMPACT OF DEPRESSION ON VARIOUS STAGES OF SMOKING

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Our understanding of the link between depression and smoking in the US population would benefit from an expanded conceptualization of smoking across the range of the behavioral continuum, as well as research into the nature of the depression-smoking association for men vs. women. The rates and clinical characteristics of both depression and tobacco dependence vary by sex, suggesting the need for stratification of depression-smoking analyses. The current study examines the impact of depression on smoking initiation, progression, maintenance, cessation, or relapse separately for men and women. Our sample of 3,493 men and 4,174 women, ages 17-39 years, was selected from a nationally representative dataset, the NHANES-III. Scores from the Diagnostic Interview Schedule, a structured psychiatric interview, were used to provide a diagnosis of a lifetime history of Major Depression. Using SAS/SUDAAN to adjust for the complex sampling design of NHANES, both chi square and logistic regression were conducted to analyze the relation of depression to each of the stages of smoking. The rate of lifetime history of depression was 6.0% for men and 11.2% for women. For men, a history of Major Depression was associated with initiation of smoking ($p<0.05$), progression to amounts of 10 or more CPD ($p<0.05$), maintenance for 5 or 10 years smoking duration ($P<0.05$), and smoking cessation ($p=0.05$). No association was found for men's risk of relapse. For women, Major Depression was associated with initiation ($p<0.005$) and progression to 20 or more CPD ($p<0.005$). An association between Major Depression and maintenance, cessation, and risk of relapse was not found for women. Our findings suggest that the role of Major Depression in smoking initiation may be similar for men and women, but that there are sex-specific effects on other aspects of the smoking trajectory. Age constraints of the sample preclude drawing definitive conclusions, particularly for cessation/relapse. These findings highlight the continued need for additional research regarding depression, sex, and smoking and the importance of considering smoking as a complex behavior that occurs along a developmental trajectory.

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POS1-29 VIABILITY AND ISSUES ASSOCIATED WITH A WEB SURVEY IN FOUR COUNTRIES

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Objective: The International Tobacco Control Four Country Survey (ITC – 4) is conducted annually since 2002 with a representative sample of adult smokers from four countries – Canada, United States, United Kingdom, and Australia. In 2009, a web-based survey Pilot project was implemented. The purpose was to determine the amount of cost savings we could achieve if some of the cohort participants completed the survey on-line, and to determine whether we could reach some of the people that might otherwise be lost.

Methods: 783 continuing respondents were invited to participate in the on-line survey. Respondents were mailed an invitation letter along with an incentive check. Those who provided an e-mail address at the Wave 6 survey were also sent an e-mail invitation to participate in the on-line survey.

Results: We obtained 174 completed Web surveys (24%). Participants who completed the Web survey were more likely to be non-smokers, live in Canada, Australia or the U.S., and have a higher income and education ($p<0.05$). Among participants who received an e-mail invitation and reminders, 38% completed the survey. Among participants who only got a mailed letter and reminder (we did not have their e-mail address), 15% completed the survey. Among those invited to complete the web survey, 48% did so either online or by phone, compared to our historical completion rate of 57% among those that have been in the cohort for exactly 1 past survey wave. Therefore, it is not clear if the web option increases the net cohort retention rate. A cost-benefit analysis demonstrated that if the entire cohort had been invited to complete the survey on-line, and we obtained the same response rate (24%), then the cost per completed survey would have been $21.

Conclusions: Some recommendations based on our experience include focusing energy on getting correct e-mail addresses to boost the 38% email address rate. Many participants gave us positive feedback about this method of data collection. More research is needed to understand factors that boost participation.

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POS1-30 CIGARETTE BUTT ANALYSIS TO EXAMINE THE EFFECT OF CIGARETTE TYPE AND DESIGN ON SMOKING BEHAVIOR

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Tobacco smoking remains the leading cause of lung cancer and related preventable diseases resulting from harmful exposure to potent carcinogens and other harmful chemicals in mainstream smoke. Many of the over 4,000 chemicals present in tobacco smoke are harmful and cigarette smoke has been classified as a Group 1 carcinogen by the International Agency for Research on Cancer. While machine smoking remains a useful tool for brand comparison, it is a poor predictor of human exposure. Clinical visits and topography devices have also demonstrated utility but a clinical setting or smoking through a device may influence how a person smokes a cigarette. As part of an ongoing study approved by CDC and Battelle Institutional Review Boards we are assessing how people smoke cigarettes during their normal daily activities by collecting and analyzing spent cigarettes as a means to probe smoke intake. Participants smoked their usual cigarette brand between and during two clinic visits on consecutive days recording the time each cigarette was smoked and collecting the spent filter. Preliminary data report on smoking characteristics for the current completed participants (n = 233). Large-scale topography studies have the ability to understand how people consume cigarettes and have demonstrated the ability to correlate mouth level intake to biomarkers of exposure. With the understanding of delivery of these toxic chemicals it may be possible to accurately compare the delivery of toxic substances from different cigarette brands based on consumption. Current data will be presented on mouth level delivery of nicotine between 76 different cigarette brands and how smoking behavior relates to brand, tar delivery, cigarette design parameters, and flavor.

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POS1-31 PERCEPTIONS OF THE RELATIVE RISK BETWEEN SNUS AND CIGARETTES AMONG GPS IN NORWAY

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Background: Snus is a product that involves health risks to users, but researchers have nevertheless advised us that this risk is quite small compared with the health risks associated with cigarette smoking. However, information about this difference in risk is scarce and ambiguous, and many are therefore not aware of it. This paper presents the results from a survey among general practitioners in Norway, with the aim to measure the GPs' perceptions of the relative risk potential in cigarettes and snuff.

Data: A questionnaire was administered to GPs in 2008. Approximately 900 doctors participated, giving a response rate of about 50%. To measure perceived relative risk we used the following question: In terms of health risks, how do you think snus compares to cigarettes? The answer categories ranged from "Snus is much more harmful," to "snus is much less harmful."

Results: Only 36 percent of the GPs thought that Snus was much less harmful than cigarettes. Also, as much as 20 percent of them either said they did not know what the relative risk was, or that the two products were equally harmful or even that snus was the more harmful product. GPs that rated snus as less harmful would more often suggest snus as an aid in smoking cessation. There was no association between relative risk perception between snus and cigarettes and the degree to which other types of quitting aids were recommended.

Conclusion: Almost two thirds of the GPs had beliefs about the relative risk between snus and cigarettes that were at odds with scientific consensus. This shows that more and better information is needed, particularly from the health authorities, to bring the medical professin up to date in these questions.

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POS1-32 CIGARETTE CRAVING AND DEPENDENCE IN PEOPLE WITH SCHIZOPHRENIA COMPARED TO NORMAL CONTROLS

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We examined cigarette craving and level of dependence in smokers with schizophrenia (N=100) and smokers without a psychotic disorder (normals, N=100). The study included smokers who were not currently trying to quit aged 18-65 years. During the 2-3 hour visit, participants completed questionnaires and provided a breath CO sample 10 min after smoking one cigarette. Assessments in this analysis were the Fagerström Test for Nicotine Dependence (FTND), Tobacco Craving Questionnaire-Short Form (TCQ-SF), and withdrawal symptoms from the Nicotine Dependency Form. Scores on the FTND were significantly higher for normals than for people with schizophrenia (5.3 ± 2.0 vs. 4.7 ± 2.2, p=0.045). Forty-six normals (47.4%) and 34 people with schizophrenia (35.1%) were considered highly dependent (p=0.08). Immediately following a cigarette there was no differences in TCQ-SF scores (46.7 ± 19.5 schizophrenia, 42.8 ± 18.2 normals, p = 0.15); however, after 15 minutes post smoking TCQ-SF scores were significantly higher in people with schizophrenia (50.0 ± 19.6) than normals (38.6 ± 19.4, p < 0.0001). TCQ-SF factors of emotionality (p < 0.0001), expectancy (p=0.004), compulsivity (p<0.0001) and purposefulness (p=0.008) were significantly greater in the schizophrenia group 15 minutes after the last cigarette. However, among abstainers for 24 hours or longer, people with schizophrenia were significantly less likely to report craving (70% vs. 87%, p=0.01), irritability (52% vs. 72%, p=0.007), anxiety (59% vs. 81%, p=0.002), impatience (52% vs. 77%, p=0.0007), and increased eating (42% vs. 72%, p<0.0001). No differences were noted between groups in difficulty concentrating during withdrawal. Dependence and withdrawal symptoms were higher in normals than in people with schizophrenia. Craving was significantly greater in people with schizophrenia compared to normals 15 minutes post smoking, but not during sustained withdrawal.

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POS1-33 PROMOTING SMOKE-FREE HOSPITALS IN VIETNAM

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Although the Vietnam National Assembly is only now considering comprehensive smoke-free legislation, Ministerial directives exist requiring some establishments to be smoke-free (e.g., hospitals). However, compliance is limited; enforcement is uncertain; and implementation is hindered by high prevalence of smoking (49.4% of males) and social norms. A concerted effort is underway to make hospitals smoke-free, emphasizing the contradiction between smoking in health care facilities and their overall goals, the exemplary role of health-care workers in society, and respect towards patients. This study aimed to assess the presence of smoke-free policies and secondhand smoke (SHS) exposure in 9 hospitals in Vietnam and knowledge and attitudes among hospital employees. We conducted a survey of 900 health workers. Passive air nicotine monitors (18/hospital) were exposed for 7 days in specified locations to estimate levels of SHS and analyzed using gas-chromatography. Observational data included the presence of no-smoking signs, smokers and cigarette rubbish. Mostly women (60%) participated with an average age of 35yrs; 56% were nurses; and 15% were current smokers. A majority (78%) felt the level of SHS in their hospital was fair or good. They also believed a hospital should be smoke-free (91%), would improve hospital's image (74%) and improve job performance (66%). While all hospitals had no-smoking signs posted in various locations, cigarette butts were found on floors, especially in lobbies, cafeterias, restrooms and stairwells. Cigarettes were sold in all hospitals even though each had a smoke-free policy for a majority of the building. Overall 85% of the air nicotine monitors (representing all 9 hospitals) recorded detectable levels of nicotine. The range of median concentrations was 0.01-0.09μg/m3 for 9 hospitals. Highest values were detected in cafeterias (2.45μg/m3) and doctors' lounges (1.87μg/m3). This study demonstrates that smoke-free policies exist and are supported, but not always enforced. Tailored interventions are needed to create a 100% smoke-free hospital for patients and non-smokers and follow-up data is needed to assess implementation effectiveness.

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POS1-34 CONTRABAND NATIVE TOBACCO ON POST-SECONDARY CAMPUSES IN ONTARIO, CANADA

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Background: In the province of Ontario, Canada, 27% of young adults smoke, and annual surveillance data suggests tobacco use is plateauing after years of decline. Given young adults' sensitivity to tobacco prices, the availability of inexpensive contraband tobacco products may be contributing to this situation. Limited research has been conducted on the use of contraband tobacco and despite the increasing availability of contraband 'Native cigarettes' (produced and/or sold through Indian Reserves); no studies to date have examined the prevalence of their use among young adults. Accordingly, this study examines: (a) what proportion of cigarette butts discarded on post-secondary campuses is contraband; and (b) whether the proportion of contraband butts varies between colleges and universities, and between urban/southern and rural/northern campuses.

Methods: In March and April 2009, discarded cigarette butts were collected from the grounds of 25 post-secondary institutions across Ontario. Institutions were selected to represent a range of attributes including size, location, and population diversity. At each school, cigarette butts were collected on a single day from four locations. The collected cigarette butts were reliably sorted into four categories according to their filter-tip logos: legal, contraband Native cigarettes, international and suspected counterfeit cigarettes, and unknown.

Results: Contraband use was apparent on all campuses, but varied considerably from school to school. Data suggest that contraband Native cigarettes account for as little as 1% to as much as 27% of the total cigarette consumption at a particular school. The highest proportion of contraband was found on rural campuses in the Northern part of Ontario. Consumption of Native contraband was generally higher on universities compared to colleges.

Significance: The presence of contraband tobacco on all campuses suggests that strategies to reduce smoking among young adults must respond to this cohort's use of these products. Education about the negative economic and social consequences of the contraband tobacco market may dissuade young adult smokers from purchasing contraband products.

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POS1-35 DIFFERENCES BETWEEN US AND UK SMOKERS REGARDING INTEREST IN QUITTING GRADUALLY

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Enabling smokers to use therapeutic nicotine (TN) medications (e.g., nicotine gum, patch and lozenge) for reduction as a route to cessation may present opportunities to increase population quitting rates by engaging a broader group of smokers in quitting, and clinical trials show that TN can help smokers quit gradually, and can also increase quit rates when used for reduction among smokers who are not currently interested in quitting. Moreover, US survey data suggest high smoker interest in using TN for gradual cessation. However, the availability of a "reduce-to-quit" indication in the UK may not have dramatically increased quitting. Here, we analyze a survey of US (n=1,746) and UK (n=1,652) daily smokers interested in quitting within 12 months, to assess the comparability of the US and UK environment for gradual cessation. US smokers showed greater interest than UK smokers in quitting gradually (62.9% vs. 53.2%, p < .001; "GQs"). Moreover, US smokers were more likely than UK smokers to have used gradual reduction in the past 12 months (45.0% vs. 34.1%, p < .001), suggesting greater commitment to gradual cessation. The higher interest in GQ among US vs. UK smokers was particularly marked among younger (<35) smokers, where it was higher both among those with perceived low addiction (63.1% US vs. 45.3% UK) and those with greater addiction (65.9% vs. 52.0%; interaction OR=5.88, 1.12-33.3). The greater US interest in GQ also holds among smokers open to using TN to change smoking behavior (65.7% vs. 54.1%, p < .001). Finally, the profile of GQs differs between US and UK smokers, with US GQs by being: more dependent (FTND 4.73 vs. 4.32, p < .001); more likely to be impoverished (21.8% vs. 14.5%, p < .001); less likely to have used TN in the past (43.4% vs. 53.4%, p < .001); and marked by more prior failed quit attempts (10.02 vs. 8.86, p < .05). These results suggest that there is greater interest in GQ among US smokers compared to UK smokers, particularly in certain important subgroups, and that the population dynamics of such interest differ between the two countries, making it likely that US uptake of gradual reduction will be greater than that in the UK.

This research was funded by GlaxoSmithKline Consumer Healthcare. Through their work at Pinney Associates, the authors serve as consultants to GlaxoSmithKline Consumer Healthcare on an exclusive basis on matters relating to smoking cessation. Dr Shiffman and Mr. Gitchell also have an interest in a venture to develop a new nicotine replacement medication.

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POS1-36 SMOKING CESSATION ASSISTANCE FOR AFRICAN-AMERICANS: QUITLINE UTILIZATION AND EFFECTIVENESS

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African Americans suffer disproportionately from many chronic and preventable diseases associated with smoking. Compared to European Americans, African Americans are at increased risk for lung cancer even though they smoke about the same amount. The American Cancer Society's (ACS) Quitline project provides telephone-based cessation assistance in contract areas to anyone who has access to a telephone. This assistance is tailored to the individual without any specific race-based modification. Historically this service has been very successful in reaching and assisting African Americans. This presentation will combine empirical studies of over 45,000 Quitline callers from Louisiana, Texas, and Washington, DC to demonstrate that African-Americans tend to use the assistance in proportions at least as great (18%-89%) as their proportional representation in the smoking communities in those states (9%-63%) and that their quit rates are substantially equivalent to those of European Americans (AA 22%-25% vs. EA 23%-28%. African Americans are more likely to request counseling (AA 74%-92% vs. EA 67%-85%. They complete a comparable number of counseling sessions (AA 1.1-2.0 vs. EA 1.2-2.0), and report equivalent or higher satisfaction with counseling assistance (AA 3.3-3.5 vs. EA 3.2-3.4 on a 4-point Likert scale). The results from two completed clinical trials in which over 8000 clients were randomized to either be mailed self-help materials or to be mailed those materials and have access to the Quitline will also be used to demonstrate that African Americas and European Americans benefit equally from access to telephone counseling in randomized trials. While utilization of telephone counseling cessation services is driven in large part by promotion, the results from these empirical and experimental studies demonstrate that African American will use those services, benefit from them, and report high levels of satisfaction. Telephone counseling is a promising tool for addressing health disparities among African Americans related to smoking.

Quitline services in Washington, DC were funded by the Government of the District of Columbia Department of Health. Quitline services in Louisiana were funded by the Louisiana department of Health and Hospitals. Quitline services in Texas were funded by the Texas Department of State Health Services. Clinical trials were funded by the American Cancer Society.

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POS1-37 SMOKING CESSATION AMONG A SHELTERED HOMELESS POPULATION: A PILOT STUDY

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The aim of this pilot study was to test the feasibility and evaluate the potential effect of motivational interviewing (MI) plus cognitive behavioral therapy (CBT) combined with pharmacotherapy on smoking cessation outcomes implemented among a sheltered homeless population living in New York City. A quasi-experimental design was used, with the intervention group (n=58) participating in a 12-week group MI+CBT counseling program plus pharmacotherapy, and the comparison group (n=50) receiving usual care (brief advice to quit plus access to pharmacotherapy. Among the intervention group, carbon monoxide-confirmed abstinence rates at 12 and 24 weeks were 15.5% and 13.6% respectively. None of the clients in the comparison group were abstinent at 12 weeks. We also found that smokers who received the intervention were significantly more likely to make a quit attempt ($p < .001$). For participants in the intervention group, the mean number of sessions attended was 7.2(SD = 3.2). Seventy-five percent of smokers in the intervention group and 68% in the comparison group completed the 12-week study, and 89% of clients eligible for 24-week follow-up were interviewed. Results support the feasibility of enrolling and retaining sheltered homeless in a smoking cessation program. Further, MI+CBT plus pharmacotherapy options, offered as part of existing sheltered homeless services, may be effective in helping sheltered homeless smokers quit.

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POS1-38 EVALUATING THE EFFECTIVENESS OF ANTI-TOBACCO MEDIA CAMPAIGNS

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Background: Since 2006, the NYC Health Department has aired hard-hitting anti-tobacco media campaigns to lower smoking prevalence in New York City (NYC). These campaigns have received extensive earned media coverage, generated high call volume, and have been used in other countries. To evaluate the impact of each campaign, a media tracking system was developed to monitor calls for help quitting smoking, gross ratings points (GRPs), costs, earned media, and complaints.

Methods: Calls for help to quit smoking to NYC's general information line (311) and calls from NYC to the New York State Smokers' Quitline, along with media costs and GRPs, are used by the Health Department to evaluate anti-tobacco media efforts. Weekly call volume data from 2005, before hard-hitting media was aired in NYC, is used as a baseline and subtracted from the corresponding week's call volume during media flights to establish Flight Attributable Calls (FAC). From this, cost per FAC, FAC by week and FAC per GRP are calculated to assess campaign effectiveness and impact. The amount of earned media coverage and the number of complaints received from the public is also assessed.

Results: Graphic, hard-hitting media campaigns that depict the devastating consequences of smoking-related illness for smokers and their families are most effective in generating calls for help quitting smoking. Flights airing at levels of 1100-1500 GRPs are most effective; additional GRPs do not generate significantly higher call volume. From 2005-2007, after a three-year stall in the smoking rate, and when hard-hitting media was the only new tobacco control measure implemented in NYC, adult smoking prevalence declined 11%, from 18.9% to 16.9%.

Conclusions: In order to continue the smoking decline in NYC, hard-hitting media with strong cessation messages must air regularly. As New Yorkers become accustomed to hard-hitting, anti-smoking media, the Health Department will need to do more (e.g., develop new concepts, adjust the duration and intensity of campaigns, expand to new media outlets) to reach the same level of campaign effectiveness.

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POS1-39 RESPONSE TO THE REGULATION OF "LIGHT" DESCRIPTORS: TOBACCO INDUSTRY RESEARCH ON CONSUMER PERCEPTION OF REPLACEMENT SENSORY DESCRIPTORS

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Background: In addition to "traditional" descriptors (light, low-tar, ultralight, mild), tobacco companies have long promoted cigarettes using language that describes these product sensory characteristics (i.e., smooth, refreshing, satisfying, flavor). This language is not specifically identified in regulation of tobacco products and advertising, and it remains unclear how consumers might interpret these terms.

Methods: We analyzed internal tobacco industry documents describing consumer perception of sensory descriptors, how they relate to product expectations and perceptions of risk, and tobacco companies' efforts to adapt to impending regulation of misleading descriptors. External sources, including tobacco industry websites and direct mail campaigns, were reviewed to document the use of sensory language in brands being introduced onto the U.S. market between 2007 and 2009.

Results: Product descriptors have long been used to make direct and indirect claims to consumers. Beginning in the 1970s, descriptors such as "light" and "low tar" were used to promote ventilated cigarettes using straightforward appeals, and sensory language was used to promise adequate nicotine delivery and reduced harshness. Sensory language was developed based on consumer response testing conducted by the industry, and falls within two domains: strength of taste and satisfaction, which implied nicotine delivery; and physical comfort that implied reduced health risk.

Conclusions: Tobacco companies identified salient physical sensations among smokers and establish product expectations using sensory language. Sensory descriptors are increasingly being used as substitutes for traditional descriptors by the industry. These terms carry implicit messages about health risk, product appeal, and nicotine delivery, and therefore should be considered in federal regulation of tobacco industry messaging.

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POS1-40 ROLE OF SNUS IN INITIATION AND CESSATION OF SMOKING IN NORWAY

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This study examined patterns of tobacco use among Norwegian men to clarify whether snus (smokeless tobacco) use is associated with initiation or cessation of cigarette smoking. This was a retrospective analysis of a web-based cross-sectional survey of 7,170 Norwegian men aged 20-50 in 2007. Survey questions focused on demographic data, current and prior tobacco use, and smoking initiation/cessation procedures. The response rate on the survey was 49% (out of 14,744 invited). The sample was representative of 20- to 50-year-old Norwegian men (on age, geography and tobacco use) except the participants had more education. 20% of the men completing the survey were current daily smokers (another 14% smoked occasionally). 16% were daily current snus users (10% occasional snus users). 16.8% of all primary snus users (i.e., those who started tobacco use as snus users) then started daily smoking, whereas 38.8% of all non-primary snus users started daily smoking. The odds of becoming a daily smoker was lower for primary snus users than for non-primary-snus users (OR=0.31, 95% C.I. 0.27- 0.38. Among primary smokers (started tobacco use as a smoker), 44% started secondary snus use, and 56% did not start snus. 36% of the primary smokers who started snus were non-smokers at the time of the survey; whereas, 45% of primary smokers who did not start secondary snus were non-smokers at the time of the survey (OR=0.69, 95% C.I. 0.61-0.8). Thus secondary snus use was associated with a lower probability of quitting smoking. Among daily smokers who used a single cessation aid on their last quit attempt, 63% (of 428) of snus users succeeded in quitting smoking completely, as compared with 40% (out of 178) of those using nicotine replacement therapy. The odds of quitting smoking completely were greater for those using snus as a single cessation aid as compared with those who used NRT as a single cessation aid (O.R.= 2.5, 95% C.I. 1.7-3.5). Primary use of snus in Norway is associated with a reduced risk of becoming a daily smoker. Secondary snus use among primary smokers was associated with a decreased probability of quitting smoking, unless used as part of a quit smoking attempt.

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POS1-41 OPTOMETRISTS AND SMOKING CESSATION REFERRALS — PRACTICES, BARRIERS AND OPPORTUNITIES IN CANADA

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Purpose: Understand how optometrists and senior optometry interns (working in a university clinic), in Ontario, Canada, are currently involved in addressing smoking with their patients.

Context: It is well documented that an effective and efficient way to help current smokers quit is to provide smoking-cessation information via their health care providers. Smoking has been linked causally to numerous eye diseases, and in particular age-related macular degeneration (AMD) and cataracts. Optometrists can play an important role in providing trusted advice about the impacts smoking can have on the health of the eye and the benefits of smoking cessation. Smokers are commonly unaware of the link between tobacco smoking and blindness.

Methods: A series of 5 focus groups were held with practicing optometrists and optometry student interns to understand what involvement optometrists have and optometry students anticipate having in: Asking patients about their tobacco use, referring patients to cessation services, and encouraging patients to reduce and/or quit smoking.

Results: There were four emergent themes from this research: (1) Smoking behaviour is not routinely assessed or addressed by optometrists; it is routinely communicated to patients that smoking is a risk factor for certain eye diseases when and if symptoms or signs of macular degeneration are present. Practitioners sometimes encourage patients to quit or cut down on smoking; however, no practitioners had ever referred patients to cessation services and none were aware of optometrists who had; (2) Optometrists rationalized their inaction as smoking behaviour not being part of their role and assumed their patients did not expect them to address their smoking behavior; (3) Barriers to further involvement in smoking cessation exist including perceived time limitations with patients, poor self-efficacy in delivering a clear message and a lack of knowledge of support services; and (4) Opportunities also were identified including a role for public campaigns making links between smoking and blindness along with improved inter-professional collaborations.

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POS1-42 DO EXISTING DEFINITIONS OF "HARDCORE" SMOKERS PREDICT WHO CONTINUES TO SMOKE?

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Background: The extent of the existence of "hardcore" smokers is currently debated. Although a few studies have reported on the prevalence of "hardcore" smokers and some have even reported on trends in the prevalence of "harcore" smokers over time, the literature uses a variety of definitions of "hardcore" and no study has examined whether these definitions are predictive of continued smoking.

Purpose: The purpose of this study is to compare the predictive ability of existing definitions of "hardcore" smokers with respect to continued smoking.

Methods: Data were obtained from the Ontario Tobacco Survey (OTS), a regionally stratified random telephone survey of adults in Ontario, Canada. 4130 current smokers were interviewed at baseline and again at 6- and 12-month follow-ups. Five definitions of "hardcore" smokers were operationalized using available OTS data. The two outcome variables examined were: (1) being a current smoker at 6 months; and (2) being a current smoker at 12 months. Predictive ability was assessed in multiple ways: bivariate analyses; concordance and goodness-of-fit statistics based on multiple logistic regression and negative binomial regression; and, plots of calibration curves. Analyses were weighted and took account of the complex survey design.

Results: Only the definition based solely on nicotine dependence was significantly associated, in logistic regressions, with being a smoker at 6 and 12 months. This finding was maintained even after controlling for socio-demographic characteristics. When the negative binomial regression was used, the three definitions that included nicotine dependence were associated with being a smoker at 12 months. However, the fit statistics were not strong and did not favor any one definition over the others. The calibration curves favored the two definitions that included quit intentions and quit attempts, but not nicotine dependence.

Conclusions: Our assessment of predictive ability did not favor one definition over the others. These findings call into question the utility of the "hardcore" characterization. Alternatives to this characterization will be discussed.

This work was undertaken by the Ontario Tobacco Research Unit, which receives funding from the Ontario Ministry of Health Promotion.

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POS1-43 THE CIGARETTE DEPENDENCE SCALE AS A PREDICTOR OF SMOKING CESSATION AFTER 10-WEEKS OF NICOTINE REPLACEMENT THERAPY AND AT 6-MONTH FOLLOW-UP

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Background: Higher levels of nicotine dependence may decrease the effectiveness of cessation treatment. The Cigarette Dependence Scale (CDS-12) is a brief, self-administered questionnaire that measures the level of tobacco dependence, as defined by DSM-IV and ICD-10. The objective of this study was to assess the predictive value of baseline CDS-12 on short- and long-term cessation following combined behavioural and pharmacological intervention. We hypothesized that lower CDS-12 scores would predict smoking cessation.

Methods: Treatment-seeking smokers (n=2766) attended a workshop for smoking cessation where they completed a baseline questionnaire including CDS-12 and attended a 45-minute group psycho-education session. Participants were given a 10-week supply of free nicotine replacement therapy (NRT) of their choice (inhaler, gum or patch) and self-help materials. After 10 weeks and at 6 months post-treatment, participants completed a follow-up questionnaire in which the 7-day point-prevalence (PP) abstinence rate was reported. Baseline variables significantly associated with the 7-day PP were identified and logistic regression was then used to identify significant predictors of cessation.

Results: At 10-week follow-up, the mean (±SD) CDS-12 scores were lower among quitters than non-quitters (50.18±6.35 vs. 51.16±6.29)(p=0.016). However, the CDS-12 score was not a significant predictor of smoking cessation at 10-week (OR=0.986, 95% CI: 0.966-1.007) in the regression model. Significant predictors were (OR, 95%CI): a current psychiatric disorder (0.62, 0.49-0.78); confidence to quit smoking (1.11, 1.02-1.2); importance to quit smoking (1.05, 1.0-1.1); and Heaviness of Smoking Index (HSI), both mid vs. low (0.68, 0.5-0.92) and high vs. low (0.44, 0.32-0.61).

Conclusion: While a lower CDS score was independently associated with higher quit rates, it was not a significant predictor in a regression model. However, specific aspects of the CDS (smoking quantity and time to first cigarette comprising the HSI) were a significant predictor. Six-month outcomes will also be presented.

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POS1-44 DEVELOPING A SUSTAINABLE MODEL FOR STATEWIDE TOBACCO CESSATION OUTREACH

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Introduction: The Tobacco Cessation Resource Center (TCRC), funded by the Washington State Department of Health, conducted a field-based assessment in 2007 to determine the effectiveness of healthcare provider outreach. The evaluation revealed that due to competing demands, local contractors were not able to offer providers with adequate tobacco cessation training and technical assistance. Based on research in 12 other states, TCRC designed and developed the Washington State Outreach Program in 2008. The overall goal of the program is to help organizations build sustainable tobacco treatment systems and increase referrals to free statewide cessation resources (like the Tobacco Quit Line).

Program Design: Washington's Outreach Program consists of devoted field-based cessation specialists who promote services to health care organizations in a multi-county territory. Services are offered primarily in a face-to-face manner using academic detailing techniques. The specialists offer resources, trainings and technical assistance to a variety of health care providers from physicians and nurses to social workers, administrators and quality managers serving the uninsured, underinsured, or other disparate populations.

Results: During the nine-month test period, over 500 providers were contacted and at least two-thirds of them were interested in services. Providers were most likely to request training about the Quit Line, Fax Referring to the Quit Line, or the Brief Tobacco Intervention. The four-county test area in southwest Washington represented only 13% of the state's population, yet contributed more than 25% of the state's total fax referrals each quarter with an treatment acceptance rate that was significantly above the state average. In 2009-2010, the program expanded to eight additional counties in north-central Washington and eastern Washington.

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POS1-45 PREDICTORS OF SMOKING CESSATION AMONG ADULT SMOKERS IN SIX CITIES IN CHINA

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This paper uses longitudinal data from the first two waves of the International Tobacco Control Policy Evaluation (ITC) China Survey to examine predictors of smoking cessation among adult smokers in China, and compares them with those found in previous research in two other Asian countries (Malaysia and Thailand) and four Western countries (Australia, Canada, the UK and USA). A total of 3,863 adult smokers from 6 cities in China first surveyed in 2006 were re-contacted in 2007. Baseline measures of sociodemographics, dependence and interest in quitting were used prospectively to predict both making quit attempts and quit success. Overall, 979 out of the 3863 (25.3%) Chinese smokers reported having made at least one quit attempt between Waves 1 and 2; of these, 212 (21.7%) were still stopped at Wave 2. Independent predictors of making quit attempts included having higher quitting self-efficacy, previous quit attempts, some intention to quit, disagreeing that s/he enjoyed smoking too much to quit, and having very negative opinion of smoking. Independent predictors of quit success among those who attempted were having longer previous abstinence from smoking (7 months or more), and having greater interest in quitting (planning to quit within 1 month). Compared to other countries fewer adult smokers in China attempt to quit and predictors vary: with measure of nicotine dependence less predictive and, like in Malaysia and Thailand, interest in quitting more predictive of success. These findings indicate that existing knowledge from Western countries about smoking cessation are not necessarily readily generalizable to China, which has different social-economic conditions and tobacco control environment.

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POS1-46 APPLYING USER-CENTERED DESIGNS: AN EXAMPLE OF USABILITY TESTING FOR WOMEN.SMOKEFREE.GOV

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The usage of web-assisted tobacco interventions (WATIs) is becoming a more common technique to promote smoking cessation. Research reveals that one barrier to the effectiveness of WATIs can be the ability of a user to successfully interact with the site. However, usability testing is a key feature of site development that is often overlooked. Usability, by definition, focuses on the user's quality of interaction with a website as it relates to the design, readability, navigation, and accessibility. This paper presents an example of the utilization of formal usability testing as a critical component for informing the site development process. Women.smokefee.gov, developed specifically to promote smoking cessation among women, was the tested site. The objective of the study was to conduct a formal usability evaluation, assess navigation, consumer perception and determine how women choose to use the site. A user-centered design was employed to answer the following research questions: Do users: (1) understand the purpose of the site; (2) easily navigate the site and locate the content; (3) understand how to use the interactive features and find them interesting; and (4) find the site appealing and/or helpful? Seven pre-screened women who were current smokers or recently quit were recruited for the testing. They represented an array of demographic characteristics targeted by women.smokefree.gov. Users were instructed to both independently explore the website and then perform a series of predetermined tasks. Our findings revealed a favorable appraisal of the site by the participants deeming it both attractive and informative. However, important usability problems were elucidated: reflecting areas of confusion and difficulties in accomplishing website-related tasks. This study highlights the importance of conducting usability tests of WATIs. Despite being created by a team with extensive experience in cessation website development, the usability testing revealed important modifications needed to optimize utility.

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POS1-47 CIGARETTE SMOKING AMONG ADOLESCENTS WITH ASTHMA: THE ROLES OF ASTHMA MORBIDITY AND DEPRESSIVE SYMPTOMS

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Rationale: Although cigarette smoking is particularly harmful for adolescents with asthma, the rate of smoking by adolescents with asthma is comparable to that of healthy adolescents. The present study examined the relationship of asthma morbidity, depressive symptoms, and current smoking behaviors among Florida adolescents with asthma.

Methods: Weighted analyses were conducted using the 2008 Florida Youth Tobacco Survey data. Logistic regression was performed to predict current smoking (defined as having smoked 100+ cigarettes and having smoked in the last 30 days) from the asthma morbidity in the past year (defined as having had an asthma attack in the past year) and depressive symptoms (responding "yes" to a question: "during the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?")

Results: The final analyses included 5,301 adolescents with asthma (mean age=16.1 years; 54.1% female; 25.0% African American, 22.6% Latino, 47.8% White, and 4.6% Other). Of the adolescents with asthma, 6.4% were current smokers, 23.3% had an asthma attack in the past year, and 29.3% reported depressive symptoms. Controlling for demographic variables and the presence of smoker(s) in the home, having had asthma attack was independently associated with current smoking (OR=1.93, $p < .001$). Depressive symptoms (OR=2.01, $p < .001$) partially explained the relationship between asthma attack and current smoking (OR=1.74, $p < .01$). These associations did not vary by age, gender, or ethnicity.

Conclusions: Poorly controlled asthma and depressive symptoms may put adolescents with asthma at risk for cigarette smoking. The mechanism of this association is not understood and warrants further research.

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POS1-48 TOBACCO USE MODERATES THE ASSOCIATION BETWEEN MAJOR DEPRESSION AND OBESITY

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Tobacco use may be an important moderator of the relationship between major depression (MD) and obesity. Based on a maladaptive coping explanation of the MD/obesity link, one may expect the relationship between MD and obesity to be particularly strong among nonsmokers, who may engage in unhealthy eating and sedentary behavior to cope with depression. By contrast, the MD-obesity association may be particularly weak among smokers, who can use tobacco (instead of food or sedentary behavior) to cope with mood symptoms. Accordingly, the present study examined smoking status and tobacco dependence as two potential moderators of the association between MD and obesity. Participants were 41,654 respondents in the National Epidemiologic Study of Alcohol Related Conditions, a representative sample of US residents aged 18 or older. Self-reported height/weight were used to compute body mass index (BMI). The AUDAIS-IV interview was used to diagnose DSM-IV MD and tobacco dependence, as well as smoking status over the past 12 months. Weighted logistic and linear regression models accounting for the design complexities of the NESARC showed that smoking status moderated the association between MD and obesity status (BMI > 30), Wald c2= 14.4, p = .0001, as well as the link between MD and the quantitative BMI value, F = 24.6, p < .0001. MD significantly predicted obesity and BMI among nonsmokers (ps < .0001) but did not do so in smokers (ps > .10). A similar pattern of findings emerged when tobacco dependence was incorporated as the moderator variable (ps < .0007). Each of these findings remained consistent after adjusting for demographic and psychiatric variables, and potential confounding factors (e.g., medication use, smoking heaviness). These results suggest that tobacco use characteristics are important individual difference factors that moderate the association between recent MD and obesity in the US adult population. Although limited by a cross-sectional design, these findings potentially shed light on the mechanisms linking MD and obesity and may have implications for identifying which individuals may benefit most from obesity interventions that target mood.

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POS1-49 SMOKERS COMMONLY HAVE MISPERCEPTIONS CONCERNING NICOTINE AS A MAJOR CARCINOGEN: NATIONAL SURVEY DATA

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Aim: To determine levels and trends in smokers beliefs around nicotine as a major carcinogen so as to better inform the promotion of nicotine replacement therapies for smoking cessation.

Methods: The NZ arm of the International Tobacco Control Policy Evaluation Survey (ITC Project) uses as its sampling frame the NZ Health Survey (a representative national sample). From this sample we surveyed adult smokers in two survey waves (n=1376 and n=926) one year apart (wave 2 in 2008/early 2009).

Results: When asked if "the nicotine in cigarettes is the chemical that causes most of the cancer?" most smokers (52.6%) said that it was true, 36.7% said it was false (the correct answer), and 10.7% couldn't say (in wave 1). The proportion answering correctly only increased by 1.3% after one year (absolute increase in those participating in both waves). Both Maori (at 62.6% for "true" responses, 95%CI=55.4–69.7) and Pacific smokers (at 72.8%, 95%CI=56.4–89.2) had significantly higher levels of misperception than those in the European/Other ethnic group (46.2%, 95%CI=40.5–51.9). Levels of misperception were highest in the most deprived population (61.3%) and lowest in the least deprived (49.1%) but this difference was not statistically significant (using a small area deprivation measure).

Conclusions: New Zealand smokers (and particularly Maori and Pacific smokers) commonly have misconceptions concerning nicotine being the major carcinogen in cigarettes. Also the decline in this misperception over time is at a trivial rate. To maximise uptake of nicotine replacement therapy (which is heavily subsidised in NZ and available via a national quitline) mass media campaign information should address smoker misperceptions around the health impacts of nicotine.

Health Research Council of New Zealand.

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POS1-50 ASSESSMENT OF INDOOR SECONDHAND TOBACCO SMOKE EMISSION LEVELS IN SIX LEBANESE CITIES

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Background: To date, Lebanon has failed to enact comprehensive clean indoor air laws despite ratification of the FCTC, which calls for the protection of nonsmokers from exposure to secondhand tobacco smoke. Complicating the problem of SHS exposure in Lebanon is the widespread use of tobacco waterpipe. While most research on SHS has involved cigarette smoking as a source of emissions, other sources, including tobacco waterpipe may be an important contributor.

Methods: PM2.5 concentrations (μg/m3) were measured in a sample of 28 public venues located in six major Lebanese cities. Active smoker density (number of smokers/volume (100 m3)) was calculated for both cigarette and waterpipe smokers. Venues were thus categorized as higher waterpipe density or higher cigarette density, and resultant emission levels were compared between the two categories.

Results: Cigarette and waterpipe smoking were observed in 14 venues, while cigarette smoking only and waterpipe smoking only were found in 12 venues and 1 venue, respectively. Among all smoking-permitted venues, the mean PM2.5 concentration was 342 μg/m3. Venues with a higher density of waterpipe smokers (n =14) showed a slightly greater, although nonsignificant, median PM2.5 concentration (349 μg/m3) compared with venues with a higher density of cigarette smokers (n =13; 241 μg/m3). The average PM2.5 concentration in the single venue with a voluntary smoke-free policy was 6 μg/m3.

Conclusions: Despite ratification of the FCTC in 2005, both cigarette and waterpipe smoking are commonly practiced in enclosed public places throughout Lebanon, leading to unsafe levels of indoor particulate pollution. Smoke-free policies are needed in Lebanon to protect the public's health, and should apply to all forms of tobacco smoking.

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POS1-51 A DAY IN THE LIFE OF COLLEGE STUDENTS: PERSONAL AIR MONITORING FOR EXPOSURE TO SECONDHAND SMOKE

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Although only 26% of students from 10 colleges in North Carolina reported current smoking in 2006, 83% reported exposure to secondhand smoke (SHS) during the previous week. This high rate of SHS exposure indicates a potential health threat and highlights the need for more information about the location, timing, and level of exposure. This study was conducted to objectively assess exposure to SHS among college students and identify correlates of exposure. Participants were 41 undergraduate students from a Southeastern U.S. university. Students were trained on the use of the TSI SidePak AM 510, which measures the real-time concentration of particles smaller than 2.5 microns in diameter (PM2.5), a sensitive marker of SHS. Participants wore the monitors during their waking hours for 4 consecutive days during fall 2008 and kept a log of their locations. Fifty-one percent of participants were female, 76% were Greek-affiliated, 20% were smokers. Students' average age was 20.2 years (SD = .75). Students' highest level of PM2.5 over the 4-day testing period was compared to EPA Air Quality Index categories as follows: 29% in "good," 12% in "moderate," 15% in "unhealthy for sensitive groups," 5% in "unhealthy," 7% in "very unhealthy," 12% in "hazardous," and 20% above the highest EPA category (>500 PM2.5). We assessed the concentration of PM2.5 and several individual (age, gender, smoking status, and Greek status) and environmental characteristics (day of week, time of day, location, on/off campus) using a linear mixed effects regression model. In multivariate analyses, PM2.5 concentration was positively associated with being a smoker and negatively associated with Greek affiliation (p < .05). Higher levels of PM2.5 were found during the evening (6pm-11pm) and late night hours (11pm-2am) compared to the afternoon (12pm-6pm). Compared to smoke-free buildings, PM2.5 was higher outside and in stores, vehicles, living quarters, and dining places (p < .05). Results highlight the times and locations where college students were exposed to higher levels of PM2.5 and provide important information for the development of interventions to reduce exposure.

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POS1-52 EVALUATING THE EFFECTS OF THE SMOKE-FREE LEGISLATION ON YOUTH SMOKERS IN HONG KONG: PERCEIVED SOCIAL AND ENVIRONMENTAL INFLUENCE

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The Hong Kong Government has implemented a comprehensive smoke-free legislation on 1 January 2007, which restricts smoking in indoor workplaces, restaurants, karaokes, public places/park, beaches, and school (both indoor and outdoor). Previous studies showed positive effects of tobacco control policies on changing the smoking behaviour of youth smokers. We examined the differences in perceived social and environmental influence on youth smokers recruited to the Youth Quitline (YQ) before and after the enactment of the smoke-free legislation. Data obtained before (73 weeks) formed the pre- group and after 1 Jan 2007 (78 weeks) formed the post-legislation group. Callers who are ethnic Chinese, aged 12 to 25, smoked ≥ 1 cigarette in the past 30 days and can communicate in Cantonese, were recruited to the YQ for smoking cessation intervention. Chi-square tests compared perceived social and environmental influence on youth smokers in the pre- and post-legislation group, and logistic regression was used to adjust for baseline difference. A total of 254 and 288 youth smokers formed the pre and post-legislation groups. 73% were male, 61% were students, and 61% had mild nicotine dependency level. On average, they were 18 years old, started smoking at 14 years old and consumed 11 cigarettes daily. The post-legislation group were younger (19 vs. 17 years old; $p < 0.001$), started smoking earlier (14 vs. 13 years old, $p = 0.02$), and more were students (55% vs. 67%, $p = 0.01$). Half reported had smoking parents (52% vs. 54%; $p = 0.72$), at least more than half classmates/colleagues (50% vs. 48%; $p = 0.05$) and majority of their friends (67% vs. 70%; $p = 0.11$) were current smokers. More youths in the post-legislation group perceived family members would give support in their quitting plan (57% vs. 68%; $p < 0.01$), and the difference remains significant after controlling for differences in the three baseline characteristics (AOR, 1.45; 95% CI, 1.01-2.10). The legislation showed a positive effect on youth smokers in their perception of more support from family members on their quitting smoking. However, there seems a minimal difference in their social and environment.

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POS1-53 WHAT REASONS DO SMOKERS WHO WANT TO QUIT STATE FOR NOT USING HELP FOR SMOKING CESSATION?

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Objective: Many smokers wish to quit smoking, but few of those who try achieve successful absence from smoking. Several smoking cessation aids are available, but the different methods seem to be underused. Smoking prevalence is declining at a slow rate, and the social gradient in smoking is significant. We wanted to investigate possible reasons for not seeking help for smoking cessation.

Method: A web-panel was used, inviting 1,000 daily smokers in age group 20-50 years old in both Sweden and Norway. The main theme for the questionnaire was smoking cessation. Several statements concerning reasons for not seeking smoking cessation help was given with a 5-point scale, and recoded to disagree (1-3) and agree (4-5). Only daily smokers who stated a smoking cessation wish was included in the analysis, N = 1 766.

Results: The most common reason for not seeking help for smoking cessation among both men and women was the high cost of NRT and other pharmaceutical smoking cessation medicine (50% agree), and the belief that NRT is ineffective for smoking cessation (47% agree). Low SES smokers agreed at a higher extent than high SES smokers that NRT and other smoking cessation medicine was too expensive, and expressed a greater concern about long-term nicotine dependence as a result of using NRT for smoking cessation. On the other hand, high SES smokers more strongly agreed that seeking help for smoking cessation was too circumstantial. Among smokers who also used snus daily or occasionally, 3 out of 4 disagreed in the statements that "snus is not an acceptable aid for smoking cessation," "snus is not an effective method for smoking cessation," and "I am concerned that the use of snus for smoking cessation leads to stronger nicotine dependence."

Conclusion: NRT are seen as both an expensive method for smoking cessation, and lacks status as an effective method among potential quitters. There is also a concern of continued nicotine dependence using NRT among some groups of smokers. The attitudes among double users of tobacco, is that snus is seen as more effective for smoking cessation compared to NRT.

Norwegian Institute for Alcohol and Drug Research (Independent research institute, organized under the Norwegian Department of Health) and the Norwegian Research Council (also governmental institution).

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POS1-54 IS SELF-PERCEIVED RISK OF SMOKING RELATED TO PERCEIVED RISK OF SECOND-HAND SMOKE EXPOSURE? A CROSS-SECTIONAL STUDY OF SMOKERS WITH CHILDREN WITH ASTHMA

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No studies have examined the relationship between smokers' self-perceived risk of smoking and smokers' perceived risk of smoking effects on their children. We had two aims (1) to determine the relationship between self-perceived risk of smoking and risk to child, and (2) to determine whether child's asthma-related functional morbidity was associated with smokers' perceived risk of smoking to the child. Participants were 271 smokers (Mage=32.9 yrs, 79% female, Mcigs/day= 14.8, Mchild age=4.9 yrs) with children who had an emergency room admission for asthma within the past 3 months. We hypothesized (1) self-perceived smoking-related risk would be positively associated with self-perceived risk of smoking to the child, and (2) caregivers who have a child with greater asthma functional morbidity would have greater perceived risks for the effects of smoking on their child. Risk perception measures were: (1) perceived vulnerability (PV) to the health effects of smoking, (2) optimistic bias (OB: belief that personal risk is less than that faced by others), and (3) precaution effectiveness (PE: the belief that quitting smoking reduces risks). Each construct was measured with separate items for personal risk vs. risk to child. The Asthma Functional Severity Scale (AFSS) assessed the limitations imposed by asthma on the child in the past month (e.g., school days missed). Regression analyses, controlling for caregiver and child age, were performed with the specified child perceived risk measure as the DV. The results indicated that greater child PV was significantly associated with greater self PV (b=.28, p<.001). Greater child-PE was significantly associated with greater self PE (b=.13, p<.05) and self PV (b=.23, p<.001). Greater child OB was associated with greater self OB (b=.13, p<.05), lower self PV (b=-.20, p<.001), and lower self PE (b= -.14, p<.01). None of the perceived risk measures were significantly associated with asthma functional morbidity. Results show that interventions that focus on augmenting risk in one area may augment risk in another, and children's functional limitations regarding asthma may have little or no effect on perceived risk of smoking to child.

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POS1-55 THE IMPACT OF THE SMOKE-FREE LEGISLATION ON SMOKERS' MOTIVATION AND CONFIDENCE TO QUIT SMOKING: A COMPARISON OF TWO SAMPLES IN HONG KONG

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Background: The Hong Kong Government implemented a comprehensive smoke-free legislation on 1 January 2007, which restricts smoking in indoor workplaces, restaurants, karaokes, public places/park, beaches, and school (both indoor and outdoor). This study aims to examine the perceived self-efficacy to quit smoking of smokers from two study samples after the smoke-free legislation.

Method: Two cross-sectional samples were recruited. The first sample was Chinese youth smokers, aged 12-25, who called the Youth Quitline and received smoking cessation counseling. The second sample was Chinese smoking fathers living with non-smoking mother and a child aged ≤12 years old. We conducted a telephone survey in the two samples, consisted of 4 items on perceived impact of the legislation on self-efficacy to quit smoking and compared the proportions of smoking participants in the two studies by chi-square tests.

Results: A total of 288 youth smokers and 608 smoking fathers completed the questionnaires. 75% of the youth smokers were male, 67% were students, a mean age of 17 years, and 62% had mild nicotine dependency. The smoking fathers' mean age was 39.3 years, 75.1% had secondary education, 95.4% were currently employed, and 62% had mild nicotine dependency. In both samples, about one-third had increased in their motivation to quit smoking (youths vs. fathers) (37% vs. 26%), perceived importance in successful quitting (32% vs. 25%), confidence in quitting (28% vs. 18%); and fewer had perceived difficulty in quitting (11% vs. 6%). While the majority (>60%) remained no change, significant differences were observed in all the 4 variables between the two samples after the legislation ($p < 0.001$).

Conclusion: Although majority of the smoking fathers and youth smokers had little/no change after the legislation, more subjects reported an increase in motivation and confidence to quitting, suggesting the need for more effort from the government to promote smoking cessation. More youth smokers than smoking fathers showed positive changes indicating youth smokers are sensitive to the enactment of the legislation and changes in the overall environment, compared to adult smokers.

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POS1-56 SMOKING BELIEFS AND BEHAVIOR AMONG YOUTH IN SOUTH KOREA, TAIWAN, AND THAILAND

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Beliefs about smoking are important predictors of smoking behavior among adolescents, and adolescents who hold positive beliefs about the benefits of smoking are also at an increased risk of smoking initiation. An alarming fact is the rising smoking prevalence in Asian countries, particularly the increasing trend in smoking during adolescence. This cross-sectional study examined smoking beliefs and behavior among a nationally representative sample of youth in South Korea, Taiwan, and Thailand. Associations of beliefs and behaviors with pro-tobacco advertising exposure and smoking status were also examined. Data analyzed in this study were from 13-15 year old adolescents who participated in the 2005 Global Youth Tobacco Survey (GYTS) in South Korea (N=4,765) and Thailand (N=15,420), and the 2007 GYTS in Taiwan (N=3,955). The rate of ever smoking among youth was similar in all three countries and ranged from 26.7 to 28.0%. The prevalence of current smoking among youth in Thailand (11.4%) was nearly double the prevalence in South Korea (6.6%) and Taiwan (6.5%). Pro-tobacco advertising exposure, as well as older ages ($p < 0.001$), was a positive and significant predictor of positive beliefs about smoking among youth in all three countries. Findings regarding gender differences were mixed. Being male was significantly associated with increased positive smoking beliefs among youth in Thailand ($p < 0.001$). Being male, however, was associated with decreased positive smoking beliefs among youth in South Korea and Taiwan, but this relationship was significant only in South Korea ($p < 0.001$). These results suggest that greater attention should be directed to understanding the beliefs and attitudes about smoking among youth. Exploring the relationship between these factors and smoking behavior can provide a strong starting point in the development of effective smoking prevention interventions and tobacco control policies in this region.

This study was conducted while the first author was at Tulane University. No funding was received.

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POS1-57 BELIEFS ABOUT THE RELATIVE HARM OF SNUS AND CIGARETTES AMONG ADULT NORWEGIANS

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Background: The use of snus is related to health risks, but there is scientific consensus that this product is much less harmful to the user's health than smoking. The public debate presents mixed messages about the harmfulness of snus. We know little about how people perceive the relative harmfulness of different tobacco products.

Material and methods: The data comes from a set of yearly cross-sectional surveys conducted by Statistics Norway on behalf of the Directorate of Health. Data from 2003 to 2007 have been pooled, producing a sample of 6,262 respondents in the ages 16-74. Respondents were asked to rate harmfulness of different tobacco products available in Norway. Data about own use of these products were also collected, including the use of snus and NRT for cessation purposes. We first examined how the relative harm of the different products was rated by comparing mean scores. Perceived harmfulness was also analyzed in a logistic regression model where age, gender and own use of tobacco were included.

Results: Cigarettes were in general rated as more harmful than snus. Still, as much as 46% of the respondents rated snus as equally or more harmful than cigarettes. Women reported higher levels of harm in all products than men did, and so did older persons more than younger. Snus use was associated with reporting lower harmfulness of snus, while smoking had no influence on the reporting of harm from cigarettes.

Conclusion: The findings indicate that the Norwegian public has incorrect perceptions of the relative harmfulness of snus and cigarettes. This indicates a potential for changing people's perceptions of relative health risks in different tobacco product, so that more smokers may choose snus over cigarettes. The strategy of information would have to be developed with sensitivity of the risk of attracting new snus users who would not otherwise have used tobacco, as well as smokers who could manage to stop smoking without the help of snus.

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POS1-58 GENDER DIFFERENCES IN YOUTH SMOKING CESSATION

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There are a number of well-described differences in smoking behavior between males and females. For example, males tend to smoke more than females and more are more successful in the cessation attempts. Unfortunately, much of what is known about gender differences in smoking has been garnered from adult populations; relatively little is known about gender differences in groups of adolescent smokers. Moreover, even less is known about how gender differences in smoking behavior may influence cessation outcomes. The present study provides a descriptive overview of gender differences in a range of known correlates of smoking and smoking cessation in an adolescent population. Additionally, we seek to explore explain potential reasons for these differences. A sample of 425 adolescents completed questionnaires prior to beginning a cessation intervention and again at the end of the program. Separate hierarchical linear regression models were used to examine end-of-program cigarettes per day (CPD) as predicted by nicotine dependence, baseline CPD, motivation to quit, confidence in quitting, and several dimensions of expected utilities of smoking, including Behavioral, Emotional, and Habitual smoking utilities. Additionally, logistic regression models explored the ability to predict cessation status (i.e., quit or not-quit) following the program. Results show that whereas males reported smoking significantly more CPD than females at baseline, there were no differences in nicotine dependence, motivation, or confidence. Findings suggest that females who place a high value on smoking-related behaviors, such as enjoying "holding a cigarette" or "the process of lighting up a cigarette" or "watching as I exhale smoke" are significantly less likely to quit; even when controlling for initial motivation, confidence, nicotine dependence, and baseline CPD. However, this model does not hold for males. Result will also be presented which explore other potential meditational pathways, including smoking history and psychosocial variables. Results highlight the need to further investigate how gender plays a role in both ongoing smoking behavior and cessation efforts.

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POS1-59 USE OF SMOKERS' QUITLINE BY ASIAN LANGUAGE SPEAKERS: RESULTS FROM 15 YEARS OF OPERATION IN CALIFORNIA

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Tobacco quitlines have become an integral part of U.S. tobacco control programs, recommended by the U.S. Public Health Guidelines and supported by state public health agencies. Currently, all 50 U.S. states have quitlines, providing counseling service to tobacco users free of charge. However, none of them, except one, provides direct counseling to smokers who speak Asian languages (although some attempt to provide counseling through translation services). One reason for the lack of service in Asian languages is the perception that Asians generally do not seek counseling or "talk therapy." This is believed to be especially true for the less acculturated recent Asian immigrants, who are even less familiar with the concept of behavioral counseling. This study examines quitline utilization by smokers who speak Chinese, Vietnamese, or Korean. It uses data from the California quitline, which in 1993 established service and separate phone lines for three Asian languages, Chinese, Korean, and Vietnamese. From 1993 to 2008, this quitline served 22,061 Chinese-, Korean-, and Vietnamese-speaking callers. Using data from the 15 years of quitline operation in California and data from multiple California Health Interview Surveys (population-based), we computed call rates for three groups: Whites, English-speaking Asians, and Asian-language-speaking Asians. We found that English-speaking Asian smokers were significantly less likely than Whites to call the quitline (odds ratios ranged from 0.36 to 0.62), confirming the perception that the Asian Americans tend to be less likely to use behavioral service than Whites. However, smokers speaking Asian languages (namely the recent Asian immigrants) were no less likely than Whites to call (odds ratios ranged from 0.82 to 3.25). In some years, they were actually more likely to call the quitline than Whites. This unexpected difference between English-speaking Asian and Asian language-speaking Asians (when compared against Whites) will be discussed in relation to other tobacco control literature that has reported similar differences, contrary to the predictions based on acculturation theory.

The data analysis and writing were supported by National Cancer Institute Grants R01 CA104573. The California Smokers' Helpline's services provided in Mandarin, Cantonese, Korean, and Vietnamese have been supported by the California Dept. of Public Health, Tobacco Control Program, under contracts 90-10961, 92-15416, 96-27049, 00-90605, and 05-45834, and First 5 California, under contract CCFC-6810.

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POS1-60 DOES THE USE OF SNUS INCREASE THE RISK FOR LATER UPTAKE OF CIGARETTES. A LONGITUDINAL STUDY

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Aims and Background: An ongoing discussion is if the use of snus might increase the risk of later uptake of cigarettes, and in this study we wanted to illuminate the role of snus on underlying cognitions known to increase the risk of smoking initiation. This could elucidate mechanisms that establish a statistical correlation between the use of snus and subsequent onset of smoking. Expectancies has shown to be a strong predictor of smoking, and the purpose of this study was thus to investigate if non smoking adolescents significantly changed their expectancies of smoking after the introduction of snus, and if adolescents who were exclusive snus users changed their smoking expectancies during a two-year period.

Measurement: The data stems from a longitudinal study among Norwegian boys with three measuring points in the period '06-08 (mean age =16, 6 standard deviation 1, 1). Among the respondents, 904 were non-tobacco users, and 836 were exclusive snus users at the time of inclusion (T1). The response rates were 55 and 30% at T2 and T3, respectively. The questionnaire contained 28 expectancy items related to the use of cigarettes grouped as 8 expectancy scales: negative affect, state enhancement, weight control, negative physical feelings, sensorimotor manipulation, boredom reduction, social facilitation and negative social impression. Several t-tests were conducted to reveal any significant differences between the groups at different points in time.

Results: The analysis shows that adolescents who went from being non-tobacco users at T1 to starting to use snus at T2 (N= 69) had no significant changes in their expectancies to smoking cigarettes. However, among those who where exclusive snus users in the whole period fromT1 to T3 (N= 108) there could be traced significant changes in expectancies related to smoking and social facilitation. There was at T3 significant lower expectancies of cigarettes to facilitate social situations compared with T1.

Conclusion: The findings indicate that the use of snus does not significantly change smoking expectancies in the direction of increased risk of later uptake of cigarettes.

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POS1-61 NEW YORK PRESBYTERIAN TOBACCO CESSATION INITIATIVE: BASELINE KNOWLEDGE, ATTITUDES AND OPINIONS SURVEY

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In 2008-09, the New York Presbyterian Hospital (NYPH) developed a web-based training program for its healthcare providers. Completion of the training module will be mandatory for all house officers, nurse practitioners (NPs) and physician assistants (PAs) starting in late 2009. The educational program is part of a tobacco cessation effort at NYPH that includes provider and patient education programs and the implementation of a "smoke-free" campus. A pre-test survey was administered prior to participation in the educational program to assess tobacco cessation knowledge, attitudes and opinions. We report findings from 171 NPs and 212 PAs who completed the training program. Over 74% of respondents had received no prior education in tobacco cessation; 61% always or often asked their patients about tobacco use, and 71% always or often advised their patients to stop smoking. Only 24% felt confident or very confident in their ability to help a patient stop smoking and 20% rated their knowledge about helping patients to stop smoking as excellent or very good. PAs were less confident than NPs on their ability to assist a patient with tobacco cessation training (P=0.011), but rated their knowledge about helping patients to quit smoking at a higher level (p=0.021). 78% identified lack of knowledge as regularly or sometimes being a barrier to implementation of tobacco cessation activities. Counseling in combination with nicotine patch was thought to be the most effective way to assist a patient with a quit attempt (62% of respondents). Varenicline was thought to be the most effective pharmacotherapeutic agent for assisting patients with their quit attempt (51% of respondents). PAs and NPs reported that they incorporate asking about tobacco use and advising patients to stop smoking into their patient interactions, but felt limited in assisting and arranging behaviors by a lack of knowledge and self-efficacy about tobacco cessation activities. The NYPH tobacco cessation initiative is designed to increase healthcare provider knowledge and to increase tobacco cessation Asking, Advising, Assisting, and Arranging behaviors.

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POS1-62 A PILOT TEST OF A COMPUTER-GENERATED, TAILORED EMAIL MESSAGING PROGRAM FOR SMOKING CESSATION

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This session will review the development and pilot test of a computer-generated, tailored email-messaging program called the "Quit Smoking E-Messenger." The emails were developed as part of an efficacy study at the Nebraska State Quitline, which is managed by the American Cancer Society, to test whether proactive phone counseling enhanced with email messages will result in higher quit rates and caller satisfaction. Callers receive approximately 15 emails timed around their quitdate over the course of two months. Each email includes the following sections: (1) A personalized greeting; (2) The body of the email (tips on getting ready to quit; staying quit); (3) A table summarizing a client's key information (quit date, reasons for quitting, and social support in their life); and (4) A resources footer which includes web links. User feedback (n=25) on the design the emails will be reviewed, as well as key lessons learned.

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POS1-63 DO MENTAL HEALTH INPATIENTS WANT TO QUIT SMOKING?

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Introduction: Barriers to the provision of smoking cessation care for mental health patients include staff views that patients do not want to quit. The little evidence available however suggests such views may not reflect reality. This paper reports the findings of a survey of mental health inpatients, assessing: smoking prevalence, nicotine dependence, 'stage of change,' motivation to quit, and the existence and nature of previous quit attempts.

Methods: Patients were interviewed within the inpatient setting of a large regional mental health facility in NSW using a structured survey tool, incorporating the Fagerstrom Dependence Scale, Reasons for Quitting Scale, Readiness and Motivation to Quit Smoking Questionnaire, and a number of brief measures developed for this study concerning smoking and quitting behaviour.

Results: Findings are reported for 100 patients, utilising descriptive statistics to report smoking prevalence, motivation to quit and previous quit attempts. Key findings include a smoking prevalence of almost 100% and a majority who one day want to quit smoking, but a small proportion who plan to do so soon. The results of logistic regression analyses exploring differences in previous quit attempts and motivation to quit by demographic factors and clinical characteristics such as psychiatric diagnosis are also reported.

Conclusions/Significance: The study has provided quantitative data on motivation to quit smoking and previous quit attempts made, for mental health patients. It's findings will enable mental health staff to be better informed and hence assist in removing barriers to the provision of care for this significant population of smokers, and facilitate the development of cessation strategies.

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POS1-64 PARENTING BEHAVIOR AND SMOKING ESCALATION AMONG HIGH-RISK ADOLESCENTS

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Parenting has been linked to youth smoking patterns primarily through questionnaire assessments. This study, however, examined how direct observations of parent-adolescent interactions influenced male and female adolescent smoking escalation across time. Data for this study come from a large longitudinal investigation of the social and emotional contexts of adolescent smoking. All participants reported some smoking experimentation at baseline (Mean= 1.48 days smoked/month, SD = 3.30) and thus, were at high-risk for active smoking. Participants were ethnically and socioeconomically diverse 9th and 10th grade adolescents (N =332) with a mean age at baseline of 15.61 (SD = 0.62); 56.9% were female. Mothers averaged 44.55 (SD = 6.66) years of age and fathers averaged 47.42 years of age (SD = 7.35). Parent-adolescent interactions were videotaped in participants' homes between the baseline and 6-month waves. Parenting dimensions were assessed during a standard developmental parent-teen disagreement task. Parenting was coded using the well-validated Iowa Family Interaction Rating Scale (IFIRS). Four parenting factors emerged from factor analysis using varimax rotation: critical, directive, engaged, and developmentally supportive. Smoking was examined at baseline and 24 months by a self-report questionnaire assessing the total number of cigarettes smoked in the previous month. Using hierarchical moderated regression, we examined the main effects of each parenting dimension and its interaction with adolescent gender to predict 24-month smoking, controlling for baseline smoking and adolescent age. Models were conducted separately for mothers and fathers. Higher maternal engaged parenting was associated with decreased smoking for both males and females, B= -7.00, t(296) = -2.24, p<.05. Higher maternal critical parenting was associated with smoking escalation for males, B= 28.21, t(296) = 4.49, p< .01, but not females. There were no significant effects for fathers. Results suggest that different dimensions of parenting may be influential for reducing the risk of smoking escalation of high-risk male and female adolescents. Implications for prevention will be discussed.

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POS1-65 IGNITION STRENGTH OF 30 INTERNATIONAL CIGARETTE BRANDS

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Background: Cigarette-ignited fires are a leading cause of fire death and injury throughout much of the world and remain a global public health and safety problem. To reduce this burden, legislation in the United States and Canada requires cigarettes to conform to fire safety standards. However, most of the world remains unprotected.

Methods: The ignition strength of thirty cigarette brands from nine countries was measured using the ASTM E2187-04 "Standard Test Method for Measuring the Ignition Strength of Cigarettes." Cigarettes that do not burn full-length under this test method (<25% full-length burns) demonstrate a reduced ignition propensity (RIP) and are less likely than conventional cigarettes to ignite mattresses and other soft furnishings.

Results: Of the cigarette brands purchased in countries not requiring fire safety standards for cigarettes, 96% (963/1,000) of the cigarettes tested burned full-length and all of these brands exceeded 75% full-length burns. By contrast, only 4% (7/200) of the cigarettes from the United States and 5% (2/40) of the SRM 1082 Reference cigarettes burned full-length. None of the cigarette brands from the United States or the SRM 1082 Reference cigarettes exceeded 10% full-length burns.

Conclusion: The ignition strength of cigarettes can be greatly reduced through the passage of legislation requiring cigarettes to meet fire safety standards. RIP cigarettes have the potential to significantly decrease the number of fire deaths, injuries, and destruction of property caused by cigarette-ignited fire. To protect smokers, the public, and firefighters, globally, all cigarettes sold should be regulated for fire safety.

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POS1-66 TOBACCO PURCHASING PATTERNS AMONG SMOKERS WITH SERIOUS MENTAL ILLNESS

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Objective: Smokers with serious mental illness (SMI) consume almost half of the cigarettes sold in the United States yet little is known about their exact purchasing patterns and if these differ from smokers without mental illness.

Methods: We conducted a secondary data analysis to evaluate tobacco-purchasing patterns among smokers with SMI (n=192) and compared these results to a control group of smokers without mental illness (n=60) using data from two studies. Both groups were well matched on sociodemographic characteristics and amount smoked. Questions included site of purchase such as convenience store or gas station, Internet, mail order, Indian reservation and/or buying loose tobacco.

Results: Of the total sample (N=252) 54% were male, 80% were unemployed and 65% completed high school education or less. Results indicated that smokers with SMI were significantly less likely to buy tobacco products from the convenience store as compared to those without any mental illness (86% vs. 98%; p=0.005). Additionally, smokers with SMI were significantly more likely to buy tobacco products from the Internet as compared to controls (10% vs. 2%; p=0.032). Smokers with SMI were also significantly more likely to buy tobacco products through the mail (21% vs. 5%; p=0.003) and from Indian reservations (22% vs. 3%; p=<0.001) as compared to controls. Both groups had similar patterns for buying loose tobacco and rolling their own cigarettes (25% vs. 18%; p=0.382).

Conclusions: Interestingly, smokers with SMI are purchasing cigarettes through the Internet, despite the potential barriers of limited computer access and non-cash payment option. The lack of in-state Indian reservations in NJ, imply these purchases are also online or mail purchases. Taking extra steps to purchase tobacco in smokers with SMI may not only be attributable to low income, but also attributable to high levels of addiction. Buying loose tobacco would seem a reasonable economizing strategy for smokers with SMI, but this was no different in comparable low SES controls in our sample.

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POS1-67 MOTIVATORS FOR SMOKING CESSATION AND KNOWLEDGE AND PERCEPTION OF SMOKING RISKS/CONSEQUENCES AMONG PEOPLE WITH SCHIZOPHRENIA COMPARED TO NORMAL CONTROLS

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We examined the views and attitudes regarding health risks of cigarette smoking and motivators for cessation in smokers with schizophrenia (N=100) and smokers without a psychotic disorder (normals, N=100). The study included smokers who were not currently trying to quit aged 18-65 years. During the 2-3 hour visit, participants completed questionnaires and provided a breath CO sample 10 min after smoking one preferred-brand cigarette. Assessments in this analysis include: Smoking Consequences Questionnaire-Adult (SCQ-A), the Reasons for Quitting Scale (RFQ), and the Stages of Change (SOC). There were no differences in mean age of smoking onset (16.2 ± 5.4 years schizophrenia vs. 15.6 ± 5.5 years normals, p=0.44), frequency of smoking >20 cigarettes daily (23% schizophrenia vs. 26% normals, p=0.62), or in breath CO (28.0 ± 14.5 ppm schizophrenia vs. 22.9 ± 8.0 ppm normals, p=0.61). Compared with normals, people with schizophrenia had greater scores on stimulation/state enhancement, sensorimotor/taste manipulation, and social facilitating benefits from smoking. Normals had a greater appreciation of health risks associated with smoking than people with schizophrenia (p<0.0001). People with schizophrenia rated themselves as less motivated to quit smoking (1-7 Likert) (4.2 ± 1.9 vs. 3.4 ± 2.0, p=0.002) compared with normals. On the SOC, fewer people with schizophrenia were currently thinking of quitting smoking (39% vs. 64%, p=0.0005), but more people with schizophrenia reported a past quit attempt (88% vs. 70%, p=0.0028). Immediate reinforcement/rewards (p=0.02) and health concerns (p=0.0007) were greater motivators for considering smoking cessation for normals than for schizophrenia patients. People with schizophrenia reported a greater likelihood to stop smoking due to social pressure than normals (p=0.03). In conclusion, motivation for quitting in schizophrenia is significantly lower and quitting is less likely to occur for rewards and health consequences. This may be due in part to the greater benefits in state enhancement; taste manipulation and social facilitation people with this illness receive relative to controls.

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POS1-68 THE ASSOCIATION OF AVAILABILITY OF TOBACCO PRODUCTS WITH SOCIOECONOMIC AND RACIAL/ETHNIC CHARACTERISTICS OF NEIGHBORHOODS

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Objective: To examine the association of neighborhood median income and racial and ethnic composition with the availability of tobacco products in Omaha Metropolitan Area, Nebraska, USA.

Methods: A total of 94 census tracts were randomly selected. The outcome measures were percentage of stores that sold tobacco and the number of stores that sold tobacco per square mile in each census tract.

Results: Median household income was negatively associated ($p<0.001$) and percent African American ($p<0.001$) and percent Hispanic ($p=0.049$) were positively associated with percentage of stores that sold tobacco. Median household income was negatively associated ($p<0.001$) and percent Hispanic ($P=0.012$) was positively associated with the number of stores that sold tobacco per square mile.

Conclusion: Policies that reduce the number of tobacco outlets might reduce social disparities in tobacco use.

The study was funded by a grant from the Center for Reducing Health Disparities at the University of Nebraska Medical Center.

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POS1-69 MEASURING CONTRABAND TOBACCO USE WITH SELF-REPORT AND BUTT COLLECTION METHODS

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Background: While higher tobacco taxes have the positive consequence of reducing tobacco use, they can also trigger a shadow market of inexpensive contraband tobacco products. This has been the case in the Canadian provinces of Ontario and Quebec, and the U.S. state of New York. Because availability of cheap contraband cigarettes may counteract efforts to reduce tobacco use, it is important to learn more about contraband tobacco use. Unfortunately, measuring the extent of contraband use is hampered by the lack of reliable sales data and the possible reluctance of smokers to admit to purchasing (illegal) contraband cigarettes. This study investigated whether self-report and ground/receptacle collection of cigarette butts yielded similar estimates of contraband tobacco use in a young adult population.

Methods: Self-report data were collected from a sample of 1,143 students who voluntarily completed an anonymous online health assessment that was emailed to a representative sample of 6,100 students attending a 4-year Ontario university. Ground/receptacle collection of cigarette butts was done at four, outdoor, high-use smoking areas on the campus: near a dormitory, bus stop, campus pub, and library.

Results: Self-report data showed 18% of students were current smokers. Among these smokers, 14% had consumed contraband tobacco in the past 6 months; 4% reported 'usually' doing so. Ground/receptacle collection of butts suggested that 4.5% - 8% of discarded butts were contraband tobacco. (The proportion varied depending on whether or not butts that were 'beyond recognition' were counted in the denominator).

Significance: The limited congruence between measurement methods was not entirely surprising. The butt collection measure reveals the proportion of total tobacco use that is contraband tobacco use while the self-report measure reveals the proportion of smokers who use contraband. Using ground/receptacle collection of butts may circumvent concerns about smokers failing to self-report contraband use, but it does not elucidate how many smokers use contraband. Researchers must remain sensitive to limitations of various measures of contraband tobacco use.

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POS1-70 LIVEHELP: USING INSTANT MESSAGING TO COMMUNICATE WITH SMOKERS ABOUT CESSATION

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Instant messaging is increasingly being used as a form of communication. LiveHelp is the first of its kind instant messaging service offered by the National Cancer Institute (NCI) since 2001. LiveHelp offers real time access to reliable and accurate cancer and tobacco cessation information and resources. Due to the live interaction, clients can also anonymously share issues and receive support concerning tobacco cessation. Communicating via instant messaging poses unique challenges because of the lack of non-verbal cues (e.g., tone, facial expressions) that are present in varying degrees when communicating face-to-face or by telephone. We conducted a study to assess the nature of interaction between LiveHelp specialists and their clients using instant messaging. A total of 400 transcripts were randomly sampled — 200 transcripts, from a total of 1,138 dating between July and December 2004; and 200 transcripts from a total of 1,512 dating between January and June 2006. The research team conducted a global review of half of the transcripts to inform the development of a coding scheme. Three main themes (i.e., behaviors of LiveHelp specialists) found in the transcripts were disseminating information, building rapport, and engaging clients. Sub-codes were developed for each of the three topics. This paper discusses the different ways that LiveHelp specialists disseminated information (e.g., links, boilerplate language), built rapport (e.g., active listening, making affirmative statements, displaying empathy), and engaged clients (e.g., asking open ended question, working collaborative to develop quit plans). It also describes some of the unique barriers of communicating via instant messaging, and how to address these issues. The findings from this study suggest that instant messaging can be used to provide information, support, and/or counseling to clients either by itself or in concert with face-to-face or telephone communication.

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POS1-71 THE POTENTIAL REACH OF SMOKING CESSATION TREATMENT THROUGH PRIMARY CARE PRACTICE

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Objectives: Tobacco treatment guidelines have focused on providing intervention through primary care. Because healthcare access has changed in the U.S. population, this analysis is particularly important to identify subpopulations that are likely to be missed by tobacco treatment delivered in primary care settings. The purpose of this study is to revisit smoker utilization of primary care with a focus on major ethnic/racial groups in the U.S., gender, and age in order to describe the prevalence of smokers with a visit to a healthcare provider in the past 12 months.

Methods: We conducted secondary analyses of the adult responses to the 2006 National Health Interview Survey among smokers (N=4,866). We used SUDAAN to adjust for standard errors for the sampling design and adjusted for age, sex, race/ethnicity, education and insurance status.

Results: Overall, 61% of smokers reported having a visit to a general doctor (family medicine, general medicine, or internal medicine) in the past 12 months. Factors associated with not seeing a provider in the past 12 months were younger age (AOR=2.80; $p<0.0001$), male gender (AOR=1.79; $p<0.0001$), Hispanic ethnicity (AOR=1.27; $p<0.03$), and no insurance coverage (AOR=2.97; $p<0.0001$). Visiting a provider in the past 12 months varied widely among subgroups; Hispanic male smokers aged 18-32 years had the lowest prevalence of having a visit to a provider in the past 12 months at 33% compared to 84% among white non-Hispanic females over the age of 65.

Conclusions: Smokers are less likely to visit their doctors than previously reported. Those that are younger in age, male, or Hispanic are independently less likely to have had a doctor's visit in the past 12 months. When these characteristics are combined, there are subgroups that are even less likely to visit a doctor in the past 12 months, such as young, Hispanic males. The potential reach of clinic-based smoking cessation for these groups is limited. It is important to find alternative ways for delivering tobacco treatment to smokers in order to reach the goals of Healthy People 2010 and increase quit attempts among ethnic minorities.

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POS1-72 THE ASSOCIATION BETWEEN SOCIOECONOMIC STATUS AND SMOKING PREVALENCE AND INTENSITY AMONG MEN FROM DIFFERENT IMMIGRANT GROUPS IN OSLO, NORWAY

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Objectives: To analyze socioeconomic differences in smoking prevalence (daily smoking) and smoking intensity (number of cigarettes smoked per day) among men from different immigrant groups in Oslo, Norway.

Methods: Two connected health surveys conducted in Oslo in 2001/2002 were used. In the first study, all citizens in Oslo aged 30, 40, 45 and 59/60 years were invited. In the second study, all citizens aged 19-60 from the five largest immigrant groups in Oslo (born in Turkey, Iran, Pakistan, Sri Lanka or Vietnam), and who had not taken part in the first study were invited. The number included in the analysis was 2,294. Logistic regression was used to predict the odds of being a daily smoker and linear regression was used to predict the numbers of cigarettes smoked per day controlling for education, manual/non-manual work, receiving social security benefits and age.

Results: The overall importance of SES on smoking among men with immigrant backgrounds was modest. Among Iranians we found that the odds of being a daily smoker were lower among higher educated compared to lower educated (OR=0,7) and performing manual work gave higher odds of being a daily smokers than performing non-manual work (OR=1,8). Higher education predicted smoking fewer cigarettes per day (B=-2,7), while receiving social security benefits were associated with more cigarettes per day (B=3,4). Among Turkish men higher education predicted fewer cigarettes per day (B=-4,7), while performing manual work was associated with more cigarettes per day (B=3,4). Among Vietnamese, the odds of daily smoking were lower among higher educated than among lower educated (OR=0,6), while among Pakistanis receiving social security benefits was associated with a higher odds ratio for daily smoking (OR=1,8).

Conclusion: The relationship between SES and smoking among people with immigrant backgrounds is much less clear than among the majority population where smoking is more prevalent among people with lower education, manual work and higher degrees of social strain, e.g., receiving social security benefits. This indicates that other factors, perhaps more culturally specific, are important for whether one smokes or not.

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POS1-73 SOCIOECONOMIC DISADVANTAGE AND ABRUPT QUITTING

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Objective: Quitting smoking is done either abruptly or gradually. Likelihood of success is greater in abrupt quitting. The objective of this research was to examine socioeconomic differences in abrupt quitting.

Methods: The analysis used data from 6,034 smokers from Waves 1 through 6 (2002-2008) of the International Tobacco Control (ITC) Four Country Survey, a prospective study of a cohort of smokers in the US, Canada, UK, and Australia. Logistic regression was used to examine the association of socioeconomic disadvantage with abrupt quitting after controlling for a host of demographic, psychosocial, and smoking-related factors.

Results: One unit increase in a 12-point socioeconomic disadvantage index was associated with a decrease of 7% in the odds of abrupt quitting ($p < 0.001$).

Conclusion: Lower socioeconomic smokers are less likely to adopt abrupt quitting. The results shed light on the mechanism of the link between socioeconomic disadvantage and smoking behavior.

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POS1-74 REPORTED HEALTH EFFECTS OF PASSIVE SMOKING BY MALE INDOOR AND OUTDOOR BAR WORKERS IN IBADAN, NIGERIA

Olanrewaju Onigbogi*

Background: Exposure to passive tobacco smoke has been linked to a variety of health outcomes. Workplace exposure occurs in indoor bars and restaurants in Nigeria, which are the major areas where workers get exposed. This survey was conducted to evaluate the immediate and long-term reported health problems among a group of indoor bar workers and another group of outdoor bar workers and evaluate their perceptions of the dangers of passive tobacco smoke. The study included a self-reported component of general health feeling, common ailments and the number of sick days off work.

Methods: Interviewer-administered questionnaires were used for the study. The questionnaires had sections on knowledge about health effects of passive tobacco smoke and health problems of respondents as well as their attitude towards passive smoking. All the subjects were non-smokers and were male.

Results: The median duration of exposure to passive smoking was 2.5 months (range 1-13 months) in the indoor group. Seventy-nine respondents in the indoor group (83%) reported a poor health feeling as against 15 (15%) in the outdoor group. Cough and nasal irritation were reported in 10 (11%) of the workers in the indoor areas as against 8 (8%) in the outdoor areas ($P = 0.042$). Skin irritation were reported in 7 (6.2%) of those in the indoor areas as against 7 (7.0%) in the outdoor areas ($P = 0.11$), while acute eye irritation and watery discharges were reported in 14 (15%) of workers in the indoor areas as against 7 (7%) in the outdoor areas ($P = 0.015$), and nausea in 8 (9%) and 2 (2%) in indoor workers and outdoor workers respectively ($P = 0.03$).

Conclusion: The reported health feeling and common ailments among this group of workers point to the fact that indoor exposure to passive smoking may have impacted on the health of the workers. Further studies with a component measuring the SPM would be required to convince policy makers to take further action on enforcing the existing ban of smoking in indoor places.

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POS1-75 INORGANIC TOXICANT LEVELS IN CONTEMPORARY SMOKELESS TOBACCO PRODUCTS

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IARC monograph 89 summarised historical literature on the presence of carcinogens in smokeless tobacco products. 28 chemical agents are listed including nitrosamines, carbonyls, benzo(a)pyrene, angelica lactones, coumarin, ethyl carbamate, and a series of metallic and radioactive species. There is significant data in the literature concerning the levels of nitrosamines in smokeless tobaccos, but there is little information available for the majority of the other species. Much of the data is 20-30 years old but smokeless tobacco product styles, ingredients and production practises have undergone significant changes over this time. Moreover, most of the existing data has been generated on a small number of brands in each study with little comprehensive comparative information available on the contents of different product styles. A study was initiated in 2008 examining the levels of the agents in contemporary smokeless tobacco products from the US and Sweden. 70 smokeless tobacco brands, covering loose and pouched snus, chewing tobacco, dry and moist snuff, tobacco pellets and plug tobacco, were sourced covering all major manufacturers and 80-90% market share in both markets. The smokeless tobacco products were analysed for the metalloid species identified in Monograph 89 (the metals Arsenic, Nickel, Beryllium, and the radio-elements Polonium-210, Uranium-235 and -238), as well as other toxic metalloids and radioactive species previously identified in tobaccos and other plant materials (Cadmium, Chromium, Lead, Mercury, Selenium; the alpha emitters Uranium-234; Thorium-232, -230, -228; Radium-226; and beta emitter Lead-210). The following mean values (micrograms per gram) were obtained, Nickel 1.66, Chromium 0.85, Lead 0.59, Cadmium 0.53, Selenium 0.068, Arsenic 0.03, Beryllium 0.014, and Mercury: 0.01. Mean values for the radioactive species ranged from nanograms to atto-grams per gram. Comparison of measured values amongst different smokeless tobaccos styles, and with historic values will be presented at the meeting. This work extends significantly the available knowledge base on toxicant levels in contemporary Swedish and US smokeless tobaccos.

The study was funded by British American Tobacco.

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POS1-76 YOUNG ADULT SMOKING CESSATION IN WEST VIRGINIA: ATTITUDES, PERCEPTIONS AND QUITTING METHODS

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West Virginia has the highest rate of adult smoking prevalence in the US and high rates of young adult smoking at 45%, with an unmet need for cessation programs tailored to young adult smokers. This study was conducted to assess smoking behavior, attitudes, perceptions and quitting methods among young adult smokers in West Virginia. Data were collected among 118 college students by self-administered PDA programmed questionnaires at three West Virginia University campus locations across Morgantown, WV. All respondents were 18 to 25 years of age and current smokers (smoked at least one cigarette during past 30 days). A majority of respondents were male (58%), had first tried smoking at a mean age of 18.7 years, and 41.2% were ever daily smokers; although a majority did not self-identify as a smoker (59.4%). Less than half (41.2%) supported a smoke-free indoor/outdoor campus and 2/3rds of respondents were not at all concerned that smoking controlled their life. A majority was at least somewhat concerned about: the amount of money spent on cigarettes; the smell of hair and clothes from smoking; and smoking affecting their breathing or energy level. Approximately half of young adults (51%) had ever tried to quit smoking and of those, more than 90% had not used assisted cessation methods or NRT. The most common quitting methods were to stop buying cigarettes, to cut down on cigarettes, and to exercise more. Chi-square tests showed no significant differences by gender in respondents who ever tried to quit smoking; however, females were more likely to exercise more as a quitting method ($p<0.05$). Among this study sample, young adulthood was an important time for smoking initiation, and while a majority did not self-identify as smokers and were not concerned about smoking controlling their life, half reported at least one quit attempt. Assisted cessation methods, including NRT, were not commonly used in quit attempts and need to be promoted and tailored for this age group. A better understanding of young adult attitudes and smoking cessation practices may provide insight to target interventions and encourage successful quit attempts among this hard-to-reach population.

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POS1-77 PHYSICIAN USE OF SOCIAL NETWORKING SITES AS WEB ASSISTED TOBACCO INTERVENTION (WATI)

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Use of social networking media like Facebook is increasing, promoting the potential of information sharing across diverse ranges of health-related topics. Despite this growth, little is known about how physicians use social media in relation to their medical practice. Preliminary research indicates that physicians may use social networking websites for information gathering or to share research findings, and there appears to be a desire for asynchronous consultation through the medium's discussion board format. Literature addressing physician use of these tools within the healthcare setting or the potential to promote health is scarce. More information addressing the determinants of physician use is important to better understand how to best utilize social networking tools for public health benefit. It is also necessary to understand barriers that physicians face with social networking media, particularly a need for separation between their professional and personal lives. The Dean of Harvard Medical School recently warned faculty and students that unprofessional behaviour on such sites reflects poorly on them and the medical profession. The University of Florida concluded that up to 70% of their medical students had content within their Facebook profiles that could be interpreted negatively, and recommended that future professional competency training include "instruction on the intersection of personal and professional identities." This study seeks to understand how and why physicians use Facebook in the context of a Web Assisted Tobacco Intervention (WATI). A regional Cessation Center's Facebook page was created to provide physicians with resources to promote tobacco cessation with their patients. Over 150 health care providers trained in tobacco cessation counselling were invited to "become a fan of the page." Through key informant interviews, we identify social networking features that are most attractive and meaningful. Furthermore, those who have chosen not to use Facebook provide insight into the barriers to using social networking for health promotion. Recommendations for best practices for public health workers will be presented.

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POS1-78 CONTRASTING EFFECTS FROM SNUS AND NRT IN SMOKING CESSATION; RESULTS FROM A SURVEY OF SELF-SELECTED TREATMENT SEEKERS IN NORWAY

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Background: In the absence of RCTs, self-reports in surveys of self-selected treatment seekers can supply us with some evidence regarding the effectiveness of snus as compared to NRT for smoking cessation.

Material and Methods: 14 744 Norwegian males aged 20-50 years were randomly selected from a large web-panel (Synnovate), and invited through e-mail to answer a questionnaire electronically. Among the seven, 170 (48,6%) responding, there were 1 775 ex-smokers and 1 808 current smokers who informed about the methods used and the subsequent result from their latest quit attempt. Options were 'quit smoking,' 'dramatic reduction in smoking intensity,' 'some reduction in smoking intensity,' and 'smoke as before.'

Results: In a logistic regression model controlling for length of education, number of prior quit attempts, risk perception and age, the odds ratio for reporting total abstinence at the time of the survey were higher for single use of Champix (OR=4.95, $p=0.006$) and single use of snus (OR=2.68, $p<0.001$) as compared to single use of NRT (reference). Among ever-smokers reporting a quit attempt using snus, a majority of 62.4% reported continued use of snus either daily (43.8%) or occasionally (18.6%). 10% of smokers using a NRT-product were still using the patch or the gum at the time of the survey. After using snus as a quit smoking method, concomitant daily use of snus and cigarettes was observed in 8% of those with no reduction and 16% of those with some reduction in smoking intensity. Using NRT as a smoking cessation method was positively correlated with the use of other traditional smoking cessation aids (telephone counseling, attending groups, self help material, etc.), while the use of snus was negatively correlated.

Interpretation: According to self-reports from ever-smokers in an uncontrolled cross-sectional survey producing low degree of evidence, use of snus may increase quit rates compared to NRT. However, using snus as a smoking cessation method may result in prolonged nicotine addiction and also in double use of snus and cigarettes.

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POS1-79 THE THEORY OF PLANNED BEHAVIOR PREDICTS INTENTIONS TO QUIT SMOKING AMONG SMOKERS IN CHINA: LONGITUDINAL FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL (ITC) CHINA SURVEY

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According to the Theory of Planned Behavior, attitudes towards smoking, subjective norms, and perceived behavioural control all influence whether an individual is likely to intend to quit smoking. The purpose of this paper was to examine whether the Theory of Planned Behavior would predict intentions to quit smoking among smokers in China, a country with more positive attitudes and social norms in favour of smoking than Westernized countries. China also has the world's largest population of smokers and one of the lowest rates of quitting in the world. It is therefore important to understand which factors predict intentions to quit smoking. We analyzed data from the International Tobacco Control (ITC) China Survey, a face-to-face cohort survey of 3,087 adult smokers in 6 cities in China with data from Wave 1 (April-Aug 2006) and Wave 2 (Nov 2007-Jan 2008). Longitudinal analyses predicting intentions to quit smoking at Wave 2 found support for the Theory of Planned Behavior. Negative attitudes towards smoking (a combination of overall opinion of smoking and the belief that you enjoy smoking too much to give it up) at Wave 1 predicted an increase in intentions to quit smoking at Wave 2 ($p=0.004$, OR=2.06 (1.27-3.36)). Subjective norms were assessed using two items. The perception that people who are important to you believe you shouldn't smoke at Wave 1 was associated with increased intentions to quit smoking at Wave 2 ($p<0.001$, OR=1.73 (1.37-2.18)). Smokers at Wave 1 who believed that society disapproves of smoking were also more likely to intend to quit smoking at Wave 2 ($p=0.02$, OR=1.24 (1.04-1.47)). Finally, perceived behavioural control (self-efficacy of quitting) at Wave 1 also predicted increased intentions to quit smoking at Wave 2 ($p<0.001$, OR=1.76 (1.46-2.13)). Therefore the Theory of Planned Behavior was predictive of quit intentions, and is therefore relevant in China. Tobacco control policies addressing attitudes towards smoking, subjective norms (e.g., advertising denormalizing tobacco use), and self-efficacy of quitting (e.g., smoking cessation support) could have an impact on increasing intentions to quit smoking among smokers in China.

Chinese Center for Disease Control and Prevention, Canadian Institutes of Health Research, Canada (#79551), National Cancer Institute (NCI)/National Institute of Health (NIH R01 CA125116-01A1), Roswell Park Transdisciplinary Tobacco Use Research Center (TTURC- P50 CA111236), funded by the U.S. National Cancer Institute, with additional support from a Canadian Institutes of Health Research Doctoral Research Award, and the Canadian Institutes of Health Research Strategic Training Program in Tobacco Research.

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POS1-80 SUSCEPTIBILITY TO INITIATE CIGARETTE SMOKING AMONG YOUTH IN THREE ASIAN COUNTRIES: SOUTH KOREA, TAIWAN, AND THAILAND

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Growing public health concerns as a result of the opening of the foreign tobacco market provided an impetus for the development of tobacco control programs in South Korea, Taiwan, and Thailand. Countless efforts have been made in the area of youth smoking prevention, which has become the primary focus for many tobacco control programs. The design and evaluation of effective interventions to prevent smoking should be based on knowledge of the smoking uptake process which can take several years, considering that a number of behavioral transitions are involved in converting a youth never smoker to an established smoker. This cross-sectional study examined correlates of susceptibility to smoke among a nationally representative sample of youth in South Korea, Taiwan, and Thailand. Data analyzed were from 13-15 year old self-reported never smokers who participated in the 2005 Global Youth Tobacco Survey (GYTS) in South Korea (N = 3,440) and Thailand (N = 11,447), and the 2007 GYTS in Taiwan (N = 2,830). Logistic regression analysis indicated that having friends who smoke, having a more positive attitude towards smoking, increased exposure to pro-tobacco advertising, and lack of exposure to smoking prevention in the school curricula were significant predictors of susceptibility to smoke among youth and were found to be consistent across all three countries. Gender, age, parental smoking, and not having a family member discuss the harmful effects of smoking were also predictors, but findings were inconsistent and mixed. Results provide evidence-based data for targeting smoking prevention efforts in Asian countries towards individuals who are susceptible to future smoking. Our findings will help guide future interventions, including those addressing policy.

This study was conducted while the first author was at Tulane University. No funding was received.

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POS1-81 AIR NICOTINE CONCENTRATIONS GLOBALLY: A REVIEW OF THE LITERATURE

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Secondhand smoke (SHS) is a cause of chronic disease and death. The Framework Convention on Tobacco Control calls for the protection from exposure to tobacco smoke, defined as 100% smoke-free environments. SHS exposure has declined in many developed countries due to reductions in smoking prevalence and implementation of smoke-free legislation. This is not the case in many developing countries. Questionnaires have been routinely used to assess exposure to SHS but do not provide quantitative estimates of exposure. Air nicotine monitoring can provide objective information on the levels of a specific marker of tobacco smoke exposure in various locations. The 2006 US Surgeon General Report extensively reviewed and compiled the literature on concentrations of SHS in various settings, with the majority of studies focusing on the US. In this review, we summarized studies measuring indoor concentrations of vapor-phase nicotine in public places to describe levels of tobacco smoke exposure outside of the U.S. and to identify data gaps. Only articles in English and Spanish were included. Using PubMed, we identified 32 articles covering 33 different countries from five regions (Asia=3, Australia, Europe=17, Latin America=11 and North America [non-US]=1). Data were collected from 1984-2007. Of these countries, 15 are developing countries (Latin America=11, Asia=2 and Europe=2), based on World Bank classifications. Studies measuring differences pre/post smoke-free legislation were conducted in Europe (n=8) and China (n=1). Sampling method and time as well as summary statistics reported varied greatly across studies. Various venues were monitored but most measurements were collected in restaurants. The range of median concentrations in restaurants was 2.9 – 24.1μg/m3. In conclusion, there is a paucity of data on SHS exposure in public places in much of the world. Comparing concentrations of airborne nicotine within and/or between countries is complicated by differences in sampling protocols. Environmental monitoring of SHS exposure is needed in developing countries to document policy needs and evaluate the impact of smoke-free legislation.

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POS1-82 TOBACCO SALES AND PROMOTION IN BARS, CAFES, AND NIGHTCLUBS FROM 22 COUNTRIES AROUND THE WORLD

Shahida Shahrir*, Heather Wipfli, Erika Avila-Tang, Patrick Breysse, Jonathan Samet, and Ana Navas-Acien

With changing restrictions on how and where tobacco can be sold and advertised, tobacco companies are placing greater focus on bars, cafes, and nightclubs in their marketing strategies. Information must be gathered to better understand and control tobacco industry activities in these venues. Between 2007-2009, we administered a cross-sectional survey with bar/cafe/nightclub owners in 22 countries in 4 world regions (Americas, Eastern Europe, Asia and Africa) to evaluate the sales and marketing of tobacco products within these venues. A total of 212 establishments were included. After adjustment for years in business, occupancy, food menu, dance space, live music and smoking policy, venues recruited in Eastern Europe were 3.53 (95 percent CI: 1.07, 11.6) and 3.00 (95 percent CI: 1.16, 7.77) times more likely to sell and promote cigarettes, respectively, compared to the Americas. Compared to establishments with full smoking bans, the odds ratio for selling cigarettes was 8.46 (95 percent CI: 2.26, 31.6) for partial restrictions and 8.47 (95 percent CI: 2.94, 24.5) for no restriction. Establishments with a maximum occupancy greater than 100 customers were strongly associated with advertising, odds ratio 4.07 (95 percent CI: 1.88, 8.83), and receiving promotional items from tobacco companies, 3.47 (95 percent CI: 1.50, 8.04). Univariable associations with presence of dance space and live music disappeared after multivariable adjustment. Using a sentinel surveillance approach, our findings suggest that venues recruited in Eastern European countries and larger venues were at increased risk of tobacco industry influence in bars, cafes and nightclubs. The lack of a full smoking ban was also associated with the in-venue selling of cigarettes. Socializing venues need to be included in legislations regulating tobacco sales and promotions in countries around the world.

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POS1-83 WILL PARENTS QUIT SMOKING TO PROTECT THEIR KIDS FROM SECONDHAND SMOKE EXPOSURE? A SYSTEMATIC REVIEW AND META-ANALYSIS OF INTERVENTION TRIALS

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Background: Cessation remains the fastest way to reduce the burden of disease from smoking. Various techniques to encourage cessation are available, but none have high success rates. Some researchers have attempted to convince parents that their smoking affects their children's health, and that parental quitting benefits children. However, the evidence for effectiveness of this approach is mixed.

Objectives: To perform a systematic review and meta-analysis to quantify the effect of interventions to protect children from secondhand smoke exposure (SHSe) on parental quit rates.

Methods: We searched the following databases: Pubmed, Cochrane library, Web of Science, and PsycoInf. We included all randomized and nonrandomized controlled trials which aimed to protect children from SHSe, recruited parents of infants or young children, and measured parental (maternal, paternal, or both) quit rate. Analyses: Relative risks and risk differences were calculated using the Mantel-Haenszel random-effects approach to meta-analysis, with the Cochrane Collaboration's RevMan 5 software.

Results: Seventeen trials met the inclusion criteria. Interventions took place in hospitals, pediatric clinical settings, well baby clinics, and family homes. The size of individual trials varied. Interventions were performed by physicians, nurses, clinic staff, and research assistants. Quit rates averaged 22% in the intervention group and 17.9% in the control group. The interventions successfully increased the maternal quit rate (RR=1.34, CI: [1.04,1.73], p=.02), however, the size of the absolute effect was small: there was only a 4% difference between quit rates in the intervention and control groups (RD=0.04, CI: [0.01,0.06], p=.008).

Conclusions: The effectiveness of interventions to improve cessation which are aimed at parents of young children, with the intent to reduce child SHSe, produce success rates which are slightly higher than brief physician advice in the clinical setting. Thus, this approach may be a useful addition to the arsenal of cessation approaches. However, the small effect size suggests that most children may not benefit from the intervention.

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POSTER SESSION 2

POS2-1 RELATIONS OF THREE ANXIETY DISORDERS WITH NICOTINE DEPENDENCE, WITHDRAWAL AND CESSATION OUTCOME

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Rates of anxiety disorders are two to three times higher amongst smokers than in the general U.S. population. However, smoking rates among people with anxiety disorders range from 5-66%, depending on the specific disorder. To date, little is known about the relation between specific anxiety disorders and nicotine dependence, nicotine withdrawal and smoking cessation outcome. Using data from a randomized, double-blind smoking cessation trial (N = 1504; 58% women, 83.9% white, 13.6% African-American) we examined the relations between nicotine dependence, withdrawal and cessation outcome and three lifetime anxiety diagnoses (panic attacks, social phobia and generalized anxiety disorder [GAD]). Diagnoses were established using the WHO-CIDI interview for DSM-IV diagnoses. Participants had a mean age of 44.7 years (SD = 11.1) and smoked 21.43 cigarettes per day (SD = 8.93). In total, 579 participants received at least one lifetime anxiety disorder diagnosis: 78.6% (n = 455) had panic attacks, 34.4% (n = 199) had social phobia, 17.1% (n = 99) had GAD, and 25.9% (n = 150) had more than one anxiety disorder. Compared to smokers with no anxiety disorders, there were no differences for any of the anxiety groups in number of cigarettes smoked or other smoking history variables. However, the social phobia and GAD groups had higher FTND scores compared to the no-anxiety group, and the anxiety groups tended to score higher on most Wisconsin Inventory of Smoking Dependence Motives (WISDM) subscales. Smokers with a history of panic attacks had greater quit day increases in negative affect, while smokers with a history of GAD had greater post-quit increases in withdrawal. Panic attacks were associated with significantly worse cessation outcome at 8 weeks and 6-months post-quit. Social anxiety did not predict 8-week outcome but did predict 6-month outcome. GAD predicted 8-week but not 6-month cessation outcome. There were no treatments by anxiety category interactions. These findings suggest that specific anxiety disorders have differential relations with nicotine dependence, withdrawal and cessation.

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POS2-2 WEIGHT GAIN WHILE QUITTING: EFFECT OF COMPLIANCE WITH NICOTINE GUM DOSING

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Weight gain during cessation may be a barrier to quitting. Using nicotine gum can reduce the amount of weight gained when quitting. This effect may depend on medication compliance. In this analysis, we examined the relationship between weight gain and use of adequate amounts of gum. Contrasting the effects of active gum and placebo, and analyzing the effect of gum prospectively can help eliminate confounds that plague correlational analyses of the relationship between gum use and weight gain. In this randomized double-blind placebo controlled trial, we examined the effect on weight gain of the interaction between treatment (active vs. placebo) and daily gum use (≥9 pieces/day [compliant use] vs. <9 pieces/day). Subjects (n=608) were randomized to either active (2mg or 4mg) or placebo gum and instructed to use 9-15 pieces of gum/day for the first two months of treatment. Weight gain was assessed at 30 days among abstinent subjects. At the 30-day follow-up, smokers treated with active gum had not gained any less weight than those on placebo (1.1kg vs. 1.6kg, p=0.175). However, a significant gum use X treatment interaction was observed (p=0.005): While active gum users who used ≥9 pieces/day during the first 14 days of treatment had gained less weight at follow-up (0.6kg vs. 1.6kg for those who used <9 pieces/day, p=0.017), subjects randomized to the placebo group saw no such benefit from compliant gum use. A similar trend was seen when the data were analyzed retrospectively: When gum use and weight were both assessed at 30-days, a significant gum use X treatment interaction was also observed (p=0.038). The observed pattern of results indicates that it is the intake of nicotine from nicotine gum (rather than the effects of chewing a gum, per se, or the influence of other variables that might affect both gum use and abstinence) that helps mitigate weight gain during cessation. Using the recommended number of pieces of nicotine gum per day can help to reduce weight gained during quitting.

This re-analysis was funded by GlaxoSmithKline Consumer Healthcare. The original study was funded by grants DA06183 and DA10073 from NIDA and by the Department of Veterans Affairs. Through their work at PinneyAssociates, SF, SS, JR, & JG serve as consultants to GlaxoSmithKline Consumer Healthcare on an exclusive basis on matters relating to smoking cessation. Dr Shiffman and Mr. Gitchell also have an interest in a venture to develop a new nicotine replacement medication.

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POS2-3 DO SMOKERS WITH ASTHMATIC CHILDREN HAVE GREATER SMOKING-RELATED RISK PERCEPTION AND MOTIVATION TO QUIT THAN SMOKERS WITH HEALTHY CHILDREN?

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Controversy exists over whether medical illness constitutes a teachable moment that facilitates quitting among smokers. We examined differences in perceived risk, motivation to quit, and smoke exposure to their child between smokers whose children had an emergency room visit for asthma within the previous 3 months (Asthmatic Children, AC; N=271; M age=32.9, 79% female, M=14.8 cigs/day) vs. smokers whose children did not have asthma or emergency room visits (Healthy Children, HC; N=138, M age=37.1, 83% female, M=15.7 cigs/day). We hypothesized that AC would have greater perception of the risks of smoking, higher motivation to quit and lower smoke exposure to their child vs. HC. Participants were measured at pre-treatment in a study on asthma education/child wellness. Smoking was discussed but participants did not have to want to quit for study entry. Measures included: Contemplation Ladder (motivation to quit 1-10 scale; Biener & Abrams, 1991), stage of change, perceived vulnerability to the health effects of smoking, optimistic bias (belief that personal risk is less than that faced by others), precaution effectiveness (belief that quitting smoking will reduce risk) and Environmental Tobacco Smoke exposure (ETS; assessed by structured interview; highly correlated with objective measures; Matt, Hovell et al., 2000). After controlling for demographic differences (child and caregiver age) between HC and AC in multivariate regression, HC had higher levels of nicotine dependence (B = .79, SE = .26, p = .002; HC: M = 5.1; AC: M = 4.2), lower levels of motivation to quit (B = -.32, SE = .14 p = .02, HC: M = 6.2; AC: M = 6.6,), and greater levels of optimistic bias regarding the risks of their smoking to their child (B = .38, SE = .18, p = .03, HC: M = 3.1; AC: M = 2.7). A greater proportion of HC were not thinking of quitting smoking (% Precontemplators 9.4% HC vs. 4.1% AC, p=0.03). HC were less likely to have a household smoking ban (39.7% HC vs. 66.7% AC, p<0.001) and had higher levels of ETS in their home and car (B = -11.77, SE = 3.40, p = .001; HC: M = 26, AC: M = 12). Having a healthy child may engender a false sense of security regarding the effect of smoke exposure.

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POS2-4 SMOKING RELAPSE AFTER LONG-TERM ABSTINENCE

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Objective: There is a lack of prospective studies that have provided estimates of risk of relapse after long-term abstinence. To fill this gap, we use prospective data to estimate the probability of smoking relapse by length of sustained abstinence among former daily smokers who have quit for at least a year.

Method: Using longitudinal data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), a total of 5381 former smokers who had a history of daily smoking but who had not smoked any cigarettes in the year prior to the baseline interview were identified. Duration of abstinence was defined as number of years since last smoked at time of baseline interview. Relapse was defined as smoking at least 100 cigarettes at any time in the three-year follow-up period.

Results: Overall 5 percent of long-term abstinent smokers relapsed in the 3-year follow-up interval. There was an inverse association between duration of abstinence and probability of relapse. Probability of relapse for those abstinent for one year was 28 percent, decreasing to 14 – 17 percent for two to four years of abstinence, then steadily declining from 10 percent for 5 years of abstinence to 3 percent at 10 years of abstinence relapse. Relapse rates were 2 percent or less for duration of abstinence 11+ years. History of number of cigarettes smoked per day prior to abstinence was not related to risk of relapse.

Conclusion: These findings indicate that risk of smoking relapse was relatively high after a year of abstinence and diminished with increasing duration of abstinence. Nonetheless, even smokers with 5 years of abstinence have significant risk of relapse, regardless of how much they smoked prior to quitting. Treatment for smoking cessation should include long-term monitoring of patients who are able to achieve sustained cessation in order to provide early intervention if relapse occurs.

This work was completed while all authors were employees of GlaxoSmithKline.

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POS2-5 DISTRIBUTION OF FREE SMOKING CESSATION MEDICATION: HOW MUCH NICOTINE REPLACEMENT THERAPY TO OFFER?

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Background and Objective: Offering smoking cessation medication free of charge is an effective way to engage smokers to make a quit attempt. Pioneering programs in the United States and Canada have provided varying amounts nicotine replacement therapy (NRT) to smokers who wanted to quit smoking. The current analysis aims to provide insights that can help determine the appropriate amount of NRT to dispense in similar programs.

Methods: The data was collected as part of the STOP on the Road study, wherein half-day long cessation workshops were conducted in various localities in Ontario, Canada. Eligible participants were smokers (³10 cigarettes/day) who wanted to quit smoking. At the workshop, smokers attended a psychoeducation session (40 min) on smoking cessation and self-selected one of three types of NRT (patch, gum or inhaler) for 10 weeks. Follow-up data collected after 10 weeks were used to estimate the parameters in this analysis.

Results: 1,605 participants completed the 10-week follow-up: 58% female, 49 ± 12 yeas old and 63% smoked 20 or more cigarettes/day at baseline. The proportion (95% CI) of sample that reported using 'all of the NRT' was 19.8% (17.9-21.8), while 28.3% (26.1-30.5) used 'most of it', 46.5% (44.0-48.9) used 'some of it' and 5.4% (4.3-6.5) used 'none of it'. The 7-day point prevalence cessation rate (95% CI) varied amongst the four groups: 64% (59-70), 40% (35-44), 22% (19-25) and 20% (12-29), respectively. Significant predictors of cessation were low Heaviness of Smoking Index (HSI) score in the group that used 'all of the NRT' (OR: 1.8, 95%CI: 1.0-3.2), and low HSI score (OR: 2.0, 95%CI: 1.3-3.2) and one or more past quit attempt (OR: 3.0, 95%CI: 1.3-7.0) in the group that used 'most of the NRT.' One or more current psychiatric diagnoses as a predictor approached significance in the combined 'used some of the NRT' and 'used none of it' group (OR: 0.66, 95%CI: 0.41-1.04, p=0.075).

Conclusion: Offering 5 or more weeks of NRT may help keep many smokers engaged in the quit process longer, improving their chances of quitting smoking. Smokers with psychiatric diagnosis may particularly benefit from longer durations of NRT use.

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POS2-6 PROVIDING SMOKING CARE TO PSYCHIATRIC INPATIENTS: THE VIEWS OF AUSTRALIAN NURSE MANAGERS

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Objectives: Although smoking rates have reduced in general populations, the prevalence of smoking in psychiatric settings remains high. Previous research has not identified the factors that staff considers to be determinants of smoking care provision, nor whether staff attitudes are predictive of smoking care provision. The current study aims to describe the views of nurse managers in psychiatric inpatient settings regarding the provision of smoking care and to describe the factors that nurse managers perceive to be determinants of smoking care provision. The study also investigates whether there are associations between such nurse manager views and the provision of smoking care.

Methods: A cross-sectional survey was mailed to all public psychiatric inpatient units in New South Wales, Australia, for completion by Nurse Unit Managers.

Results: Of the identified 131 service units, 123 completed questionnaires were received (94%). Patient-related factors were considered to have a high level of influence on the provision of smoking care: patients requesting assistance to quit (58%), patients being receptive to interventions (52%), and patient health improving with quitting (45%). Units where the respondent reported that smoking care was as important as other roles were more likely to provide smoking care compared to units whose respondents did not hold this view (OR = 0.257, df = 1, p <0.01).

Conclusions: While the results indicate strong apparent support for the provision of smoking care, this support appears qualified by perceived patient readiness to quit, thereby suggesting that care is provided selectively rather than systematically for every smoking patient.

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POS2-7 ASSESSMENT OF DEPRESSION AMONG AFRICAN-AMERICAN LIGHT SMOKERS

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The relationship between depression and smoking is well documented. Smokers who try to quit may experience increased symptoms of depression, and depression has been linked to poorer treatment outcomes. This study evaluated two measures of depression, the 2-item Patient Health Questionnaire (PHQ-2) and the 10-item Center for Epidemiological Studies Depression Scale (CES-D), in 468 African American (AA) light smokers enrolled in an ongoing clinical trial of bupropion for smoking cessation. Participants smoked 7.9 cigarettes per day (cpd; SD=2.6), were predominantly female (65.0%), and had a mean age of 47.3 years (SD=11.3). At baseline, participants completed the PHQ-2 and CES-D, the Positive and Negative Affect Scale (PANAS), the 4-item Perceived Stress Scale (PSS-4), the Interpersonal Support Evaluation List (ISEL) measure of social support, and time to first cigarette. PHQ-2 scores range from 0 to 6 with a score of 3 or greater suggesting clinical depression: mean (SD) PHQ-2 score was 1.40 (1.55), with 20.94% of smokers reporting significant depressive symptoms. CES-D scores range from 0 to 28 with a score of 10 or greater reflecting clinical depression: mean (SD) CES-D score was 7.83 (5.34), with 33.33% of smokers reporting significant depressive symptoms. Cronbach's alphas for the PHQ-2 and CES-D were 0.64 and 0.65 respectively. These measures demonstrated a moderate association (kappa = 0.47), and 16.45% of the sample was identified as depressed using both measures. Using either the PHQ-2 or CES-D, individuals with greater depression reported lower income, education, social support, and positive affect, and greater levels of negative mood and stress (p<0.01). No significant differences were found based on gender, cigarettes per day, or time to first cigarette. Both PHQ-2 and CES-D identified a notable proportion of our sample reporting symptoms of depression, despite the fact that smokers using antidepressant medications were excluded from this study. Findings emphasize the need to address depression within the context of treatment. Future research will evaluate changes in depressive symptoms over the course of treatment and relation to cessation outcomes.

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POS2-8 PREDICTORS OF ATTRITION AND ADHERENCE TO NICOTINE PATCH AND EXERCISE INTERVENTION IN AN AID-TO-CESSATION TRIAL FOR WOMEN

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Attrition is a critical problem in clinical trials for substance use and dependence. To improve outcomes, factors related to attrition must be identified and addressed. This study sought to determine which baseline factors contribute to attrition, exercise adherence, and nicotine replacement therapy (NRT) in an aid-to-cessation clinical trial for female smokers. Three hundred females (18-55 years) were enrolled in a 15-week aid-to-cessation program combining with an exercise regimen and NRT. Demographic information, smoking history, depression, and smoking history and quitting motivation were measured at the baseline visit. Three major outcomes were analyzed: completion of the study, adherence to the exercise and NRT. Univariate analysis revealed significant differences in race ($p < .05$), education ($p < .01$), and socioeconomic status ($p < .01$) between those who dropped out following the baseline visit ("early dropouts"), those who dropped out after the baseline visit but prior to the 12-week follow-up ("late dropouts") and those who completed the 12-week treatment phase ("treatment completers"). Additionally, treatment completers had significantly fewer children at home ($p < .001$), a later age of initiation ($p = .05$), and more quit attempts ($p = .02$). Early dropouts also had significantly higher CES-D depression scale scores at baseline ($p= .04$). Those who adhered to the nicotine patch and exercise interventions were primarily white ($p = .02$ for NRT and $p= .01$ for exercise), had fewer children at home ($p < .001$; $p \leq .01$), had made more previous quit attempts ($p < .01$; $p< .05$), and had lower CES-D depression scale scores ($p = .01$; $p < .01$) than those who quit with the study but did not adhere. Attrition and adherence were strongly predicted by having fewer children in the home and demographic variables. Depression scores were significantly higher for women who dropped out early and did not adhere to the nicotine patch and exercise interventions, indicating the need to address depressive symptoms as they relate to smoking and exercise behaviors.

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POS2-9 USE OF ABSTINENCE MEASURES AND BIOCHEMICAL VERIFICATION TO ENHANCE METHODOLOGICAL RIGOR IN SMOKING CESSATION RESEARCH WITH CANCER PATIENTS

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Several abstinence measures have been proposed for use in smoking cessation clinical trials but studies have not examined the use of these measures in smokers with cancer. The aims of this presentation are to identify whether abstinence measures (7-day point prevalence (pp), continuous (CA) and categorical) differ among lung and head and neck cancer patients and determine discrepancies between self-report and biochemical verification of smoking. Standardized questionnaires were used to collect demographics, tobacco history and abstinence measures. Biochemical verification was done with carbon monoxide and urinary cotinine. Descriptive, Chi-square and Kappa statistics were used for analysis. Data were collected from 163 smokers or recent quitters (quit <6 months) at entry to the study, 132 and 121 had data collected at 3 and 6 months. The median age of participants was 57 years, 64% were male, 93% were white, 56% had lung cancer, and 46% of the lung cancer had stage IV disease. Seven-day pp for lung cancer patients was 53% compared with 68% of head and neck cancer patients at 6 months ($p=0.1$). CA for lung cancer patients was 40% compared with 64% for head and neck cancer patients at 6 months among quitters at study entry ($p=0.04$). Among lung cancer patients 31% were continuous quitters compared with 48% of head and neck cancer patients ($p=0.06$), whereas 33% of lung cancer patients were continuous smokers compared to 19% of head and neck cancer patients at 6 months (p-value=0.09). Kappa statistics for self-report and biochemical verification of smoking ranged between .74 to .87 for lung cancer and .84 to .94 for head and neck cancer. Significant differences were noted for CA rates between lung and head and neck cancer patients such that head and neck cancer patients who quit smoking before study entry were more likely to remain abstinent. The abstinence measures provide different information about smoking outcomes. Use of standardized measures is recommended so that outcomes among studies are comparable. There was substantial agreement between self-report and biochemical verification raising questions about the need for biochemical verification in cancer patients.

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POS2-10 INCREASING VARENICLINE TO 3 MGS/DAY IMPROVES ABSTINENCE RATES: A PRELIMINARY EFFICACY REPORT IN CANCER PATIENTS

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To our knowledge there are no published data on the efficacy of increasing the dose of varenicline for tobacco cessation beyond the current FDA approved daily maximum of 2 mgs. In a program designed to treat tobacco dependence in patients receiving care at a large cancer treatment center, we treated a total of 28 patients with varenicline 1mg twice a day for 6 weeks. Patients who had only a partial response to varenicline (reducing smoking to 2-5 cig/day, yet did not quit) but remained motivated received an increase in dose from 1 mg twice a day to 1 mg three times per day for an additional 6 weeks (2 mgs in AM and 1mg PM). For comparison, 28 control cases were selected from our patient population who were matched to the 28 experimental group cases on age, sex, race, cigarettes/day and FTND score, and also failed to quit after 2 weeks on the 2 mg dose. Controls remained on the 2 mg dose another 6 weeks (through week 12). In addition to varenicline, patients in both groups were provided with 6-8 sessions of 30-45 minutes of smoking cessation counseling based on cognitive behavioral and motivational interviewing therapies. At 12 weeks (end of treatment or EOT) abstinence outcome data (7 day point prevalence) were obtained by patient self-report and confirmed by expired CO (<10ppm) where possible. The difference between smokers receiving the 3 mgs vs. those on 2 mg per day, approached significance at EOT $\chi 2=3.43$, $p=0.064$. At week 12, 4 out of the 28 patients (14.29%) in the 2mg control group and 10 out of the 28 patients (35.71%) in the 3 mg group achieved abstinence (odd ratio=3.33, 95%CI .90 - 12.36). While these results require replication in a randomized placebo controlled trial, it may be that among our highly nicotine dependent sample (mean FTND=5), additional dosing of varenicline is required to boost abstinence rates among those who would otherwise not quit. The limitations of the study include the small sample size, open label and case-control design. However, these preliminary results suggest that increased dosing of varenicline in partial responders at 6 weeks may improve abstinence and warrant further study.

MD Anderson Cancer center through proceeds of Tobacco Settlement to the state of Texas.

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POS2-11 VARIABILITY IN OUTCOME AS A FUNCTION OF TREATMENT PROVIDER IN THE ENGLISH STOP SMOKING SERVICES

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Background: There is wide variability in outcome across the English stop smoking services (SSSs) but it is not clear (a) how far this can be accounted for by patient characteristics, differences in reporting standards, or treatment effectiveness, and (b) how far individual specialists and types of provision with each service also show variability in success rates.

Objective: The study aimed to assess whether the chances of a smoker quitting vary as a function of service provider adjusting for smoker characteristics. Design: This study used data from clients in three SSSs in England including client socio-demographic and smoking characteristics, medications used, type of treatment provider, and individual stop smoking specialist to predict Carbon Monoxide (CO)-verified abstinence 4 weeks after the quit date.

Results: A total of 16,312 clients were included. The 4-week CO-verified quit rate was 43%. In multivariable logistic regression models adjusting for all socio-demographic, smoking, and treatment characteristics including medications used, there were large differences in successful quit rates between provider types. The rank order for adjusted success rates (from most to least effective provider type) was general practice nurse, individual stop smoking specialist, drop-in clinic, pharmacist, and group counseling specialist ($p < 0.001$). These models also showed large differences in adjusted success rates between different individual specialists ($p < 0.001$).

Conclusion: Within the English SSSs, there is evidence of large differences in treatment outcomes according to type of service provision and individual stop smoking specialist, after adjusting for smoker and treatment characteristics.

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POS2-12 EARLY BREASTFEEDING PREDICTS CONTINUED SMOKING ABSTINENCE AMONG WOMEN WHO QUIT SMOKING DUE TO PREGNANCY

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The purpose of the current study was to characterize the relationship between early breastfeeding and continued postpartum smoking abstinence among women who quit smoking during or prior to pregnancy and were participating in a smoking cessation intervention. Logistic regression analyses were conducted to determine whether breastfeeding status at 8 weeks postpartum predicted continued smoking abstinence at 8 and 26 weeks postpartum. Although 81.9% reported that they intended to breastfeed, only 40.2% of participants reported breastfeeding at 8 weeks postpartum. Characteristics associated with breastfeeding included Caucasian race/ethnicity, greater education, higher annual household income, and being married or living with a significant other. Logistic regression analyses indicated that self-reported breastfeeding at 8 weeks postpartum was significantly associated with continued smoking abstinence at 8 weeks, $p < .001$; OR = 4.98 (95% CI, 2.42, 10.27), and 26 weeks postpartum, $p = .001$; OR = 4.15 (95% CI, 1.79, 9.63). Encouraging breastfeeding among women who quit smoking due to pregnancy may facilitate continued postpartum smoking abstinence, while concurrently increasing knowledge of and adherence to currently accepted infant feeding guidelines.

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POS2-13 ALCOHOL USE AND SMOKING CESSATION RATES OF NY QUITLINE CALLERS

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Based on published data showing that daily smokers have high rates of hazardous drinking and higher rates of smoking relapse, we hypothesized that New York State Smokers' Quitline callers would exhibit similar rates of risky drinking and that these callers would be more likely to relapse. We assessed hazardous drinking using both AUDIT-C and NIAAA published guidelines. We also compared point prevalence smoking cessation rates at 2 week and 3 month follow-up calls among callers based on whether or not the caller met criteria for hazardous drinking. Callers who could not be reached for follow-up were coded as smoking. For baseline rates of drinking for Quitline callers (N=30,667), 58.31% (17,883/30,667) reported drinking any alcohol at all, and 41.43% (12,706/30,667) reported drinking at hazardous levels as defined by the AUDIT-C. This rate was somewhat lower [24.28% (7,389/30,438)] but still substantial using NIAAA guidelines. The 2-week follow-up smoking cessation rates were significantly different by both the AUDIT-C [Risky drinker: 26.42% vs. Non-risky drinker: 28.77%; percent difference = 2.35%, chi-square = 4.81, p=0.03] and the NIAAA [Risky drinker: 24.26% vs. Non-risky drinker: 28.97%; percent difference = 4.71%, chi-square = 21.41, p<0.001] categorization. For the 3 month follow-up quit rates, the groups were not significantly different, potentially due to the smaller sample sizes, but the numerical difference remained large for the NIAAA categorization [Risky drinker: 16.92% vs. Non-risky drinker: 23.38%; percent difference = 6.46%, chi-square = 2.00, p=0.16]. Thus, a high proportion of callers to the NY Quitline were found to be drinking at hazardous levels using either AUDIT-C or NIAAA guidelines. Importantly, these callers had significantly less success quitting smoking. Given that the NY Quitline has the proven ability to reach approximately 280,000 smokers per year, these data reveal that at least 70,000 heavy drinking smokers (i.e., 25%) could potentially be reached and helped every year with an alcohol intervention.

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POS2-14 TASK PERSISTENCE PREDICTS EARLY SMOKING CESSATION SUCCESS IN SMOKERS WITH SCHIZOPHRENIA AND NON-PSYCHIATRIC CONTROLS

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Task persistence describes a tendency to persist on effortful tasks and may be the behavioral manifestation of distress tolerance. This suggests that people high in task persistence are likely to persist in the face of uncomfortable withdrawal symptoms and/or in response to craving to smoke. This study represents the first to evaluate task persistence in a sample of smokers with schizophrenia. Smokers with schizophrenia (N=72) and non-psychiatric controls (N=78) seeking tobacco dependence treatment in state-funded tobacco cessation clinics completed a mirror tracing task as a measure of task persistence before their target quit date. We conducted bivariate analyses to examine baseline differences between smokers with schizophrenia and non-psychiatric controls. Because we detected a significant relationship between receiving public assistance and diagnostic status ($p < .001$) and with persistence ($p = .03$) we included public assistance as a covariate in all subsequent analyses. ANCOVAs indicated that non-psychiatric control smokers were significantly more persistent than smokers with schizophrenia ($p = .006$). In addition, those who were able to maintain 48 hours abstinence post quit-date ($p = .041$) and those able to obtain 7-day point prevalence abstinence (CO confirmed) at 30-days ($p = .001$) were significantly more persistent than those less successful at quitting smoking. This study is the first to examine the ability of task persistence to prospectively predict short-term abstinence in smokers with schizophrenia and to demonstrate that smokers with schizophrenia are less persistent on a difficult task than non-psychiatric control smokers. This reduced persistence in smokers with schizophrenia may be one factor contributing to lower cessation rates as compared to non-psychiatric controls in randomized controlled trials. If future studies demonstrate that persistence is modifiable, this would have important implications for all smokers wishing to quit.

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POS2-15 CHRNB2 VARIATION AND SMOKING CESSATION IN FOUR RANDOMIZED CLINICAL TRIALS

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Single nucleotide polymorphisms (SNPs) at CHRNB2 (rs2072660 and rs2072661) have been associated with abstinence in smoking cessation trial participants randomized to bupropion or placebo. To further investigate patterns of effect for CHRNB2 SNPs in this trial and in three additional trials that differed in design, we evaluated, in a planned analysis, association of four CHRNB2 SNPs (rs2072659, rs2072660, rs2072661 and rs3811450, using a dominant model) with abstinence at the end of pharmacotherapy treatment. The four trials included N=1643 participants randomized or assigned to nicotine replacement therapies (NRTs), bupropion, placebo, varenicline, and combined NRTs plus bupropion, for a total of six pharmacotherapy arms (Arms) analyzed. Association results from unadjusted and adjusted analyses were similar despite significant differences in demographic and behavioral characteristics among the Arms. Genotype, haplotype, and diplotype frequencies and overall SNP linkage disequlibria (LD) were similar among Arms and among abstinent and non-abstinent participants within Arms. As expected, we observed statistically significant associations with abstinence at rs2072660 and rs2072661 in the bupropion and in the placebo Arms, a novel association at rs2072659 in the NRT plus bupropion Arm (Odds Ratio (OR)=2.90, 95% Confidence Interval (95%CI)=1.36–6.18, P=0.006) and significant heterogeneity for rs2072660 and rs2072659 associations with abstinence among Arms. The similarity of genetic parameters, differences in participant factors and trial design characteristics, and heterogeneous SNP abstinence association results, suggest that interaction analyses should be performed to identify the factors or characteristics influencing smoking cessation in interaction with CHRNB2.

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POS2-16 DOPAMINE D4 RECEPTOR GENE EXON-III VNTR POLYMORPHISM MODERATES THE EFFICACY OF BUPROPION FOR SMOKING CESSATION

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Bupropion sustained-release is a front line treatment for smoking cessation, which inhibits dopamine reuptake. A variable number of tandem repeats (VNTR) polymorphism in Exon-III of the Dopamine D4 (DRD4) receptor gene that is putatively functional has been shown to play a role in phenotypes relevant to addiction, including smoking relapse. We explored whether this polymorphism moderates the effects of bupropion on smoking cessation outcomes. Smokers (> 10 cig/day; N =334) of European ancestry took part in a double-blind placebo-controlled randomized trial of 12 weeks of treatment with bupropion SR plus counseling for smoking cessation. Alleles were classified as long (L) if they consisted of seven or more repeats, and short (S) if they consisted of six or fewer. Participants were grouped into those with at least one copy of the L allele (SL + LL) versus those with no copies (SS). Generalized estimating equations showed that bupropion (vs. placebo) was associated with increased odds of abstinence, B = 0.12, SE = 0.04, p = .002. The main effect of DRD4 was not significant, B = 0.06, SE = 0.04, p = .13. A significant DRD4 × bupropion interaction was found, B = 0.22, SE = 0.08, p = .006, such that bupropion had significant effects on abstinence in SL+LL smokers, B = 0.27, SE = 0.06, p < .0001, whereas bupropion did not have a significant effect among SS smokers, B = 0.05, SE = 0.05, p = .28. Abstinence rates in the SL+LL group, by treatment (bupropion vs. placebo), were as follows: end of treatment (EOT) (60% vs. 21%, p < .0001), 2 (47% vs. 14%, p = .0003), 6 (36% vs. 5%, p < .0001), and 12 (21% vs. 9%, p = .08) month follow up. Abstinence rates in the SS group were: EOT (55% vs. 42%, p = .04), 2 (40 vs. 30%, p = .12), 6 (25% vs. 23%, p = .78), and 12 (19% vs. 21%, p = .74) month. The DRD4 × bupropion interaction remained significant when controlling for gender and depression severity, B = 0.24, SE = 0.08, p = .005. Bupropion may be more efficacious for smokers who carry the L allele than those who do not. These findings are relevant to personalized treatment approaches, and shed light on the neuropharmacological underpinnings of smoking relapse.

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POS2-17 ADHERENCE TO STUDY MEDICATION AND CESSATION OUTCOMES IN A RANDOMIZED PILOT STUDY OF CHANTIX AMONG AFRICAN AMERICAN SMOKERS

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African Americans (AA) have had lower than expected quit rates in previous studies due, in part, to sub-optimal pharmacotherapy adherence. Improving medication adherence could significantly increase tobacco treatment outcomes in this high-risk group. This 3-month pilot study estimated the effect of counseling for increasing medication compliance and cessation. 72 AA smokers [>10 cigarettes per day (cpd)] were randomized to adherence support (AS; n=36) or standard care (SC; n=36). All participants received 3 months of Chantix and quit day counseling. AS participants received 5 additional counseling sessions (Days 8, 12, 20, 28, 56) focused on managing medication side effects and developing adherence aids. Adherence was measured by pill count at months 1, 2, and 3. Cessation was measured by cotinine at month 3 and carbon monoxide (CO) at months 1 and 2. Follow-up is ongoing. Interim findings for the 51 completing Month 2 are presented. Participants were 46.8 (12.5) years of age, predominately female (62.8%), and smoked an average of 16.8 (5.8) cpd. The majority experienced gas (52.1%), nausea (44.9%), and/or dry mouth (40.8%) that they largely attributed to Chantix. At Month 2, no treatment effect was found for adherence [AS=93.6% (13.3) versus SC=86.1% (19.5)] or quitting (AS=29.2% versus SC=25.9%). Across treatment, adherence [89.9%(16.9)] and CO-verified quitting (27.5%) were promising. Chantix may be effective among AA smokers. Quit rates may be due, in part, to excellent adherence that was achieved despite a high rate of reported side effects. A pillbox alone may be an adequate adherence intervention, although findings should be tested in a fully powered clinical trial. More work is also needed to determine optimal levels of adherence and to discern the relationship between adherence and quitting using both objective (Chantix steady-state) and self-report measures of adherence. We will report these findings on all 72 participants at the conclusion of the trial.

This research was conducted at the University of Kansas School of Medicine with support from Pfizer Global Pharmaceuticals and the Kansas Masonic Cancer Research Institute.

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POS2-18 NALTREXONE AND VARENICLINE: WEIGHT GAIN AND TOLERABILITY IN SMOKERS

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Varenicline is an effective smoking cessation medication, but it does not reduce post-quit weight gain. Hence, weight concerns may keep some smokers from taking advantage of this valuable therapy. A potential solution would be to combine varenicline with an agent that reduces weight gain, such as low dose naltrexone. We conducted a pilot clinical trial of 25 mg naltrexone compared to placebo for minimizing weight gain in combination with varenicline for smoking cessation. Individuals (N=40) who smoked at least 10 cigarettes per day received open-label varenicline for 12 weeks according to the recommended titration schedule up to 1 mg twice daily. Subjects were randomized to receive either placebo (n=19) or 25 mg naltrexone (n=21) daily, with treatment starting at the quit date (after 1 week on varenicline to minimize nausea, a side effect of both varenicline and naltrexone) and continuing for 11 weeks. All participants received weekly brief behavioral counseling based on CBT to reduce weight concerns. The primary outcome was change in weight from baseline to the end of treatment for participants who completed the study. Nausea was the only adverse event that showed higher rates in the 25 mg group as compared to placebo. There was no difference between the groups in post-quit weight gain [naltrexone (n=17): 3.35 lbs + 6.61 vs. placebo (n=11): 4.14 lbs + 5.15, p=0.74, d=0.13]. When examining separately by gender, although still non-significant, weight gain was numerically lower in the naltrexone group [Males: naltrexone (n=4): 0.88 lbs + 6.98 vs. placebo (n=5): 2.40 lbs + 6.22, p=0.74, d=.23; Females: naltrexone (n=13): 4.12 lbs + 6.59 vs. placebo (n=6): 5.58 lbs + 4.07, p=.62, d=.27]. Smoking abstinence rates were not significantly different (naltrexone: 47.6% vs. placebo: 36.8%, OR=0.64, CI=0.18-2.28, p=0.49). This preliminary study suggests that low dose naltrexone in conjunction with varenicline appears to be well tolerated. Small effect sizes were found for reductions in weight gain and improved quit rates. Future studies should consider examining the tolerability and efficacy of higher naltrexone doses that show greater evidence of smoking efficacy.

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POS2-19 ADHERENCE TO STUDY MEDICATION AMONG AFRICAN-AMERICAN LIGHT SMOKERS ENROLLED IN A PLACEBO-CONTROLLED TRIAL OF BUPROPION

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Improving pharmacotherapy adherence could increase smoking cessation. Little is known about factors most likely to facilitate adherence in special populations. This study describes adherence to 3 weeks of study medication and examines factors related to adherence among 366 African American (AA) light smokers [≤10 cigarettes per day (cpd)] in a cessation trial of bupropion SR (active versus placebo) and counseling. Adherence was measured using self-reported 3-day recall of daily pill consumption. Participants were 47.9 (11.4) years of age, predominately female (63.4%), and smoked an average of 7.9 (2.6) cpd. Mean adherence at week 3 was 79.4% (35.5). The majority (67.8%) reported taking ≥ 70% of the study medication over the last three days. No differences were found in age, income, education, employment, marital status, cpd, alcohol use, perceived stress, or withdrawal and craving change scores (baseline to week 3) between adherent (≥70%) and non-adherent (<70%) participants. Significant individual associations were found between adherence and nicotine dependence; 77.5% of individuals who smoked >30 minutes after waking were adherent versus 63.5% who smoked ≤30 minutes of waking [$\chi 2$ (1)=6.9, p<0.01)]. Trends were found for gender [60.5% of females versus 39.5% of males had ≥ 70% adherence, 2 (1)=2.9, p<0.10] and depressive symptoms [CES-D of adherent=7.5(5.3) versus non-adherent=8.5(5.5), f (1,364)= 2.9, p<0.10]. From these findings a significant reduced model was constructed (Wald $\chi 2$ (1)=6.8, p<0.01). Only nicotine dependence was retained; participants who smoked their first cigarette >30 minutes after waking were 2 times more likely to be adherent than those who smoked their first cigarette ≤30 minutes after waking (OR=2.0, 95% CI=1.2-3.3). Lower dependence may be associated with better adherence in AA light smokers. More work is needed to determine optimal levels of adherence and to examine the relationship between adherence and quitting. Objective measures of adherence are also needed. At the conclusion of this study we will report bupropion steady-state and re-examine the relationships described here with this objective adherence measure.

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POS2-20 NICOTINE REPLACEMENT PRESCRIBING TRENDS IN A LARGE PSYCHIATRIC HOSPITAL, BEFORE AND AFTER IMPLEMENTATION OF A HOSPITAL-WIDE SMOKING BAN

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We examined the change in prescribing patterns for nicotine replacement therapies (NRT) in a large, academic, psychiatric hospital before and after the implementation of a smoking ban. The ban went effect on January 1, 2007. NRT utilization data were extracted from hospital pharmacy records for the two years before and after the ban, representing n=25,996 total inpatient hospital admissions. As expected, the average monthly rate of NRT utilization increased significantly after the ban. The average utilization for nicotine gum and lozenges (combined) rose from M=172.38 (SD=183.52) to M=3485.04 (SD=2356.93) doses per month after the ban (>2000% increase, p<0.0001). Similarly, the average monthly utilization for nicotine patch rose from M=82.13 (SD=34.15) to M=894.42 (SD=114.85) patches per month after the ban (>1000% increase, p<0.0001). Overall, these findings suggest that physicians are more likely to identify and treat symptoms of nicotine dependence when smoking is restricted. Psychiatrists and psychiatry residents should be encouraged to continue assessing and treating nicotine withdrawal symptoms to limit their interference in the treatment of other psychiatric and substance use disorders, including schizophrenia, mood, and anxiety disorders.

This study was conducted while the first author was at Western Psychiatric Institute and Clinic. This project was not funded.

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POS2-21 TESTING THE FEASIBILITY AND FIDELITY OF TELEHEALTH CARE MANAGEMENT AND TOBACCO CESSATION FOR VETERANS WITH PTSD

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Veterans smoke at a higher rate (22%) than the U.S. adult population (19.8%), and veterans with Post Traumatic Stress Disorder (PTSD) have even higher rates of smoking (53-66%). Care management using telehealth has been shown to improve access to care while reducing costs for veterans with chronic diseases. Motivational Interviewing (MI) can enhance readiness for change. It is important to test the fidelity of a psychosocial intervention to ensure validity and reliability. This study tested the feasibility and fidelity of a MI driven telehealth strategy to improve quit rates of veterans with PTSD. Veterans were recruited from the Denver VA Medical Center. A home telemonitoring device was used to deliver a stage-based/MI cessation intervention coupled with weekly MI counseling tailored to the patient's readiness to quit. The cessation intervention was delivered daily for 90 brief sessions through the device. Eleven patients were enrolled; one patient voluntarily dropped out and three patients did not complete the study due to changes in eligibility. Treatment fidelity was assessed through expert review, daily usage, scoring of counseling, patient satisfaction surveys, and smoking behavior changes. Results showed an average of 104 minutes/week in counseling time (19 minutes/call). Subjects completed the intervention in an average of 126 days. Monthly completion rates were 64% (counseling) and 66.3% (device). The nurse collaborated with patients to set current and future discussion topics as well as adhered to MI principles. Patients reported satisfaction with home telemonitoring and counseling. Patient behaviors were measured by daily device use and counseling sessions, number of cigarettes smoked in last 24 hours and stage of change. A significant relationship was found between the number of completed device sessions/counseling and stage of change (p 0.013). Two veterans quit smoking. These results demonstrate treatment fidelity and feasibility to deliver the telehealth strategy as intended. Patients report high satisfaction with this experience. With feasibility and fidelity established, the intervention will be studied in a larger randomized trial.

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POS2-22 PREGNANCY SMOKING, ETS EXPOSURE, AND BIRTH OUTCOMES: RELATIVE RISK AND TIMING OF EXPOSURE

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Background: Research has revealed associations between pregnancy smoking and adverse pregnancy, birth, and long-term child health and developmental outcomes. Less well studied and understood is the potential role of environmental tobacco smoke (ETS). The goal of the current study was to examine links between pregnancy smoking, ETS, and birth outcomes, the relative risk of each, and the possible role of timing of exposure.

Methods: 665 pregnant women from Southern Appalachia were recruited at entry to prenatal care based on smoking and smoke exposure status. Interviews were conducted and medical charts were reviewed.

Results: Women who smoked throughout pregnancy had significantly worse birth outcomes, including decreased birth weight and length, reduced gestational length, increased risk of fetal loss, and increased rates of NICU admission, compared with those who quit smoking by 20 weeks. Smoking at least a half pack per day was associated with the highest risk. Women with significant ETS exposure throughout pregnancy had birth outcomes comparable to, and in some cases worse than, those of active smokers, and significantly worse than those who smoked early in pregnancy but quit by 20 weeks. Risk was moderately reduced for those who eliminated active ETS exposure by 20 weeks. Effects remained after control for potential confounders.

Conclusions: In this sample, pregnancy ETS exposure was as detrimental as pregnancy smoking with respect to birth outcomes. In addition, the effects of both smoking and ETS were minimized if eliminated by 20 weeks. Findings underscore the need to address both active smoking and ETS during pregnancy, and the benefits of smoking cessation and elimination of ETS even into the second trimester.

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POS2-23 ROUTINE ASSESSMENT OF SEXUAL ORIENTATION IN TOBACCO USERS SEEKING CESSATION HELP

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Smoking prevalence is higher among lesbian, gay, bisexual, and transgender individuals (LGBT) than among heterosexuals. State tobacco quitlines can play a role in helping LGBT smokers quit because the convenience and the anonymity of telephone counseling result in broad program reach across age, gender, ethnicity, and sexual orientation. A controversy exists about whether to assess sexual orientation during intake when smokers first call the quitline for help. The controversy is instructive because it represents a tension that sometimes exists between behavioral service programs that focus on serving individual clients and advocacy efforts that focus on changing social norms. One view is that routinely asking callers about sexual orientation would communicate that the program is welcoming to LGBT callers. On the other hand, there is concern that callers, from both the heterosexual and LGBT communities, may find the question out of context, confusing, or even intrusive. We embedded a study within an ongoing state quitline to obtain empirical data to help make an informed decision. Callers (N=23,866) to the California Smokers' Helpline were randomly assigned to be asked their sexual orientation at intake or not. Measures of program impact included length of intake call, rate of enrollment in counseling, refusal rate, spontaneous comments made, and rate of calling back for service. About 2% refused to answer the sexual orientation question. There was no difference in enrollment in counseling between the two experimental conditions. However, among those who initially did not opt for counseling, there was a significantly lower rate of calling back for more service among those asked their sexual orientation (9.2% vs. 11.4%, p<0.05). Qualitative information about comfort with being asked sexual orientation in the quitline setting was gathered through structured interviews of a random selection of responders. Comfort level was highly variable both within and between sexual orientation groups. Implications of the findings for both quitline operation and outreach to LGBT smokers will be discussed.

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POS2-24 VIEWING SMOKING SCENES IN FILMS: IMPLICATIONS FOR IMMEDIATE SMOKING BEHAVIOR

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The National Cancer Institute identified exposure to smoking in movies as a cause of adolescent smoking, and other data show an association between exposure to smoking in movies and young adult smoking behavior. The goal of the current experimental study was to investigate the direct effect of exposure to smoking scenes in a movie montage on subsequent smoking behavior in a sample of young adult smokers. Participants were 100 cigarette smokers recruited from the San Francisco Bay Area and tested in a university medical center. They were randomly assigned to watch a movie montage comprised of clips that either did or did not contain smoking scenes. All participants were then given a 10-minute break, and whether or not they smoked during the break (assessed by a breath carbon monoxide sample) served as the primary dependent variable. Participants were not aware that a primary goal of the study was to measure their smoking behavior during the break, so as not to influence their decision to smoke. Results confirmed a causal relationship between exposure to smoking scenes in the film clips and subsequent smoking behavior. Smokers who watched the montage with smoking scenes were more likely to smoke during the break than those who watched the smoke-free montage (OR=3.32, 95% CI 1.12-9.85). Greater prior exposure to smoking in movies (OR=6.84, CI, 1.09-42.88), greater level of nicotine dependence (OR 1.58, CI 1.20-2.07) and earlier stage of readiness to quit smoking (OR 0.15, CI 0.03-0.76) also predicted smoking during the break. The results suggest that individuals who are attempting to reduce or quit smoking should refrain from or reduce their exposure to movies that contain smoking behaviors and paraphernalia. The results may also have implications for the necessity of preventative steps by the U.S. film industry to reduce the impact of exposure to smoking on screen.

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POS2-26 iPHONE APPS FOR SMOKING CESSATION: A CONTENT ANALYSIS

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Recent studies have demonstrated that mobile phones — using text messaging — can be useful in helping people quit smoking. With the proliferation of smartphones such as the iPhone, mobile phones are being used in novel ways to promote smoking cessation. This study set out to examine the content of the 52 iPhone applications (apps) for smoking cessation which are distributed through the iTunes store. Each app was independently coded by two reviewers for their (1) approach to smoking cessation; (2) adherence the US Public Health Service's 2008 Clinical Practice Guidelines for Treating Tobacco Use and Dependence; and (3) popularity of use. Results indicate that most apps used a calendar approach (30.8%) followed by a calculator (25.0%), rationing (9.6%), and hypnosis (7.7%) approach. Of the 9 apps that were most frequently downloaded, the majority were calendar and hypnosis apps. Few, if any, apps recommended or linked the user to proven treatments such as pharmacotherapy, counseling and/or a quitline. Download frequency of an app was unrelated to adherence to evidence-based practices. iPhone apps represent a potentially powerful tool in smoking cessation, and current apps could be much improved by following established guidelines for smoking cessation.

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POS2-27 COMPUTER-BASED, HIGH-REACH INTERVENTIONS FOR SMOKING DURING PREGNANCY

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Background: Smoking during pregnancy is associated with a wide range of negative effects. Efficacious interventions for this population are available, including brief "5As" interventions and contingency management (CM), but multiple obstacles have limited their implementation in prenatal care settings. We therefore developed two highly replicable interventions for smoking during pregnancy: (a) an interactive, single-session, computer-delivered 5As-based brief intervention, and (b) a computer-assisted, simplified and low-intensity CM through which participants can receive a $50 gift card, at up to five separate prenatal clinic visits, if they notify staff and provide a cotinine-free urine sample.

Method: In this Stage I, 2 x 2 clinical trial, pregnant smokers attending one of several prenatal care clinics in Detroit are being randomly assigned to either the 5A session only, low-intensity CM only, both, or neither. Primary outcomes are acceptability/feasibility of the two interventions, smoking at 8-week follow-up, and birth weight.

Results: At present, a total of 95 out of a planned 120 participants have been recruited. Of 45 women receiving the brief motivational intervention to date, ratings of acceptability and feasibility are very high: on a 1-5 scale, ratings for ease of use, helpfulness, respectfulness, and impact on future smoking ranged between 4.3 and 4.9. Of 49 women assigned to the low-intensity CM condition for at least two weeks, 15 (30.6%) have self-initiated at least one episode of testing urine for cotinine (with the vast majority of these samples, as expected, being negative for cotinine). Outcome data will be presented in terms of breath CO-confirmed self-report and urinary cotinine for each of the four groups.

Discussion: The computer-delivered 5A intervention is clearly feasible and acceptable; use of the low-intensity CM intervention is modest. Possible modifications based on these Stage I results will be discussed. It is hoped that a simplified, computer-based intervention could promote the widespread adoption of effective smoking cessation activities in prenatal clinics.

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POS2-28 WEB-BASED MOBILE SUPPORT FOR THE DC TOBACCO QUITLINE

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Many national consensus documents emphasize the enormous potential to maximize the population impact of smoking cessation interventions via tobacco telephone quitlines. The effectiveness of quitlines remains small (reachXefficacy/ cost), because while their potential for outreach is unrivaled, they are principally a time-limited counseling service, neither intended nor staffed to provide intensive, momentary support following the dozens of temptations and lapses that typically characterize a cessation attempt. This presentation describes a groundbreaking collaborative effort to enhance the efficacy, efficiency and fidelity of an established quitline program benefiting underserved communities in Washington, DC, via integrated web-based mobile support. Web-based mobile quitline enhancement (MQE) fills the gaps between quitline calls with 24-hr access to a menu of evidenced-based treatment components, while simultaneously providing DC Quitline counselors with detailed information about their clients' ongoing progress with cessation — two developments that constitute a major advance over standard quitline programming. Information is continuously synchronized with a web-based server, where it is used to generate summary statistics and graphics that are provided to quitline counselors on an on-demand, case-by-case basis. Eliminating the need for client and quitline counselor to reconstruct from memory the circumstances that precipitated temptations and lapses over the days or weeks since their last discussion, quitline counselors can use MQE data to provide personalized cessation support from the start of each call. Review of MQE data also allows counselors to track clients' progress from one session to the next, or over the entire course of one or more cessation attempts. This translational work is innovative in the way it leverages web-based ecological momentary assessment to literally close the loop between research and practice. Bolstering the effectiveness of tobacco quitlines is a critical and timely endeavor, illustrating the use of mobile technology to expand the public health impact of this "broad reach" treatment modality.

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POS2-29 CONCURRENT SMOKING CESSATION AND ALCOHOL TREATMENT: ECOLOGICAL MOMENTARY ASSESSMENT OF ALCOHOL RELAPSE RISK

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Most alcohol treatment programs do not systematically address cigarette smoking during treatment. One obstacle is a concern that smoking cessation during early recovery might increase risk of drinking relapse. Research on concurrent smoking cessation and alcohol treatment has yielded inconsistent findings with respect to the impact of smoking cessation on drinking outcome, and further information about the process of concurrent alcohol-tobacco treatment is needed. This presentation reports on real-time in vivo process data collected as part of a clinical trial of concurrent smoking cessation and alcohol treatment. At five randomly selected times per day, participants (N = 96) used cellular telephones and an Interactive Voice Response system to provide brief self-report assessments of alcohol beverage consumption, urge to drink, alcohol abstinence self-efficacy, positive affect, and negative affect. Assessments were obtained after starting alcohol/tobacco treatment for 2 weeks before and 2 weeks after the target smoking quit date. Separate analyses were conducted on the participants who reported stopping all smoking for three days beginning on target quit date (quitters; n = 51) and for those who smoked during this time (non-quitters; n = 45). Results revealed decreased alcoholic beverage consumption among the quitters but not the non-quitters. Reported urge to drink declined and alcohol abstinence self-efficacy increased after quit date in both groups. After quit date, negative affect declined only in the non-quitters, and positive affect declined in the quitters. Results revealed affect changes associated with smoking cessation, but there was little indication from the alcohol consumption, alcohol urge, or self-efficacy measures that would suggest greater alcohol relapse risk in the early days of smoking abstinence in a concurrent alcohol-tobacco treatment clinic.

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POS2-30 SMOKING WITHDRAWAL SYMPTOMS AND CRAVING SEVERITY ARE WORSE AMONG SMOKERS WITH ADHD

F. Joseph McClernon, Ph.D., Joe English, M.S., Matt Hallyburton, B.A., Elizabeth E. Van Voorhees, Ph.D., Alex Holdaway, B.A., and Scott H. Kollins, Ph.D., Duke University Medical Center, Durham, NC

Compared to individuals in the general population, those with Attention Deficit Hyperactivity Disorder (ADHD) smoke at higher rates, start smoking at a younger age, and have a more difficult time quitting. In spite of the considerable public health significance of smoking-ADHD, relatively little is known about the mechanisms underlying this comorbidity. The objective of this study was to characterize the differential effects of intermediate term smoking abstinence on withdrawal symptoms, affect and cognition in adult smokers with and without ADHD. Forty-one adult, male and female, non-treatment seeking, moderate to heavy smokers (n=21 with ADHD; n=20 without ADHD) entered a 12-day contingency management (CM) program to promote smoking abstinence. A range of withdrawal (Shiffman-Jarvik Withdrawal Questionnaire), mood (Positive Affect-Negative Affect Schedule) and cognitive performance (CPT, n-Back) measures were collected pre-quit and following 1, 3, 5, 8 and 12 days of biologically verified abstinence. General estimating equations were used to evaluate the effects of Group (ADHD vs. non-ADHD), Sex (male, female) and Session on each dependent variable. Fifty-seven percent of smokers maintained abstinence throughout the CM period and group differences in relapse rates were not observed. As expected, during the CM phase, smokers with ADHD reported greater severity of smoking withdrawal symptoms including somatic symptoms and habit withdrawal. Group x Sex x Session interactions were observed for craving, somatic symptoms and negative affect and, consistent with previous findings from our lab, these interactions were driven by greater withdrawal severity among females with ADHD. Though additional work aimed at identifying the precise mechanisms underlying these findings is necessary, they preliminarily suggest that sex/gender potentially moderate relations between ADHD and smoking. In addition, we will discuss how these findings will inform future prevention and treatment strategies.

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POS2-31 DEVELOPMENT OF A BEHAVIORAL EXERCISE INTERVENTION FOR SMOKING CESSATION

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In general, the exercise intervention literature has been plagued by difficulties with poor adherence. Not surprisingly, the few existing exercise intervention studies for smoking cessation also identify exercise adherence as a methodological issue limiting the ability to determine the potential efficacy of aerobic exercise for smokers who want quit. As a result, in addition to engaging in moderate-intensity aerobic exercise, the proposed intervention consists of two innovative components designed to increase adherence to exercise: (1) monetary incentives and (2) a cognitive-behavioral group intervention to promote adherence. The rationale for the proposed exercise intervention, along with detailed descriptions of each component will be presented. Nineteen smokers (63% female, mean age = 47.7 years) were recruited to participate in: (1) a 12-week behavioral exercise intervention, and (2) an 8-week standard smoking cessation protocol (with the transdermal nicotine patch) delivered to 8 participants in a group format and 11 participants in individual telephone sessions. Adherence, acceptability, and preliminary smoking outcomes were examined. Very good adherence to the intervention was observed with 16 participants (84.2%) attending at least 75% of all group exercise sessions, with the mean number of sessions attended being 10 (out of 12) sessions. Of the 19 smokers, 9 (47.4%) self-reported smoking abstinence at 2-months post quit date. Participants who received the smoking cessation sessions through individual telephone calls, compared to the group participants, demonstrated better adherence (10.4 vs. 9.1 exercise sessions) and smoking abstinence outcomes (64% vs. 25% abstinence at 2-months post-quit). Acceptability ratings showed a high degree of the perceived utility of the intervention in smoking cessation and incorporating exercise into daily life. Given the potential public health impact of the demonstrated efficacy of exercise for smoking cessation, the continued development and optimization of exercise interventions for smokers merits pursuit.

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POS2-32 ABSTINENCE THOUGHTS AND TOBACO-ALCOHOL INTERACTION EXPECTANCIES IN ALCOHOL-DEPENDENT SMOKERS IN EARLY RECOVERY

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The purpose of this study was to investigate abstinence thoughts and tobacco-alcohol interaction expectancies in alcohol-dependent smokers in early recovery. Baseline data were analyzed for participants enrolled in a clinical trial aimed at determining the efficacy of an intensive smoking cessation intervention versus usual care. The study sample consisted of 162 veterans, 96.9% male, with 48% identifying as Caucasian and 37% identifying as African-American. The mean age was 50 years, 91.3% were single, 68.5% had a high school education or less, 80.9% were unemployed, and 25.9% were homeless. Mean daily cigarettes were 16.8; mean number of previous quit attempts was 5.1; and mean FTND score was 4.1 (±2.37). Mean BDI total score at baseline was 14.1 (±10.55) and mean POMS TMD score was 44.8 (±47.20). Study participants reported that they anticipated more difficulty in quitting smoking compared with quitting alcohol ($t = 4.64$, $df = 160$, $p<0.001$). In addition, they expected smoking to have less of an impact on the urge to drink than drinking on the urge to smoke ($t = 17.46$, $df = 160$, $p<0.001$). The results of multiple regression models indicated that emotional distress, but not history of mood disorders, was associated with lower desire ($R2 = .14$, $p< .0002$) and lower expected success ($R2 = .17$, $p<0.0001$) in quitting alcohol use. Neither emotional distress nor history of mood disorders were predictive of desire to quit smoking or expected success in quitting smoking. It is hoped that the investigation of abstinence thoughts and tobacco-alcohol interaction expectancies in alcohol-dependent smokers in early recovery will inform the development of more effective interventions for concurrent alcohol and tobacco use disorders.

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POS2-33 INTENSIVE INTERVENTION FOR SMOKERS IN ALCOHOL TREATMENT: CHANGES IN TOBACCO AND ALCOHOL USE DURING TREATMENT

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The prevalence of cigarette smoking in alcohol-dependent individuals in early recovery is quite high and the cessation rate low. This poster describes changes in tobacco and alcohol use for alcohol-dependent smokers in early recovery who were randomized to either an intensive smoking cessation intervention or usual care. Participants were 162 military veterans with a mean age of 50 years who were enrolled in a VA drug and alcohol treatment program. At baseline, mean daily cigarettes = 16.8; mean number of previous quit attempts = 5.1; and mean FTND score = 4.1. The intensive intervention consisted of 16 individual sessions of cognitive behavioral therapy, including mood management, and combination nicotine replacement therapy provided for 6 months. The Timeline Follow-back Interview (TLFB) and Addiction Severity Index (ASI) were used to assess changes in use of tobacco, alcohol, and other drugs at mid-treatment (12 weeks) and end of treatment (26 weeks). At 12 weeks, patients in the intensive intervention group reported significantly more attempts to quit smoking (chi square = 12.1, df = 7, p = .007), use of more quitting modalities (chi square = 10.24, df = 4, p = .04), and fewer cigarettes (t = 2.58, df = 114, p = .01) than patients in the usual care group. The number of days of abstinence from smoking was significantly greater for the intensive intervention group than for the usual care group at 12 weeks (t = 2.17, df = 117, p = .03) and at 26 weeks (t = 2.63, df = 117, p = .01). Alcohol use outcomes and reported problems with drug use of any kind were not significantly different for the two treatment groups either at mid-treatment or end of treatment. At 26 weeks, the prevalence of patients who reported total abstinence from alcohol during the past 30 days was 94.6% for the intensive intervention group and 90.5% for usual care. The intensive intervention appeared to be effective in reducing tobacco use in alcohol-dependent smokers in early recovery without having a negative impact on their drug and alcohol use outcomes.

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POS2-34 EVIDENCE FOR AN INVERSE RELATIONSHIP BETWEEN RISK TAKING PROPENSITY AND SMOKING QUANTITY IN ADOLESCENTS

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Research suggests that certain personality traits, like risk-taking propensity and impulsivity, may contribute to cigarette smoking and other risky behaviors. The Balloon Analogue Risk Task (BART), a computerized lab-based measure of risk taking propensity, has been shown to distinguish non-smokers and smokers (greater risk taking propensity). Other studies have linked self-reported impulsivity to smoking. However, there is little known about how these traits relate to the quantity of smoking among those who already smoke. Within an ongoing cross-sectional study of stimulus control in adolescent smokers age 16-20 (current N=32; anticipated N=100), participants completed the BART as well as paper and pencil measures of impulsivity and smoking quantity. Results indicated a significant negative (age-adjusted) relationship between risk taking propensity and smoking quantity, whether quantity was measured as days smoked in past week (r= -.34; p=.05), average cigarettes per day during weekdays (r= -.38; p=.03), total cigarettes in past week (r= -.39; p=.03) or total cigarettes in past month (r= -.36; p=.04). A negative relationship between risk taking propensity and nicotine dependence (FTND: r= -.37; p=.04) was also identified. There was no relationship between impulsivity and smoking quantity. Given the unexpected inverse relationship between risk taking propensity and smoking quantity, we examined the relationship between risk taking and self-reported alcohol use, and found a positive, but non-significant relationship. These results suggest that, risk-taking propensity among adolescent smokers may be a protective factor associated with lower quantity of smoking. While risk taking and impulsivity may play some role in the onset of smoking, once smoking is initiated, these personality traits may have little or no effect to increase smoking. Alternatively, it may be that increased nicotine exposure dampens the neurobiological processes that subserve behavioral expression of risk taking, thereby resulting in the observed inverse relationship. This suggests that adolescents may increase smoking to medicate risk taking. Ongoing data collection may clarify our findings.

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POS2-35 MOTIVATION/READINESS MEASURES AND THE PREDICTION OF SMOKING INTERVENTION OUTCOMES

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Although various motivational/readiness measures for smoking cessation are used, there is little consensus on the underlying constructs they measure (e.g., desire to quit, readiness to quit) and which are the best predictors of outcomes. The purpose of this study was to explore the interrelationships of different motivational/readiness measures and their associations with smoking outcomes. Following a brief smoking cessation intervention, college student smokers (N=61, 46% Female, Mean Age = 26.5) completed measures of motivation/readiness to quit using a 10-point single item "Motivation Ruler," a similar single item "Importance Ruler," the Contemplation Ladder, the Decisional Balance scale and a novel 4-item measure of Desire to Quit. At one week participants completed a survey assessing quit attempts, reduction attempts, and if they had quit smoking. Bivariate correlations between all scales revealed that the highest correlations were between the Desire to Quit scale and Motivation Ruler and the Importance Ruler (r's ranged from .68 to .84, all p's < .01). The Decisional Balance scale had the lowest correlations with the other scales. Stepwise regression was used to identify the best predictor(s) of smoking outcomes. Results revealed that the Decisional Balance scale was the best and sole predictor of quit attempts and reduction attempts. Findings suggest that most motivation/readiness measures tap strength of desire to quit. The Decisional Balance scale appears to measures a distinct aspect of motivation/readiness, which was more predictive of behavior change efforts. Understanding distinctions between motivation/readiness measures and their relative predictive power could improve prediction of behavior change.

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POS2-36 AFRICAN AMERICANS DIFFER IN FREQUENCIES OF CYP2B6 GENETIC VARIANTS: POTENTIAL IMPACT ON SMOKING CESSATION

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Bupropion is a smoking cessation drug metabolized by the genetically polymorphic enzyme cytochrome P450 2B6 (CYP2B6). Smoking cessation outcomes of bupropion treatment, compared to placebo, are altered by genetic variation in CYP2B6. We investigated the frequencies of six non-synonymous CYP2B6 variant alleles known to influence bupropion metabolism in vitro or acute bupropion pharmacokinetics in vivo. We hypothesized that the percentage of CYP2B6 slow metabolizers (SM, individuals with one or more copy of a non-synonymous allele such as CYP2B6*5, CYP2B6*6, CYP2B6*16 or CYP2B6*18) in African Americans will be higher compared to Caucasians and Asians. African American light smokers (individuals who smoke less than 10 cigarettes per day) were recruited from a smoking cessation trial and their CYP2B6 genotypes were assessed by CYP2B6*4, *6 and *9 haplotyping and CYP2B6*5 genotyping assays previously established by our group. Additionally, we developed a new CYP2B6*16 (785A>G and 983T>C, amino acid substitution K262R and I328T) and *18 (983T>C, amino acid substitution I328T) haplotyping assay to assess the frequencies and haplotype relationship of the novel 983T>C SNP. The newly developed assay reliably detects these alleles, which was confirmed by sequencing. Currently, 410 individuals have been genotyped for CYP2B6*4, *5, *6, *9, *16 and *18 alleles. CYP2B6*4, *9 and *16 alleles were very rare (<1%) in this population, but CYP2B6*5, CYP2B6*6, and CYP2B6*18 were prevalent with the allele frequencies of 2.9%, 33.8% and 5.2%, respectively. Each genotype was in Hardy-Weinberg equilibrium. These data indicate that more than 70% of African American light smokers were CYP2B6 SMs, which is substantially greater than observed in Caucasians (≈ 60% were CYP2B6 SM) and Asians (≈ 30% were CYP2B6 SM). We are currently assessing the impact of these variant genotypes on chronic bupropion pharmacokinetics and smoking cessation outcomes.

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POS2-37 NICOTINE DEPENDENCE AS A MODERATOR OF MESSAGE FRAMING EFFECTS ON SMOKING CESSATION OUTCOMES

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Prospect theory suggests that gain-framed messages may be more persuasive for smoking cessation than loss-framed messages because quitting smoking is a health behavior associated with a relatively certain reduction in illness. Preliminary evidence in non-treatment seeking smokers, however, suggests that message persuasiveness may vary by smokers' level of dependence. This secondary analysis examined dependence as a moderator of message framing effects on smoking cessation success using data from a smoking cessation trial. Nicotine dependence scores were dichotomized using a median split (N = 249). Among high dependent smokers, exposure to loss-framed messages was associated with a decreased likelihood of abstinence both during and post-treatment than exposure to gain-framed messages. There was no effect of message framing condition, however, among low dependent smokers. These findings suggest that the effectiveness of message framing interventions for treatment seeking smokers may also vary by smoking characteristics.

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POS2-38 ASSOCIATIONS BETWEEN ANXIETY SENSITIVITY, TRAIT ANXIETY AND SMOKING-RELATED CHARACTERISTICS IN ALCOHOL-DEPENDENT SMOKERS

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Though anxiety appears to be a prominent characteristic of individuals with nicotine dependence, few studies have examined associations between anxiety sensitivity, trait anxiety, and smoking-related characteristics in alcohol dependent smokers. The present study examined (1) associations among anxiety sensitivity, trait anxiety, and smoking-related characteristics of urge to smoke, severity of nicotine dependence and nicotine withdrawal, and (2) the relative contributions of anxiety sensitivity and trait anxiety to characteristics of nicotine dependence in a sample of alcohol dependent smokers. The Anxiety Sensitivity Index, Spielberger State-Trait Inventory, Minnesota Nicotine Withdrawal Scale, Fagerström Test for Nicotine Dependence, and Tiffany Questionnaire for Smoking Urges were administered to 83 individuals with alcohol and nicotine dependence who were enrolled in concurrent alcohol and tobacco treatment. This paper reports upon baseline measures obtained during alcohol abstinence but prior to quitting smoking. Levels of anxiety sensitivity and trait anxiety were positively associated with nicotine withdrawal symptoms ($r=.43$, $p<.001$ and $r=.73$, $p<.001$, respectively), levels of nicotine dependence ($r=.27$, $p=.015$ and $r=.35$, $p=.001$, respectively), and urges to smoke in anticipation of relief of negative affect ($r=.39$, $p<.001$ and $r=.31$, $p=.004$, respectively). Anxiety sensitivity and trait anxiety were not significantly related to urges to smoke in response to positive reinforcement. In regression analyses, trait anxiety independently accounted for the most variance in both pre-quit levels of nicotine withdrawal symptoms and nicotine dependence compared to anxiety sensitivity. However, anxiety sensitivity accounted for more variance in relation to urges to smoke in response to relief of negative affect than trait anxiety. For alcohol dependent smokers, trait anxiety may be more important to consider in the assessment and treatment of nicotine dependence, while anxiety sensitivity may have more important implications for the assessment and treatment of urges to smoke in response to relief of negative affect.

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POS2-39 A RANDOMIZED CONTROLLED TRIAL OF MOTIVATIONAL INTERVIEWING COMPARED TO PSYCHOEDUCATION FOR SMOKING PRE-CONTEMPLATORS WITH SEVERE MENTAL ILLNESS

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The primary objective of this study was to determine the efficacy of a cognitive behavioral therapy/motivational (MI) interviewing intervention relative to a psychoeducational (PE) intervention in terms of promoting increased readiness to quit smoking among smokers with severe mental illness who were in not ready to quit. Participants were 44 adults diagnosed with schizophrenia, schizoaffective disorder, or chronic major depression. Assessments were conducted at baseline, end of the 4 session treatment, and at a 1 month follow-up. At 1-month follow-up, there was no difference in the proportion of participants in the MI (81%) and PE groups (61%) in terms of seeking smoking cessation treatment (61%). At end of treatment, recipients of the MI intervention were more likely than the ED group to report an increased readiness to change their smoking behavior. There were no differences in smoking knowledge acquisition across groups. These results suggest an advantage of MI over ED approaches in promoting increased self-reported readiness to change smoking behavior, although there was no significant difference in seeking smoking cessation across groups. We conclude that minimal intervention encourages treatment seeking that is associated with increased readiness to change in the majority of smokers with SMI who say they are not ready to quit.

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POS2-40 TOBACCO USE RELAPSE PATTERNS IN A STATEWIDE CESSATION PROGRAM

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Background: QUITPLAN Services assist Minnesota tobacco users to quit smoking. Each program — centers, worksite, helpline and website — differs in its approach but together they combine counseling, medication and community to help smokers. Relapse is an important challenge for these programs. While the majority of users quit for 30 days or more at any time from enrollment to follow-up, only a third achieve 30-day point prevalence abstinence. Evaluations were conducted to examine relapse.

Methods: Intake, program use and follow-up data were collected from participants enrolling in these programs from October 2007 through March 2008 (n=1,273). For the centers, worksite and helpline programs, follow-up telephone surveys were conducted 7 months post enrollment. For the website, a mixed-mode survey (internet and telephone) was conducted 5-6 months post enrollment. The overall response rate was 65.2%. Hierarchical logistic regression analyses were performed to identify predictors of relapse.

Results: Relapse is common among those who make a quit attempt of 30 days or more sometime after enrollment (44.9% across all interventions). Participants start their longest quit attempt one month (M=31 days, SD=39.5) after enrollment. The average duration of longest quit is just over three months (M=92.1 days, SD=51.0). Across all interventions, relapse occurs 4.6 months after enrollment (M=127.6 days, SD=59.1). Those with "Medium Tobacco Use and Good Quit History" were less likely to relapse when compared to all clusters of tobacco users based on clinical characteristics ($p=0.004$). Intervention was an important predictor of relapse ($p=0.004$) with those in centers and worksite programs having higher relapse rates than those using the website.

Conclusion: Enrollees in face to face counseling interventions were more likely to relapse. More study is needed to understand this relationship. Many of the predictors of abstinence for this sample, including medication use, quit confidence and program utilization, were not significant in the relapse model. Findings suggest optimal timing for relapse prevention and the need for further study to identify intervention strategies.

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POS2-41 OCCUPATIONAL DIFFERENCES IN SMOKING BEHAVIOR AMONG FEMALE SMOKERS

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Introduction: Approximately 1 out of 5 women in the U.S. currently smoke cigarettes. Data suggests that smoking varies not only by race, ethnicity and gender but also by occupation. Evidence suggests smoking rates in blue-collar workers are higher than rates in white-collar workers. In addition to differences in smoking rates by occupation, occupational differences in smoking behavior are unknown and may play a role in the success of an individual's smoking cessation attempt.

Methods: Data was taken from a smoking cessation study which recruited women aged 18 - 40, motivated to quit smoking, not on psychotropic or hormonal medications and in stable physical/mental health. At baseline subjects completed a survey detailing smoking behaviors including number of cigarettes smoked per day, smoked first cigarette within 30 minutes of waking, age of smoking initiation, number of past quit attempts, and length of longest previous quit attempt. Each subject's self-reported occupation was categorized into one of twenty-three major groups in the Bureau of Labor Statistics Standard Occupational Classification, and then collapsed into six groups. Differences in smoking behaviors by group were assessed using one-way analysis of variance (ANOVA) and chi-square tests of independence.

Results: A total of 326 participants, mean age 29.5 ± 6.6 years, completed the survey including the following occupational groups: Managerial/Professional (n=86), Technical/Administrative (n=68), Support Staff/Other (n=56), Unemployed (n=28), Homemaker (n=33), and Student (n=33). There were significant differences in the following smoking behaviors: number of cigarettes smoked per day (f=2.38, p=0.04), smoked first cigarette within 30 minutes of waking (df=5, □17.78, p=0.0032), and age of smoking initiation (f=2.61, p=0.03). Number of past quit attempts and length of past quit attempts were not significantly different by occupational group.

Conclusion: Occupation appears to be associated with some smoking behaviors. Further research is needed to identify the reasons for the differences in these behaviors and interventions that may provide more help to individuals attempting to quit smoking.

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POS2-42 EFFECTS OF QUITLINE COUNSELING UTILIZATION IN A REAL-WORLD COMPARATIVE EFFECTIVENESS PHARMACOTHERAPY CLINICAL TRIAL

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Background: Telephone quitline counseling significantly increases abstinence rates. Further, increasing contact time is associated with increased abstinence rates; however, dwindling quitline funding makes it imperative to garner more information regarding the optimal level of effective quitline counseling delivery.

Objective: To determine the association between quitline utilization and cessation outcome in a comparative effectiveness study.

Methods: 1,346 smokers (≥ 10 cigarettes/day) in 12 primary care clinics were recruited for a cessation clinical trial testing five active pharmacotherapy conditions. All participants were offered counseling through the Wisconsin Tobacco Quit Line (WTQL). 545 participants utilized the WTQL (median number of calls=4). Total minutes of counseling time were used as the measure of WTQL utilization. The association between WTQL utilization and abstinence rates was separately analyzed at 8 weeks and 6 months by logistic regression (LR) controlling for medication condition, age, gender, and FTND.

Results: Initial analysis of six-month abstinence rates by deciles, based on minutes of counseling, revealed a step function rather than a linear relationship. Based on this analysis, WTQL utilization was operationalized as follows: nonuse (N=801; abstinence rate=19.5%), < 89 minutes (N=316; abstinence=19.6%), and > 90 minutes (N=229; abstinence=35.8%). In the LR analyses, the 3 WTQL utilization groups were represented by two dummy variables with nonuse group as the reference group. At 8 weeks, the abstinence rate for the nonuse group was significantly lower than the rate for the < 89 and ≥ 90 minute groups, (p=.044) and (p<.001), respectively. At 6 months, the abstinence rate of nonusers was virtually identical to the < 89 minute group, but significantly lower than the ≥ 90 minute group (p<.001).

Conclusions: Quitline counseling in this real-world comparative effectiveness study enhanced cessation success for callers engaged in at least 90 minutes of counseling. Findings may be limited by participant self-selection such that those who were more motivated to quit smoking may have utilized the quitline more intensively.

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POS2-43 EFFECTS OF BUPROPION ON THE SIMULATED DEMAND FOR CIGARETTES AND THE SUBJECTIVE EFFECTS OF SMOKING

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The efficacy of bupropion for smoking cessation has been demonstrated in several clinical trials. The biobehavioral mechanism(s) mediating bupropion's efficacy are not well understood, however. Behavioral economic measures have proven useful in investigations of the reinforcing effects of drugs of abuse. These investigations have demonstrated that demand for a drug of abuse, like other commodities, decreases as price increases. Demand curves may also be used to measure the effect of pharmacotherapies on the reinforcing effects of drugs of abuse. In the present study, we conducted a laboratory investigation of the effect of medication (bupropion and placebo) on simulated demand for cigarettes. We also investigated the effect of medication condition on the subjective effects of smoking. Medication effects were observed on some measures of demand (e.g., the maximum number of cigarettes participants said they would purchase in a single day) but not others (e.g., the relationship between price per cigarette and demand). Medication group had no effect on any subjective effects.

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POS2-44 TOBACCO USAGE ATTITUDES AND KNOWLEDGE PATTERNS OF 498 CHEMICALLY DEPENDENT ADULT OUTPATIENT SMOKERS AFTER RECEIVING TWO HOURS OF CESSATION INFORMATION

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Fairbanks is a nonprofit institution focused on recovery from alcohol, cocaine, heroin, the opiates, prescription agents and other drug addictions. From July 2008 to June 2009, 2,050 patients received addiction treatment. Of those individuals, 1,005 were involved in a long-term recovery management program that included tobacco cessation. The following data describes the mentioned individuals treated: (a) 65% male, 35% female; (b) 70% Caucasian, 27% African American; (c) 75% between the ages of 20-59; (d) 48% single, 34% married, 13% divorced; (e) 33% high school graduates, 42% attended or graduated from college or took postgraduate studies.

Study Methods: Last year, 498 adult, entry-level addiction treatment patients received a one-hour tobacco cessation orientation lecture, based on information from the Mayo Clinic Program and the USPHS 2008 Clinical Practice Guideline, and delivered by an experienced dentist. Thirty to sixty days following the initial lecture, these same participants, now in an Intensive Outpatient (IOP) status, were given a second lecture by a trained, licensed social worker, stressing specific tobacco cessation options. Immediately following the second lecture, each attendee was assessed by questionnaire to determine their smoking history, understanding of tobacco-related diseases, the cessation process, and their increased interest to quit tobacco use.

Study Findings: Of the 498 IOP attendees, 406 (82%) were current smokers; 85 (17%) had never smoked, and 7 (1%) were ex-smokers. Of the current smokers, 281 (69%) expressed an increased interest in quitting tobacco after hearing both lectures. This poster describes positive data showing that cessation education increased interest in quitting tobacco.

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POS2-45 MYLASTDIP.COM: A WEB-BASED CESSATION PROGRAM FOR YOUNG CHEWERS

Herbert H. Severson*, Brian Danaher, and Milagra Tyler

Many young users of smokeless tobacco want to quit but lack the resources to do so. Because there is evidence that web-based interventions have been helpful for tobacco cessation we were funded by the National Cancer Institute to develop and evaluate a web based cessation program for young users 14 through 25 years of age. The My Last Dip randomized clinical trial compares the efficacy of an Enhanced vs. a Basic condition. The Enhanced condition offers a targeted, tailored, and highly interactive ST cessation website and users will experience tailored and dynamic content based on ongoing participant interaction with the program. The site also offers ST cessation tools, maintenance resources, and information; and monitored online peer-to-peer and expert-to-participant support in a web forum. Participants in the Basic condition will experience a more static informational website containing ST cessation content, with annotated links to information-only resources on the Internet. The primary outcomes are self reported tobacco cessation at 3 months and 6 months post-enrollment, with quit rates expected to be higher for the tailored, targeted interactive condition. Given that a majority of adult tobacco users started their use before age 18, and there are few cessation resources available to young chewers and dippers, the MyLastDip.com cessation program can be a valuable resource with the potential to assist this population of ST users in quitting early in their addiction. Data will be presented on the first 780 users of the program.

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POS2-46 EFFECTS OF TREATMENT WITH VOUCHER-BASED CONTINGENCY MANAGEMENT ON MATERNAL SMOKING, BIRTH OUTCOMES, and BREASTFEEDING

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Our group has been researching the efficacy of voucher-based contingency management as a smoking-cessation intervention for pregnant women. In this intervention vouchers exchangeable for retail items are provided contingent on biochemically verified abstinence from start of prenatal care through 12-weeks postpartum. In several controlled trials, this intervention increased abstinence rates at end-of-pregnancy and early postpartum compared to a control condition wherein incentives of comparable value were provided independent of smoking status. In one trial, the intervention increased estimated fetal growth in serial ultra-sound assessments. In the present study, we collapsed data across trials to obtain a more precise estimate of treatment effects on abstinence and to investigate effects on birth outcomes and postpartum breastfeeding. Subjects were 158 women still smoking at entry to prenatal care, with the first 32 subjects in the initial trial assigned as consecutive admissions and all others assigned randomly to treatment conditions. Point-prevalence abstinence was greater in the abstinence-contingent compared to the control condition at the end-of pregnancy (35.8% vs. 7.8%), and 12- (24.7% vs. 2.6%) and 24-week (14.8% vs. 1.3%) postpartum assessments ($p < .005$ in all comparisons). Mean gestational age (39.14 + 0.2 wks vs. 38.3 + 0.3 wks, $p = .02$) and mean birth weight (3298.7 + 62.9g vs. 3085.6 + 70.6g, $p = .03$) were greater in the abstinence-contingent vs. control conditions. Percent preterm (< 37 wks) births (4.9% vs. 15.8%, $p = .02$) and low birth weight (< 2500g) births (6.2% vs. 19.7%, $p = .01$) were less in the abstinence-contingent vs. control conditions. Finally, the percent of women still breastfeeding at 12-weeks postpartum (35% vs. 17%, $p = .002$) was greater in the abstinence-contingent vs. control conditions. These results demonstrate broad beneficial treatment effects that have the potential for improving maternal and fetal/infant health.

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POS2-47 PATHWAYS LINKING SOCIOECONOMIC STATUS AND POSTPARTUM SMOKING RELAPSE AMONG WOMEN WHO QUIT SMOKING DURING PREGNANCY

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Objective: Nearly half of all smokers who become pregnant quit during pregnancy. However, up to 80% return to regular smoking within one year postpartum. Low socioeconomic status (SES) has been shown to exacerbate the high rate of relapse in women following childbirth. The purpose of the current study was to examine mechanisms linking SES and smoking relapse among women who quit smoking during pregnancy.

Methods: Participants were 251 women enrolled in a randomized clinical trial designed to evaluate a new counseling approach for postpartum smoking relapse prevention. All participants had quit smoking during their pregnancy. Participants began treatment 30-33 weeks into their pregnancy and were followed through 8 weeks postpartum. A conceptual model of the mechanisms linking SES and smoking cessation was evaluated using a structural equation modeling approach. Negative affect/stress and agency were tested as mediators of the relation between SES (i.e., years of education, income, employment status) and smoking status at eight weeks postpartum. In addition, nicotine craving was hypothesized to have a direct influence on negative affect and agency.

Results: Model fit indices indicated that the hypothesized model was a good fit for the data. Additionally, hypothesized direct and indirect pathways linking SES to smoking cessation were found. In the indirect pathway, low SES was related to high negative affect/stress, which in turn, was associated with lower agency, ultimately increasing the likelihood of relapse. In addition, nicotine craving indirectly increased the chances of relapse through increased negative affect and decreased agency.

Conclusions: The current study highlights the role of negative affect and agency as mediators of the relation between SES and smoking relapse among women who quit smoking during pregnancy, as well as the impact of craving. Findings have implications for the design of smoking cessation interventions as well as public policy decisions.

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POS2-48 SOCIAL NETWORK STRUCTURE OF A LARGE ONLINE COMMUNITY FOR SMOKING CESSATION

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Since the early days of the Internet, ad hoc and formal efforts to create online communities to encourage smoking cessation have flourished, but few have persisted over time. Created in the late 1990s, QuitNet.com maintains a long-term quality improvement database of all interactions between participants, including messaging, blogging and interactions with expert systems and tailored information. As of 2007, the system had approximately 120,000 new registrants a year. We examined a cohort of active members during a 60-day period in 2007. Multiple subgroups of members were derived based on connections and communication patterns, including buddy lists, posts to public forums, and one-to-one messaging. A total of 7,569 participants had 103,592 connections to other individuals. Metrics of social network integration were associated with increased likelihood of being female, older, having been in the system longer, and being abstinent from smoking. New registrants ("Newcomers," n=792) came into contact with a relatively small number of "Integrators" (n=756) who also tended to be older, female, abstinent, and persistent users, with over 40% having been members for a year or more. Escalating set sizes of "Key Players" were created to determine the optimal set size to reach the largest percentage of the whole community. While these Key Players were similar to Integrators in demographic and smoking characteristics, sets of greater than 20 individuals had little additional benefit in terms of communications reach. These results support the conclusion that the QuitNet community is a large-scale social network that has the common characteristics required for sustainability of social support and social influence to promote smoking cessation and abstinence. These characteristics include persistence of members over time, heterogeneity of smoking status, and evidence of rich, bi-directional communications. We believe that the identified subgroups (Key Players and Integrators) represent fruitful targets for future network level interventions.

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POS2-49 SOCIAL SUPPORT INTERVENTIONS FOR SMOKING CESSATION: LESSONS LEARNED AND ONLINE APPLICATIONS

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Social relationships can have powerful effects on smoking cessation, and as such, researchers have attempted to manipulate social influence and social support processes to enhance quit rates. This paper presents a historical overview of social support interventions and results, focusing on strengths and limitations, lessons learned, and implications for translation to online environments. We start with an overview of key concepts of social influence processes, drawing on more established social support and social influence theories and proposed mechanisms, and addressing the question of whether and how theoretical mechanisms through which support may influence cessation require elaboration and testing in online contexts. Next, based on data from prior trials of support interventions, we discuss how these intervention models may apply in online settings, noting practical and theoretical lessons learned from off-line trials. Summaries from meta-analyses of trials are presented, along with critiques of specific published studies. Third, we discuss methodological challenges and approaches to studying support online, including highlighting the need for mixed approaches, such as using cluster analysis of patterns of interaction, qualitative analyses of content of interactions, and more formal social network analyses. Drawing on data from more recent theories of internet usage, including models of social affect regulation and "goods-information acquisition" models, we consider who to engage with online support interventions, and how patterns of online interactions may influence intervention content, delivery, and evaluation. Finally, we end with the consideration of whether online social support interventions are supplements or substitutes for offline interventions and how we can potentially maximize support delivered electronically.

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POS2-50 ACCESS STRATEGIES FOR TEEN SMOKING CESSATION IN EUROPE

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Background: Recruitment of teen smokers into interventions supporting them to quit is a major problem in the field of adolescent smoking cessation. Two in three teenage smokers want to stop smoking but prefer to do this by themselves or with the help of friends. Professional cessation aids are not attractive to them. This lack of interest might exist because smoking adolescents are not aware of cessation aids, are prejudiced against them and do not expect them to be effective. However, only a small percentage succeeds in quitting. The aim of this study is to gain knowledge on how to motivate young smokers to take part in smoking cessation interventions.

Method: Literature review on recruitment in adolescent smoking cessation and survey of best practice in eight European countries. Motivational strategies of providers of adolescent smoking cessation in each participating country are assessed through a questionnaire. National networks including cessation professionals as well as other stakeholders in youth development provide new ideas of access to teen smokers.

Results: Basic principles of motivating adolescent smokers are presented, e.g., that motivation should take place in every youth-related setting. Strategies reported in the scientific literature as well as from providers all over Europe were classified by setting (e.g., school, media, peers, family).

Discussion: Access to teen smokers is a topic that has to be put on the agenda of health policy makers. Providers are well aware of (if not frustrated by) the recruitment problem. There is a need for youth-orientation and creativity with regard to successful strategies. Several innovative ways of motivating teens to use cessation interventions are currently tested.

This work arises from the project ACCESS (Access strategies for teen smoking cessation in Europe), which has received funding from the European Union, in the framework of the Health Programme.

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POS2-51 TEEN TOBACCO USE CESSATION: STATUS OF OUTCOMES RESEARCH 2009

Steve Sussman, Ph.D., Preventive Medicine and Psychology, University of Southern California

This presentation reviews the current status of teen tobacco use cessation research. A review of 64 teen tobacco use cessation studies (with comparison groups) is provided. Examined include program contents, delivery modalities, number of contacts, and expected quit rates. In addition, means of recruitment and retention of smokers in programming are discussed. Also, other studies that present promising contemporary methods of teen smoking cessation are examined, including use of pharmacologic adjuncts, electronic technology, and cigarette price increases (and no smoking policy). A few additional very recent cessation efforts are presented, including a television/radio campaign, modified formatting to enhance implementation of cessation, and contingency management. Conclusions are made regarding implications for developing and implementing teen tobacco use cessation programs.

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POS2-52 FIRST RESULTS ON EFFECTIVENESS AND MODERATORS OF EFFECTIVENESS OF A TEEN SMOKING CESSATION PROGRAM

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Objectives: The risk of developing nicotine dependency in adulthood is increased by an early onset of smoking. Therefore smoking adolescents represent an important target group for smoking cessation. However, up to now only few smoking cessation programs are specifically geared to adolescents and their needs within the cessation process. Based on a systematic survey of established theories, latest studies and scientific literature a new smoking cessation program for adolescents was developed. The objective of the project is to examine the acceptance of this new youth-specific, smoking-cessation program and to find a connection between personality traits (impulsivity/depression) and the acceptance and effectiveness of the program.

Methods: In a pilot study the new program was conducted at four schools. Data concerning acceptance and smoking behaviour were collected by standardized questionnaires. The trainers documented reach and feasibility of the program. Subsequently, in a main study the program was offered at 30 schools. Items concerning personality traits supplemented the standardized questionnaires.

Results: In the pilot study 4 courses were conducted. Depending on school type, 30 to 40% of smoking pupils were reached. Of consented participants (n = 30), 100% completed the program until the end-of-treatment. At the end-of-treatment 36.7% of participants had quit smoking, the rest of participants had reduced smoking. At the end of aftercare 4 weeks later, the quit rate still was 36.7%. Preliminary results of the main study (n=200) show that effectiveness of smoking cessation is moderated by personality traits (impulsivity, depression).

Conclusion: The problem of reach and retention in adolescent smoking cessation can be attenuated by genuine youth-oriented concepts. The notion of differential effectiveness depending on personality traits is discussed.

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POS2-54 UNDERSTANDING AND ENABLING ONLINE SOCIAL NETWORKS

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Recent advances in digital technologies invite consideration of social influence and social support as processes that are accomplished by global, flexible, adaptive, and ad hoc networks that can be created, maintained, dissolved, and reconstituted with remarkable alacrity. This presentation describes and empirically tests a multi-theoretical multilevel (MTML) model of the socio-technical motivations for creating, maintaining, dissolving, and reconstituting knowledge and social networks in massively multi-player online role-playing games (MMORPGs). Enabled by advanced graphic and networking technologies, MMORPGs provide three-dimensional playgrounds for people to interact with one another. In this study, we analyzed activities in an MMORPG, Sony's EverQuest II. We analyzed the entire network of 3,140 players who were on one server (Antonia Bayle) from Aug 25 to Aug 31, 2006. Of these, 2,998 were from the US, 142 were from Canada. 2,447 were males. We examined whether their geographic distance offline and their demographic similarity (or homophily) influence the likelihood of four online interactions: partnering, instant messaging, trading, and mailing. The results show that geographical proximity of distance and temporal proximity of time zones have a strong impact in players' online behavior in creating relations. Individuals were 22.6 times more likely to link with others within 50 kms than from someone who was within 50 to 800 kms. In addition, homophily in age and game experience also had a strong impact on creating relations. However, there was no evidence of gender homophily in the virtual world. The presentation proposes that MTML insights based on understanding the social motivations to create links in online social networks can be used to enable more effective social networks by designing more effective network recommender systems. These network recommender systems can serve as interventions to enhance and target social support and social influence within online smoking cessation communities.

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POS2-55 LOW-DOSE NALTREXONE AUGMENTATION OF NICOTINE REPLACEMENT FOR SMOKING CESSATION WITH REDUCED WEIGHT GAIN: A RANDOMIZED TRIAL

Benjamin A. Toll, Ph.D., Robert Makuch, Ph.D., Marney A. White, Ph.D., Ran Wu, M.S., Boris Meandzija, M.D., Peter Jatlow, M.D., and Stephanie S. O'Malley, Ph.D.*, Yale University School of Medicine

Fear of weight gain is a significant obstacle to smoking cessation, preventing some smokers from quitting. Three of our preliminary studies of naltrexone and a study by another group yielded promising results for reduction of post-quit weight gain. Given these findings, we tested whether reduction of weight gain with naltrexone would translate into higher quit rates for a population of smokers who were weight concerned and believed that smoking helped manage their weight. Since most weight gain occurs within the first 6 months, we evaluated a 27-week treatment. We hypothesized that participants who received naltrexone would gain less weight post-quit and have higher rates of quitting smoking. Smokers (N=172) who reported concerns about smoking cessation related weight gain and beliefs that smoking suppressed weight gain were randomized to receive either 25 mg naltrexone or placebo for 27 weeks (1 week pre-, 26 weeks post-quit). All participants received open label therapy with the nicotine patch for the first 8 weeks post-quit and brief behavioral counseling over the 27-week treatment. The 2 pre-specified primary outcomes were change in weight for continuously abstinent participants and biologically verified end-of-treatment 7-day point prevalence abstinence at 26 weeks after the quit date. Although there was a small numerical difference in weight at 26 weeks post-quit that favored the naltrexone group, this difference was not statistically significant (naltrexone: 6.8 lbs + 8.94 vs. placebo: 9.7 lbs + 9.19, p=.47). Weight gain was relatively low in the placebo group compared to prior naltrexone studies, potentially due to the high weight preoccupation of these participants. Smoking abstinence rates were not significantly different but numerically favored the placebo group at 26 weeks post-quit (naltrexone: 22% vs. placebo: 27%, p=.43). Interestingly, naltrexone significantly suppressed the increase in the amount smoked per day over time following the quit date. Nonetheless, we conclude that for smokers high in weight concern, the relatively small reduction in weight gain with low dose naltrexone is not worth the potential for lower rates of smoking abstinence.

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POS2-56 CHARACTERISTICS OF PARTICIPANTS IN ADOLESCENT SMOKING CESSATION PROGRAMMING

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This presentation will examine the characteristics of youth participating in the Texas Youth Tobacco Awareness Program. Demographics of youth will be discussed and compared with state patterns. Additionally, tobacco use history, current use patterns and nicotine dependence patterns will be described. Youth in the program typically display ambivalence toward cessation, and indicators of this ambivalence and how it is highlighted in the program will be discussed, as will be self-definition patterns, readiness to change, and future behavioral intentions. A high percentage of youth in the program report significant levels of depressed affect, and this will be examined in light of tobacco use patterns. The presence of other associated comorbidities will be discussed and their possible import for tobacco use cessation will be discussed. Conclusions regarding the population and effective mechanisms of meeting their needs will be discussed in light of the Best Practices in Youth Cessation recommendations.

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POS2-57 VALIDITY OF THE 12-ITEM FRENCH VERSION OF THE TOBACCO CRAVING QUESTIONNAIRE IN THE ADONIS CLINICAL TRIAL

Ivan Berlin, M.D., Ph.D.[1], Edward G. Singleton, Ph.D.[2], and Stephen J. Heishman, Ph.D.*[3]; [1]Université P. & M. Curie-INSERM U894; [2]Stevenson University; [3]NIDA Intramural Research Program

The French version of the Tobacco Craving Questionnaire (FTCQ) is a valid and reliable 47-item self-report instrument that assesses tobacco craving in four factors: anticipation of relief from withdrawal/negative mood (emotionality), anticipation of positive benefits from smoking (expectancy), inability to control smoking (compulsivity), and intention to smoke (purposefulness). We constructed a 12-item version of the FTCQ (FTCQ-12) and present here its reliability, validity, and clinical utility. We administered the FTCQ-12 to French smokers (n=310) enrolled in the Adjustment of Doses of Nicotine in Smoking Cessation (ADONIS) trial (ClinicalTrials.gov Identifier: NCT00235313). We conducted confirmatory factor analysis (CFA) and examined congruence in factor loadings between the FTCQ and FTCQ-12. We examined the ability of craving scores to distinguish participants who were highly dependent on nicotine from those less dependent. Measures of tobacco craving, withdrawal, smoking patterns, and smoking history were included to explore the validity of the FTCQ-12. CFA indicated perfect fit for a 4-factor model, with congruence coefficients suggesting very high similarity in factor loadings between the FTCQ and FTCQ-12. Compulsivity and purposefulness correlated positively with the number of cigarettes smoked during the week before enrollment. Expectancy and compulsivity correlated positively with daily cigarette use. Emotionality, expectancy, and compulsivity correlated positively with craving on the Minnesota Nicotine Withdrawal Scale (MNWS), and emotionality and compulsivity correlated positively with the number of withdrawal symptoms on the MNWS. Purposefulness correlated positively with number of previous quit attempts. A general craving factor score at a cutoff of 6-7 was nearly 6 times more likely to come from participants who were highly dependent on nicotine than those less dependent. Findings suggest the FTCQ-12 measures the same four constructs as the FTCQ and yields valid and reliable indices of tobacco craving with potential clinical utility in treatment-seeking samples. Findings also suggest that the four factors have discriminative properties.

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POS2-59 USE OF MEDICATIONS AMONG SMOKERS IN A CESSATION TRIAL: RELATIONS WITH CESSATION OUTCOME

Susannah Moroney, Pharm.D.*, Megan E. Piper, Ph.D., Kenneth Krajewski, M.D., and Douglas E. Jorenby, Ph.D., University of Wisconsin

Objective: The objective of this analysis was to investigate the relations between baseline medication use, demographics, and treatment outcomes in smokers participating in a large, randomized, placebo-controlled clinical trial that evaluated the relative efficacies of five smoking cessation pharmacotherapy interventions.

Methods: The American Hospital Formulary System (AHFS) classification scheme was utilized to categorize baseline medications participants reported using 30 days prior to enrollment in the study.

Results: Of the 1,504 smokers who participated in this trial, 1,035 reported using an average of 5.4 ± 4.6 baseline medications while 469 reported using no medications prior to their quit attempt. The most commonly reported classes were analgesics (n = 806), vitamin/herbs (n = 482), pulmonary (n = 383), gastro (n = 223), antihypertensive (n = 220) and antiinfective agents (n = 215). Females reported more use of antiinfectives, analgesics, psychiatric, sedative, pulmonary, gastro, hormones, thyroids, and vitamin/herb medications compared to males ($p < 0.05$). African Americans reported more use of antihypertensive, pulmonary, and diabetic medications compared to Whites while Whites reported more use of thyroid medications and vaccines (e.g., flu vaccine) than did African-Americans ($p < 0.05$). Smokers with a high school degree or less reported more use of antihypertensives, analgesics, or psychiatric agents compared to smokers that attended at least some college ($p < 0.05$). Logistic regressions, controlling for treatment, age, gender and education revealed that of all the medications examined, only the use of vitamin/herbs was associated with abstinence from smoking at 6 months (OR = 1.09, CI = 1.004-1.175, p = 0.04).

Conclusions: Results suggest that while many participants took medications to address medical problems related to smoking (e.g., pulmonary or cardiac medications) use of such medications was not related to cessation success. However, participants who actively took vitamins/herbs to maximize their health may represent a population of smokers who may be more health conscious and they appear to be more successful in their quit attempts.

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POS2-60 CHANGE IN SELF-EFFICACY, AUTONOMOUS AND CONTROLLED MOTIVATION PREDICTING SMOKING CESSATION

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Introduction: Improvement in psychosocial variables has been related to fewer cigarettes smoked per day, lower levels of nicotine dependence, longer abstinence period and higher motivation to stop smoking. However, few studies have explored how changes in self-determination variables predict smoking cessation.

Objective: The purpose of this study is to assess change in self-efficacy, autonomous motivation and controlled motivation predicting smoking cessation.

Methods: KanQuit is a population-based clinical trial for smoking cessation in rural primary care practices. In this study, 726 smokers, regardless of their interest in quitting, received offers of free smoking cessation pharmacotherapy at 6-month intervals supplemented by varying intensity of counseling and disease management.

Analyses: Treating self-efficacy, autonomous motivation, and controlled motivation as latent variables manifested each by four questionnaire items at both baseline and six months; a structural equation model was fitted treating the final outcome as cessation at 12 months while controlling for KanQuit treatment allocation.

Results: Although 568 participants continued to smoke at month 6, mean Smoking Self-Efficacy Questionnaire scores increased by 2.94 (SD=10.85). Increases in self-efficacy were significantly related to month 12 abstinence. While baseline autonomous motivation had a direct impact on smoking cessation at month 12, controlled motivation had an indirect effect on smoking cessation at month 12 mediated by increase in self-efficacy. This model had a CFI=0.94, RMSEA=0.045, and explained 31% of the variability on cessation at 12 months.

Conclusions: Improvements in self-efficacy and controlled motivation predicted subsequent cessation success while lower autonomous motivation was related to cessation. Future research should examine how interventions based on these psychosocial variables can be designed to support changes in self-efficacy facilitate smoking cessation.

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POS2-61 AN EXPERIMENTAL INVESTIGATION OF ECOLOGICAL MOMENTARY ASSESSMENT FREQUENCY REACTIVITY

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Ecological momentary assessment (EMA) allows investigators to track target constructs in real-time in participants' natural environments. EMA has several advantages over paper diary and retrospective assessments. Frequent or intensive investigator-prompted assessment may induce reactivity effects in participants, however. Few experimental investigations have assessed such reactivity effects. The present study randomly assigned 95 smokers to receive either one or six prompts to complete two-minute reports during each of 31 days. The time-stamped reports were completed using palmtop computers and assessed current affect, withdrawal symptoms, urges to smoke, smoking expectancies, stressful events, and smoking behavior. All participants were adults who smoked at least 10 cigarettes per day for at least one year and were motivated to quit smoking. Participants received individual counseling and 12 weeks of nicotine lozenge treatment at no cost. Results indicated that the frequency of investigator prompting to complete self-monitoring reports was not significantly predictive of abstinence when EMA recording ended three weeks post-quit, although 31.3% of those prompted six times per day achieved CO-confirmed point-prevalence abstinence compared with 21.3% of those prompted only once per day. This moderately sized effect did not reach significance in this sample. Median survival time to the first lapse within the first three months post-quit was also not significantly increased by more frequent assessment. Nicotine dependence and self-reported smoking cue reactivity did not moderate assessment frequency effects. Results suggest that receiving more prompts to complete reports regarding did not significantly increase the risk of lapsing following an assisted cessation attempt, and may have had a modest cessation-promoting effect, although this requires replication in a larger sample. More research in this area is needed to support the validity of frequent recording of behavior, affect, and cognitions.

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POS2-62 REVIEW AND APPRAISAL OF CLINICAL PRACTICE GUIDELINES FOR SMOKING CESSATION

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Introduction: The Canadian Action Network for the Advancement, Dissemination and Adoption of Practice-based Tobacco Treatment (CAN-ADAPTT) is designed to develop a dynamic set of smoking cessation guidelines for use in clinical practice and population-based strategies.

Purpose: To determine which existing Clinical Practice Guidelines (CPGs) to include in the next version of Dynamic Guidelines for Tobacco Control in Canada.

Method: In order to determine CPGs of high quality, a systematic search and rating of existing CPGs was conducted. A search of medical literature databases was followed by an Internet based guideline search to ensure that all relevant guidelines were found. Websites for specialty societies and associations were also searched. The next stage applied two criteria for the CPGs found: (1) Did the Guidelines Development Group conduct a systematic search of the literature? (2) Are recommendations in the guideline linked to a level of evidence? Guidelines meeting these criteria were sent to four independent reviewers, mostly family physicians. These reviewers have been formally trained in the application of the Appraisal of Guidelines Research and Evaluation (AGREE) instrument. AGREE is a validated instrument that evaluates the quality of the guideline development process. It includes questions in six domains: Scope and Purpose, Stakeholder Involvement, Rigour of Development, Clarity and Presentation, Applicability, and Editorial Independence. Composite domain scores are created, and reviewers are asked to make a judgment as to the overall guideline quality.

Results: Fourteen guidelines met the basic criteria. Six guidelines, including 3 from the US, 2 from Canada, and 1 from New Zealand met the criteria for high quality.

Discussion: The highest scoring CPGs will be discussed. Limitations of this methodology for CAN-ADAPTT's purposes will be discussed. For example, the domains vary in priority. Clarity and Presentation could be considered a lower priority than other domains if CAN-ADAPTT wants to adapt or develop its own implementation tools. Other limitations and implementation issues will be discussed.

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POS2-63 SUPPORT FOR TOTAL SMOKING BANS AMONG PSYCHIATRIC HOSPITAL STAFF

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Background: The introduction of total smoking bans represents an important step in addressing smoking in mental health settings. Despite the importance of staff support in the successful implementation of smoking bans, little research has examined levels of such support or factors, which may be associated with it.

Aims: First, to examine the views of staff working within a psychiatric hospital setting concerning the perceived impacts of a total smoking ban and clinical issues with respect to providing nicotine dependence treatment for patients. Second, to investigate support for a total smoking ban at three service levels: health services generally; mental health services, and, within the specific clinical unit within which the clinical staff surveyed were working. Lastly, to examine factors associated with clinician support for a total smoking ban within their own clinical unit.

Method: Cross-sectional questionnaire study of both clinical and non-clinical staff at a large psychiatric hospital campus.

Results: Of the 300 staff available, 183 (61%) responded, representing 73 (41%) clinical staff, and 110 (92%) non-clinical staff. Two thirds (66%) of respondents indicated support for a total smoking ban. The greatest concerns for staff working under a total smoking ban related to fear of patient aggression and other patient non-compliance issues A majority of clinical and non-clinical respondents supported a ban in all health services, throughout the Area's mental health services, and (for clinical respondents) in their clinical unit. Clinical staff, who believed a smoking ban would help patients to stop smoking, were more likely to support a smoking ban in their own unit.

Conclusions: There is a clear need to communicate research evidence and patient management strategies to clinicians to address current levels of fear and lack of knowledge regarding the outcomes of smoking bans in psychiatric settings.

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POS2-64 A VALIDATION OF THE NICOTINE WITHDRAWAL ASSESSMENT FOR YOUTH

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The present study examined the psychometric properties of the Nicotine Withdrawal Assessment for Youth (N-WAY), a new measure of adolescent nicotine withdrawal symptoms. Adolescent smokers (n = 43) and nonsmokers (n = 50), ranging in age from 13-19 years old, were found to report significantly different rates of ten measured purported nicotine withdrawal symptoms: anger, headaches, alertness, feeling depressed, nervousness, dizziness, irritability, conflict with family, conflict with school staff, and cigarette cravings. An examination of the N-WAY demonstrated good test-retest reliability, split-half reliability, and internal consistency. Its total symptom and impact score both accurately discriminated current smokers from nonsmokers. There was also weak concurrent validity with an established measure of nicotine dependence, the Modified Fagerström Tolerance Questionnaire. This was hypothesized to support that the N-WAY validly measures nicotine withdrawal symptoms, a distinct construct from nicotine dependence symptoms. Other correlates of nicotine withdrawal symptoms, such as number of daily cigarettes smoked and prior quit attempts, accurately predicted total N-WAY impact score, further indicating the N-WAY's validity. These results suggest that with some minor alterations, the N-WAY can be used as an accurate measure of adolescent nicotine withdrawal symptoms. As prior studies (e.g., Sussman, 2002) demonstrate, withdrawal symptoms are a primary reason for a smoking cessation failure, which occurs 88% of the time. With an improved understanding of adolescent nicotine withdrawal symptoms and a method for assessing it, treatment providers will have an additional tool to improve rates of adolescent smoking cessation success.

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POS2-65 ASSESSMENT OF DAILY SMOKING USING TIMELINE FOLLOW-BACK (TLFB) AMONG AFRICAN AMERICAN LIGHT SMOKERS

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Clinical Practice Guidelines call for greater attention to intervention among light smokers, often identified as those who smoke 10 or fewer cigarettes per day (cpd). Smoking level is commonly measured using a single item, self-reported estimated average of cpd in the past week. Whether cpd adequately captures smoking patterns among light smokers is unclear. African American (AA) smokers report using fewer cpd compared to Whites, yet have higher cotinine levels relative to self-reported cpd: such findings lead to questions about nicotine metabolism, measurement of smoking levels, and potential under-reporting of cpd. An alternate measure is the Timeline Follow-back (TLFB), which assesses multiple estimates of daily smoking over a designated period of time and has been validated against cotinine. The TLFB has not been evaluated in African American light smokers. The purpose of this study is to evaluate smoking level using both cpd and 7-day TLFB among 468 AA light smokers (65% female, mean (SD) age 47.3 (11.3) years) enrolled in an ongoing clinical trial of bupropion for smoking cessation. We assessed self-reported cpd, 7-day TLFB, and serum cotinine at baseline. Participants reported smoking an average cpd of 7.9 cigarettes (SD=2.6, range 0-15), with mean cotinine of 311 ng/ml (SD=181). Average (SD) TLFB was 7.45 (2.59) cigarettes, with individual minimum daily smoking ranging from 0-12 cigarettes and individual maximum daily smoking ranging from 1-25 cigarettes. The mean (SD) range of smoking within an individual smoker was 3.64 (3.18) cigarettes, with some smokers showing up to a 17 cpd difference from lighter to heavier days. Average TLFB was moderately correlated with cpd ($r = 0.68$) and weakly correlated with cotinine ($r = 0.30$) ($p < 0.0001$). Cotinine showed the highest correlation with TLFB for the single day prior to baseline assessment ($r = 0.39$, $p < 0.0001$), and lower correlation to the single item cpd ($r = 0.16$, $p < 0.05$). Findings demonstrate that, compared to single item assessment of cpd, 7-day TLFB captures variability in daily smoking patterns and provides a stronger correlation to cotinine among African American light smokers.

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POS2-66 RACIAL DISPARITIES IN SCREENING AND ELIGIBILITY DETERMINATION IN A SMOKING-CESSATION CLINICAL TRIAL

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Enrolling sufficient representation of minority smokers, particularly African Americans, into smoking cessation clinical trials has largely been unsuccessful. This study compared the recruitment of African American and non-Hispanic White smokers into a large pharmacotherapy and behavioral therapy treatment trial for smoking cessation to identify barriers to successful enrollment of African Americans. Data were taken from recruitment records from March 1, 2008 to February 28, 2009 within a randomized clinical trial examining a combined pharmacological (naltrexone, nicotine patch) and behavioral smoking cessation intervention. The clinical trial, conducted at a large urban medical center and two satellite locations within the Chicago metropolitan area, enrolled a racially diverse sample with 35% African American, 57% White, and 8% Other. Among the 1,316 smokers interested in and telephone screened for the study during the 12-month interval, there were a higher percentage of smokers identified as African American (62%) compared with White (28%) or other racial/ethnic groups (10%). While African American smokers reported a higher desire to quit smoking than Whites ($p<.001$), they were more likely to be determined ineligible for study inclusion during initial telephone screening (57% vs. 50%, respectively; $p<.05$), and more likely to fail to attend the in-person screening (55% vs. 39% non-attendance, $p<.01$). Of those who did attend the in-person screen, African Americans were more likely than Whites to be determined ineligible (68% vs. 28%, $p<.001$). Finally, within those candidates deemed eligible, African Americans were more likely to elect not to enroll (23% vs. 9%, $p<.05$). In sum, African American smokers were four times more likely to be non-participants in the clinical trial than their White counterparts [non-enrollment rates: 96% (785/819) vs. 83% (308/370); OR= 4.65, $p<.001$]. There were numerous barriers to their participation, including a higher likelihood of ineligibility and lower attendance rates at screening than observed in Whites, and further research addressing strategies to ameliorate this racial disparity is warranted.

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POS2-67 BASELINE CHARACTERISTICS OF AMERICAN INDIAN SMOKERS IN A PILOT CESSATION STUDY

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American Indians have the highest smoking rates of any racial/ethnic group in the U.S. and have more difficulty quitting smoking. There are currently no proven, effective culturally tailored smoking cessation programs for American Indian smokers. This study enrolled 71 American Indian smokers in the Midwest to pilot test a culturally tailored smoking cessation program that was developed using community-based participatory research methods. The main components of the cessation program include culturally tailored group sessions with or without pharmacotherapy or nicotine replacement. We present baseline characteristics of the participants related to their smoking behavior, as outcome results are not yet available. Participants smoked an average of 15.4 cigarettes per day (cpd; SD=8.7), were predominantly female (60.6%), and had a mean age of 45.4 years (SD=13.6). The majority of our participants (73.2%) reported using tobacco for traditional purposes, such as ceremonial, spiritual, or prayer. Smokers also completed the Fagerström Test for Nicotine Dependence (FTND). The average FTND score for this sample was 3.9 (SD=2.4), with males [4.2 (SD=2.5)] reporting a higher score compared to females [3.7(SD=2.3)]. Using the cutoff of 4 or higher to indicate nicotine dependence, approximately 54% of our participants met this criterion of nicotine dependence. The majority of participants chose pharmacotherapy (Varenicline) plus group sessions (70%) with only 8% selecting only group sessions without pharmacotherapy or nicotine replacement. At baseline, participants also completed the 2-item Patient Health Questionnaire (PHQ-2), to assess level of depressive symptoms. PHQ-2 scores range from 0 to 6 with a score of 3 or greater suggesting clinical depression: mean PHQ-2 score was 1.5 (SD=1.6), with 25% of smokers reporting significant depression (>3). Findings emphasize the need for effective culturally tailored smoking cessation programs, since their level of addiction is comparable to other racial/ethnic groups and the majority reported using tobacco for traditional purposes.

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POS2-68 INFLUENCE OF SMOKING INTERVENTION GROUP ASSIGNMENT ON SMOKING AND DEPRESSION SELF-REPORTED MEASURES

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Aim: To determine whether reinforcement of cigarette smoking abstinence (i.e., contingency management) produces changes on self-reported measures related to smoking and depression.

Methods: The effect of assignment to an abstinence contingent (n=26) or yoked control (n=26) group in an Internet-based smoking cessation study was determined for self-reported measures related to smoking and depression. Scores on the Fagerström Test for Nicotine Dependence, Questionnaire of Smoking Urges, University of Rhode Island Change Assessment, Contemplation Ladder and Beck Depression Inventory completed at intake and at 2, 4, 6 and 12 weeks following study entry served as the dependent variables. Scores on the measures were analyzed using a mixed model ANOVA with Group Assignment as the between-subjects factor and Assessment Time as the within-subjects factor

Results: ANOVA revealed significant effects of Assessment Time on the Fagerström, Contemplation Ladder, QSU Factor 1 and Factor 2 and BDI Scores. For the Fagerström, scores were highest at Intake, decreased at Week 2 and remained stable throughout the remainder of the trial. For the Contemplation ladder, scores increased from Intake to Week 2 and decreased across the remainder of the trial. For the QSU Factors, scores were lowest at Intake, increased at Week 2 and remained stable throughout the remainder of the trial. Lastly, for the BDI, scores generally decreased across time in the trial. No significant effects of Group Assignment were observed on any of these measures, nor were any significant effects observed on the URICA.

Conclusions: The results of the present analysis demonstrate that group assignment in an abstinence reinforcement smoking cessation intervention did not produce robust changes in a number of self-reported measures related to smoking and depression, which is consistent with some previous findings. It does appear, however, that merely enrolling into the research project produced changes on these measures as a function of time. Future research should determine how study enrollment produces changes on other self-reported measures.

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POS2-69 CORRELATES OF CRAVING AMONG AFRICAN-AMERICAN LIGHT SMOKERS

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Cigarette craving or the desire to smoke is thought to play a central role in nicotine addiction and serve as a leading reason for relapse among smokers. Further, current smokers report experiencing craving while still engaging in active smoking. Little attention has been given to craving among light smokers. The purpose of the current study was to determine correlates of baseline craving among a sample of 468 African American light smokers enrolled in an ongoing clinical trial of bupropion for smoking cessation. Participants reported smoking an average of 7.9 cigarettes per day (CPD; SD=2.6), were predominately female (65%), and had a mean age of 47.3 years (SD=11.3). Individuals completed the Brief Questionnaire of Smoking Urges (QSU-Brief), Minnesota Withdrawal Scale (MNSW), Positive and Negative Affect Schedule (PANAS), and the four item Perceived Stress Scale (PSS-4) at the baseline visit before beginning treatment. Results indicate baseline craving levels were higher among individuals who reported greater levels of withdrawal (MNSW, $p<.0001$), perceived stress (PSS-4, $P<.0001$), and negative affect (PANAS NA, $p<.0001$). In addition, participants who reported smoking more cigarettes per day ($p<.01$) also had higher craving scores on the QSU-Brief. The QSU-Brief was found to be correlated to a single craving item on the MNSW ($r=0.40$, $p<.0001$). Smokers who reported smoking within 30 minutes of awakening in the morning reported experiencing higher levels of craving ($t=-4,209$, $p<.0001$). No significant differences were found between participants smoking five or less CPD and 6 or more CPD on measures of withdrawal, affect, perceived stress, craving, and years smoked. Identification of smokers who experience craving may inform individual treatment planning with the goal of enhancing cessation outcomes.

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POS2-70 DEVELOPMENT AND VALIDATION OF A SCALE ASSESSING TAILORING-RELATED EXPECTANCIES: THE TAILORED INTERVENTION EXPECTANCIES QUESTIONNAIRE

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Individually tailored smoking cessation interventions have been found to be more effective than standard interventions. Generally, intervention expectations are a significant predictor of outcomes. Expectancies are an individual-difference variable that may partially explain the efficacy of tailoring. With regard to smoking cessation interventions, Webb et al. (2005) found that expectations for tailored versus standard messages predicted subsequent readiness to quit smoking. This study describes the validation of the Tailoring Intervention Expectancies Questionnaire (TIE-Q). This study sought to develop and validate a 15-item instrument to assess expectancies for tailored and standard intervention approaches. Items were developed using rational methods and item response theory. Participants indicated agreement with each item on a 5-point Likert scale, ranging from “strongly disagree” to “strongly agree.” Examples included: “In order for a program to be effective, it should be developed based on my own characteristics and needs” and “I do not think that the majority of smokers need individualized information on ways to quit.” Adult smokers (N = 289) completed the questionnaire. Participants were mostly female (61%), Caucasian (90%), with an average age of 49 years (SD = 9.94). The observed range of scores was 23-73, with a mean of 48.26 (SD = 9.26). Internal consistency of the measure was high (= .85). A factor analysis using maximum likelihood factor extraction and a promax rotation was conducted. Examination of eigenvalues and scree plot revealed three distinct factors: (1) high tailoring expectancies (6 items; accounting for 32.1% of item variance), (2) low tailoring expectancies (5 items; accounting for 14.7% of variance), and (3) neutral intervention expectancies (4 items, accounting for 8.6% of variance). The factors explained 55% of total variance in the measure. Our findings support use of the TIE-Q for assessing intervention expectancies and for further understanding links between participant expectations and intervention outcomes. Future research will focus on testing the validity of the measure in different populations and examining clinical applications.

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POS2-71 NICOTINE DEPENDENCE AMONG AFRICAN AMERICAN LIGHT SMOKERS: EVALUATION OF THE WISCONSIN INVENTORY OF SMOKING DEPENDENCE MOTIVES (WISDM-30)

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African American (AA) smokers are at increased risk for tobacco-related morbidity and mortality despite smoking fewer cigarettes per day compared to white smokers. To better understand nicotine dependence among AA smokers, our group previously evaluated AA light smokers (10 or fewer cigarettes per day) using the Cigarette Dependence Scale (CDS), the Fagerström Test for Nicotine Dependence (FTND), and the Nicotine Dependence Syndrome Scale (NDSS). The purpose of the current study is to extend this work by evaluating dependence using the multidimensional, brief Wisconsin Inventory of Smoking Dependence Motives (WISDM-30) among 468 AA light smokers enrolled in an ongoing clinical trial of bupropion for smoking cessation. Participants smoked an average of 7.9 cigarettes per day (cpd; SD=2.6), were predominantly female (65.0%), and had a mean age of 47.3 years (SD=11.3). Participants completed the WISDM-30, FTND and Brief Questionnaire of Smoking Urges (QSU-Brief). The WISDM-30 global score was significantly correlated with the QSU-Brief, the FTND, and cpd ($r = .64, .44, .25$, respectively, $p < 0.001$). Compared to those who smoked 1-5 cpd, smokers who averaged 6-10 cpd reported higher global WISDM-30 scores (32.36 vs. 38.14, $p<0.0001$). Relative to those who wait to smoke, smokers who smoked their first cigarette within 30 minutes of waking reported higher global WISDM-30 scores (31.98 vs. 38.96, $p<0.0001$), and higher subscale scores for Affiliative Attachment, Loss of Control/Tolerance, Cognitive Enhancement, Craving ($p<0.0001$); Automaticity, Taste/Sensory Process ($p<0.001$); Weight Control and Negative/Positive Reinforcement ($p<0.01$). The WISDM-30 provided multidimensional evaluation of dependence among AA light smokers, with notable differences in global and key subscale scores based on smoking level (cpd) and time to first cigarette. Given numerous domains assessed by different measures, use of multidimensional scales may provide the most comprehensive assessment of dependence to improve our understanding of this construct in relation to smoking behavior.

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POS2-72 ECOLOGICAL MOMENTARY ASSESSMENT ANALYSIS OF RELATIONS AMONG COPING, AFFECT, AND SMOKING LAPSE

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Coping skills in response to stressful events are promoted in typical smoking cessation counseling to increase successful cessation rates. However, research has yet to demonstrate conclusive benefits of coping on cessation success. Exerting coping efforts and self-control require cognitive resources. Therefore, while coping is generally viewed as beneficial, exerting extra effort to cope with stress may negatively affect one's ongoing cessation effort through the exhaustion of limited resources needed for sustained self-control, especially in those with little coping experience. The present study used data from a large scale smoking cessation clinical trial of bupropion SR and individual counseling to assess complex relations among coping, affect, and smoking. Subjects' smoking, coping, and affect were assessed with multiple EMA reports collected using electronic diaries pre-and post-quit. We hypothesized that coping with stress would prospectively predict change in the likelihood of a smoking lapse over the 48 hours following the coping effort. We also predicted that negative and positive affect as well as temptation coping would mediate coping-lapse relations. Moreover, analyses tested whether individual differences in pre-quit coping experience moderated post-quit coping effects on subsequent affect, coping effort, coping efficacy, and smoking behavior. Results of multilevel models provided mixed support for the model. Coping did not improve negative affect within 4 hours of coping efforts, but coping improved positive affect and increased the odds of engaging in temptation coping in the short-term. Furthermore, lapses were more likely to happen when recent coping was reported within the same 48 hours. None of the putative mediators of coping were predictive of later lapse risk as anticipated. Analyses also revealed that pre-quit coping practice moderated the effects of post-quit coping to deal with stressful events on later affect. Moreover, significant moderating gender effects were found in these relations. Further research exploring the direction and duration of coping effects on affect and lapse risk is needed.

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POS2-73 SEVERITY OF NICOTINE WITHDRAWAL SYMPTOMS AND EFFECT OF NICOTINE REPLACEMENT THERAPY IN SMOKERS HOSPITALIZED WITH HEART DISEASE

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Background: Smokers commonly develop nicotine withdrawal symptoms when deprived of nicotine. Little is known about the severity of nicotine withdrawal symptoms in smokers hospitalized with heart disease and the effect of in-hospital treatment with nicotine replacement therapy (NRT).

Purpose: To assess (1) the severity of nicotine withdrawal symptoms among smokers hospitalized with heart disease; and (2) the effect of in-hospital treatment with NRT. We hypothesized that smokers hospitalized with heart disease would experience nicotine withdrawal symptoms and that the provision of NRT would relieve patient discomfort.

Methods: Charts were reviewed from a consecutive series of smokers (n=106) admitted to a tertiary-care cardiac facility. All were referred to an in-hospital smoking cessation program in accordance with institutional protocols. Nicotine withdrawal symptoms were measured using the Minnesota Nicotine Withdrawal Scale at baseline and 24 to 48 hours following baseline. Treatment with NRT was documented on the patient chart.

Results: Participants had a mean age of 54.2 ± 11.5 years and had smoked for a mean of 34.3 ± 13.1 years. Seventy-four percent of participants were male. Approximately 2/3 (65.1%) of participants received NRT and 34.9% did not (noNRT). There were no significant differences between NRT and noNRT groups in terms of age, number of years smoked, and feelings of conviction and confidence regarding smoking cessation. Mean nicotine withdrawal symptom scores decreased by 1.51 ± 3.91 and by 0.21 ± 2.11 in the NRT and noNRT groups, respectively. Mixed model repeated measures analysis showed a significant main effect both for time ($F=7.298$; $p=0.008$) and for NRT treatment ($F=5.459$; $p=0.021$).

Conclusions: Treatment with NRT is associated with a rapid reduction in nicotine withdrawal symptoms in smokers hospitalized with heart disease. Medications, such as NRT, can assist hospitalized smokers to reduce cravings to smoke, increase comfort during hospitalization, and improve the likelihood of achieving long-term. The use of other pharmacotherapies to treat withdrawal symptoms in patients hospitalized with heart disease warrants investigation.

Ministry of Health Promotion of Ontario.

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POS2-74 NATURAL HISTORY OF CHANGES IN CIGARETTE SMOKING UPON LEARNING OF PREGNANCY

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Cigarette smoking is the leading preventable cause of poor pregnancy outcomes in the United States. Among women who report smoking at the time they learned of their pregnancy, some quit with little or no intervention before their 1st prenatal care (PNC) visit and those still smoking at their 1st PNC visit report they have reduced their smoking an average of 50% from their pre-pregnancy rate. To our knowledge, there are no reports characterizing the trajectory of these changes. Participants were 109 pregnant women who reported smoking at the time they learned of their pregnancy, recruited through PNC providers and the WIC clinic in the Burlington, VT, area to participate in ongoing clinical trails examining the efficacy of voucher-based incentives to promote smoking cessation and prevent relapse in pregnant smokers. Participants self-reported their pre-pregnancy smoking rate at trial intake and completed a timeline follow-back interview to assess the number of cigarettes they smoked each individual day, from the day they learned of their pregnancy until their first PNC visit. On average, participants were 5 weeks estimated gestational age (EGA) when they learned of the pregnancy and 11 weeks EGA at their first PNC visit. In the intervening period, 29 (27%) participants reported quitting (≥7 days continuous abstinence), 38 (35%) reported making a significant reduction (≥7 days of smoking at ≤ 50% of pre-pregnancy rate) and 42 (39%) reported no significant changes in their smoking. The majority of participants reported making changes within the first several days of learning of pregnancy. Fifty-five percent of quitters and 72% of reducers reported initiating abstinence or significant reduction in smoking within 1-2 days of learning of pregnancy. The majority of women who made changes in their smoking (72% of quitters and 89% of reducers) continued to abstain or smoke at a significantly reduced rate until her first PNC visit. These data indicate that women who do not quit or significantly reduce their smoking on their own shortly after learning of pregnancy are unlikely to do so and suggest that treatment interventions should be initiated before the first PNC visit.

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POSTER SESSION 3

POS3-1 DO STATE-LEVEL FACTORS MATTER? TOBACCO CESSATION QUITLINE SPENDING IN 2008

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Introduction: Tobacco cessation quitlines are an effective population-wide strategy for smoking cessation. All 50 U.S. states, the District of Columbia, Puerto Rico, and many other provincial and national governments have implemented quitlines. While the evidence base for quitlines is robust, funding available for this service varies widely. State-level factors may influence states' funding decisions about quitlines, but little is known regarding such factors.

Methods: Data from the 2008 North American Quitline Consortium survey and data from publicly available sources were analyzed to identify state-level factors that predict per capita quitline funding. Factors evaluated were: demographics (education, income, age), tobacco use (adult smoking prevalence, consumption), tobacco control spending (per capita tobacco control expenditures, MSA securitization), and political and economic climate (state cigarette excise tax rate, governor and legislature political affiliation, state political ideology, and tobacco agriculture).

Results: In univariate analysis, higher levels of per capita quitline spending were predicted by a larger percentage of the state's population having a high school degree or greater (B=0.06, p = 0.01, 95% CI 0.02-0.11), and higher levels of per capita tobacco control funding (B=0.15, p=0.00, 95% CI 0.11-0.19). The best-fitting multivariate model that predicted higher overall levels of per capita quitline funding in 2008 comprised one variable: higher levels of per capita tobacco control funding (B=0.15, p =0.00, 95%CI 0.11-0.19).

Conclusions: Consistent with our previous research, select state-level factors – specifically overall per capita tobacco control funding – appear to have influenced per capita quitline services funding in 2008. The Centers for Disease Control and Preventions' recommendations for comprehensive tobacco control programs include quitlines, which may help explain this finding. Additional research is needed to understand why other state-level factors appear to be less influential in 2008 than in previous years.

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POS3-2 MAORI SMOKERS SUPPORT MAJOR TOBACCO CONTROL INTERVENTIONS: NATIONAL SURVEY DATA FROM AOTEAROA/NEW ZEALAND

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AIM: To describe the attitudes of Maori smokers to a range of tobacco control policy options. This indigenous population has notably high smoking rates, which has prompted some Maori leaders to advocate for new and radical measures in tobacco control.

METHODS: The NZ arm of the International Tobacco Control Policy Evaluation Survey (ITC Project) uses as its sampling frame the NZ Health Survey (a representative national sample). From this sample we surveyed adult smokers (n=1376) including 607 Maori respondents.

RESULTS: Maori were more likely than the European/Other ethnic group to want further tobacco product regulation (70.5% vs. 62.9%, crude odds ratio (OR)=1.41, 95%CI: 1.04–1.91). This was also the case for more government action on tobacco control (65.9% vs. 53.0%, OR=1.71, 95%CI: 1.28–2.30). Most (70.4%) also thought that tobacco companies should not be allowed to advertise as they please. Maori were also more likely than European/Other to support an increase in tobacco tax if the revenue was used to promote healthy lifestyles and support quitting (64.6% vs. 55.4%, but this difference was not statistically significant in the multivariable analysis). In terms of smokefree areas, Maori were more likely than European/Other to support new types of smokefree environments that covered outdoor areas and cars (56.0% vs. 48.8% for a scoring high in a 6-item smokefree support index). All 4 multivariable models showed this pattern (albeit not at a statistically significant level). Most Maori supported a ban on the point-of-sale display of tobacco products (62.5%) and also a law for factory-made cigarettes to be fire-safe (75.8%). Both these results were similar to those for the European/Other group.

CONCLUSION: There was majority support by Maori smokers for a wide range of major tobacco control interventions. For most of the policies canvassed the support was higher in Maori than among the European/Other ethnic group, though differences were not always statistically significant. Policy makers should consider this support when proposing tobacco control to advance Maori health and reduce health inequalities in Aotearoa/New Zealand.

Health Research Council of New Zealand.

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POS3-3 "E-CIGS" ARE ELECTRONIC NICOTINE DELIVERY SYSTEMS (ENDS): CONCLUSIONS AND RECOMMENDATIONS FOR RESEARCH AND POLICY BY THE WORLD HEALTH ORGANIZATION TOBACCO REGULATION (WHO TOBREG) STUDY GROUP

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This poster will present the Scientific Recommendation of WHO TobReg on ENDS. The recommendation was developed within the context of the WHO Framework Convention on Tobacco Control ("FCTC"), with particular attention to aiding Parties to the treaty in their implementation of Articles 9, 10, and 11, which address tobacco product contents, disclosures and packaging and labeling. In addition, guidance for implementation of Article 8, which requires protection from exposure to tobacco smoke, is vital because many of the manufacturers advertise that ENDS can be used where smoking is not permitted. The recommendation was developed because ENDS pose significant public health issues and raise questions for tobacco control policy and regulation. ENDS do not meet definitions of conventional tobacco products but most claim lung delivery of nicotine and other substances. They have the potential to undermine public smoking bans and undermine prevention and cessation by serving as attractive nicotine/tobacco starter products and by their claims as safe alternatives to tobacco products. There are at least 24 licensed companies and many more brands and model names, their marketing websites make diverse claims concerning their contents, sensory properties, and uses which include cigarette substitution, smoking cessation, craving and for use where smoking is not permitted. Contents include nicotine, propylene glycol, "tobacco extract" flavouring and other substances and appear to vary widely across products, but there is not regulated system of disclosure of ingredients, operation or emissions. The recommendation document includes findings of fact based on available evidence, and recommendations for research, policy, and regulation.

No external funding was provided. The Recommendation was developed by the TobReg Study Group of the World Health Organization.

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POS3-4 FDA AUTHORITY TO LIMIT NICOTINE IN SMOKED TOBACCO PRODUCTS: OPPORTUNITIES AND OBSTACLES FOR A SMOKE-FREE SOCIETY

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Legal authority now exists to require smoked tobacco products to be non-addictive. The Family Smoking Prevention and Tobacco Control Act ("Act") of 2009, now codified as amendments to the Federal Food, Drug, and Cosmetic Act, authorizes the U.S. Food and Drug Administration (FDA) to promulgate product standards for nicotine yields of smoked tobacco products. It further authorizes the FDA's Tobacco Products Scientific Advisory Committee to provide advice and recommendations on the effects of the alteration of nicotine yields from tobacco products and on whether there is a threshold level below which nicotine yields do not produce dependence on the tobacco product involved. The determination of such a threshold presents certain challenges. Research suggests that some non-daily smokers, long thought to have avoided addiction, actually show evidence of dependence. While a single threshold may not apply to the entire population, minimal nicotine yields akin to those found in nightshade vegetables or slightly higher should be below any dependence threshold. An additional challenge is to determine the relative public health implications of a phased reduction versus a one-time reduction in nicotine yields. While a phased reduction mitigates the withdrawal symptoms of current smokers, compensatory smoking behaviors may create additional health risks. This paper addresses policy concerns that such a regulatory approach would create some of the unintended consequences associated with drug and alcohol prohibition. The Harrison Narcotics Act, Volstead Act (alcohol) and Marihuana Tax Act and subsequent laws are examined and distinguished from possible FDA action to reduce nicotine yields. A critical distinction is that nicotine itself would not be prohibited. Rather, only the most lethal form of nicotine delivery would be subject to regulation. Under the Act, the Secretary of Health and Human Services must consider the public health benefits of a proposed tobacco product regulation. Such a nicotine yield reduction would appear to have the potential to transform the tobacco control landscape by dramatically reducing risk to smokers and smoke exposure of others.

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POS3-5 EVALUATION METHODS FOR TOBACCO CONTROL PROGRAMS AND POLICIES

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This paper reviews methods used for the evaluation of health outcomes of tobacco control and second-hand smoke policies and provides guidance for future evaluation. We reviewed the literature and identified the policies and program types that have been evaluated and the approaches used with respect to study populations and sampling design, data sources, outcome measures, and analytic methods. A systematic literature search of PubMed was conducted and twenty-one articles were selected reporting evaluations of health effects of tobacco control policies and programs other than cessation programs published between 1998 and 2009. The level of policies evaluated ranged from local to nationwide, the majority (57%) of which were smoke-free indoor air policies. Health outcomes evaluations of other tobacco control policies (e.g., taxation, advertising bans, youth access restrictions) were generally absent from the literature. Short-term health outcomes were assessed in twelve evaluations, including seven examining acute myocardial infarction hospitalizations. Other short-term health outcomes were respiratory symptoms, or pulmonary function. Nine studies focused on long-term health outcomes, primarily lung and other cancer incidence and coronary heart disease. The majority of evaluations were secondary analyses of existing data primarily from national and administrative databases. Primary data collection included self-reports from survey questionnaires, and clinical laboratory data (e.g., cotinine, forced expiratory volume). Study designs were pre-post (12), longitudinal (6), or cross-sectional (3). Statistical analyses were generally regression (linear logistic, Poisson, and Joinpoint) and time series analyses. Future evaluations of health effects of tobacco control could expand the range of policies examined and health outcomes assessed, such as pediatric asthma, COPD, and oral cancers.

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POS3-6 EVALUATION OF A COMPREHENSIVE OUTDOOR SMOKING BYLAW – A LONGITUDINAL STUDY OF SMOKERS AND NON-SMOKERS IN THE CANADIAN CITY OF WOODSTOCK

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Background: The City of Woodstock, Ontario, Canada, implemented a comprehensive outdoor smoke-free ordinance that came into effect September 1, 2008. This bylaw restricted or banned smoking in different outdoor environments including downtown sidewalk cafés, city parks and recreational fields, public doorways and private doorways that elect to be listed, and areas around bus stops. This is, we believe, the first systematic evaluation of an outdoor smoke-free law.

Methods: A mixed-mode survey (phone and face-to-face) was conducted prior to the bylaw coming into effect, to measure support for the restrictions and smoking behaviours. The phone survey component included a random digit dialing (RDD) general adult population survey of non-smokers and smokers. Another set of smokers was contacted through a convenience sample street intercept, ensuring that smokers who frequent the environments to be regulated would be included in the sample. Using a longitudinal cohort design, respondents from wave 1 were re-contacted by phone approximately 1 year after the ban was implemented to measure changes.

Results: The second wave included 199 smokers, 24 quitters and 304 non-smokers; approximately 75% of the sample was retained from wave 1. Of the respondents who quit smoking between waves, approximately half (n=11) said the bylaw had helped them to quit. Of the respondents who continued to smoke, 31% (n=61) reported that the bylaw had helped them to cut down the amount they smoke. When considering the entire sample, 86% (n=453) agreed or strongly agreed that the bylaw was good for the community. Most smokers and non-smokers indicated that the restrictions had not affected their use of outdoor city facilities. Most people who smoke or quit smoking (87%, n=195) reported the bylaw had not affected how often they visit a park. Some non-smokers (8%, n=23) reported they use parks more now, and approximately 10% of smokers reported they use parks less (n=23). Smokers' support for 100% smoke-free parks increased from 15% (n= 61) to 27% (n=61).

Conclusions: These findings suggest positive reactions and support for the city of Woodstock's outdoor smoke-free law, even among smokers.

This study was funded by a Fast-track Policy Research Grant from CTCRI -- the Canadian Tobacco Control Research Initiative.

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POS3-7 LESSONS FROM NEW ZEALAND'S INTRODUCTION OF GRAPHIC HEALTH WARNINGS ON TOBACCO PACKAGING

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AIM: To identify lessons from the introduction of New Zealand's (NZ) regulations requiring tobacco companies to feature graphic health warnings (GHWs) on product packaging in 2008.

METHODS: We reviewed official (particularly Ministry of Health) documents describing the processes used to develop and introduce the GHWs and held discussions with officials involved.

RESULTS: The major process lessons were: (i) Processes used by other developed countries (i.e., Canada and Australia) provided useful guidance (e.g., a mass media campaign run when the GHWs were introduced drew on a parallel Australian campaign); (ii) Cost savings were achieved by obtaining permission to use copyrighted warnings from other countries (albeit at quite a large cost in administrative time). Key research-related lessons were that: (i) Commissioned literature review work and qualitative research in NZ was helpful in preparing the case for GHWs; and (ii) Careful attention to multiple national laws and trade agreements may have helped avoid legal challenges by the tobacco industry. However, other countries' measures can also prove limiting. For example, the NZ front-of-the-pack warning covers only 30% of the available area, since larger warnings may have been challenged on the basis of trade agreements with Australia. Also, some of the 14 GHWs used could have had more impact. Some lacked a focus on specific health conditions; others included less recognisable images (e.g., internal organs), and the Quitline number is small and is printed on the back only. Furthermore, the final regulations did not specify any monitoring of industry processes around printing GHWs, nor was there a process for routinely refreshing the warnings.

CONCLUSIONS: Given documented tobacco industry opposition to introducing GHWs and the NZ Ministry of Health's resource constraints, the implementation process was fairly robust. Countries planning on introducing GHWs could learn from the experience of countries like New Zealand and should support moves by the Framework Convention on Tobacco Control's Secretariat to develop an international bank of copyright free warnings.

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POS3-8 CONSUMPTION TRENDS AND PROJECTED CONSEQUENCES OF HARM REDUCTION

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Background: The "hardening of the target" theory assumes that persons remaining that continue to smoke are the "inadvertent smokers," the most addicted, heaviest smokers, and are unable to quit. The theory would be a rationale for promotion of reduced harm products. However, evidence from Giovino et al. suggests a correlation between the level of dependence and smoking in state populations. The present study further examines the possible implications and validity of this assumption.

Methods: Linear trends in annual per-capita cigarette consumption and smoking prevalence were determined and extrapolated to the year 2020 based on assumptions. State-level temporal trends in Massachusetts and California (two states that have had strong tobacco control programs) smoking prevalence, and measures of dependence among smokers (quit attempts, abstinence, number of cigarettes smoked per day, and every day smoking) derived from Tobacco Use Supplement to the Current Population Survey (TUS-CPS) from 1992 to 2007 were examined. The relationship between prior use of a PREP and motivation to quit smoking was examined by logistic regression of TUS-CPS data.

Results: Annual per-capita cigarette consumption and smoking prevalence are projected to continue to approach zero by 2020 at the current rate of decline. State-level temporal trends of declining Massachusetts and California prevalence have been paralleled by decreasing trends in all measures of dependence examined. Use of a PREP was higher among smokers motivated to quit than smokers not motivated to quit (OR 1.19, 95% CI 1.03, 1.38).

Conclusion: Smoking and dependence have been decreasing in tandem, and remaining smokers, including persons who have tried reduced harm products, tend to wish to quit. Strategies to continue the reduction in tobacco use might be more effective than reduced harm strategies.

No funding.

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POS3-9 APPLYING REGULATORY RISK ASSESSMENT MODELS TO TOBACCO SMOKE TOXICANTS

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There is a number of tobacco smoke toxicants identified in the scientific literature as being potentially responsible for the adverse health effects of cigarette smoking. Recent papers have presented quantitative risk estimates of the contribution of individual toxicants. Such estimates could help the development of potential reduced exposure products, as defined by the US Institute of Medicine. In some assessments, the calculated potency includes a cigarette smoke toxicant yield and a disease potency factor, usually taken from a regulatory database which uses information from a single critical publication. We have reviewed the literature to estimate disease potency factors, for lung cancer and chronic obstructive pulmonary disease, for some tobacco smoke toxicants, and applied a margin of exposure (MOE) model developed by the European Food Safety Authority and considered useful by EU scientific committees. Under this model, which was not developed to address tobacco toxicants, MOE values <10,000 are said to indicate a high priority. We have calculated MOE values for a range of studies to produce a MOE range representative of the literature rather than from a single paper. For formaldehyde, from 4 publications, 10 MOEs for respiratory tumour endpoints can be computed from 124 to 888 indicating that this toxicant would be identified as being of high priority. For 1,3-butadiene, from 3 papers, 16 MOEs for respiratory tumours in mice are in the range 7 - 12050 indicating again that this toxicant would be identified as a high priority. However, 1,3-butadiene induces leukemia but not lung tumours in man and lung tumours in mice. For 1,3-butadiene there is a considerable amount of metabolic data indicating that the mouse may not be a relevant model for lung carcinogenesis in man suggesting that this compound, whilst a known carcinogen, may not be a high priority in relation to tobacco smoke related lung cancer. This suggests that while the MOE approach may identify which toxicants are potentially of high priority, additional assessment will be needed to ascertain the importance of individual toxicants to smoking-related diseases.

The study was entirely funded by British American Tobacco.

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POS3-10 HIGH-RESOLUTION ANALYSIS OF TOBACCO DEMAND IN A COMMUNITY SAMPLE OF SMOKERS

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One of the most effective strategies to decrease tobacco consumption and motivate smokers to seek treatment has been via increased taxation of tobacco products. Tobacco demand refers to the relationship between tobacco consumption and its price, and estimates of tobacco demand are used to estimate the optimal levels of taxation. Cigarette purchase tasks are novel measures of tobacco demand that, in contrast to traditional approaches from health economics, assess individual-level estimates of tobacco consumption at various prices. Previous research in this area has been limited by small sample sizes and large intervals between prices. In this study, we sought to address these issues by assessing cigarette demand in a relatively large sample of community smokers using a larger number of cigarette prices. Participants were 296 smokers (60% male, 72% Caucasian, mean age = 32.6, mean cigarettes/day = 17.4) who completed a cigarette purchase task with individual cigarette price intervals ranging from zero cost to $80/cigarette and other potentially related variables. The data topographically conformed to expectations, with consumption decreasing as a function of escalating price and terminating for the vast majority of participants. Overall elasticity of demand, calculated arithmetically as the ratio of proportionate decreases in consumption to proportionate increases in price, was -.97. This is somewhat more elastic than previous macroeconomic estimates. Demand was inelastic at very low prices, but subsequently elastic with notable successive decreases toward zero. The most potent price changes were $.49 to $.50 (-9.23), $.98 to $1 (-8.63), $.39 to $.40 (-4.20), and $.44 to $.45 (-4.07), all of which are above the current typical price of cigarettes. Nicotine dependence was significantly associated with intensity of demand (consumption at zero cost; $r = .61$, $p < .0001$) and maximum expenditure on cigarettes (Omax; $r = .19$, $p < .001$). These findings further support the utility of a cigarette purchase task to provide a high-resolution assessment of tobacco demand and to potentially contribute to tobacco tax policy.

This work was funded by the Robert Wood Johnson Foundation Substance Abuse Policy Research Program (grant #65626, JM).

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POS3-11 THE IMPACT OF SMOKE-FREE ORDINANCES ON ABSTINENCE FOR PARTICIPANTS IN CESSATION INTERVENTIONS

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Smoke-free ordinances prevent harm caused by exposure to secondhand smoke. These laws may also have broader effects, such as creating barriers to smoking in public places or strengthening anti-smoking norms that indirectly influence smokers to quit. Minnesota's 2007 Freedom to Breathe Act (FTB) prohibits smoking in indoor public and work places statewide, including bars and restaurants. Prior to this statewide ban, 15 local smoke-free ordinances were in place. As part of a larger program evaluation of tobacco cessation interventions, this study assessed the effects of smoke-free laws on smokers' use of cessation programs and on outcomes. Intake, program use, and 7-month follow-up data were collected from cessation program participants in pre-FTB and post-FTB cohorts. Hierarchical logistic regression analyses were performed to determine the relationship between FTB and abstinence while controlling for other factors. The statewide FTB Act appears to positively impact 30-day abstinence. After controlling for exposure to local bans and other variables, those who enrolled in the program after FTB were 1.2 times more likely to quit ($p = .042$) and are predicted to achieve a 30-day abstinence rate 4.1 percentage points higher than those who enrolled before FTB. Controlling for FTB and other variables, each additional year residing in or adjacent to a local ban reduced the likelihood of achieving 30-day abstinence ($p < .001$, 0.912 relative risk). The effect of FTB on quitting diminished with each additional year of exposure to local bans. The relationship between ban-related variables and relapse is similar. Those who quit after FTB were less likely to relapse and would achieve a predicted relapse rate 6.4 percentage points below those who quit before FTB. Each additional year of exposure to a local ban increased the likelihood of relapse and the predicted relapse rate. Conclusion: The statewide smoke-free law influences cessation and reduces relapse among smokers participating in cessation interventions. However, previous exposure to more circumscribed local ordinances appears to lessen the impact of the subsequent statewide act.

Funding was provided by ClearWay Minnesota.

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POS3-12 INCREASING SUPPORT BY SMOKERS FOR BANS ON POINT-OF-SALE TOBACCO DISPLAYS: NATIONAL SURVEY DATA

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AIM: To determine the levels and trends in smokers' attitudes for a ban on point-of-sale tobacco displays. The setting is New Zealand where there has been increasing advocacy and media coverage on the issue of banning such displays and where some supermarkets have covered tobacco retail displays voluntarily.

METHODS: The NZ arm of the International Tobacco Control Policy Evaluation Survey (ITC Project) uses as its sampling frame the NZ Health Survey (a representative national sample). From this sample we surveyed adult smokers in two survey waves (n=1376 and n=926) one year apart (wave 2 in 2008/early 2009). Here we focus on the results for only those 926 respondents who participated in both survey waves.

RESULTS: Most smokers reported seeing "cigarette packages displayed at the place where you usually buy your tobacco" in both waves (60.4% and 63.7%). When asked, "do you support complete bans on displays of cigarettes inside shops" there was majority support that increased significantly from 60.5% to 66.5% over the 2 waves (i.e., for stating "somewhat" or "a lot" of support). The level of NZ smoker support in wave 2 was 67.8% (63.8% – 71.9%) when weighted and adjusted for the complex sample design. In wave 2 there was also majority support by smokers from all four major ethnic groups: Maori (72.2%), Pacific (75.2%), Asian (79.1%), and European/Other (64.8%). Majority support was also seen within five quintiles of socioeconomic deprivation (small area measure), with the highest support among the most deprived quintile (72.5%). For those with any level of individual deprivation, support was higher at 71.8% (vs. 64.0% for no deprivation) and with a significantly greater increase in support between waves (9.5% vs. 3.4%, p<0.001).

CONCLUSIONS: There was increased majority support by NZ smokers for complete bans on displays of cigarettes inside shops over a one-year period. This finding provides additional support for regulatory action on this persisting loophole in the otherwise relatively comprehensive marketing restrictions used in this country.

Health Research Council of New Zealand.

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POS3-13 IMPACT ON SMOKERS OF PRINTING A QUITLINE NUMBER ON NEW GRAPHIC HEALTH WARNINGS ON CIGARETTE PACKS: NATIONAL SURVEY DATA

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AIM: To examine the impact on smokers of new warnings on tobacco packaging that included the national Quitline number.

METHODS: The NZ arm of the International Tobacco Control Policy Evaluation Survey (ITC Project) uses as its sampling frame the NZ Health Survey (a representative national sample). From this sample we surveyed adult smokers in two survey waves (n=1376 and n=926) with those in wave 1 exposed to text-based warnings that had a phone number but no "Quitline" wording, and those in wave 2 to graphic health warnings (GHWs), which had the word "Quitline" by the number. We present results for respondents who participated in both survey waves.

RESULTS: The introduction of GHWs with the Quitline number was associated with an absolute increase in recognition of 24% that the phone number printed on the packs was that of the Quitline (from 37.0% to 61.0%, p<0.001). In wave 2 there was majority recognition of the Quitline number by smokers from all four major ethnic groups, including Maori (61.8%) and Pacific peoples (61.2%). The absolute increase in knowledge over the two waves was similar for Maori (25.1%) and Pacific (26.6%) but significantly higher for Asians (43.5%, p=0.005) compared with 23.6% for European/Other smokers. Majority recognition was seen within all five quintiles of socioeconomic deprivation (range 58.1% to 65.5%). The increase between the waves was lowest in the most deprived quintile (p<0.001) due mainly to higher recognition at baseline.

CONCLUSIONS: Adding a descriptor to the telephone number on tobacco packaging warning labels resulted in increased recognition by smokers that this was a Quitline number. This is despite this specific information being in small print and only on the back of the NZ packs. These findings are consistent with international literature on the effectiveness of health warnings and a previous study, which found increased registrations to the NZ Quitline were associated with the introduction of new GHWs. The findings should encourage policy-makers to increase further the visual prominence of all such information on tobacco packaging.

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POS3-14 EVALUATION OF GRAPHIC CIGARETTE IMAGES ON CRAVINGS TO SMOKE

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The use of graphic anti-cigarette warning images placed on cigarette packs has become a popular method of tobacco control worldwide. However, the effectiveness of such images as compared to existing warnings has not been evaluated. The purpose of this study was to compare the effect of graphic cigarette images with text-only messages and neutral images on cravings to smoke in a sample of smokers attending a tobacco treatment clinic. A randomized trial was conducted in 25 smokers attending the UMDNJ-Tobacco Dependence Clinic for help in quitting smoking. Subjects were shown a series of 9 cigarette-warning images in 3 sets (graphic, text, and neutral) in a random order. Cravings were evaluated at baseline and after each set of images using the Brief Questionnaire of Smoking Urges (QSU - BRIEF), a validated 10-item questionnaire that provides a composite craving score from 10-70, with higher numbers indicating higher levels of craving. The mean reduction in QSU-Brief craving scores was highest for the graphic warnings (mean -6.20 points; standard deviation (SD) 13.86) compared with text warnings (mean -5.75; SD 13.29) and neutral images (mean -3.36; SD 9.47). The difference between graphic and text warnings was not statistically significant. 84% of subjects identified the graphic images as the most effective stimuli for motivation to quit smoking. The results of this study showed that graphic cigarette warning images presented to this sample of smokers reduced cravings to smoke more than neutral images and current text warnings, although not in a statistically significant manner. These findings are particularly timely with FDA currently considering issues regarding cigarette pack warnings.

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POS3-15 NEW GRAPHIC WARNINGS IMPROVE KNOWLEDGE OF SMOKING HARMS AMONG SMOKERS

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AIM: We aimed to assess how the change from text-based health warnings on tobacco packaging to graphic health warnings (GHWs) affected New Zealand (NZ) smokers' knowledge of smoking-related harms.

METHODS: The NZ arm of the International Tobacco Control Policy Evaluation Project (ITC Project) uses as its sampling frame the NZ Health Survey (a representative national sample with boosted sampling of Maori, the indigenous people of NZ). From this sample we conducted a telephone survey of adult smokers in two survey waves (n=1376 and n=926), with those in wave 1 exposed to text-based warnings and those in wave 2 to GHWs. Only those who participated in both survey waves were included in this analysis. The questionnaire explored respondents' knowledge of smoking-related harms.

RESULTS: After the introduction of GHWs, smokers' knowledge of the relationship between smoking and blindness increased (from 40.4% to 62.5% between waves, p<0.001). Knowledge of reductions in peripheral circulation caused by smoking (from 64.7% to 77.4%, p<0.001) and the causal link with mouth/throat cancer (from 89.4% to 92.3%, p=0.02) also increased. Changes in knowledge of second-hand smoke (SHS) causing asthma and for SHS causing lung cancer were relatively minor (with both these at over 78% in wave 2). Maori smokers in both waves had higher knowledge levels for three out of five harms. The extent of increase was slightly higher for Maori than European/Other smokers but the difference was not statistically significant (average of 7.6% points for Maori vs. 6.4% for European/Other in five knowledge areas). We also found that smokers in the least deprived five population deciles (using a small area measure) had higher knowledge levels (in 4 out of 5 areas in wave 2). Knowledge increased slightly more in the most deprived deciles but once again the difference was not significant (average of 7.0% points vs. 6.4% between waves).

CONCLUSIONS: The new GHWs increased knowledge of smoking-related harms among smokers, and this intervention is reaching a wide range of smokers in terms of ethnicity and socio-economic status.

Health Research Council of New Zealand.

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POS3-16 CHANGES IN MASSACHUSETTS SMOKERS' EXPERIENCE, FIRE-RISK PERCEPTIONS AND BEHAVIORS IN RESPONSE TO RIP CIGARETTE LEGISLATION

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Background: Cigarette fires are a leading cause of mortality and injury throughout the world. An increasing number countries and state governments are mandating that cigarettes sold have a reduced-ignition propensity (RIP) to help prevent this harm to the public's health. Smokers' experience, perceptions, and risk behaviors following this requirement have not been thoroughly studied.

Methods: A random-digit-dialed telephone survey was administered to a cohort of Massachusetts (MA) smokers before and six months after the state mandated sale of RIP cigarettes. Changes in smokers' experience with cigarettes, perceptions of fire risk, fire-risk behaviors, and reported fire events before and after the law were assessed with McNemar's $\chi 2$ statistic.

Results: A total of 620 MA smokers completed the baseline survey conducted prior to implementation of the law, and 353 (57%) completed the follow-up survey conducted after implementation. No changes were observed in smokers' reports that their cigarette brand tasted unpleasant (p=0.109) or was not satisfying (p=0.243), however respondents were more likely to report that their cigarettes extinguished between puffs (OR = 4.28, 95% CI = 2.54-7.60) and that this occurred often (OR = 2.71, 95% CI = 1.44-5.42) after the law. Smokers were less likely after the law to report smoking more than 20 cigarettes per day (OR = 0.25, 95% CI = 0.08-0.63) and inhaling deeply (OR = 0.53, 95% CI = 0.32-0.86). No changes were observed in fire-risk behaviors (p=0.148) or fire events (p=0.471). Smokers were less likely after the law to report worrying about starting a fire (OR = 0.55, 95% CI = 0.33-0.90), but more likely to report worrying about burning others (OR = 1.89, 95% CI = 1.06-3.50) by their smoking. Smokers were less likely after the law to report believing that the law would result in fewer fires (OR = 0.40, 95% CI = 0.26-0.59).

Conclusions: The introduction of RIP cigarettes in MA did not have adverse effects in terms of smokers' experience with cigarettes or fire-risk behaviors, however fire-risk perceptions of smokers in response to the law are variable. Further research is needed to evaluate the law's effectiveness.

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POS3-17 PACIFIC PEOPLES' VIEWS ON MAJOR TOBACCO CONTROL INTERVENTIONS: NATIONAL SURVEY DATA FROM NEW ZEALAND

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AIM: To describe the attitudes of Pacific smokers to a range of tobacco control policy options in the New Zealand setting.

METHODS: The NZ arm of the International Tobacco Control Policy Evaluation Survey (ITC Project) uses as its sampling frame the NZ Health Survey (a representative national sample but with boosted sampling of Pacific peoples). From this sample we surveyed adult smokers (n=1376, 90 of whom were Pacific peoples).

RESULTS: Pacific smokers were significantly more likely to support more government action on tobacco control (78.2% vs. 53.0% in the European/Other ethnic group). A similar pattern was seen for support for further tobacco product regulation (74.0% vs. 62.9%, but this difference was not statistically significant). Most (63.4%) also did not think that tobacco companies should be allowed to advertise as they please. Pacific smokers were also more likely than European/Other smokers to support an increase in tobacco tax if the revenue was used to promote healthy lifestyles and support quitting (66.4% vs. 55.4%, but this difference was not statistically significant in a multivariable analysis). In terms of smokefree areas, Pacific peoples were more likely than European/Other to support new types of smokefree environments that covered outdoor areas and cars (59.6% vs. 48.8% for a scoring high in a 6-item smokefree support index). This pattern was consistent across varying multivariable analyses but not at a statistically significant level. Most Pacific peoples supported a ban on the point-of-sale display of tobacco products (significantly higher than the European/Other group at 77.1% vs. 57.5%). Similarly, most (82.8%) supported a law for factory-made cigarettes to be fire-safe.

CONCLUSIONS: Smokers of Pacific peoples ethnicity voiced majority support for a wide range of major tobacco control interventions. The level of support was at least as high, or even higher than that of the European/Other ethnic group. Policy makers should consider this strong support when proposing tobacco control to reduce health inequalities in NZ and for advancing the health and economic wellbeing of Pacific peoples.

Health Research Council of New Zealand.

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POS3-18 RESTRUCTURING THE TOBACCO MARKET FOR PUBLIC HEALTH PURPOSES: QUALITATIVE STUDY OF REACTIONS TO A SUPPLY-SIDE PROPOSAL

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Aims: There is growing interest in tobacco end-game solutions among New Zealand (NZ) tobacco control advocates and Maori politicians. We aimed to describe reactions among the public and policy-makers to supply-side structural interventions to enhance tobacco control in this country.

Methods: We first identified five currently proposed structural tobacco control interventions such as a semi-autonomous Nicotine Regulatory Authority or introducing tobacco product import quotas. These were presented as means of achieving a vision of a smokefree NZ by 2020. We carried out interviews and focus groups with 19 government policy officials, public health physicians, and journalists, to explore reactions to these ideas. In the second stage, we selected one of the structural interventions – a regulated market in which a 'Tobacco-free Commission' is the sole purchaser and distributor of tobacco product. We devised a presentation communicating the case for it and investigated the reaction of Maori and non-Maori smokers and non-smokers, public health workers and policy-makers (total n=40) to this model.

Results: There was strong support for the smokefree NZ vision, and great interest in the interventions. There was general support for more radical tobacco control interventions, with a range of views about the desirability, practicality and acceptability of each proposal. We were able to communicate successfully the concept of a regulated market and a Tobacco-free Commission to all the participants in stage 2. Most of the public strongly supported the intervention. Public health practitioners and policy-makers were also mostly supportive, but were also often critical and identified a range of potential implementation problems.

Conclusions: We were able to communicate and to interest this sample of policy-makers, public health workers and the public in novel and radical supply-side interventions for controlling the tobacco market to achieve public health goals. The findings provide guidance on how these ideas might be communicated, and suggest that such measures are capable of gaining public and policy-maker understanding and support.

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POS3-19 SMOKING RELAPSE AND USE OF NICOTINE REPLACEMENT PRODUCTS

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Introduction: The potential benefit of public subsidization of nicotine replacement products (NRP) depends on its cost-effectiveness for promoting smoking cessation and preventing relapse and on efficacy of alternative strategies. The present study examines effects of NRP use on abstinence and relapse among recent quitters.

Methods: A longitudinal random-digit-dial telephone survey conducted in years 2001, 2003, and 2005 of Massachusetts' adults, including 787 at baseline and 321 at first follow-up reporting having quit smoking in the past two years. Outcome measures were relapse at first and second follow-up interviews, respectively. The main predictor variable was reported NRP use for at least six weeks in the recent quit attempt, with or without professional counseling. Analyses controlled for length of abstinence, heavy dependence, age, gender, education, and race. Bivariate and multinomial logistic regression analyses were conducted with weighting to account for probability of selection and for attrition in respective waves.

Results: Likelihood of relapse between baseline and first follow-up was unaffected by reported NRP use with (p=0.995) or without (p=0.446) professional help, lower with six months or longer reported abstinence at baseline [OR 0.35 (95% CI 0.21, 0.60)], and higher with heavy dependence [OR 1.99 (95% CI 1.11, 3.58)]. Relapse between first and second follow-up was more likely with reported NRP use without professional help [OR 7.78 (95% CI 1.24, 48.6)] and unaffected by reported NRP use with professional help (p=0.425).

Conclusions: NRP in the absence of professional counseling may be counterproductive or less cost-effective than demonstrated tobacco control policies including taxation, smoke-free policies, and product and packaging regulations.

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POS3-20 PREDICTORS OF QUIT INTENTIONS BETWEEN CIGARETTE AND BIDI SMOKERS: FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL (ITC) BANGLADESH SURVEY

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Research designed to predict quitting among smokers and to identify factors that relate to future quitting has demonstrated the importance of intentions to quit. However, nearly all of the existing studies have been conducted in high-income countries; it remains unclear whether the determinants of quitting found in high-income countries can generalize to developing nations with different patterns of smoking and sociocultural influences. The present study was designed to identify the predictors of quit intentions among a large probability sample (N=3,070) of adult smokers from Wave 1 (2009) of the International Tobacco Control (ITC) Survey in Bangladesh. Unweighted regression analyses of a model predicting quit intentions revealed the universality of certain individual-level factors found to be related to quitting in previous studies in Western countries (e.g., Hyland et al., 2006). Smokers who were more likely to intend to quit in the next 6 months were those who had made previous quit attempts, had lower nicotine dependence, more negative attitudes and beliefs about smoking, more worries about future health, and expected greater benefits from quitting. In addition, quit intentions differed by the primary type of smoked tobacco product: cigarette smokers were significantly more likely to intend to quit (15.8%) than were bidi smokers (5.4%), $x2(1, N = 2,662) = 40.81$, $p < .001$. This bivariate relation also held in a multivariate analysis: after controlling for all other variables in the model, the odds of intending to quit were more than three times greater for cigarette than for bidi smokers (OR=3.47, $p < .001$). Furthermore, the inclusion of all possible interactions with product type revealed that the individual predictors of quit intentions did not significantly differ for cigarette versus bidi smokers. These findings suggest that the factors relating to quit intentions may be more similar across countries and across tobacco product than might have been assumed. If so, policies and interventions designed to reduce tobacco use may also have greater commonality across countries and tobacco products.

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POS3-21 CLEAN INDOOR AIR ORDINANCE COVERAGE IN THE APPALACHIAN REGION

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Objectives: The Appalachian region is characterized by a long history of tobacco farming, a high smoking prevalence, and socioeconomic disadvantage. The primary objectives of this study were to quantitatively examine the pattern of, and factors associated with, adoption of clean indoor air (CIA) ordinances in Appalachia. A secondary objective was to qualitatively explore the local forces that promoted or blocked passage of ordinances in these communities.

Methods: CIA ordinances in Appalachian communities in six states were collected and reviewed. The prevalence of comprehensive CIA ordinances in workplaces, restaurants, and bars were estimated. Additionally, a strength score was computed, which was a measure of the level of protection from secondhand smoke in seven locations. Logistic and linear mixed effects models were fit to determine if the presence of a comprehensive ordinance and the strength of the ordinance, respectively, were related to community disadvantage. For the second aim, 24 local leaders were asked a series of questions related to the role coalitions played in the passage of the ordinances, processes used during the passage period, and barriers and solutions.

Results: Of the 332 communities included in the analysis, only 16.6%, 15.1%, and 10.7% had adopted a comprehensive workplace, restaurant, or comprehensive bar ordinance, respectively. While 170 communities had passed a CIA ordinance, most were weak, as the average ordinance achieved only 43% of the possible points. Communities with a higher unemployment rate were less likely and those with a higher education level were more likely to have a comprehensive ordinance and a strong ordinance. From the qualitative study we found that there was not a "one size fits all" model for passage of ordinances. The main barriers included lack of inertia, libertarian arguments, and economic arguments.

Conclusions: The majority of residents in these communities are not protected from the dangers of secondhand smoke. It is our recommendation that CIA efforts should be statewide and that efforts to pass strong state CIA laws should take priority over local initiatives in these states.

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POS3-22 LONG-TERM COMPLIANCE WITH THE GEORGIA SMOKEFREE AIR ACT OF 2005 AND HOSPITALITY WORKER EXPOSURE TO SECONDHAND SMOKE

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The Georgia Smokefree Air Act of 2005 (the Act) banned smoking in most public places. Public venues are required to post a "no smoking" sign at the entrance, remove ashtrays, and communicate the policy to employees. Restaurants and bars may be exempted from the law by posting a sign "Smoking permitted, no one under the age of 18 allowed." The objectives of this study were to assess compliance with the Act and to evaluate the impact of the "adult only" exemption. We followed a panel of 38 restaurants located in Atlanta City. All allowed smoking prior to enactment of the Georgia law. Ten control restaurants were located in Decatur, a nearby city that had completely banned smoking prior to enactment of the Act. Each establishment was checked at baseline and at five follow-ups over four years. Teams of trained volunteers monitored particle levels, checked for signs, counted patrons and lit cigarettes, and looked for ashtrays at each wave. Compliance was measured by the percentage of establishments with appropriate signs. Worker exposure to secondhand smoke was measured by levels of respirable suspended particles (PM2.5). At baseline, we observed lighted cigarettes in 97% of the Atlanta City sites and in none of the control sites. At 6-month follow-up, the percentage of lighted cigarette establishments in Atlanta had decreased to 51%. Also at 6 months, 24% of the Atlanta sites and 10% of the control sites had posted legal signs. Four of the signs were "no smoking" signs and eight were "smoking allowed" signs. At 4-year follow-up, we observed lighted cigarettes or ashtrays in 44% of the Atlanta City establishments. Four sites (12%) had posted legal signs. PM2.5 levels in establishments with lighted cigarettes were generally higher than at baseline. Conclusions: Among establishments that allowed smoking prior to 2005, the Act, and perhaps changing social norms among smokers, have reduced by about 50% the number of hospitality venues with smoking. Many owners of bars and restaurants are disregarding the law by allowing smoking without posting the required signs. Hospitality worker exposure to secondhand smoke is still a problem in Georgia.

No funding.

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POS3-23 A PRE-POST STUDY OF A PROVINCIAL BAN ON THE DISPLAY OF CIGARETTES AT RETAIL

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Background: The retail point-of-sale (POS) environment is critical for tobacco industry communications with current, former, and potential smokers. In Ontario, Canada, cigarettes have not been visible at retail outlets since May 2008.

Purpose: To describe changes in tobacco POS promotions in Ontario, observed in a cohort of stores at five points in time: (1) one year before restrictions on the types of promotions allowed in stores; (2) one month before restrictions; (3) one year after restrictions; (4) three months after the total display ban; and (5) one year after the total display ban.

Methods: Stores (n=481) were randomly selected from lists of convenience stores, gas stations, and grocery stores in 20 cities. Trained observers captured the range and intensity of tobacco promotions. A tobacco promotion index was calculated for each store, measuring powerwalls, countertop displays, presence of tobacco near candy, and cigarette ads. Prevalence of various tobacco promotions was compared across time.

Results: At wave 1, tobacco promotions were extensive across Ontario in all store types examined. Although restrictions were not yet in force when we returned to stores at wave 2, 54% of stores were already complying. Prior to the display ban but one year after the restrictions on tobacco promotions (wave 3), promotions were at a minimum: only 3% of stores had indoor signs, 1% had a side/middle panel on the powerwall, and 0% had countertop displays. Three months after the total display ban (wave 4), tobacco promotions were virtually nonexistent, with the only remaining promotions being non-branded cigarette accessories, product binders, and plain cigarette signs on the covered cigarette cabinets. These findings persisted in wave 5. Compliance with the display ban was 99.9%.

Conclusions: When point-of-sale tobacco promotions are restricted and then banned, tobacco promotions at retail become virtually nonexistent. Banning cigarette promotions at the point-of-sale reinforces health messages about the harms of smoking. The study design used here may serve as a model for other jurisdictions proposing to ban in-store displays.

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POS3-24 CLINICAL CHARACTERISTICS OF HEAVY AND LIGHT SMOKERS WITH SCHIZOPHRENIA

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Up to 70-90% of persons with schizophrenia smoke cigarettes, a prevalence much higher than the general population. Limited data and theories suggest that persons with schizophrenia may smoke for different reasons than persons without schizophrenia, and smoking cessation interventions are particularly challenging in this population. Health consequences of smoking are widely known, but less information is available regarding the differential characteristics of different amounts of smoking exposure in this population. This study was performed to investigate the differences between heavy (equal to or greater than one pack per day) and light (less than one pack per day) smoking in patients with schizophrenia. Data from 745 patients with schizophrenia, mean age 41.3 +/-12.6 years, were drawn from a population admitted to State of Maryland hospitals between 1994 and 2000. Inpatient medical records from 7 hospitals were reviewed to obtain demographic information, diagnosis, and medication use as well as smoking and other substance use. Forty-three percent (319/745) of patients were heavy smokers. The heavy and light smoking groups did not differ in respect to age, general assessment of functioning (GAF), weight, or body mass index (BMI). No differences were found in race, gender or antipsychotic treatment between heavy and light smokers with schizophrenia. However, patients who smoked one or more packs per day of cigarettes were more likely to also use other substances such as alcohol (df=1, Chi square=6.67, p=0.01), cocaine (df=1, Chi square=6.66, p=0.01), and other substances of abuse (df=1, Chi square=9.95, p=0.003) as compared to light smokers. No differences in marijuana or heroin use were found between these two groups. Heavy smokers had higher total cholesterol (df=223, t=-2.23, p=0.02), but no differences were found in blood glucose, diabetes, or blood pressure between heavy and light smokers with schizophrenia. Heavy smoking may be a particular health risk in schizophrenia due to higher alcohol and illicit drug use as well as higher cholesterol values. Significant efforts for smoking cessation or reduction are needed.

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POS3-25 PATTERNS OF CIGARETTE SMOKING AMONG REPRODUCTIVE-AGED WOMEN AND MEN IN 4 LATIN AMERICAN COUNTRIES

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Objective: To study cigarette smoking patterns among reproductive-age women and men in 4 Latin American countries.

Method: Self-reported smoking was analyzed from CDC Reproductive Health Surveys of women aged 15-49 years in Ecuador (2004), El Salvador (2002-3), Guatemala (2002), and Honduras (2001) and men aged 15-59 years in El Salvador, Guatemala, and Honduras for the same years. Prevalence and predictors of smoking were examined, and unadjusted and adjusted odds ratios calculated. Data were weighted to represent households of women and men of reproductive age in each country.

Result: Smoking prevalence varied in women from 2.6% (El Salvador) to 13.1% (Ecuador) and in men from 23.1% (Guatemala) to 34.9% (El Salvador). Country-specific differences in non-daily and daily smoking patterns were found. In Ecuador (only women surveyed), 65% of smokers were non-daily users; for the other 3 countries, daily use was more prevalent than non-daily use in women and men. For women, significant differences in smoking prevalence were found by age, urban/rural, education, marital status, socio-economic status, and pregnancy-status, but results were not consistent across countries. In contrast, smoking prevalence did not vary in men by education or SES in any country but varied by the remaining factors. Within countries, associations between smoking and specific demographic variables differed between men and women. For Guatemala, formerly married men had 2.4 odds of smoking compared with married men, whereas having been married increased the odds of smoking in women. For daily smokers in all countries, cigarettes smoked per day were 1.9-2.3 for women and 2.1-3.6 for men.

Conclusion: Study results indicate patterns of smoking vary by country. For women, prevalence varied by demographic characteristics. Men had higher smoking prevalence, but this varied less by demographic characteristics. Non-daily smoking was common and more prevalent than daily smoking in one country studied. More research is needed to understand health effects of non-daily use and develop effective interventions. Our findings can be used to guide the development of country-specific tobacco control programs.

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POS3-26 HOW DOES IT ALL FIT TOGETHER? A COMPREHENSIVE, EMPIRICAL ANALYSIS OF THE EFFECT OF POTENTIAL CONFOUNDERS ON THE LONGITUDINAL ASSOCIATION OF DEPRESSIVE SYMPTOMS AND SMOKING AMONG ADOLESCENTS

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The association between smoking and depression can differ depending on whether covariates are treated as confounders or intermediate variables in the causal pathway. The Nicotine Dependence in Teens cohort in Montreal, Canada surveyed adolescents every three months for five years. A subsample of 837 participants who had not smoked at baseline and had depressive symptom scores lower than two standard deviations above the mean, were included in Cox regressions that modeled time to (i) elevated levels of depressive symptom scores, and (ii) smoking initiation. A set of 15 variables previously identified as important in the association between depression and smoking were systematically evaluated as predictors of the onset of exposure, as predictors of the onset of the outcome, for attenuation of the association between depressive symptoms and smoking by more than 10%, and for intra-individual change in the variable after onset of exposure. Results: The magnitude of the association between smoking and depressive symptoms was attenuated after adjustment for all variables (smoking predicting onset of depressive symptoms crude hazard ratio (HR) 2.1 (1.6, 2.7); adjusted HR 1.1(0.8, 1.5)(depressive symptoms predicting onset of smoking crude HR 2.1 (1.4, 3.1); adjusted HR 0.9 (0.6, 1.4). A concept map was developed detailing the empirical associations between the variables within this data set. Stress, worry about weight, and worry about parents were intermediate variables for both smoking predicting depressive symptoms and depressive symptoms predicting smoking. After including only variables identified as confounders, the hazard ratios were 1.8 (1.2, 2.8) for depressive symptoms predicting smoking and 1.7 (1.2, 2.3) for smoking predicting depressive symptoms. Cigarette smoking is associated with higher depressive symptoms prior to and after inclusion of appropriate empirical confounders. Inclusion of intermediate variables in multivariable models can lead to the erroneous conclusion that there is no association between smoking and depression. However the existence of intermediate variables suggests potential causal pathways.

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POS3-27 ONE WAY TO SMOKE LESS: DON'T CARRY YOUR CIGARETTES

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Given that cigarettes are an efficient nicotine delivery device and a highly accessible commodity, it is intriguing why many occasional smokers never progress to a daily smoking habit. Even more interesting is that some smokers who have established a daily habit later reduce their consumption to become occasional smokers. It is not well understood how either group of occasional smokers maintains low-frequency smoking. One hypothesized mechanism for occasional smokers maintaining low frequency of smoking is that they often do not carry cigarettes with them, a behavior that may be intentional or inadvertent. This study examined the cigarette-carrying habit of occasional smokers and compared it with that of daily smokers. Participants were current smokers from a population survey: 2008 California Tobacco Survey. A total of 2,732 smokers were grouped into four categories: occasional smokers who had never smoked daily (N=255), occasional smokers who used to smoke daily (N=365), low-rate daily smokers who smoked < 5 cigarettes per day (N=280), and regular daily smokers who smoked > 5 cigarettes per day (N=1,832). Percentages in response to the cigarette-carrying question were weighted to the California population. The main results are that most occasional smokers, 78.3% of those who had never smoked daily and 74.1% of those who used to smoke daily, reported not usually carrying cigarettes with them. In contrast, 10.2% of regular daily smokers reported not usually carrying cigarettes. In between were the low-rate daily smokers (38.1%). The pattern of results is consistent across ethnic groups, even though the proportion of occasional smokers varies significantly across ethnicity. This study shows for the first time that the habit of carrying cigarettes is a major behavioral difference between occasional and regular daily smokers. The fact that occasional smokers who used to smoke daily were not significantly different from those who never smoked daily in whether they habitually carry cigarettes with them demonstrates a strong correlation between this cigarette-carrying habit and nicotine dependence, and suggests that change in one could lead to change in the other.

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POS3-28 DAILY SMOKING AND DEPENDENCE AS PREDICTORS OF CHRONICITY OF DAILY SMOKING

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OBJECTIVE: Daily smoking and nicotine dependence are two major indicators of chronic smoking. This research aims to determine whether each indicator represents different smoking phenotypes and whether each contributes independently to chronicity of smoking.

METHODS: The data are from Waves III and the restricted use contractual Wave IV data of the National Longitudinal Survey of Adolescent Health, a nationally representative sample of young adults. Data have been released for daily smoking but not dependence. Multivariate logistic regressions were estimated to identify the roles of daily smoking and nicotine dependence (measured by the FTND) on persistence of daily smoking over a six-year interval among 10,210 lifetime smokers at Wave III (mean age at Wave III = 21.9 years, SD = 1.8). Other predictors included demographic characteristics, smoking history (pleasant initial sensitivity to cigarettes, onset age of smoking), psychosocial variables (delinquency, depression, novelty seeking), smoking in the youth's proximal social context (parents, peers), and use of other substances.

RESULTS: Both prior daily smoking and nicotine dependence contributed significantly and independently to the persistence of daily smoking. However, current daily smoking at Wave III had by far the strongest effect of any covariate in the model (AOR=13.9, p = .001 vs. former smoker, never daily). Current nicotine dependence was next in importance (AOR=2.2, p = .001). Other significant risks factors included parental lifetime smoking, peer smoking, pleasant initial sensitivity to smoking and use of marijuana; protective factors included years of education, being Hispanic and use of alcohol.

CONCLUSION: While epidemiological studies have established that daily smoking most often precedes dependence, both dependence and daily smoking contribute independently to the persistence of daily smoking. Both behaviors index aspects of chronic smoking that are not completely subsumed by each indicator alone. These aspects remain to be determined. With control for other covariates, selected drugs other than tobacco can either increase (marijuana) or decrease (alcohol) the persistence of daily smoking.

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POS3-29 CONCORDANCE BETWEEN SELF-REPORTED AND COTININE-BASED SMOKING PREVALENCE NATIONALLY AND IN NEW YORK CITY

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Introduction: As smoking becomes increasingly marginalized, social response bias in self-reported smoking status may increase, with smokers reporting as non-smokers. National Health and Nutrition Examination Survey (NHANES) and New York City (NYC) HANES data were used to assess changes in concordance between self-reported (SR) vs. cotinine-based (CB) smoking prevalence over time and to determine differences in concordance between NYC and the U.S. We hypothesized that national concordance declined over time, and would be lower in NYC compared to the U.S. due to increased social desirability bias resulting from NYC's comprehensive tobacco control program.

Methods: NHANES is an ongoing nationally representative, cross-sectional survey of the U.S. NYC HANES, modeled after NHANES, surveyed adult NYC residents in 2004. NHANES data (1999-2006) assessed changes in concordance of smoking measures over time through four surveys. NYC vs. U.S. comparisons used data from the 2003-2004 NHANES survey only. Analyses were limited to adults >20 years. A serum cotinine level of >15 ng/mL indicated current smoking. SR smokers smoked >100 cigarettes in their life and currently smoked every day or some days.

Results: National smoking prevalence estimates from 1999-2006 were consistent over time: CB rates ranged from 27% to 29% and SR rates from 24% to 25%. In each NHANES survey, SR and CB smoking measures were not significantly different from each other and concordance rates were steady (range: 78%-82%). In NYC HANES, SR and CB measures were not significantly different [24% (95% CI: 21-26%) vs. 23% (95% CI: 20-26%)]. Compared to the 2003-2004 US data, the concordance rate in NYC was significantly higher (89% vs. 78%, p<0.001).

Conclusion: NHANES data do not indicate a change in social response bias between 1999 and 2006. While we expected the concordance in NYC to be lower than the U.S. due to NYC's tobacco control efforts, concordance was higher in NYC. This might be due to differences in populations, including race/ethnicity. A second NYC HANES would be helpful to assess concordance rates over time.

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POS3-30 SMOKING AS A PREDICTOR OF DISABILITY RETIREMENT: A POPULATION-BASED COHORT STUDY

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Smoking is a well-established risk factor of many diseases. However, comprehensive studies on the association between smoking behavior and the risk of disability retirement are rare. We studied how smoking behavior predicts disability retirement using the nationwide Finnish Twin Cohort data. Smoking status (never, occasional, former or current), a cumulative exposure measure of 'pack years' and other life style factors were assessed with a mailed questionnaire in 1975. Registry data on all retirement events during the follow-up until the end of 2004 were obtained from the Social Insurance Institution and the Finnish Centre for Pensions. After excluding twins retired before 1975 and those having missing values in any of the study variables, the study sample included 21,719 twin individuals. Hazard ratios (HR) when predicting disability retirement were computed by Cox regression for the smoking behavior variables. Clustered study design was taken into account when computing 95% confidence intervals (CI). After sex, age and alcohol use were adjusted for, both former (HR=1.2, 95%CI 1.1,1.3) and current smokers (HR=1.5, 95% CI 1.4,1.7) showed elevated risk for disability pension when compared to non-smokers. Among the 10,660 ever smokers, those who smoked 5-10 pack years (HR=1.3 95% CI 1.2,1.5), 10-20 pack years (HR=1.4 95% CI 1.2,1.6), and more than 20 pack years (HR=2.1 95% CI 1.8,2.4) showed elevated risks for disability pension when compared to those who had smoked less than 5 pack years. To conclude, this population-based cohort study shows that cigarette smoking is a significant predictor of disability retirement, independent of alcohol use.

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POS3-31 MEASURING TOBACCO USE IN A PRISON POPULATION

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Widespread tobacco use and high interest in quitting make prisons an ideal environment for smoking cessation interventions, however little has been done to assist prisoners in their efforts to quit. Measuring tobacco use is central to tobacco research, yet there has been only one published examination of tobacco use measures among prisoners, and it used self-reported tobacco use as the gold standard. The current study seeks to address this gap in the literature by examining the criterion validity of several common measures of tobacco use. Interviews were conducted with 200 consecutively admitted male prisoners. Three measures of tobacco use were examined: self-reported tobacco use, expired carbon monoxide (eCO), and salivary cotinine measured by enzyme immunoassay (EIA). Optimum cut points for continuous measures were determined based on the unweighted Youden index. The sensitivity, specificity, and positive and negative predictive values were calculated for each test using salivary cotinine measured by liquid chromatography tandem mass spectrometry (LC/MS/MS) as the gold standard (cutpoint ≥15 ng/ml). Self-reports were found to be a valid measure of tobacco use in this sample of prisoners incarcerated under an indoor smoking ban (sensitivity = 98.5%, specificity = 88.9%). Expired carbon monoxide, though the poorest-performing of the three measures examined, still had excellent discrimination (cut point ≥4 ppm, sensitivity = 85.4%, specificity = 91.7%). EIA correctly identified non-users, however produced some false-negative results (cut point ≥10 ng/ml, sensitivity = 94.2%, specificity = 100.0%). Directly asking prisoners about their tobacco use is accurate, inexpensive, and provides researchers with information on variations in tobacco use. Expired CO testing had the poorest performance as a stand-alone test, though validity of the test may be improved with increased frequency of testing. Given that the test is inexpensive and minimally invasive, it may still be useful in some research contexts. False negative results using EIA limit its utility as a stand-alone test; however as part of a two-stage screening process it may reduce the cost of testing.

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POS3-32 RACIAL DIFFERENCES IN RESPONSE TO FIRST CIGARETTES AND PROGRESSION IN CIGARETTE SMOKING

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African American (AA) teens are less likely than whites to progress in smoking during adolescence. The factors underlying this difference are not well understood. We report data from a national sample of 3,653 14-18-year-old youth from across the US interviewed via phone survey in 2007. Subjects included 2,093 (57.3%) white and 820 (22.5%) AA youth. Both AA and whites in this sample initiated at mean age 14.5y, and AA had tried smoking only slightly less often (35.8% white vs. 32.4% AA [p=0.02]). Among ever-smokers (n=1312), AA youth reported lower rates of factors linked to progression of smoking: inhaling (79.4% white vs. 55.2% AA), really needing a cigarette (32.3% vs. 15.8%) or craving cigarettes (27.5% vs. 11.7%), and had smoked more than a pack of cigarettes in their life far less often (34.1% vs. 9%) (all p<0.01). Among 961 inhalers recalling reaction to their first inhaled cigarette, white and AA youth equally reported coughing, feeling like throwing up, and feeling chilled/relaxed. AA youth less often reported feeling dizzy/lightheaded (56.0% vs. 40.3%, p<0.001). White and AA youth equally seldom reported that smoking would help control weight (9%), but AA youth were less likely to endorse that cigarettes would help with feeling stressed (36.9% vs. 25.3%), with feeling depressed (25.1% vs. 16.2%), with concentration (12.1% vs. 5.2%), or be more comfortable with others (14.8% vs. 6.5%) (all p<0.01). Multivariate logistic regression was conducted to determine factors associated with having smoked a pack or more of cigarettes. Coughing [adjusted odds ratio 0.5, (95% CI 0.4, 0.8)] or vomiting [0.5 (0.3, 0.9)] with first inhaled cigarette was associated with lower risk. Factors associated with greater risk included feeling dizzy [3.0 (2.0, 4.5)] or chilled [1.5 (1.0, 2.3)] with first inhaled cigarette; reports of ever needing [3.4 (2.1, 5.5)] or craving [3.4, (2.1, 5.5)] a cigarette; or reports that cigarettes would help them be more comfortable with others [2.3 (1.2, 4.4)]. How African American youth respond to early experiences with smoking may explain in part why they do not progress during adolescence, despite equal rates of trying at an early age.

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POS3-33 INTRA-ETHNIC DIFFERENCES IN LIFETIME OCCURRENCE OF NICOTINE DEPENDENCE AMONG LATINOS IN THE UNITED STATES

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Aim: The aim of this study is to advance our understanding on intra-ethnic differences as they relate to lifetime occurrence of nicotine dependence (LONT) among Latinos living in the United States (US).

Methods: The National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) surveyed a probability sample of the general population in the US 18 years of age and older (n=43,093). Latinos (n=7,043) were classified in four mutually exclusive categories: Cubans (C), Mexicans (M), Other Latinos (OL), and Puerto Ricans (PR). We then estimated the association that links specific Latino subgroups with LONT. The Latino sample consisted of 1,988 respondents that smoked 100 or more cigarettes in their life (28%). The key response variable in this study is LONT. Multiple logistic regression was used to obtain crude odds ratio (OR) estimates for the association between LONT and different Latino subgroups. Age, sex, educational level, smoking age of onset, and birthplace (i.e., US born or not) were included in the model to obtain adjusted estimates.

Results: LONT among Latinos was for C (20%), M (26%), OL (20%), and PR (42%). We observed an association between LONT and specific Latino subgroups only for PR. Compared to M, crude weighted OR estimates were for C (1.0; 95% C.I.: 0.4, 2.3), OL (0.7; 95% C.I.: 0.4, 1.3), and PR (2.2; 95% C.I.: 1.5, 3.2). This moderately robust association remained, although somewhat attenuated, after adjusting for the covariates mentioned above. Adjusted weighted OR estimates were for C (1.3; 95% C.I.: 0.6, 2.7), OL (0.9; 95% C.I.: 0.4, 1.7), and for PR (1.9; 95% C.I.: 1.3, 2.8) when compared to M. Among these covariates, an inverse statistically robust association with LONT was found for age and age of first cigarette. Born in the US and having at least some college education were positively related to LONT.

Discussion: Based upon this initial evidence from a nationally representative sample of Latinos in the US, we found statistically robust differences in LONT among these Latino subgroups after adjusting for several covariates. Caution needs to be exercised before assuming any degree of homogeneity among Latinos and their LONT.

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POS3-34 A POPULATION-BASED PREVALENCE STUDY OF CIGARETTE SMOKING AND MENTAL ILLNESS FOR BLACK AMERICANS PARTICIPATING IN THE NATIONAL SURVEY OF AMERICAN LIFE

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Background: Lasser et al. (2000), in their analysis of the National Comorbidity Survey data, estimated persons with past-month mental illness are twice as likely to smoke as those without mental illness (41% vs. 22.5%). The sample was 75.3% Caucasian. Smoking according to mental health status has not been evaluated among Black Americans. Objectives: To compare the prevalence of cigarette smoking among Black Americans with and without mental illness in a nationally representative sample.

Methods: Data are from the National Survey of American Life, a 2001-2003 cross-sectional national household probability study of 5,008 non-Latino Black Americans (3,570 African Americans and 1,438 US Black Caribbeans) aged 18-94 years. Lifetime smoking was defined as smoking 100 or more cigarettes. Quit rates were calculated by subtracting the number of current smokers from lifetime smokers (yielding proportion of former smokers) and dividing by lifetime smokers. Mental illness was assessed using a modified version of the Composite International Diagnostic Interview.

Results: Current smoking rates for Black Americans without mental illness, lifetime mental illness, and past-month mental illness were 18.8%, 32.9%, and 42.4%, respectively (P<.001 none vs. lifetimes; P<.003 none vs. past-month). Relative to Black Americans without mental illness, the odds ratios for current and lifetime smokers with mental illness were 2.35 (95% confidence interval [CI] = 1.76-3.12) and 1.98 (95% CI = 1.71-2.29), respectively, after controlling for age, sex, education and income levels, marital status, and region of residence. Quit rates were lowest for individuals with a past-month mental illness (21.1%), and 31.1% for individuals with a lifetime prevalence of mental illness.

Conclusions: The smoking prevalence is more than two times higher among Black Americans with mental illness than those without mental illness. The findings replicate those of Lasser et al. within a sample of Black Americans. The presentation will report tobacco use and quit rates by diagnosis and number of diagnoses. Treatments are needed to address the high rate of tobacco use among Black Americans with mental illness.

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POS3-35 EVALUATION OF SMOKING CESSATION THERAPY UTILIZATION AND OUTCOMES IN THE NETHERLANDS – RESULTS OF A LINKED ONLINE SURVEY-ADMINISTRATIVE DATABASE STUDY

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Introduction: Despite restrictive smoking policies and evidence-based guidelines for smoking cessation, smoking remains a major health threat. Analysis of utilization and morbidity-related outcomes of smoking cessation pharmacotherapy (SCT) may help inform clinical decisions and improve guidelines.

Methods: We used an encrypted methodology by which PHARMO's administrative database network of outpatient pharmacies, hospitals and other settings was linked to an advanced web-based system for longitudinal patient-reported data collection: ePRO-LINK. A panel of 78 pharmacists 2008 recruited users of SCT between March and September 2007. Through a survey we collected data on SCT use, indication of use, nicotine dependence, smoking history, motivation to quit and abstinence. Administrative data on SCT and comorbidities from the databases were linked on an individual level.

Results: Of 636 eligible respondents (response rate 23%), the majority of respondents were female (54%), 41-60 years old (60%) and highly nicotine dependent (44%; FTND score ≥ 6). Most frequently reported comorbidities were COPD (18%), cardiovascular disease (14%), and psychological disorders (14%). Many respondents (29%) reported using multiple medications in their quit attempt and 30% reported to have also received behavioral therapy. Reported SCT use was as follows: bupropion (51%), varenicline (41%), nicotine replacement therapy (NRT; 29%), nortriptyline (3%). Overall abstinence at the time of survey was 45%, and 56% for bupropion single use (N=108; 40 days, IQR:21-60), 58% for varenicline single use (N=73; 42 days, IQR:30-84), and 37% for NRT single use (N=10; 51 days, IQR:30-100).

Discussion: SCTs are administered to a population with various comorbidities. Use of nortryptilin was rarely reported despite being recommended as second choice therapy in Dutch guidelines. Duration of SCT use was lower than recommended in guidelines. Due to the observational design, differences in reported abstinence rates between SCTs can be subject to confounding. The ePRO-LINK methodology offers time- and cost-efficient ways to prospectively monitor SCT use and its morbidity-related outcomes.

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POS3-36 ASSOCIATION OF CHRNA3/A5/B4 (rs1051730) GENOTYPE WITH DEPRESSIVE SYMPTOMS AMONG PREGNANT WOMEN

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Cigarette smoking and depressive symptoms are highly co-morbid, but the direction of causation remains unclear. A single nucleotide polymorphism (rs1051730) has been described within the chromosome 15q24 region, containing the CHRNA3/A5/B4 gene cluster, coding for the α3, α5 and β4 subunits of neuronal nicotinic acetylcholine receptors. This variant, a C>T substitution, has been reported to be associated with nicotine dependence, with higher levels of dependence among T allele carriers reported in most (but not all) studies investigating this relationship. We investigated whether the T allele of the rs1051730 variant was associated with depressive symptoms in a large cohort of pregnant women (n = 2276) who were selected on the basis of self-reported smoking prior to pregnancy. In general, women who stopped smoking reported lower levels of depressive symptoms, measured using the Edinburgh Postnatal Depression Scale (EPDS), than those who continued smoking. We have previously reported an association of this variant with smoking cessation in this cohort. We observed that, among those who smoked prior to pregnancy, women who were homozygous for the T allele were less likely to be depressed than CC homozygotes and heterozygotes. This effect was not seen among women who did not smoke prior to their pregnancy (p-interaction = 0.03). Using EPDS score as a continuous measure, women with the TT genotype had a lower depressive symptom score than those with the CC and CT genotype combined, at all time points measured (ps < 0.013). Smoking cessation is generally associated with a reduction in depressive symptoms among pregnant women. The rs1051730 T allele, which is associated with a higher nicotine dependence and reduced ability to quit, also appears to be associated with lower depressive symptoms. Taken together, our data suggest that T allele carriers have higher levels of dependence, reflected in a lower likelihood of stopping smoking, and lower levels of depressive symptoms. This suggests that these individuals may be self-medicating these symptoms by cigarette smoking.

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POS3-37 WHEN CHILDREN SAY CIGARETTE SMOKE IS GROSS

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Childhood secondhand smoke exposure (SHSe) is associated with smoking initiation. Possible mechanisms include imitation of adult smoking, inherited predisposition to smoke, change in physiology due to cumulative SHSe, or individual differences in sensitivity to SHSe whether due to genetics or experience. This study explored sensitivity to SHSe in high-risk 8-13 year-old children who had never smoked. Sensitivity to SHSe was assessed with reaction measures used to assess subjective reactivity to the first cigarette. Because there is no published literature on SHSe sensitivity using reaction measures, we evaluated the latent factor structure of SHSe reactions and their relationship with demographic characteristics. The main outcome was smoking susceptibility (lack of a firm commitment not to smoke) assessed at baseline and in a longitudinal subset of the sample assessed three more times over 12 months. At baseline (n=354) one factor captured physical/unpleasant SHSe reactions (e.g., dizzy; unpleasant/gross). In the longitudinal sample (n=165), two positive reactions (relaxed/calm; liking the smell) loaded on a second factor. Consistent findings in cross-sectional and longitudinal analyses were: older age was associated with fewer reactions to SHSe, and more African-American children reported feeling relaxed/calm and fewer reported rush/buzz compared to other racial/ethnic groups. Experiencing SHS as unpleasant or gross and reporting three or more physical/unpleasant reactions were significantly related to lower risk for smoking susceptibility. Because susceptibility predicts initiation, our results suggest that experiencing SHSe as unpleasant or gross and greater sensitivity to physical reactions may be markers for protective mechanisms against smoking initiation. Differences in sensitivity by age and race/ethnicity highlight the importance of individual differences. This research is a first step in understanding previously unaddressed physical susceptibility factors for smoking initiation and adds to knowledge about the risks derived from SHSe.

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POS3-38 A SYSTEMATIC REVIEW OF LONGITUDINAL STUDIES ON THE ASSOCIATION BETWEEN DEPRESSION AND SMOKING IN ADOLESCENTS

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Background: It is well established that smoking and depression are associated in adolescents, but the temporal ordering of the association is subject to debate.

Method: Longitudinal studies in English language, which reported the onset of smoking on depression in non-clinical populations (age 13-19) published between January 1990 and July 2008, were selected from PubMed, OVID, and PsychInfo databases. Study characteristics were extracted. Meta-analytic pooling procedures with random effects were used.

Results: Fifteen studies were retained for analysis. The pooled estimate for smoking predicting depression in 6 studies was 1.73 (95% CI: 1.32, 2.40; p<0.001). The pooled estimate for depression predicting smoking in 12 studies was 1.41 (95% CI: 1.21, 1.63; p<0.001). Studies that used clinical measures of depression were more likely to report a bidirectional effect, with a stronger effect of depression predicting smoking.

Conclusions: Evidence from longitudinal studies suggests that the association between smoking and depression is bidirectional. To better estimate these effects, future research should consider the potential utility of: (a) shorter intervals between surveys with longer follow-up time, (b) more accurate measurement of depression, and (c) adequate control of confounding.

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POS3-39 USE OF CIGARETTES TO IMPROVE AFFECT AND DEPRESSIVE SYMPTOMS IN A LONGITUDINAL STUDY OF ADOLESCENTS

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Background: Smoking to alleviate negative affect or improve physiological functioning (i.e., self-medication) has been put forward as one explanation for the association between depression and smoking in adolescents. This study tests whether the behavior of adolescents who report use of cigarettes 'to improve mood or physiological functioning' is consistent with the Positive Resource Model.

Methods: Data were drawn from the Nicotine Dependence in Teens study which followed 1293 participants initially aged 12-13 years in Montreal, Canada every three months for five years. A subsample of 662 current smokers provided data on psychobiological benefits gained through smoking with a scale that assessed self-medication. Changes over time in depressive symptom scores relative to self-medication scores were modeled in growth curve analyses.

Results: Smokers who reported higher self-medication scores had higher depressive symptom scores. The interaction between self-medication scores and the acceleration rate in depressive symptom scores was significant and negative, suggesting that, after controlling for sex and number of cigarettes smoked per week, participants with higher self-medication scores had decelerated rates of change in depression over time than participants with lower self-medication scores.

Conclusion: Smoking appears to be ineffective at reducing depressive symptoms. Adolescents who report psychobiological benefit from cigarette report higher depressive symptom scores and have greater variability in scores from survey to survey. However, higher self-medication scores are also associated with decelerated rates of change of depressive symptoms over time.

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POS3-40 KOREAN AMERICANS' REACTIONS TO SECONDHAND SMOKE IN THE UNITED STATES: CLASH OF CULTURES?

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BACKGROUND: Few studies have examined the reactions of nonsmokers to secondhand smoke (SHS) or individual responses such as verbal requests and non-verbal cues. Korean Americans hail from a culture where men smoking and SHS exposure is the norm. Yet, little is known about reactions by nonsmokers of Korean descent to smokers in the United States. We explored Korean American nonsmokers' emotional, physical and behavioral reactions to cigarette smoking in their vicinity.

METHODS: In 2007-2008, eight focus groups (n=47) were conducted in Korean with nonsmokers of Korean descent in San Diego, California. To encourage open discussion, the groups were led by a trained moderator whose gender matched the group's, separately for men and women, and younger and older participants. The groups discussed their personal experience and views concerning secondhand smoke.

RESULTS: Most participants detected SHS quickly and found the smell aversive. Reactions to SHS differed by participant's gender, age, and how well they knew the smoker. Reactions ranged from passive (e.g., tolerating SHS or sending non-verbal cues such as staring) to more assertive (moving or asking the smoker to stop smoking). Younger participants were more tolerant and older participants were more assertive. Participants' reactions appeared more subtle and tentative than might be true in mainstream American culture.

DISCUSSION: Since men's smoking and SHS are expected in Korea, the research team and the participants were surprised at how quickly participants noticed SHS and how much they disliked it. Despite high awareness, SHS presents a dilemma for Korean Americans. Findings suggest that they are caught between two cultures and struggling with how to avoid the smoke and respond in a manner befitting of their social status and Korean values emphasizing harmony, avoidance of confrontation, and respect for elders. The findings highlight the need for culturally sensitive programs for immigrants such as Korean Americans to protect themselves from SHS exposure.

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POS3-41 TEMPORAL TRENDS IN SECOND HAND TOBACCO SMOKE EXPOSURE AND OTITIS MEDIA DIAGNOSES AMONG U.S. CHILDREN

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Introduction: Otitis media (OM) is the most common pediatric diagnosis made by US physicians, with an increasing frequency reported through the early 1990s. Second hand smoke exposure, one of the leading risk factors for OM in children, may be decreasing in the U.S. as smoke-free households are increasing. This study examines temporal trends in OM diagnoses in children and in smoke-free households with children.

Methods: Annual age-specific pediatric ambulatory visits with OM as primary diagnosis for children ages <1 year, 1-2 years, and 3-6 years were computed from National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey for years 1995-2006. Annual age-specific hospital discharges were computed from the National Hospital Discharge Survey. Percentages of households with children that were smoke-free were computed from the Tobacco Use Supplement to the Current Population Survey for years 1995/1996, 1998/1999, 2001/2002, 2003, and 2006/2007. Risk-factor adjusted age-specific OM visit and discharge rates were fit to the best multiple linear regression model, by minimizing the AIC statistic, while considering percentages of children in child care, immunization, air pollution, health insurance, and child poverty. Average annual percent change (AAPC) for adjusted rates were computed using Joinpoint analysis.

Results: Smoke-free households with boys and girls increased from 54.0% and 55.6%, respectively in 1995/1996 to 83.8% and 84.2% in 2006/2007. Risk factor-adjusted OM ambulatory visits among boys decreased during the same period. AAPCs and 95% CIs: were: -5.7 (-7.8, -3.6) for <1 years, -4.4 (-5.7, -3.0) for 1-2 years, and -3-3 (-6.3, 0.0) for 3-6 years. Risk factor-adjusted OM hospital discharge rates among boys decreased. AAPCs were: -11.5 (-14.4, -8.6) for <1 year, -9.2 (-10.8, -7.5) for 1-2 years, and -10.8 (-13.4, -8.1) for 3-6 years. AAPCs among girls decreased similarly.

Conclusions: A reversal of the previous increasing trend in pediatric OM diagnoses and decreasing trend across health care settings since the mid-1990s may be attributable to a concurrent increasing trend in smoke-free households with children.

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POS3-42 WHO USES QUITLINES IN CANADA?

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Canada began offering quitline services in 2000, initially in two provinces and by 2005, all provinces offered quitline services. In 2009 Canadian territories added quitline access for northern residents. Quitlines serve callers who would like information, support, or advice on quitting smoking, staying quit, or helping others to quit. Services include brief motivational counselling (both reactive and proactive), self-help materials and referrals to local cessation services. Promotion of the quitlines include mass media campaigns, paid and earned media, health professional fax referral programs, integration and referrals from other tobacco control services and special initiatives. Data on call volume and characteristics of callers are available for six of 10 provinces. Although the total number of calls (+70,000 calls), and calls for help quitting, have increased since 2003, less than 1% of all smokers are reached. The majority of quitline callers are smokers who are ready to quit or remain quit, have low to moderate levels of addiction, are older than Canadian smokers, and are more likely to be female, despite the fact more Canadian men smoke than women. This presentation will describe the characteristics of callers and patterns of call volume providing the context for comparisons with USA and European quitlines.

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POS3-43 PATTERNS AND PREDICTORS OF QUITTING AMONG NONTREATMENT SEEKING ADOLESCENT SMOKERS

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This paper examines the patterns and predictors of quitting among non-treatment seeking adolescent smokers. Subjects were 385 adolescent smokers (Mean age: 15.7, 55% female; 57% white) participating in a longitudinal natural history study of smoking and who had smoked at least one cigarette in the 7 days prior to the baseline assessment (mean of 1.54 cigarettes/day, with a range from 0.14 to 18.6). Over 33-months of follow-up, 39.0% of these smokers stopped smoking (defined as no smoking in the past 30 days) at any subsequent follow-up wave, and 53.3% of those who stopped remained abstinent at the next assessment (6 or 9 months later). Plans to quit within the next 30 days were significantly associated with quitting at the next assessment wave, but neither plans to quit nor success in quitting were stable over waves. Surprisingly few factors were significantly associated with quitting: confidence in ability to quit did not predict quitting, and neither did alcohol use, grade point average, or smoking among the members of the adolescents' household. Self-identity as a smoker, smoking rate, and the number of close friends who smoke were, however, significantly associated with subsequent quitting. Among all participants, use of evidence-based cessation treatments was low: only 3.4% had ever used cessation groups and 7% had ever used any pharmacological assistance for cessation. These results suggest that adolescent smokers do move in and out of quitting, but the challenge remains to help them prolong and sustain these quit attempts.

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POS3-44 RACIAL DIFFERENCES IN HAIR NICOTINE CONCENTRATIONS AMONG SMOKERS

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In the United States, it has been widely reported that non-Hispanic black smokers have higher levels of serum cotinine than non-Hispanic white smokers, even though they smoke less, on average. This difference has been attributed to differences in nicotine metabolism, along with possible differences in smoking topography, cigarette type, or reporting. We examined whether similar differences are observed using hair nicotine as a biomarker of tobacco use. The purpose of this study was to describe the distribution of hair nicotine concentrations in black, white, and Asian smokers and examine the relationship with self-reported cigarettes smoked per day. We conducted a cross-sectional survey of smokers in Baltimore, Maryland, including collection of a hair sample from participants. Hair was analyzed for nicotine concentrations using gas chromatography coupled with mass spectrometry (GC/MS). In total, 109 cigarette smokers were enrolled in the study (33 white, 58 black, and 18 Asian/other). The mean number of cigarettes smoked per day among whites, blacks, and Asian/other was 18, 13, and 16, respectively. Despite reporting fewer cigarettes smoked per day, black smokers had substantially greater median hair nicotine concentrations (37.8 ng/mg; IQR: 11.8 to 76.1 ng/mg) than whites (5.7 ng/mg; IQR: 1.6-18.0 ng/mg) or Asian/other (9.4 ng/mg; IQR: 5.8-11.8 ng/mg). In multivariate regression models, black smokers had higher hair nicotine concentrations after controlling for age, age at initiation, cigarettes smoked per day, and hair treatment. Additionally, hair treatment was associated with decreased hair nicotine concentrations. Our findings suggest that interpretation of hair nicotine concentrations as a measure of tobacco use and exposure may depend on the population under study. Further research is needed to understand the factors that may have contributed to the differences observed here, including variability in nicotine metabolism and uptake into hair; hair type, treatment, and color; and differences in secondhand smoke exposure in the home and workplace.

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POS3-45 THE INTERNET AS A CHANNEL FOR RECRUITING AND SURVEYING YOUNG ADULT SMOKERS

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Smoking prevalence among people aged 18–25 has remained stable in recent years, heightening the need to study smoking in emerging adulthood. The Internet has strong potential as a tool to reach young adults. This study examined the Internet as a channel for recruiting and surveying young adult smokers about tobacco and other drug use. Internet-based recruitment was conducted from 4/1/09 to 9/1/09 on Craigslist (free classified service) and hundreds of social networking/lifestyle websites visited by young adults (paid campaign). Advertisements directed young adult smokers to a consent page inviting 18-25 year olds to participate in a secure, confidential online survey, with the opportunity to enter a raffle drawing. Those who agreed to enter were then screened for eligibility. In a five-month period, 703 people provided informed consent, 243 met criteria (35%;), 221 provided smoking characteristics (91% of those eligible), and 144 completed the survey (59% of those eligible). Ineligibles were older than 25 (34.3%), younger then 18 (18.3%), or had not smoked in the past month (20.5%). With the paid ad campaign, banner ads were more effective than text ads in yielding interested (63% vs. 37%) and eligible (59% vs. 31%) participants. Cost of recruitment per subject-completed survey was $42.77. Craiglist.org and Facebook.com were the best recruitment sites for completed surveys. The sample (N = 221) was 39% female, 71% White, 12% Hispanic, 9% Asian, 5% African-American, and 4% another ethnicity; 60% were daily smokers. Participants averaged 8.4 cig/day (SD = 8.2), and had a low level of nicotine dependence (FTND M = 3.14, SD = 1.18). Most respondents intended to quit smoking in the next 30 days (33%) or 6 months (55%). Most used alcohol (86%) or marijuana (52%) in the past month. The Internet is a useful channel for engaging young adult tobacco users, particularly those motivated to quit smoking. Strategies to enhance survey completion rates are needed (e.g., sending reminders via email). This survey method appears cost-effective given the broad reach of the Internet and minimal demands on research staff time.

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POS3-46 FACTORS ASSOCIATED WITH SMOKING MENTHOL CIGARETTES IN AFRICAN AMERICAN LIGHT SMOKERS

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Background: Smoking menthol cigarettes is more prevalent among African Americans (AA) relative to whites, and AA light smokers (≤10 CPD) are more likely to smoke menthol cigarettes compared to heavier smokers. This study examines the relationship between smoking menthol cigarettes and socio-demographic, psychosocial, and smoking factors in a sample of AA light smokers enrolled in an ongoing clinical trial.

Methods: We explored bivariate differences between menthol vs. non-menthol smokers and identified baseline factors associated with smoking menthol cigarettes using logistic regression.

Results: A total of 466 participants with mean age of 47 years (SD 11.3) completed baseline assessment. Thirty one percent were married and 65% were female. Eighty-four percent had greater than high school education, 42% were employed and 41% earned >$1800 per month. Participants smoked an average of 7.9 (SD 2.9) CPD, and 71% smoked within 30 minutes of waking. Eighty-three percent smoked menthol cigarettes. Mean depression score (CES-D 10) of 7.8 (SD 5.3), perceived stress score (PSS-4) 5.3 (SD 3.2), craving score (QSU- brief) 2.9 (SD 1.7) and withdrawal score (MNWS) 9.6 (SD 6.9), suggest mild to moderate depression and stress, and relatively low craving and withdrawal at baseline. There were no significant baseline differences in smoking and psychosocial factors between menthol and non-menthol smokers. While females (OR 1.89 95% CI 1.13-3.17) and those who had less than high school education (OR 2.65 95% CI 1.13-6.20) were more likely to smoke menthol cigarettes, age was inversely related to smoking menthol cigarettes (OR 0.94 95% CI 0.91-0.97).

Conclusion: These demographic differences in menthol and non-menthol smokers are consistent with tobacco industry documents showing targeted marketing of menthol cigarettes to women, to the young, and to less educated African Americans. Appropriate education and counter-marketing are needed to effectively prevent smoking uptake in this high-risk population.

This study was conducted at the University of Kansas School of Medicine and Swope Health Services with support from NIH (R01 CA091912).

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POS3-47 CIGARETTE SMOKING FROM ADOLESCENCE TO YOUNG ADULTHOOD: CHARACTERIZING HETEROGENEITY IN SMOKING UPTAKE

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Despite the public health significance of smoking among adolescents and young adults, our understanding of the transitions in smoking behavior (e.g., adoption, persistence) and the determinants of these transitions in smoking are limited. Relatively few studies have evaluated smoking trajectories from adolescence to young adulthood and risk and protective factors that define different smoking patterns across these developmental periods. The present study builds on previous research regarding social risk factors of smoking and problem behaviors by also evaluating potentially protective factors (e.g., physical activity, church attendance) and other psychological risk factors (e.g., stress, depression, impulsivity) that may help discriminate those adolescents or young adults who experiment but do not progress to regular smoking and further define the subgroups who become regular smokers but differ in their pattern of acquisition. Growth Mixture Modeling identified four smoking trajectories in a sample spanning adolescence (14 years old) to young adulthood (22 years old): never smokers (n=271), slow progressors (n=364), late progressors (n=290), and early/fast progressors (n=151). Risk factors (e.g., impulsivity, peer smoking, substance use) as well as protective factors (e.g., physical activity, grades, college attendance) discriminated among the smoking trajectories, but the importance of these factors varied by trajectory and time point. Characterizing the heterogeneity in smoking acquisition from adolescence to young adulthood is important to identify developmental points of smoking vulnerability and highlights variables that may either promote smoking uptake or buffer smoking uptake. This information may help elucidate who needs what type of intervention when and what variables may be important to target.

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POS3-48 POORER MENTAL HEALTH IN MANY NEW ZEALAND SMOKERS: NATIONAL SURVEY DATA

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AIMS: To describe the mental health status of New Zealand smokers and to examine any relationship between mental health and quitting smoking.

METHODS: The New Zealand (NZ) arm of the International Tobacco Control Policy Evaluation Survey (ITC Project) uses as its sampling frame a national survey: the NZ Health Survey (NZHS). From this sample we surveyed adult smokers (n=1376) and measured their mental health status using the SF-36, the Kessler-10 (K10) scored 0-4, and the AUDIT. We also assessed their smoking-related beliefs and behaviours, including quit rates (in 2 survey waves). Comparisons were made with all participants in the NZHS.

RESULTS: Smokers have significantly lower SF-36 (mental health) scores than the general adult population (80.6, 95%CI=79.6 – 81.6; vs. 82.2, 95%CI=81.9 – 82.6). They also have a significantly higher chance (20.3%) of having "a moderate probability of anxiety or depressive disorder" (K10 score of 6-11) compared to the NZ adult population (14.7%). This was also so for having a high to very high probability of these disorders (K10 of 12+): 9.7% vs. 6.6% for the NZ adult population. Other measures indicated significantly higher prevalence of hazardous alcohol use AUDIT scores (33.1% vs. 17.7% in the NZ adult population), and ever having been diagnosed with a mental disorder was fairly common (any diagnosis from a list of 8 items: 20.3%, 17.4% – 23.1%). There were no significant differences in smoking cessation intent, occurrence of previous quit attempts or quitting status at either wave 1 or wave 2 between smokers with higher K10 scores (6+) and other smokers.

CONCLUSIONS: These findings, though limited to some extent by their mainly cross-sectional nature, provide further evidence that NZ smokers have poorer mental health in multiple domains relative to the NZ adult population. This highlights the importance of advancing population-level tobacco control (and alcohol control) to protect this vulnerable population. It also suggests the need for: (i) further work to integrate smoking cessation and community mental health services; and (ii) training smoking cessation workers in mental health issues.

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POS3-49 DOES SMOKELESS TOBACCO USE HELP CIGARETTE SMOKERS QUIT SMOKING? A PROSPECTIVE ANALYSIS OF A NATIONAL REPRESENTATIVE COHORT IN US

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Previous findings were inconsistent with regard to whether the use of smokeless tobacco increased the possibility of quitting cigarette smoking. We examined smoking cessation among dual users of both smokeless tobacco and cigarettes. Participants were selected from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) Wave 1 and 2 sample. The smoking cessation outcome was defined as having quit cigarette for at least 12 months at Wave 2. The dual users were classified as snuff/chewing tobacco initiation preceding cigarette use initiation, cigarette use initiation no later than snuff/chewing tobacco initiation, and cigarette use only (reference group) according to the Wave 1 survey. Adjustments were made for the number of cigarettes used per day, smoking duration, nicotine dependence symptoms, withdrawal symptoms, and demographic variables using logistic regression. We initially found that quitting smoking was predicted by snuff use preceding cigarette use (OR=1.67; 95%CI=1.19-2.34) and nicotine withdrawal (OR=1.56; 95%CI=1.28-1.90), but not by cigarette use initiation no later than smokeless tobacco initiation, after controlling for other covariates. Furthermore, by substituting the individual withdrawal symptoms for the DSM-IV diagnostic withdrawal variable in the same model, we found that increase in appetite or weight was predictive of quitting cigarette use in three years (OR=0.67; 95%CI=0.49-0.90), but snuff use preceding cigarette use was not. All analyses were done using SUDAAN. The results suggest that smokeless tobacco use does not help smokers quit cigarette smoking. Our findings do not support the use of smokeless tobacco as a means for smoking cessation in US smokers.

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POS3-50 SMOKING AND TELESCOPING: GENDER DIFFERENCES IN THE RELATIONSHIP BETWEEN CIGARETTE SMOKING AND RATE OF ALCOHOL DEPENDENCE PROGRESSION

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Background: Cigarette smoking and nicotine dependence have been found to predict initiation and progression of alcohol use and alcohol use disorders. Given preclinical and clinical evidence of sex differences in the effects of smoking on biological stress response and alcohol-nicotine interactions, we tested the hypothesis that the relationship between smoking and progression of alcohol-related problems would differ by gender, with smoking being a stronger predictor of the rate of alcohol dependence progression in women than in men.

Method: Participants were alcohol dependent men (n=149; 58.2%) and women (n=107; 41.8%) who were already involved in or seeking treatment for the disorder. The Semi-Structured Assessment for the Genetics of Alcoholism-Version 2 (SSAGA-II) and the Family History Assessment Module (FHAM) were used to collect demographic information as well as personal and family history of substance-related and other psychiatric disorders. Multiple regression analyses were conducted to examine gender differences in predictors of the rate of alcohol dependence progression.

Results: Cigarette smoking was associated with a faster progression from onset of regular drinking to onset of alcohol dependence in women ($F[1,99]=4.97$, $p=.028$), but not in men ($F[1,141]=1.93$, $p=.168$), after controlling for age-at-onset of drinking; parental substance abuse history; and lifetime diagnosis of conduct disorder, a cannabis use disorder, or another drug use disorder. On average, the latency from onset of regular drinking to alcohol dependence was approximately 5 years shorter for women who had ever smoked (mean=9.33, SD=8.20) versus never-smoking women (mean=14.38, SD=8.05).

Conclusions: These findings suggest that the "telescoping" phenomenon, whereby women exhibit a faster progression to alcohol-related problems than men, may be particularly evident in alcohol dependent women with a history of smoking.

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POS3-51 CHANGES IN SMOKING DURING PREGNANCY: SOCIAL NETWORK INFLUENCES

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BACKGROUND: The majority of smokers stop smoking after recognizing that they are pregnant. However, some women do not stop smoking upon pregnancy recognition. There are a variety of factors that may be related to continuation of smoking. There is increasing evidence that social network factors (such as a partner's smoking or other network members' smoking) are associated with a decreased likelihood of successful smoking cessation. The objective of this work was to examine the relation between individual, partner, and general social network factors and smoking cessation (or smoking reduction for those who did not quit) among smokers in their first trimester.

METHODS: Pregnant women presenting for prenatal care were interviewed once in each trimester about their daily smoking patterns, and about their exposure to environmental tobacco smoke including partner smoking. Saliva samples were collected at each time point. A tobit regression model was used to examine factors related to changes in the number of cigarettes smoked per day from pre-pregnancy recognition to post-pregnancy recognition.

RESULTS: After controlling for the number of cigarettes smoked prior to pregnancy recognition, individuals whose partner's smoked were significantly less likely to quit (or reduce) their smoking post-pregnancy recognition. This finding persisted even after considering other smokers in the house, number of friends who smoke, and the number of relatives who smoke. In terms of exposure to smoking, women who reported being in a room with a smoker in the past 7 days were also less likely to quit (or reduce) their smoking post-recognition.

CONCLUSIONS: One of the primary impediments to smoking reduction during pregnancy appears to be the influence of a partner; an influence that was stronger than other social network influences. Interventions for smoking cessation during this critical life transition should consider the smoking status of an intimate partner.

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POS3-52 THE INFLUENCES OF PARENT, SIBLING AND FRIEND BEHAVIORS ON SMOKING INITIATION, REGULAR SMOKING AND NICOTINE DEPENDENCE

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Background: Genetic and environmental factors are known to contribute to smoking initiation, regular smoking and nicotine dependence (ND). We sought to determine whether parenting, sibling and peer influences risk for these smoking outcomes after controlling for genetic and environmental vulnerability.

Methods: Data come from 1,919 biological offspring (age 12-32 years), 1,107 twin fathers, and 1,023 mothers. Data were collected by telephone administration of structured psychiatric interviews. Offspring were classified into risk groups based on twin fathers' history of ND. Multivariate logistic regression modeled familial risk, parental lifetime substance use, parenting style, sibling support, sibling alcohol and drug use and peer smoking, alcohol and drug use on risk of ever smoking, regular smoking and ND.

Results: Risk for ever smoking was best explained by a model that included significant ($p<0.05$) effects from offspring age, father intact marital status sibling drug use, friends smoking, alcohol & illicit drug use and school peer smoking. Risk for regular smoking was best explained by a model that included significant ($p<0.05$) effects from high genetic and environmental vulnerability, offspring age, father intact marital status, lack of father closeness, maternal problem drinking, sibling drug use and friend and peer smoking and drug use but not friend and peer alcohol use. Last, ND was best explained by significant effects ($p<0.05$) from high genetic and environmental vulnerability, maternal smoking and drinking, maternal education and father's intact marital status and friend smoking. Friend and peer alcohol and illicit drug use did not significantly contribute to ND.

Conclusions: These data suggest important differences in the genetic and environmental variables that are associated with smoking milestones. A broad range of peer substance use is associated with offspring ever trying cigarettes while regular smoking ND is more strongly associated with familial vulnerability and friends smoking.

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POS3-53 ADDRESSING TOBACCO USE FOR FAMILIES AND POLICY MAKERS

Dianne Barker, Abby Rosenthal, Sara Gordon

Tobacco use affects millions of American families, causing cancer, cardiovascular diseases, respiratory diseases, reproductive health problems, and death. Individuals who do not smoke but who are exposed to secondhand smoke are at an increased risk for certain diseases as well. Children exposed to secondhand smoke are at an increased risk for respiratory problems.

Helping Families Thrive: Key Policies to Help Promote Tobacco Free Policies for Families provides actions that families, policymakers, and the public health community can take not only to prepare for these opportunities but also to bolster their comprehensive tobacco control programs and to help families live and thrive in tobacco-free environments. Because women often serve as the health promoters within households by monitoring children's health and encouraging partners and other household members to address health concerns, the report spotlights issues for women, acknowledging the ripple effect of tobacco use on their children and other family members. The report begins with public health facts related to smoking, presents five evidence-based policy solutions that affect families with young children, and goes on to make policy action recommendations. A synoposis of recent data with references to the literature is presented. The five policy solutions are:

1) One hundred percent smoke-free air environments;
2) Increased tobacco excise taxes;
3) Sufficient state spending on comprehensive tobacco control programs;
4) Medicaid coverage for tobacco treatment; and
5) Interventions to help health care providers improve their skills and confidence in helping pregnant women quit tobacco use.

Each policy section includes an action agenda for families, for the public health community, and for policymakers and decision makers respectively. The National Partnership for Smoke-Free Families developed this document for use by the public health community to help families reduce tobacco use.

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POS3-54 STAGES OF SMOKING INITIATION AND PREVALENCE OF ALCOHOL USE IN A STATEWIDE SURVEY OF ADOLESCENTS

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Adolescents who smoke place themselves at higher risk for other negative health behaviors, including alcohol use. We examined smoking initiation from a dynamic process perspective by classifying underage youth into one of five Stages of Smoking Initiation (SOSI). The SOSI algorithm uses both smoking intentions and behaviors and provides a sensitive measure of smoking uptake. Data derived from the 2008 Maryland Youth Tobacco Survey (MYTS), a classroom-based survey of 86,748 youth conducted in public middle (MS) and high (HS) schools throughout the state, were used to classify youth into one of five Stages of Smoking Initiation: Precontemplation (PC), Contemplation (C), Preparation (P), Action (A), and Maintenance (M). This study examined quantity and frequency of alcohol consumption for adolescents in these various stages. Cross-tabulations and Analyses of Variance were used to explore alcohol consumption as a function of stage and school status. Specifically, we examined whether underage youth differ in their alcohol use (i.e., lifetime drinking; days used alcohol in the past month; drinks per drinking episode; and presence of one or more binge episodes in the past month) by their SOSI and by school status (MS vs. HS). Progression toward regular smoking (i.e., $PC < C < P < A < M$) appears to be linearly related to patterns of problematic drinking. Specifically, among HS youth, less than one in ten (8.8%) of those in the Precontemplation stage for smoking initiation reported one or more binge episodes during the past month. For the other stages, one-quarter of those in Contemplation (25.9%), over half of those youth in Preparation (53.9%), almost two-thirds of the youth in Action (64.3%) and almost three-quarters (71.4%) of youth in Maintenance for smoking initiation reported past month bingeing behavior. All between stage comparisons were significant for the past month bingeing. Similar linear patterns of differences were found for the other drinking variables and among MS youth. These patterns of smoking initiation and alcohol use among MS and HS youth suggest the need for multiple risk prevention efforts based upon school status.

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POS3-55 NICOTINE WITHDRAWAL SENSITIVITY, LINKAGE TO CHR6Q26 AND ASSOCIATION OF OPRM1 SNPS IN THE SMOKING IN FAMILIES (SMOFAM) SAMPLE

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Background: Nicotine withdrawal symptoms are related to smoking cessation. Latent class analyses and Rasch models have been used to develop measures that represent multiple correlated nicotine withdrawal measures. A previous autosome-wide screen identified a non-parametric linkage (NPL) LOD score of 2.7 on chromosome 6q26 for the sum of nine withdrawal symptoms in 158 pedigrees, with 607 genotyped individuals (SMOFAM).

Methods: The objective of this analysis was to assess the influence of a Rasch modeled nicotine withdrawal sensitivity score on relapse, conduct autosome-wide NPL analysis of nicotine withdrawal sensitivity and then explore family-based association of single nucleotide polymorphism (SNPs) at the mu opioid receptor (MOR) candidate gene (OPRM1) to nicotine withdrawal sensitivity in the same sample.

Results: An increased risk for relapse was associated with the Rasch modeled nicotine withdrawal sensitivity (odds ratio, OR=1.25, 95% confidence interval, 95% CI: 1.10, 1.42). A peak NPL LOD score of 3.15, suggestive of significant linkage, was identified at chr6q26 for Rasch modeled nicotine withdrawal sensitivity. Evaluation of 18 OPRM1 SNPs via the family based association test (FBAT) with Rasch modeled nicotine withdrawal sensitivity identified eight tagging SNPs with global P-values <0.05 and false discovery rate Q -values < 0.06.

Conclusion: An increased risk of relapse, suggestive linkage at chr6q26, and nominally significant association with multiple OPRM1 SNPs was found with a Rasch modeled nicotine withdrawal sensitivity score in a multiplex smoking pedigree sample. Future studies should attempt to replicate these findings and investigate the relationship between nicotine withdrawal symptoms and variation at OPRM1.

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POS3-56 CHILDHOOD ADVERSITY, SEROTONIN TRANSPORTER (5-HTTLPR) GENOTYPE, AND RISK OF CIGARETTE SMOKING AND NICOTINE DEPENDENCE IN ALCOHOL DEPENDENT ADULTS

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Background: Epidemiologic studies have suggested a dose-response relationship between the number of adverse events experienced during childhood and development of cigarette smoking or nicotine dependence. Additionally, there is mixed evidence that a polymorphism in the serotonin transporter gene (5-HTTLPR) interacts with childhood adversity to increase risk of some addictive and mood disorders. Thus, we examined 5-HTTLPR genotype, along with gender and social support, as moderators of the relationship between childhood adversity and the development of regular smoking and nicotine dependence in alcohol dependent adults.

Method: Participants (N=256) were alcohol dependent men and women with no current, independent mood, anxiety, or psychotic disorders. All participants were enrolled in either a pharmacogenetics trial or a laboratory study evaluating the relationship between 5-HTTLPR and treatment outcome or stress responsivity. The Semi-Structured Assessment for the Genetics of Alcoholism-Version 2 (SSAGA-II) was used to assess lifetime DSM-IV diagnoses and cigarette smoking as well as adverse events (i.e., physical abuse, sexual abuse, parental substance abuse, parental mood disorder, poverty, witnessing domestic violence) and social support during childhood.

Results: A greater number of childhood adverse events was associated with increased odds of regular smoking (OR=2.17, 95% CI=1.42-3.31, p<.001) and nicotine dependence (OR=1.54, 95% CI=1.14-2.07 p=.004). 5-HTTLPR genotype did not moderate the relationship between childhood adversity and regular smoking or nicotine dependence, nor did gender or availability of social support.

Conclusions: Childhood adversity was strongly related to cigarette smoking in this sample of alcohol dependent adults, with each additional adverse life event conferring an approximate 50% increase in the odds of regular smoking and over 100% increase in the odds of being nicotine dependent. Although gene by environment interactions likely account for some of the variance in the risk for co-occurring smoking and alcohol dependence, we found no evidence to support the hypothesized 5-HTTLPR by adversity interaction in the present sample.

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POS3-57 DSM-IV NICOTINE WITHDRAWAL SYMPTOMS AND SMOKING PERSISTENCE IN 17,919 LIFETIME SMOKERS AGE 18 TO 99

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While there is abundant evidence from clinical and epidemiological studies that Nicotine Withdrawal (NW) symptoms occur for at least 50% of smokers after they quit or cut-down, the issue of which NW symptoms are predictive of persistent smoking (PS) for which smokers remains an important area of inquiry. Using data from the first wave of the National Epidemiological Study on Alcohol and Related Conditions (NESARC, Grant et al., 2004, N=43,093), we examined whether lifetime reports of DSM-IV NW symptoms (restlessness, depressed mood, irritability, nervousness, concentration problems, sleep problems, decreased heart rate, increased appetite) experienced after stopping or cutting down on cigarette use were associated with PS (any smoking over the past year) in N=17,919 lifetime smokers (smoking 100 or more cigarettes lifetime), after controlling for number of cigarettes smoked per day (cpd) at peak lifetime use. Using logistic regression models, we examined each symptom individually and jointly in four age groups, which had significantly different rates of PS: ages 18-31 (85% PS), 32-43 (69% PS), 44-60 (52% PS), and 61-99 (26% PS). For women, across all age groups, all of the NW symptoms were significantly associated with PS, except for self-reported decreased heart rate; while for men, the number of NW symptoms associated with PS was observed to increase with age. Modeling the NW symptoms jointly, we found that irritability was consistently associated with PS with adjusted odds ratios (ORs) as high as 2.1 across all groups and sex; and increased appetite predicted smoking cessation across all age groups and sex (ORs as low as .32 predicting PS). Results suggest that irritability may be an important indicator of PS in US smokers. Moreover, increased appetite emerges in those who subsequently maintain abstinence for at least one year, again across the US population of smokers. In the older smokers, especially men, additional NW symptoms may also be contributing to smoking persistence. These findings may clarify how symptoms of the nicotine withdrawal syndrome are associated with smoking persistence.

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POS3-58 SMOKING BEHAVIOR AMONG INTERMITTENT DAILY SMOKERS VS. DAILY SMOKERS

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Background: Non-daily smokers, or intermittent daily smokers (ITS), now comprise more than 20% of smokers. ITS are often conceptualized as less addicted than daily smokers (DS), and are expected to find it easy to quit. We examined quit attempts and methods used, and recent quitting over a 1-year period in a national sample of US ITS and DS.

Methods: 30,800 ever-smokers surveyed in the 2003 Tobacco Use Supplement were smoking 1 year prior to the survey. Lifetime ITS were defined as smoking on some days when surveyed (current) or in the year prior to quitting (recently-quit), and never having smoked cigarettes daily for ≥6 months. DS were defined as smoking everyday when surveyed (current) or in the year prior to quitting (recently-quit). Analyses compared quitting behavior between ITS and DS, including past-year quit attempts (defined as "serious" and/or ≥1 day) and use of smoking cessation aids. Among those who attempted to quit, successful quitting was defined as > 90-day abstinence when surveyed. Multivariable logistic regression identified determinants of quit attempts and recent quitting.

Results: There were 24,900 DS and 1,966 ITS. More ITS than DS made a past year quit attempt (56% vs. 39%, p < .01, odds ratio (OR) 1.88, 95% CI [1.68-2.11]. Among those who made a past year quit attempt, 11% of ITS used a pharmacologic quitting aid, compared to 36% of DS (p < .01), and 6% of ITS (vs. 13% of DS) used a behavioral method (p < .01). Among those who made a quit attempt, ITS were more likely to quit smoking than DS (18% vs. 13%, p < .01, OR 1.42, 95% CI [1.15-1.76]). Results were attenuated, but significant, after adjustment for age, race, gender, education, and time to first AM cigarette. Among current smokers, ITS were less likely than DS to have received professional cessation advice in the past year (30% vs. 47%, p < .01).

Conclusion: ITS had higher rates of quitting than DS, but absolute quit rates were low. ITS' use of quitting aids indicates difficulty quitting. Results challenge the notion of ITS as non-addicted, and support the conclusion that ITS may need assistance with quitting. Lower rates of professional cessation advice to ITS may be a barrier.

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POS3-59 CIGARETTE SMOKING AMONG COLLEGE STUDENTS: A LONGITUDINAL STUDY

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Although cigarette smoking among U.S. adults has decreased, smoking among college-age youth is more prevalent than among other adults. This study examines the prevalence of smoking and levels of nicotine dependence among students (N=1,253) who were interviewed during their first year of college (Y1) and at yearly intervals thereafter (Y2, Y3, Y4). At Y1 the prevalence of past-year and past-month smoking was 33.6% and 17.4%, respectively. The prevalence of past-month smoking was similar during Y2, Y3, and Y4 averaging 19.2%, 20.1% and 20.6%, respectively. At Y1, 56.9% of smokers reported smoking on 5 or fewer days per month while 20.9% reported smoking on 25 or more days per month. However, actual cigarette consumption was quite low, as 50.9% of smokers smoked 1 cigarette per day and 76.7% smoked 3 or less cigarettes per day, while only 2.5% reported smoking 15 or more cigarettes per day. These consumption patterns persisted throughout Y2, Y3, and Y 4. Tobacco dependence was assessed using the Fagerström Test for Nicotine Dependence (FTND) and the Cigarette Dependence Scale (CDS) at Y2 and Y3. At both time points very few individuals scored high on either dependence measure; less than 1% of smokers had FTND scores >5, a level often associated with nicotine dependence. The mean CDS scores at Y2 and Y3 were 20.5 and 20.4, considerably lower than in adult smokers in the general population (average 44.5 ± 9.7). The proportion of students lost to follow-up over the four years of the study was similar for past-month smokers (5.9%) and non-smokers (4.3%) at Y1. These data provide a detailed examination of cigarette smoking among students at a large mid-Atlantic university and afford the opportunity to compare with smoking behavior at other colleges and non-college attending young adults. They suggest that although many college students may experiment with smoking, relatively few are nicotine-dependent and, on average, the light pattern of smoking observed appears to be stable over the four-year period. As a result, college students may provide unique opportunities to investigate the psychosocial correlates and long-term health consequences of light smoking.

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POS3-60 THE RELATIVE IMPORTANCE OF PARENTS' AND FRIENDS' SMOKING AND SOCIOECONOMIC STATUS AS PREDICTORS OF ADOLESCENT SMOKING

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Over the last three decades, the rate of smokers in the Norwegian population has declined from 45 percent to 15 percent in 2006. Despite this decline, and that the harmfulness of smoking is well known, a number of adolescents still start smoking. This calls for studies of which factors causing adolescents to start smoking. Contributions from the social psychology and health behaviour research have highlighted the importance of social determinants of smoking, and proximal determinants are generally hypothesised to be of greater importance than more distal determinants of health behaviour. The aim of this study was to longitudinally examine the relative importance of some candidate factors for smoking initiation: distal factors like adolescents' own social status and that of their parents, and the more proximal factors as having close friends who smoke and having parents who smoke themselves. We employed data from the Norwegian Longitudinal Health Behaviour Study where participants where recruited at age thirteen in 1990, and then followed up 9 times until 2007. During the first five waves of the study, smoking was measured. Beyond questions about smoking, we measured parent's socioeconomic status through questions about their education and occupation. Peer pressure was measured by asking weather a close friend was smoking, followed by questions about parents' smoking, household smoking policies and if the participant had older siblings who smoked. We used these variables in a latent growth model and a longitudinal latent class analysis to predict adolescent smoking. The results showed, as expected, that smoking increased over time. The strongest predictor of smoking initiation over the follow up period, was the most proximate factor; having a close friend who smoked. Parents smoking behaviour and their socioeconomic status were also significant, but weaker predictors on initiation. We conclude that peer smoking is the most important predictor for adolescence smoking initiation. Anti-smoking interventions might benefit from incorporating a focus on peer-pressure, and this factor should be highlighted in our understanding of smoking initiation in a social context.

The Research Council of Norway.

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POS3-61 ADVERSE CHILDHOOD EXPERIENCES AND SMOKING IN AN INCARCERATED POPULATION: A PRELIMINARY EXAMINATION

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Studies in the general population have linked adverse childhood experiences (ACEs), such as abuse and household dysfunction, to negative health behaviors including smoking. Prisoners are known to have poorer health and higher rates of negative health behaviors, with the prevalence of smoking among prisoners consistently found to be greater than 70%. The current study seeks to establish methods for collecting sensitive information from prisoners and provides a first look at the relationship between ACEs and smoking behaviors among prisoners. A sample of 200 consecutively admitted, male inmates was drawn from two low-to-medium security prison facilities. Information on tobacco use was collected during a personal interview using a modification of the NHANES tobacco use questionnaire. Prisoners reported on ACE exposure using an Audio Computer-Assisted Self-Interview (ACASI) system, which allowed for private entry of data while overcoming issues related to illiteracy. Logistic regression was used to examine the relationship between ACEs and smoking behaviors while controlling for demographic factors. The ACASI system was found to be an acceptable means of reporting on these sensitive topics. There was less than 3% non-response for all items in the ACE questionnaire. Adverse childhood experiences were widely reported. Less than a quarter of residents (24.0%) reported no ACE exposure, while more than half (51.0%) reported experiencing two or more ACE categories. Exposure to individual ACE categories was associated with increased odds of smoking behaviors, though few of the relationships were statistically significant. A non-significant dose-response relationship was observed between ACE exposures and smoking behaviors. Past studies in the general population have linked ACEs to smoking behavior; non-significant trends in the current study suggest a similar relationship in incarcerated populations. Further study is needed to determine the role of ACEs in shaping prisoners' health behaviors. This study demonstrates the feasibility of using an ACASI system to conduct such studies in the future.

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POS3-62 PREVALENCE OF TOBACCO SMOKING AMONG ADULTS ADMITTED TO AN ACUTE-CARE GENERAL HOSPITAL: A COMPARISON OF RESULTS FROM SERUM COTININE SCREENING AND CHART REVIEW

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BACKGROUND: US hospital quality standards assess whether smokers admitted for certain diagnoses receive stop-smoking advice or counseling in the hospital. However, the accuracy of self-reported smoking status among hospitalized patients is unknown, as is the true prevalence of smoking among adults admitted to a general hospital.

METHODS: We assessed the smoking status of 1018 adults, a random 40% sample of all adults admitted to a large acute-care general hospital in Boston, MA, during 5 weeks in 2008. Smoking status was assessed by hospital chart review and by assay of an admission blood sample for cotinine, a nicotine metabolite. Current smoking was defined as a cotinine of ≥15 ng/ml (traditional cut-point) and ≥3 ng/ml (proposed newer cutoff).

RESULTS: The prevalence of current tobacco smoking was 14.4% (147/1,018) by hospital chart, 16.4% (167/1,018) using a cotinine cut-point of ≥15 ng/ml and 18.3% (186/1018) using a cut-point of ≥3 ng/ml. Smoking prevalence was higher in hospital patients who were male (p<0.001), <65 years old (P<0.001), on Medicaid health insurance (P<0.001), and admitted to Psychiatry (P=0.003); it did not vary by race. The hospital chart failed to identify as smokers 23.5% (43/183) of patients with a serum cotinine ≥3 ng/ml. Misidentified patients were more likely to be male (P=0.03) and <65 years old (P=0.024); chart accuracy did not vary by race, insurance, or admitting service.

CONCLUSIONS: Among a large random sample of adults admitted to an urban acute-care general hospital, the prevalence of active smoking, assessed by serum cotinine, resembled the self-reported smoking prevalence among adults in the state (16.4% in 2007). Nearly a quarter of patients in whom cotinine was detected were not identified as smokers by the hospital chart. This could represent inaccuracy of patients' self-report or clinicians' charting (or both). Routine screening of hospital patients' smoking status using blood cotinine would identify more smokers and provide more opportunities to encourage smoking cessation.

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POS3-63 SIGNIFICANT ASSOCIATION OF GLUTAMATE RECEPTOR, IONOTROPIC N-METHYL-D-ASPARTATE 3A (GRIN3A) WITH NICOTINE DEPENDENCE IN BOTH EUROPEAN- AND AFRICAN-AMERICAN SMOKERS

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The glutamate receptor, ionotropic N-methyl-D-aspartate 3A gene (GRIN3A) is one of seven genes that code for subunits of N-methyl-D-aspartate receptors (NMDARs). It plays an essential role in the brain by regulating ion flow across membranes in response to glutamate signaling. GRIN3A is located in a genomic region on chromosome 9 that has been linked to nicotine dependence and smoking behavior in several genome-wide linkage scans. To determine if GRIN3A is associated with ND, we analyzed 25 single nucleotide polymorphisms (SNPs) of this gene in our Mid-South Tobacco Family sample, which consists of 2037 individuals from 602 nuclear families of African American (AA) or European American (EA) origin. Nicotine dependence was assessed by smoking quantity (SQ), the Heaviness of Smoking Index (HSI), and the Fagerström Test for ND (FTND). Considering potential ethnic differences, we performed our association tests in the AA and EA samples separately as well as for the pooled sample. Individual SNP-based association analysis revealed significant associations for several GRIN3A SNPs with SQ, HSI, and FTND in the AA, EA and pooled samples after correction for multiple testing. Haplotype-based association analysis further revealed significant associations for multiple haplotypes with the three measures of ND, most of which remained significant after correction for multiple testing. Overall, based on these association findings, in conjunction with GRIN3A's central role in neural transmission, we conclude GRIN3A represents a strong candidate for involvement in the etiology of ND. Further study and replication is warranted.

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POS3-64 NICOTINE WITHDRAWAL IN U.S. SMOKERS WITH CURRENT MOOD, ANXIETY, ALCOHOL, AND SUBSTANCE USE DISORDERS

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Background: Adults with psychiatric disorders smoke at higher rates and have a more difficult time quitting smoking. Little is known about the experience of withdrawal in smokers with current Axis I disorders. The current study examined tobacco withdrawal symptoms and withdrawal-related discomfort and relapse in smokers with and without current mood, anxiety, alcohol use, and substance use disorders.

Methods: The subsample of current daily smokers (n=8213) from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC, Wave 1, 2001-2002) were included in these analyses. Cross-sectional data compared smokers with and without current Axis I disorders on withdrawal symptoms using logistic regression models. The effects of having a co-morbid mood/anxiety disorder and alcohol/substance use disorder compared to a psychiatric disorder alone on withdrawal were also examined.

Results: Participants with a current mood, anxiety, alcohol use, and substance use disorder were more likely to report withdrawal symptoms and reported more withdrawal symptoms. Having a current mood disorder, anxiety disorder, and substance use disorder was associated with increased likelihood of withdrawal-related discomfort and relapse. There were no significant interactions between psychiatric disorders and alcohol/substance use disorders on withdrawal symptoms or behavior.

Discussion: Participants with a current Axis I disorder were more likely to experience tobacco withdrawal symptoms and withdrawal-related discomfort and relapse. Having a co-morbid disorder did not synergistically increase the experience of withdrawal-related symptoms or relapse. It is important to identify Axis I disorders in smokers and provide these smokers with more intensive and/or longer treatments to help them cope with withdrawal symptoms and prevent relapse.

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POS3-65 THE DEVELOPMENT AND APPLICATION OF A METHOD FOR THE ESTIMATION OF MOUTH LEVEL EXPOSURE TO FOUR TOBACCO SPECIFIC NITROSAMINES

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The analysis of spent filters from human smoked cigarettes is one approach for estimating the mouth level exposure to nicotine and tar in tobacco smoke. To expand the application of the method we sought to develop a rapid and sensitive (LC-MS/MS) technique for the direct measurement of four tobacco specific nitrosamines (TSNA) in filters, to estimate mouth level exposure to TSNA. The analysis of filters allows a non-invasive estimation of how smokers use cigarettes in their normal environment. The International Agency for Research on Cancer has classified 4-(methylnitrosoamino)-1-(3-pyridyl)-1-butanone (NNK) and N-nitrosonornicotine (NNN) as Group 1 carcinogens and N-nitrososanabasine (NAB), N-nitrosoanatabine (NAT) as Group 3. Calibration equations with linear correlations were obtained by measuring the TSNA content of filters using this LC-MS/MS technique and measuring mainstream smoke TSNA yields. Cigarettes were smoked using six regimes to cover yields that span those expected from human smoked cigarettes. During validation of the methodology it became apparent that when filter tips were stored under ambient conditions, levels of TSNA had increased beyond the calibration range. Further work demonstrated that storage of filters (but not extract solutions) resulted in increased levels of TSNA. This phenomenon was especially evident for NNK, which showed approximately a 4-fold increase following 4 weeks storage. Storage at lower temperatures reduced the rate of post-smoking TSNA formation in the filter tips. As a result of the increase in TSNA on storage, an alternative approach was to correlate nicotine levels in filters with mainstream TSNA values to estimate mouth level exposure to TSNA. This approach resulted in correlations (R2) of >0.98. A study of 206 smokers of a commercial 6mg (ISO tar yield) product, across five cities in Germany, gave the following mean (sd) estimated exposures (nanograms/cigarette): NAB 10.28 (3.40); NAT 82.01 (27.07); NNK 50.88 (16.85); NNN 96.20 (32.52). These data are based on collection of filters from a 24-hour period.

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POS3-66 DIALOGUES AT UNIVERSITY: A NEW (AND INNEDIT) TOBACCO INDUSTRY CORPORATE SOCIAL RESPONSIBILITY PROGRAM IN BRAZIL

Anna Monteiro*, Monica Andreis, and Clarissa Homsi

The concept of Corporate Social Responsibility (CSR) is very popular within the Brazilian Corporative universe. The “Grupo de Institutos, Fundações e Empresas” (Institute, Foundations and Companies Group - GIFE) has recently published research indicating that 79% of its members do some strategic plan to direct its social acting, and 91.7% of its members do some regular evaluation of results. British American Tobacco’s subsidiary in Brazil, Souza Cruz, is the main tobacco company in Brazil, with 65% of market share. According to its website, the company believes it is committed with the Brazilian society. So in 2005, when advertising of tobacco products was restricted to point of sale, Souza Cruz created one of its most important projects, entitled Dialogues at University (Diálogos Universitários), an initiative to join youth and students. Through a debate with important personalities from different areas Souza Cruz spreads its concept as citizenship corporation, poses as an incentive to promote talks, brings important questions to Brazilian society and recruits a great number of followers. Its slogan is, “Who promotes dialogues, promotes democracy.” According to Souza Cruz website, the Dialogues at University “was created as a response to expectations of society presented by its stakeholders who participate in Corporate Dialogues, meeting sponsored by the company each two years, modeling its Social Report.” The project is promoted in partnership with universities and students representatives (Junior Companies, Academic Center, Model Offices). The Alliance for Control of Tobacco Use has, as part of its work, the monitoring of tobacco industry. For ACT, the Souza Cruz project is just marketing. The ultimate goal is to increase market share, but the approach is present themselves as an entity concerned with good citizenship and with the needs of youth. This paper intends to show that Dialogues at University project seems to be harmless, but in fact it is an excellent opportunity for industry to recover its image.

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POS3-67 DIFFERENCES IN INTENTION TO SMOKE IN HISPANIC AND NON-HISPANIC MIDDLE SCHOOL STUDENTS

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Beliefs and attitudes toward smoking have been shown to predict smoking behaviors. We sought to test whether self-identified race or ethnicity as Hispanic moderates the relationship between specific beliefs and intention to smoke or between negative emotions and intention to smoke among middle school aged adolescents. A sample of 290 middle-school students between the ages of 11 and 15 (M = 12.53, SD = .99) completed measures on tobacco use, intention to smoke and attitudes toward smoking behavior (Fishbein/Ajzen-Hanson Questionnaire), and mood (Positive and Negative Affect Scale). Approximately 5% of the students reported using tobacco, with higher rates of current tobacco use among Hispanic students (50%) compared to non-Hispanic counterparts, Chi-Square(1, N = 290) = 41.68, p <.01. Race was a significant moderator of the relationship between intention to smoke and negative affect (beta = .16, t(237) = 2.21, p =.03) and intention to smoke and positive attitude toward smoking (beta = .10, t(271) = 1.95, p =.05). In the overall sample, negative affect predicted intention to smoke (beta =.14, t(237) = 2.20, p =.03), but Hispanic youth with high levels of negative affect reported greatest intention to smoke, while negative affect was not related to intention to smoke among non-Hispanic youth. Similarly, students who had a positive attitude towards smoking and those who perceived it as being fun and enjoyable reported greater intention to smoke (beta = .64, t(271) = 12.87, p< .01). However, Hispanic youth who perceived smoking as less enjoyable and fun indicated lower intention to smoke than non-Hispanic youth who had similar attitudes. Furthermore, Hispanic youth who perceived smoking as enjoyable and fun indicated greater intention to smoke than non-Hispanic youth with similar beliefs. The results indicate that the presence of negative affect and positive attitudes towards smoking behaviors predict intention to smoke differently for Hispanic and non-Hispanic middle school aged students. The findings of this study can be used to develop guidelines for culturally sensitive smoking prevention programs for middle-school aged adolescents.

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POS3-68 DEVELOPMENT AND INITIAL VALIDATION OF A MOVIE SMOKING MEDIA LITERACY SCALE

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Evidence suggests a causal link between exposure to cigarette smoking in movies and adolescent smoking. Efforts to reduce adolescent smoking might therefore seek to lessen the impact of movie smoking by teaching youth to understand and evaluate the smoking messages they receive via movies (i.e., movie smoking media literacy). Accurate evaluation of any efforts in this regard would require a valid scale to measure movie smoking media literacy. Primack et al. developed a general smoking media literacy scale and demonstrated associations between this scale and both adolescent smoking and susceptibility to future smoking. Using Primack et al.'s general scale as a starting point, we developed a movie smoking media literacy scale (MSMLS) and tested its reliability and validity among a diverse cross-sectional sample of 77 middle school students (M age = 12.8 years). Based on item-scale correlations, we reduced our original set of 14 items to 9. These 9 items focused on the purposeful portrayal of smoking in movies, the role of the tobacco industry in these portrayals, the many ways in which these portrayals may be interpreted, and the gulf between depictions of smoking in movies and the reality of this risky behavior. Internal reliability of these 9 items was good ($\alpha = .77$). A confirmatory factor model that constrained all items to load on a single movie smoking media literacy (MSML) factor fit the data well, $\chi2(26) = 32.5$, $p = .18$, CFI=.95, RMSEA=.06. To evaluate the scale's validity, we tested bivariate associations between adolescents' status on the MSML factor and variables involved in the association between exposure to movie smoking and smoking onset. Higher MSML was associated with more negative smoking expectancies ($r = .24$, $p = .03$), decreased future smoking intentions ($r = -.22$, $p = .05$), and more negative attitudes toward smoking ($r = .22$, $p = .05$). MSML was not associated with smoking resistance self-efficacy ($r = .08$, $p = .48$) or perceived smoking norms ($r = -.11$, $p = .38$). These preliminary findings indicate that the MSMLS is a reliable and valid measure of movie smoking literacy. Efforts to increase MSML may be a promising tool for youth tobacco control.

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POS3-69 ENDOGENOUS KYNURENIC ACID (KYNA) LOWERS EXCITABILITY OF HIPPOCAMPAL INTERNEURONS – POSSIBLE ROLE OF ALPHA7 NICOTINIC ACETYLCHOLINE RECEPTORS

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Recent studies have demonstrated a reciprocal relationship between the levels of brain kynurenic acid (KYNA) and activity of alpha7 nAChR, the two entities being implicated in the pathophysiology of several diseases such as schizophrenia. To better understand their relationship in an acute experimental paradigm, we used L-kynurenine (LK) to increase the level of KYNA in brain slices that allowed us to study the effect of endogenous KYNA on alpha7 nAChR activity. Hippocampal slices were obtained from 23-25-day-old male Sprague-Dawley rats. Incubation of the rat hippocampal slices with 200 micromolar LK for 2-7 h decreased the peak amplitude of choline-induced nicotinic whole cell currents in the stratum radiatum interneurons (SRI), a decrease that was accompanied by an enhanced level of KYNA in the perfusate surrounding the slices. Because alpha7 nAChR activity contributes to the excitability of hippocampal interneurons under normal conditions, we tested the effects of LK on the excitability of SRI. To this end, we recorded under cell-attached patch-clamp mode spontaneous firing frequency in the SRI of hippocampal slices. In control hippocampal slices, 58% of SRI exhibited spontaneous firing, whereas in slices incubated with 200 micromolar LK, only 33% of SRI revealed spontaneous action potentials. In control slices the mean frequency of spontaneous action potentials was 0.425 Hz, whereas in LK slices, the frequency remained at 0.038 Hz. The results presented herein could be accounted for by the conversion of LK into KYNA with the latter suppressing alpha7 nAChR activity in the SRI in the hippocampus.

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POS3-70 A MODEL FOR IN VITRO EXPOSURE TO TOBACCO SMOKE AT THE AIR-LIQUID INTERFACE

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We have developed a model for exposing in vitro cultures of human lung primary epithelial cells and cell lines cultured on Transwell® inserts to mainstream whole cigarette smoke i.e., combined particulate and gaseous phase. Freshly generated smoke is diluted with air and delivered to a Perspex 'whole smoke chamber' to enable the direct exposure of air-liquid interface cultures. The chamber is maintained at 37°C and fed with a continuous supply of culture medium throughout the exposure period (30 minutes to 3 hours). The whole smoke chamber is versatile and inexpensive and can be produced in most engineering workshops. Made from clear Perspex it allows the operator to view the contents of the chamber during exposure and to modify the chamber to accommodate a range of culture sizes and number. The chamber can be used to assess the effects of smoke concentration, whole smoke versus smoke gas phase as well as effects of individual gas phase components. This system enables us to investigate effects of whole cigarette smoke on endpoints known to be relevant to major smoking related disease, namely cancer and chronic obstructive lung disease (chronic bronchitis and emphysema). One endpoint reported includes effects of serial dilutions of smoke on cell viability. E.g. using an ion exchange gas phase selective filter, the smoke dose (dilution) to give a 50% reduction in cytotoxicity was 1:108 from a cellulose acetate filter in comparison to 1:56 for smoke via an ion exchange filter a reduction of 48% in cytotoxicity of the smoke. Other studies reported examine the effects of smoke on oxidative DNA damage, gene expression and cytokine production of putative disease-related mediators. We propose to use this system as part of an assessment framework for the evaluation of cigarette modifications intended to potentially reduce the harmful effects of smoke. Furthermore, this system is a useful in vitro method for evaluating the effects of other aerosols and gaseous mixtures such as air pollutants and inhaled pharmaceuticals and to examine occupational exposure scenarios and is freely available to the scientific community.

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POS3-71 EXAGGERATION OF PERCEIVED SMOKING NORMS AMONG COLLEGE STUDENTS: DOES SMOKING STATUS MATTER?

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The prevalence of smoking among college students surpasses the national average and is on the rise. Research suggests that over half of students deny being smokers ("deniers") despite smoking within the past thirty days. Furthermore, college students overestimate injunctive and descriptive norms of peer drug use. The purposes of this study were to (a) estimate the prevalence of deniers and students who identified as smokers within a college sample (b) determine whether students overestimate descriptive and injunctive norms related to cigarette use by peers, and (c) determine whether the degree of exaggeration differs according to smoking status. Participants were 1,904 students (18-24 years) from a Northeastern private university who were primarily female (59%), Caucasian (70%), and freshmen (59%). Results indicated that 47% of students had never smoked a cigarette, 29% had smoked at least one puff in their lifetime, 15% of students had smoked within the past month, and 9% of students identified themselves as a "smoker." Results indicated that students significantly overestimated the percentage of peers that had ever smoked, had smoked within the past thirty days, and peers who had smoked 20 or more days within the past month. Additionally, estimates differed by smoking status, as did students' perceptions of their peers' attitudes regarding the acceptability of and policies related to smoking in college. Overall, these findings suggest that the average student believes that one's peers smoke more, and are more approving of smoking behavior than oneself. These exaggerations may result in the uptake or maintenance of smoking behavior, and future interventions may target normative assumptions of college students to reduce this detrimental health behavior.

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POS3-72 THE IMPORTANCE OF SENSORY PROPERTIES IN FACILITATING COMPLIANCE WITH SMOKING CESSATION AIDS

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A common problem of committed quitters who use nicotine gum as a smoking cessation aid is under-medication. Good sensory properties of a nicotine replacement gum may help improve compliance with the recommended dosing instructions. To accomplish this goal, Novartis Consumer Health has developed 2 new nicotine chewing gum flavours and tested each in quantitative consumer research study. 288 consumers (25-64 years), who were in the process of quitting smoking, were recruited to participate and interviewed in 6 different locations in the UK in 2007. A blinded taste test with 2 new Nicotinell® Mint chewing gum flavours (NG1 and NG2, each containing 2 mg nicotine) and Nicorette® Freshmint chewing gum (2 mg nicotine) as control were conducted. The 2 test and control gums were chewed by the participants for 30 minutes each with a 30 minute break in-between trials. The participants measured the relative sensory strengths and weaknesses of the test gum versus the control gum, and confirmed their preference. The results of the quantitative interviews showed that the smoker attempting to quit expects that a nicotine chewing gum should quickly relieve cravings to help him or her to quit effectively. In addition, gum flavour, and especially mint flavour, appears to be an important determinant for the consumer's acceptance. The blinded-taste test showed that the new Nicotinell® Mint chewing gum flavours scored in line with the control nicotine gum. An important observation from the study is that Nicotinell® NG1 had a longer lasting taste and scored better on texture attributes vs Nicotinell® NG2 and the control gum. These findings may have a significant impact in improving treatment compliance.

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POS3-73 CHANGE IN BODY COMPOSITION AND SMOKING CESSATION: A REVIEW OF THE LITERATURE

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INTRODUCTION: While the numerous studies investigating changes in weight during smoking cessation are fairly well examined, changes in body composition during cessation are unknown. This qualitative review summarizes the limited literature pertaining to changes in body composition (specifically bone, muscle and fat) and smoking.

METHODS: Relevant studies were identified by conducting a literature review in PubMed and Web of Science using combinations of the following keywords: ['smoking cessation' or 'smoking'] AND ['bone density,' 'fat free mass,' 'adipose,' 'subcutaneous fat,' 'bone health,' 'abdominal fat,' 'muscle,' 'muscle loss,' 'muscle gain,' 'percent fat,' 'body composition,' 'bioelectrical impedance analysis,' or 'Dual Energy X-ray Absorptiometry']. Each identified source was also used to find other relevant information listed in the reference section.

RESULTS: A total of fourteen studies were identified. Seven studies assessed changes in bone mass, two of which were animal studies. Data from these studies suggest increases in bone mass occur during smoking cessation. The studies that investigated changes in muscle metabolism (n=2) were designed and conducted in clinical populations. These studies indicated that muscle protein synthesis was higher in non-smokers compared to smokers, which increased muscle maintenance and reduced the chances of muscle wasting. Finally, six studies tested the change and distribution of fat. Of the six studies looking at fat change during cessation four observed an increase while two saw a decrease in amount of fat. Overall, the majority of studies (10/14) indicated that favorable changes in body composition occurred, in at least one of the components.

DISCUSSION: The recent literature yielded a few studies, which investigated individual components of body composition as it relates to smoking, but no comprehensive overview of body composition was available. Understanding the change in body composition during smoking cessation will help to identify ideal treatments (e.g., controlling fat change while increasing bone density). In sum, the area of body composition during cessation remains largely unexplored.

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POS3-74 EVALUATION OF VARENICLINE AS AN AID TO SMOKING CESSATION IN UK GENERAL PRACTICE – A THIN DATABASE STUDY

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Aims: Varenicline is a licensed smoking cessation medication in the EU, USA and many other countries worldwide. The study was designed to assess its usage in a UK General Practice setting. Methods: The main outcome measure was the rate of smoking cessation, defined as the 7-day point prevalence after 6 months from starting varenicline. Varenicline users were identified from records in The Health Improvement Network (THIN) database. A questionnaire on smoking cessation was sent to patients who commenced treatment close to the selection date (6 months prior to the date of questionnaire dispatch). Results: The response rate was 26.4%: 193 responses were received. Ninety percent had previously attempted to stop smoking and 87.4% had used nicotine replacement therapy during the previous attempt to stop smoking. The overall smoking cessation rate was 49.5%. There was a strong association between the duration of varenicline treatment and smoking cessation. Patients who reported using varenicline for 9-12 weeks were 11 times more likely to stop smoking than those who completed less than two weeks of treatment. There was some evidence that patients with a longer history of smoking were less likely to stop. No association was observed between smoking cessation and: previous number of cigarettes smoked per day; number of previous attempts to stop smoking; or motivations for stopping. Conclusions: Varenicline appears to be a useful pharmacological aid to smoking cessation in a general practice setting. The results of this study are similar to those observed from previously reported clinical trials.

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POS3-75 PERCEPTIONS OF HEALTH RISK AMONG SUBGROUPS OF COLLEGE SMOKERS

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In the United States, college smoking has been identified as a major public health concern. Previous research (Murphy-Hoefer et al., 2004) has suggested that college smokers and nonsmokers have differing perceptions of smoking risk. However, this research has not compared subgroups of college smokers, including abstainers, experimenters, and "deniers" (i.e., students who smoke, but do not identify as smokers), with students who currently identify as smokers. To better understand perceived risk among these subgroups of college students, the goals of the following study were to (a) replicate previous findings that suggest college smokers consider smoking less hazardous than non-smokers, and (b) determine whether these relationships also exist within a population of deniers and experimenters. Data were from a larger study assessing smoking behavior among college students. Participants were 1,904 students (18-24 years) from a Northeastern private university who were primarily female (59%), Caucasian (70%), and freshmen (59%). Results indicated that 47% of students had never smoked a cigarette (abstainers), 29% had smoked at least one puff in their lifetime (experimenters), 15% had smoked within the past month but did not identify as a smoker (deniers), and 9% currently identified themselves as a "smoker." Consistent with previous research, smokers and non-smokers differed in their perception of short-term smoking risk. Specifically, abstainers were over 3.5 times more likely than smokers to believe that smoking everyday was harmful. In addition, deniers were only half as likely as admitted smokers to believe that a weekend smoker should be considered a "regular smoker." These findings suggest that consideration of smoking subgroup may be warranted when delivering anti-tobacco messages and interventions designed to target risk perceptions.

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POS3-76 PREDICTING ADOLESCENT PERCEPTIONS OF THE RISKS AND BENEFITS OF CIGARETTE SMOKING: A LONGITUDINAL INVESTIGATION

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Models of health behavior emphasize the importance of an individual's perceptions of the risks and benefits of cigarette smoking in predicting smoking behavior. Longitudinal studies confirm that perceptions of greater risk and fewer benefits predict smoking initiation among adolescents, but no study has examined if smoking-related perceptions change over time as adolescents develop and become more cognitively mature. Furthermore, no study has determined whether important predictors of smoking behavior, namely parent and peer smoking, predict changes in perceptions over time. The present study was a longitudinal investigation of the developmental trajectory of the perceptions of risks and benefits of smoking over a two-year period in adolescence. Participants were 395 adolescents (53% female; mean age at baseline = 14 yrs) recruited at baseline from the 9th grade classes of two high schools. Participants completed self-administered questionnaires during regular class periods at their school every six months for two years. Multilevel modeling was used to predict perceptions of short-term risks, long-term risks, and benefits of smoking over time from participant smoking, peer smoking, parent smoking, and participant sex. Results indicated that perceptions of the long-term risks, short-term risks, and benefits of smoking did not change over time. Adolescents who smoked reported significantly lower perceptions of long-term risk at baseline ($b = -4.32$, $p < .01$). Participants who smoked had more than 10 friends who smoked, or were male endorsed lower perceptions of short-term risk at baseline ($b = -7.80$, $p < .001$; $b = -7.25$, $p < .01$; and $b = -4.52$, $p < .01$, respectively). Adolescents who smoked, had more than 2 friends who smoked, or were male reported higher perceptions of benefits at baseline ($b = 3.33$, $p < .05$; $b = 3.96$, $p < .01$; and $b = 5.82$, $p < .01$, respectively). These results suggest that individual and psychosocial variables may be more important than developmental processes in predicting changes in perceptions of smoking-related risk in adolescence, and may therefore be useful targets for youth smoking prevention programs.

This research was supported in part by grants awarded to Dr. Halpern-Felsher from the Tobacco-Related Disease Research Program, Office of the President, University of California (#9K-0072), the UCSF Academic Senate Committee on Research, and the Raschen-Tiedenann Fund from the Research Evaluation and Allocation Committee, School of Medicine, UCSF.

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POS3-77 PILOT STUDY OF SMOKELESS TOBACCO CESSATION USING NICOTINE LOZENGES AND ASSISTED SELF-HELP

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Behavioral interventions that incorporate behavioral self-help materials combined with counseling calls (assisted self-help) have been demonstrated to cost-effectively reduce smokeless tobacco (ST) use rates, and can be easily disseminated. However, the feasibility and effectiveness of incorporating pharmacotherapy into these interventions have not been evaluated. Our pilot study represents the first investigation to evaluate compliance with and efficacy of mailed nicotine replacement therapy (NRT) for ST users. We describe the results of a clinical pilot study in which 60 ST users who received self-help plus telephone support were randomized to receive either 12 weeks of the 4-mg nicotine lozenge or placebo lozenges delivered through the mail. At the end of the medication phase, 63% of subjects in the nicotine lozenge group were using lozenges compared with 43% in placebo group. Except for the in-person baseline assessment, which was conducted for safety, our approach models a telephone quitline with mailed NRT. Results confirmed that a ST cessation treatment protocol that combined mailed nicotine lozenges and an assisted self-help intervention was both feasible and safe. Lozenge use, treatment adherence, and protocol completion were comparable to clinical trials having more intensive (in-person) and consistent contact. Outcome results must be viewed in the context that the pilot study was underpowered to detect group differences in outcome. Accordingly, no statistically significant differences were observed between the two groups for any outcome at either 12 weeks (end-of-medication) or 6 months. Prolonged abstinence results for assisted self help intervention combined with the nicotine lozenge vs. the placebo lozenge were promising at 12 weeks: 43% vs. 37% ($p = .60$) but the treatment benefit was not maintained at 6 months: 27% and 38% ($p = .405$). Point prevalence results followed a similar pattern. The use of nicotine lozenge significantly decreased withdrawal symptoms. The results are discussed in terms of the possible ways to strengthen the efficacy of a low intensity self help ST cessation intervention using NRT as an adjunctive aid.

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POS3-78 LAY BELIEFS ABOUT THE ROLE OF GENETICS IN NICOTINE DEPENDENCE AND IMPLICATIONS FOR GENETICALLY-TAILORED TREATMENT

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Background: Research on the genetics of nicotine dependence and response to treatment may soon lead to tailored cessation treatment. Such advances will not have clinical impact unless patients are willing to undergo genetic testing. We assessed beliefs about the role of genetics in nicotine dependence and smokers' willingness to undergo testing to receive tailored treatment.

Methods: We report results from 1,037 black and white adult respondents of a 2009 national random-digit-dial survey (response rate 41%).

Results: In assessing beliefs about factors affecting a person's ability to quit smoking, 46% of all respondents rated willpower as the most important factor (56% whites vs. 34% blacks; $p < .0001$), while 37% rated god's help as most important (53% blacks vs. 23% whites; $p < 0001$). 10% cited the support of family or friends as most important (12% whites vs. 7% blacks; $p < .008$). Only 5% cited the use of NRT/counseling; less than 2% cited a person's genetic make-up as most important in quitting. Results were virtually identical among the subset of current smokers. In analyses controlling for race, education, sex, age, income, religiosity, and smoking status, belief that genetics is an important factor in smokers' ability to quit was driven by optimism that genetics research will lead to improved healthcare (OR:2.0; CI:1.46-2.80; $p < .0001$) and having at least some college education (OR:1.46; CI:1.07-1.99; $p < .02$). Despite the low ratings genetics received as a factor affecting smokers' ability to quit, more than 75% of smokers were willing to undergo genetic testing to be matched to optimal treatment, with no significant differences by race or education. Smokers' willingness to undergo testing was driven by motivation to quit (OR:2.4; CI:1.05-5.32; $p < .04$) and optimism about genetics research (OR:4.0; CI:1.66-9.74; $p < .002$).

Conclusions: While clear racial differences exist in beliefs about what drives smokers' ability to quit, the low importance ascribed to genetics is striking. Still, the vast majority of smokers indicate a willingness to undergo genetic testing to be matched to optimal treatment, suggesting low barriers to clinical integration of tailored treatment.

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POS3-79 AFRICAN AMERICAN & HISPANIC ADULT SMOKING PATTERNS, US 2004

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Research interest in light and intermittent smoking is growing. Further, there are documented differences in cigarette smoking among US racially classified social groups (RCSGs). Simultaneously, use of latent class and mixture models is also rapidly increasing in behavioral and medical research. The latent class model was used to identify prevalent patterns of smoking among African American and Hispanic smokers in two age groups (18-25 and 26+) in the 2004 National Survey of Drug Use and Health. The latent class model is conceptually similar to factor analysis. An unobserved categorical variable is postulated to be responsible for the associations observed among measured items. The data included four latent class indicators: (1) ever smoked 100 or more cigarettes; (2) ever smoked every day for a month; (3) how many days smoked in the past 30; and (4) average amount smoked on those days. Final models included three classes for each group, except 18-25 African Americans who required four classes. Each final model included a heaviest smoker class and a new/very light & intermittent smokers. Differences emerged across the group's light smoker classes. Classes were more similar across age groups, but less so between RCSGs. Associations between class membership and Nicotine Dependence Syndrome Scale (NDSS) subscales were mixed. Drive to smoke, continuity of smoking and tolerance largely differentiated classes as expected. Priority of smoking and stereotypy did not. Membership in light and/or new smoking classes was likely to be associated with higher priority and stereotypy scores. For the most part, other demographics had small effects. Among Hispanic respondents between 18-25, women were more likely to be members of the heaviest smoking class than the other classes. Among African American respondents between 18-25, higher education was associated with membership in a low frequency smoking class. This work can be considered a bi-directional construct validity assessment, in that it examines both the latent classes and NDSS subscales. This work also serves as a realistic case study of the application of latent class and mixture models in survey data.

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POS3-80 IMPORTANCE OF SOCIAL FACTORS IN SMOKING CESSATION IN COSTA RICA: PILOT STUDY RESULTS

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Latin America has been seeing a decline in communicable diseases, while chronic diseases have been showing an increase In Costa Rica, cardiovascular disease has been the leading cause of death for the past 30 years. An important factor contributing to this increase has been tobacco consumption. Smoking is a major public health issue in Costa Rica; however, few smoking cessation programs are available. Therefore, collaboration was established between the University of Maryland and the Universidad de Iberoamérica in San José, Costa Rica to develop and evaluate the effectiveness of a worksite smoking cessation intervention. The first step was to determine the key Costa Rican cultural values that influence the quitting process. A series of focus groups were conducted among employees of the Costa Rican Justice Department of ex-smokers and smokers. It was found that social influence and social support were vital to quitting. Therefore, a small pilot study was carried out of a smoking cessation intervention based on the best practices in the US and Costa Rica and including a social support component. The goal was to assess its effectiveness, determine the need for any modifications, and further explore the role of social factors in smoking cessation in Costa Rica prior to initiating a large-scale intervention program. Two smoking cessation programs were conducted (total combined n=14). Results indicated that 36% of the participants quit at the end of the program. Of the quitters, 0% lived with a smoker compared to 56% of the non-quitters. Also, 40% of the quitters reported that most of their friends smoke, compared to 67% of the non-quitters. In addition, 20% of the quitters stated that most of their co-workers smoke, compared to 33% of non-quitters. The results from both the focus groups and the pilot study indicate that social factors were strongly related to quitting. Therefore, smoking cessation interventions in Costa Rica need to include a strong social component in order to maximize their effectiveness.

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POS3-81 TRENDS IN TOBACCO-DEPENDENCE CURRICULA IN U.S. MEDICAL SCHOOLS BASED ON 1998 AND 2008 SURVEYS

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Improvements in tobacco-dependence treatment in the US from 1998 to 2008 include 2 revisions of the Public Health Service Guidelines (2000, 2008), 3 new FDA-approved medications (bupropion & nicotine nasal spray 1997; varenicline 2006) & regional stimuli provided by the Tobacco Master Settlement Agreement (1998). Whether US medical schools' curricula include these advancements is unknown. We faxed a survey to all US medical schools (13 items, 1997-1998) & an online survey (20 items, 2007-2008). Both surveys asked 9 comparable topical items. The 2008 survey added 11 items on the schools' curricular methods, identification of key faculty & stop-smoking training sites. Mean national curricular trends over 10 years will be assessed. In addition, curricular changes for individual schools (2008) will be compared to their baseline (1998). We had a 70% initial response to the faxed survey & 2 phone reminders (1998) with a 96.8% final response rate. The emailed survey along with 2 reminders (2008) obtained a 49.6% (62/125) initial response rate. In 2008, 88.3% of schools reported their curriculum includes tobacco dependence. Although 79% (49/62) schools reported having faculty experts in tobacco dependence, only 21% of schools identified a key tobacco curriculum coordinator. By 2008, most schools adopted 3 new FDA approved medications into the curriculum (> 85%). Required course hours for tobacco-dependence treatment skills doubled over 10 years for both categories of >1-3 hours & 3-5 hours. More schools reported they require clinical tobacco training (30.8% to 78.7%). Required clinical training increased in "teaching settings without patients" (12.5% to 36.4%) & "clinical settings with actual patients" (13.3% to 29.1%). Required performance evaluations also increased (5% to 29.1%). Tobacco education in US medical schools appears to have increased in hours of educational time in the last decade, yet only 1/3 of schools require clinical training & skill evaluation. Medical educational culture is slow to attain the aggressive benchmark established by public health advancements in order to combat the most deadly global epidemic.

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POS3-82 JUSTIFYING SMOKING AND ITS EFFECT ON SUBSEQUENT QUITTING BEHAVIOUR: FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL (ITC) FOUR COUNTRY SURVEY

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Previous studies have demonstrated that beliefs about smoking can affect a smoker's behaviour. For instance, Borland et al. (2009) found that smokers who endorsed more risk-minimizing and self-exempting beliefs were less likely to intend to quit or to make quit attempts. In the current study, we use a cognitive dissonance framework to build on these findings by proposing that various other forms of beliefs can also contribute to weaken one's motivation to quit smoking. According to the classic theory of Cognitive Dissonance (Festinger, 1957), smokers who are aware of the harmful effects of smoking, yet continue to smoke will experience an unpleasant emotional state, known as cognitive dissonance. Because dissonance is uncomfortable, smokers are motivated to reduce their dissonance. One way of reducing this dissonance would be to reduce or quit smoking. However, because quitting is difficult, Festinger proposed, that smokers are more likely to change their beliefs about smoking in order to relieve their tension, such as endorsing more justifications for smoking. We created a variable called "justifications" using a composite score of smokers' attitudes about smoking, perceived benefits of smoking, self-exempting beliefs, and justifications for smoking. We analyzed data from the first three waves of International Tobacco Control (ITC) Four Country Survey – a cohort study of over 2000 smokers in each of the four countries: Canada, United States, United Kingdom, and Australia. Consistent with other studies, logistic regression analyses revealed that higher levels of justifications at the baseline wave (W1) were predictive of a lower likelihood of having intentions to quit in the same wave (OR = 0.32; CI = 0.29-0.36; p <.001), and a lower likelihood of making a quit attempt by W2 (OR = 0.58; CI = 0.52-0.64; p <.001), but not were not predictive of the likelihood of being successful in a long-term quit attempt at W3 (OR = 0.77; CI = 0.48, 1.24; p = .280). These findings highlight the psychological barriers that diminish motivation to quit and suggest that successful interventions to motivate quitting must deal with the defensive use of justifications.

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POSTER SESSION 4

POS4-1 BRIEF NICOTINE EXPOSURE DURING ADOLESCENCE ALTERS DOPAMINE-MEDIATED BEHAVIORS

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Clinical studies have shown that adolescent tobacco use is associated with a variety of health risk behaviors including the development of anxiety disorders, high-risk sexual behavior and other types of illicit drug use. Neurotransmitter systems implicated in the modulation of these behaviors are not fully mature during this period, and can be critically altered by nicotine, the main psychoactive component in tobacco. Given the importance of dopamine (DA) in central reward functions, the purpose of this study was to determine whether nicotine induces age-specific alterations in mesocorticolimbic DA function, reflecting changes in DA-mediated behaviors. Using rat as an animal model, we found that four-day pretreatment with a low dose of nicotine (60µg/kg; i.v.), equivalent to that found in 3-4 cigarettes, significantly altered locomotion induced by direct DA agonists. Behavioral studies show that locomotor activity and erectile response induced by quinpirole (0.4mg/kg; i.p.) was increased after adolescent nicotine exposure, an effect not seen in adults. Conversely, nicotine exposure during adolescence decreased D1-agonist SKF83822 (0.3mg/kg; i.p.) induced locomotion. Neurochemical and double-labeling in situ hybridization studies showed unique changes in limbic, sex and stress-related systems. Nicotine pretreatment in adolescence selectively increased quinpirole-induced c-fos mRNA expression in the central amygdala, paraventricular nucleus, and supraoptic nucleus, but had no effects on quinpirole-induced corticosterone release. WAY 100,635, a selective 5-HT1A receptor antagonist, blocked the enhancement of quinpirole-induced locomotion when co-administered with daily nicotine treatment, implicating the involvement of the 5-HT system in nicotine's effects. These findings provide evidence that nicotine administration causes unique neural adaptations during adolescence, and elucidates novel pathways altered by nicotine that may increase vulnerability to high-risk behaviors.

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POS4-2 NEUROBIOLOGICAL AND BEHAVIOURAL RESPONSES TO NICOTINE AND INESCAPABLE STRESS

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Nicotine (NHT) dependence is higher among smokers with a history of major depression [Breslau & Johnson (2000) Am J Public Health 90:1122-1127] and it has been hypothesised that anhedonia (a key outcome of repeated stress and a primary symptom of depression) may enhance the reinforcing properties of NHT [Markou et al. (1998) Neuropsychopharmacology 18, 135-174]. Dopamine (DA) projections from the VTA to nucleus accumbens medial shell (NAcS) are implicated in the neurobiology of NHT dependence [Di Chiara et al. (2004) Neuropharmacology 47:247-241]. In study 1, in vivo microdialysis was used to explore the putative anhedonic consequences of acute and repeated exposure to an inescapable stressor, an elevated platform, on DA overflow in the NAcc medial shell in saline- and NHT-treated (0.4mg/kg sc daily for 7 days) male Sprague-Dawley rats. In unstressed rats, NHT increased DA overflow ($p<0.05$). Acute stress (30mins) significantly suppressed this response ($p<0.05$). DA overflow significantly increased following removal from the platform in both saline (vehicle) and NHT-pretreated rats ($p<0.05$). Repeated daily (6 days) exposure to the stressor significantly increased basal extracellular DA ($p<0.05$) and suppressed the response to NHT. Study 2, used an elevated plus-maze test of anxiety to investigate the effects of NHT and stress on spontaneous behaviour. This experiment showed that pretreatment with NHT evoked anxiolytic-like behaviour (increased open arm entries) when measured 24h after the last injection ($p<0.05$). Prior exposure to the stressor (1h) independently suppressed total activity ($p<0.01$). The study has shown that acute and repeated stress influence DA overflow in the NAcS. However, they also show that exposure to the stressor does not enhance the response to NHT. Thus, the results do not support the hypothesis that exposure to a stressor of this type enhances the effects of nicotine on a pathway considered critical to the reinforcing properties of the drug.

Wellcome Trust.

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POS4-3 THE INFLUENCE OF AGE AND THE TOBACCO SMOKE CONSTITUENT, NORHARMANE ON THE REINFORCING VALUE OF NICOTINE

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Tobacco smoking is the leading cause of premature death worldwide. Despite the evident health risks, quit rates remain low. This public health issue has driven the creation of pharmacological cessation aids, however they are only mildly effective. Research investigating the mechanisms behind tobacco addiction to find more efficacious pharmacotherapies has focused on nicotine in adult animal models. However, nicotine is weakly reinforcing compared to other drugs of abuse. There are over 4000 other tobacco smoke constituents and addiction may be a result of their interaction with nicotine. Also, most adult smokers began smoking during adolescence, a critical period of brain development and plasticity. Therefore, the present study was designed to determine possible age differences in the reinforcing properties of the tobacco smoke constituent and monoamine oxidase inhibitor, norharmane, alone and combined with nicotine. Adult (P90) and adolescent (P28) male rats were intravenously catheterized and allowed to self-administer saline (20 µl/inj), nicotine (7.5 µg/kg/inj), norharmane (2.5 µg/kg/inj) or nicotine+norharmane (7.5+2.5 µg/kg/inj) for days 1-5 at FR1, days 6 and 7 at FR2, days 8 and 9 at FR5 and day 10 at progressive ratio. At FR1, adults acquired self-administration of nicotine and norharmane alone with responding highest for nicotine+norharmane. The combination and norharmane alone were self-administered at FR2 and norharmane alone was self-administered at FR5. Adolescents did not find any treatment significantly reinforcing, however, there was a trend towards significant norharmane self-administration. There were no age differences in breakpoint values and neither group was motivated to self-administer at this reinforcement schedule. Results indicate significant age differences in response to different tobacco smoke constituents. This study also supports the importance of constituents other than nicotine in animal models of tobacco addiction, as norharmane alone was self-administered. Thus nicotine should not be the sole focus when designing more efficacious cessation aids.

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POS4-4 EFFECTS OF REDUCING THE UNIT DOSE FOR NICOTINE SELF-ADMINISTRATION ON INTRACRANIAL SELF-STIMULATION THRESHOLDS IN RATS

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Characterizing factors contributing to the marked individual variability in compensatory smoking may be useful for understanding the effects of reduced nicotine tobacco products on tobacco use. Compensation may be motivated by changes in the function of brain reinforcement pathways elicited by reduced nicotine exposure. The goal of this study was to examine changes in intracranial self-stimulation thresholds (ICSS, a measure of brain reinforcement function) in a nicotine self-administration (NSA) model in which the NSA unit dose is decreased to elicit compensatory increases in NSA. Rats trained under an ICSS threshold procedure were cannulated and trained for NSA during daily 22-hr sessions (0.06 mg/kg/inf). After NSA stabilized, the unit dose was reduced to 0.03 mg/kg/inf for at least 10 sessions. Following reacquisition of NSA (0.06 mg/kg/inf), rats were administered mecamylamine (0, 1.5 mg/kg) prior to ICSS sessions to assess precipitated withdrawal. Spontaneous withdrawal effects on ICSS were then assessed during extinction of NSA. Compensatory increases in NSA infusion rates occurred (27%) when the unit dose was reduced, while daily nicotine intake decreased (36%). NSA rates and nicotine intake returned to baseline levels during reacquisition of NSA (0.06 mg/kg/inf). No significant change in ICSS threshold was observed during the dose-reduction period. Mecamylamine produced an increase in thresholds (precipitated withdrawal occurred). Extinction of NSA resulted in increased thresholds in some animals (suggesting spontaneous withdrawal), although this effect was not significant for rats as a group. Magnitude of precipitated withdrawal and level of compensation were not correlated. The present study is the first to examine effects of unlimited-access NSA on brain reinforcement function. These data suggest that compensation during reduced nicotine exposure may not be associated with (motivated by) changes in brain-reinforcement function, which is consistent with the limited withdrawal signs and symptoms reported in smokers switching to reduced-nicotine cigarettes.

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POS4-5 USE OF A RODENT CIGARETTE SMOKE EXPOSURE MODEL TO STUDY THE PHARMACOKINETIC EFFECTS OF VACCINATION AGAINST NICOTINE

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Preclinical models of nicotine vaccine pharmacology have relied on i.v. or s.c. delivery of nicotine. These dosing regimens differ from human exposure, which occurs by inhalation and is accompanied by other chemicals present in smoke. Two models of rat cigarette smoke inhalation were developed to examine nicotine vaccine effects on nicotine distribution in this context; a 10 minute nose-only exposure producing serum nicotine levels equivalent to the nicotine boost from 1 cigarette in a smoker (7 ± 3 ng/ml), and a 2 hour whole-body exposure producing serum nicotine levels similar to those associated with regular smoking (32 ± 8 ng/ml). Vaccination prior to the 10 min smoke exposure markedly increased nicotine retention and protein binding in serum at the end of the exposure, and reduced nicotine distribution to brain by 87%. Vaccination prior to the 2 h exposure had similar but smaller effects, reducing nicotine distribution to brain by 29%. Results were generally consistent with the reported effects of vaccination on the distribution of i.v. nicotine. The nicotine concentration in broncheoalveolar lavage (BAL) fluid obtained immediately after the 2 h exposure was increased by 230% in vaccinated rats, suggesting that nicotine-specific antibody in BAL fluid could influence inhaled nicotine absorption. These smoke inhalation models validate results previously obtained for nicotine vaccines with i.v. nicotine dosing and provide a quantitative method for studying aspects of nicotine exposure in rats that are unique to smoke inhalation.

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POS4-6 EFFECTS OF RESTRAINT STRESS ON NICOTINE-INDUCED LOCOMOTOR SENSITIZATION IN RATS

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Stress can enhance the potential for certain addictive drugs (e.g., morphine) to induce locomotor sensitization (LMS) in rats. The effects of stress on nicotine-induced LMS are not well established. The goal of this study was to examine the influence of restraint stress on the induction and persistence of nicotine-induced LMS. On each of 15 test days, rats were administered nicotine (0, 0.1, or 0.4 mg/kg as the base, s.c.) and subsequently exposed to either restraint stress or no restraint stress for 10 min prior to activity testing. Stress produced a modest, transient suppression of activity in saline-treated animals, and did not significantly affect LMS induced by nicotine (0.1 mg/kg). Stress delayed the development and reduced the overall magnitude of LMS induced by nicotine (0.4 mg/kg). Stress also inhibited LMS to this nicotine dose during a challenge test conducted 10 days after completion of the initial protocol. The inhibition of nicotine-induced LMS by stress in this study contrasts with the facilitating effect of stress on LMS induced by other drugs. A potentially important procedural difference between this study and others is that drug and stress were administered simultaneously rather than sequentially. While the current findings may be attributable to this or other methodological factors, they may also reflect a qualitatively different relationship between stress and the psychoactive effects of nicotine versus other drugs of abuse. Further work with this model may be useful for further characterizing the role of stress in tobacco dependence.

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POS4-7 A ROLE FOR CORTICOTHALAMIC NICOTINIC RECEPTORS IN SENSORY GATING MECHANISMS

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Nicotinic Acetylcholine receptors (nAChRs) contribute to a wide range of roles in the mammalian brain. Previous work on beta2 subunit-containing nAChR knockout and inducible transgenic mice has demonstrated a role for high affinity beta2* nAChRs in the development of neuronal circuits involved in aversive learning. Specifically these receptors are necessary on layer 6 (VI) cortical neurons projecting to the thalamus during a specific developmental period (postnatal day 1-21 in mice; third trimester of pregnancy in humans) for normal passive avoidance (PA) behaviour (King et al, 2003). Here we sought to establish whether the abnormal development of corticothalamic circuits in the absence of beta2* nAChRs might have a similar effect on disrupting sensory gating processes. We tested beta2 subunit wildtype, knockout and transgenic (corticothalamic expressing) mice in passive avoidance, acoustic startle and prepulse inhibition. In the outbred strain (mixed background) tested there was a trend to the same hypersensitive passive avoidance behaviour seen previously in beta2 knockout mice and normalization in transgenic mice (with corticothalamic expression). We saw no difference in startle amplitude across genotypes with different sound intensities (90 to 120 dB) and no change in the inhibition of startle invoked by a prepulse 100ms prior to the startle stimulus. These behaviours reflect the immediate response to a stressful noise stimulus and vary from passive avoidance, which has a learning component, in that it measures a response 24 hours after the aversive stimulus (mild electric shock). We are currently establishing a fear potentiated startle paradigm in our laboratory which will allow us to test if introducing a learning component to the startle measures will differentiate the responses of mice with or without b2* receptors.

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POS4-8 CHARACTERIZATION OF THE EFFECTS OF ACUTE NICOTINE AND NICOTINE WITHDRAWAL ON CONTEXTUAL FEAR CONDITIONING IN EIGHT INBRED MOUSE STRAINS

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Research in both humans and animals demonstrates that individual differences in genetics impact sensitivity to nicotine and can modulate the severity of nicotine withdrawal. Although nicotine alters cognitive processes such as learning and memory, it remains unknown whether genetic variability modulates the effects of nicotine on these cognitive functions. Thus, the present study characterized the effects of acute nicotine and withdrawal from chronic nicotine administration on contextual fear conditioning in 8 strains of inbred mice. For acute nicotine studies, male C57BL/6J, 129/SvEv, BALB/cByJ, CBA/J, A/J, DBA/2J, C3H/HeJ, and DBA/1J mice were administered 0.045, 0.09, 0.18 mg/kg nicotine or saline five minutes prior to training and testing of fear conditioning. Acute nicotine dose-dependently enhanced contextual but not cued fear conditioning in seven inbred strains. Furthermore, sensitivity to acute nicotine varied between strains, with A/J and BALB/cByJ mice exhibiting enhanced contextual fear conditioning using the lowest dose of acute nicotine. For nicotine withdrawal studies, mice from the above-mentioned strains were implanted with osmotic-mini pumps that delivered 3, 6.3, 12 mg/kg/d nicotine or saline; all pumps were removed on day 12. Mice were trained in fear conditioning on day 13 and were tested twenty-four hours later. Genetic variability contributed to nicotine withdrawal-related deficits in contextual fear conditioning with C3H/HeJ mice showing the greatest deficits in contextual fear conditioning. Overall, these data demonstrate that genetics contribute to variability in the effects of acute nicotine and withdrawal from chronic nicotine treatment on contextual fear conditioning. The identification of genes that may alter the effects of nicotine on cognition may lead to more efficacious treatments for nicotine addiction.

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POS4-9 NEURAL CIRCUITS MEDIATING THE EFFECTS OF NICOTINE ON INHIBITORY BEHAVIOR

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It is well established that nicotine improves attention and working memory. Less research, however, has investigated the effects of nicotine on inhibitory learning. We previously found that nicotine enhanced response inhibition in a serial feature negative discrimination task (negative occasion setting; MacLeod et al., 2006). In this task, rats received daily training sessions consisting of 2 trial types: on some, a tone was presented and followed by food reward; on the remaining trials, the tone was preceded by a visual stimulus and not reinforced. Nicotine enhanced discrimination between the two trial types as evidenced by less frequent responding during presentation of the tone on non-reinforced trials; there were no group differences in responding during the reinforced trials. Rats treated with nicotine also learned the discrimination in fewer sessions than vehicle-treated rats. These data are highly consistent with studies using a procedurally similar task in humans (Stop Signal Task, Potter & Newhouse, 2004). Recently we sought to determine the neural mechanisms through which nicotine enhances inhibition in this task. Given the importance of the medial prefrontal cortex in inhibition, we tested the effects of separate neurotoxic lesions of the prelimbic (PL) or infralimbic (IL) cortex on negative occasion setting. After recovering from surgery, rats were trained as described above. Our results indicate that PL but not IL is necessary for learning the discrimination. A second study examined the effects of these lesions on rats that were first extensively trained in this task. Rats that had been trained for 30 days prior to receiving PL or IL lesions performed the task as well as controls. We also investigated the contribution of cholinergic input to PL by selectively removing input from the basal forebrain. No differences between control and lesion rats were observed. Taken together, the results suggest that PL is necessary for acquisition of a serial feature negative discrimination, although the basal forebrain cholinergic input into this region is not required to learn the task.

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POS4-10 NICOTINE, OPEN FIELD BEHAVIOR AND ENDOCRINE ACTIVITY IN THE MALE ADOLESCENT SYRIAN HAMSTER

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This study examined the effects of nicotine exposure on open field behavior and endocrine activity in male adolescent hamsters. From postnatal days 35-42, the hamsters received daily injections of nicotine or vehicle (distilled water). On postnatal day 40, hamsters were tested in open field; locomotor, rearing, and grooming behaviors were assessed. On postnatal day 42, blood samples were collected from all hamsters via the inferior vena cava. Hamsters spent the majority of their time (96%) in the periphery of the open field. Compared to the vehicle condition, a low dose of nicotine (0.4 mg/kg) significantly increased rearing frequency and locomotor activity. Testosterone levels of subjects given a higher dose of nicotine (0.8 mg/kg) were significantly lower than those receiving the vehicle. Cortisol levels were not affected by nicotine exposure. These findings suggest that nicotine alters certain open field behaviors in adolescent hamsters and these effects are not directly associated with the drug's effect on testosterone. Future studies may assess the long-term effects of adolescent nicotine exposure on adult testosterone activity and aggressive behavior in the male Syrian hamster.

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POS4-11 EFFECTS OF REPEATED ACUTE ALCOHOL INJECTIONS AFTER CESSATION OF NICOTINE IN RATS

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The health hazards of tobacco smoking are well known. Millions of people report that they want to quit smoking, but it is difficult to abstain from nicotine, the addictive drug in tobacco. Some people turn to other substances (including alcohol) to cope with the discomfort of nicotine withdrawal. But the consumption of alcohol may make matters worse. The purpose of this study was to examine alcohol's effects on behaviors associated with nicotine withdrawal. Nicotine cessation results in specific behaviors that provide indices of withdrawal symptoms in humans and animals, and are useful measures of addiction. Malin (2001) identified certain behaviors in rats that increase during nicotine withdrawal (e.g., whole body shakes). The present experiment was a 2 (saline, nicotine) x 2 (saline, ethanol) full factorial design using adult male Wistar rats. Rats were implanted with osmotic minipumps (s.c. between the withers) to receive saline or 3.16 mg/kg nicotine bitartrate continuously for 7 days. In addition, animals received daily i.p. injections of saline or 1.0 g/kg ethanol. On the 8th day, minipumps were removed. For the next three days, all rats were observed for 20 minutes each day and scored for number of withdrawal behaviors displayed after receiving i.p. injections. There was a significant effect of previous nicotine administration on withdrawal behaviors [$F(1,28) = 2.97$, $p<0.05$]. This effect was significant on the first day of withdrawal [$F(1,28) = 6.50$, $p < 0.01$], but attenuated on subsequent days. There was an effect of alcohol administration to somewhat increase withdrawal behaviors on the third day after cessation in both the nicotine cessation and saline cessation groups [$F(1,28) = 2.59$, $p = 0.03$ based on one-tailed test]. This finding suggests that alcohol does not potentiate nicotine withdrawal per se, but that alcohol may produce withdrawal-like behaviors. If the finding generalizes to humans, then it suggests that people who drink alcohol after cessation of nicotine may misinterpret and misattribute alcohol-induced effects to nicotine withdrawal. If so, then they might relapse to tobacco use to offset the "withdrawal effects."

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POS4-12 PROGRAMMED TRANSDERMAL DELIVERY OF ADDICTIVE SUBSTANCES THROUGH VOLTAGE GATED CARBON NANOTUBE MEMBRANES

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Carbon nanotubes (CNTs) have three key attributes that make them of great interest for novel applications such as programmed drug delivery: (1) atomically flat graphite surface allows for ideal fluid slip boundary conditions; (2) the cutting process to open CNTs inherently places functional chemistry at CNT core entrance; and (3) CNT are electrically conductive allowing for electrochemical reactions and application of electric fields gradients at CNT tips. Towards this goal, a composite membrane structure containing vertically aligned carbon nanotubes passing across a polystyrene matrix film have been fabricated [Science 2004]. Pressure driven flux of a variety of solvents (H2O, hexane, decane ethanol, methanol) are 4-5 orders of magnitude faster than conventional Newtonian flow due to atomically flat graphite planes inducing nearly ideal slip conditions [Nature 2005]. These properties are nearly ideal for introducing efficient electro-phoretic and electro-osmotic flow to be used as the basis of a programmed transdermal delivery device. CNT tips are functionalized with a high density of negative charge allowing the unidirectional flow of positive cations under small bias, thus inducing an efficient flux of neutral molecules. Efficiencies as high as 1 neutral molecule per ion are seen in the small CNT pores, allowing standard watch batteries to operate for 40 days. An in-vitro cell, composed of a reference electrode, reservoir solution, CNT membrane electrode, gel contact and human skin sample were assembled in a Franz cell. A differential model of diffusion in series (reservoir/CNT/gel/skin) explained observed dosage profile. Therapeutically useful fluxes for Nicotine treatment were controllably switched between, with 0.56 and 2.0 micromole/cm2-hr at 0mV and -600mV respectively.

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POS4-13 BETA3-CONTAINING NICOTINIC ACETYLCHOLINE RECEPTORS REGULATE THE STIMULATORY EFFECTS OF NICOTINE BUT NOT COCAINE ON BRAIN REWARD SYSTEMS: EVIDENCE FROM GENETICALLY MODIFIED MICE

Paul M. Johnson, Luis Tuesta, Christie D. Fowler, and Paul J. Kenny*

Nicotine is considered the major reinforcing component of tobacco responsible for addiction in smokers. The reinforcing actions of nicotine are mediated through various subtypes of nicotinic acetylcholine receptors (nAChRs) located within brain reward circuitries. Importantly, the identities of the nAChR subtypes that regulate the stimulatory effects of nicotine on brain reward systems are unclear. The stimulatory effects of nicotine on brain reward circuitries can be measured in rats through lowering of brain-stimulation reward (BSR) thresholds, but the effects of acutely administered nicotine on BSR thresholds in mice have not been reported. The ability to assess nicotine-induced lowering of brain BSR thresholds in genetically modified mice may facilitate understanding of the neurobiological mechanisms of nicotine dependence, particularly with regard to the nAChR subtypes that regulate nicotine reinforcement. Here, we assessed the effects of acute nicotine injections (0.0625-0.5 mg/kg) on BSR thresholds in mice with null mutation in the beta3 nAChR subunit (beta3 knockouts) and their wildtype counterparts. For comparison, we also assessed the effects of acute cocaine injections (5-20 mg/kg) on BSR thresholds in beta3 knockout and wildtype mice. We found that nicotine lowered BSR thresholds in wildtype mice. However, the threshold-lowering effects of nicotine were completely absent in beta3 knockout mice. In contract, cocaine lowered BSR thresholds by a similar magnitude in the beta3 knockout and wildtype mice. These data suggest that beta3-containing nAChRs regulate the stimulatory effects of nicotine but not cocaine on brain reward systems, and may therefore play an important role in the reinforcing effects of nicotine.

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POS4-14 PKC EPSILON NULL MICE HAVE ALTERED ACUTE NICOTINE PHENOTYPES AND DECREASED VOLUNTARY NICOTINE ORAL CONSUMPTION AND NICOTINE PREFERENCE

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Nicotine addiction is a serious worldwide health issue yet few drugs are available for smoking cessation treatment. Thus, there is a need for molecular studies that could yield novel strategies for treatment of nicotine addiction. We have found that mice lacking PKC epsilon have altered responses to acute nicotine treatment and have decreased voluntary oral nicotine consumption. We assessed three acute nicotine phenotypes. For nicotine-induced analgesia, PKC epsilon null (n=17-18) and wild-type mice (n=17) were injected with 0.5 or 1.0 mg/kg nicotine base s.c. and latency to respond on a 52 degree-C hot-plate was assessed. PKC epsilon null mice showed a 45% faster response time than wild-type mice at 0.5 mg/kg nicotine (p=0.049), though not at 1.0 mg/kg (p=0.73). For nicotine-induced hypolocomotion, PKC epsilon null (n=9) and wild-type mice (n=10) were injected with 2.0 mg/kg s.c. and locomotor activity was recorded for 65 minutes. PKC epsilon null mice showed hypolocomotion that persisted 35% longer than wild-type mice (p=0.01). For nicotine-induced hypothermia, PKC epsilon null (n=13) and wild-type mice (n=13) were injected with 2.0 mg/kg s.c. and skin temperature was recorded over two hours. PKC epsilon null mice had a 20% greater drop in temperature (p=0.004) than wild-type mice. To assess nicotine oral consumption, PKC epsilon null (n=23) and wild-type mice (n=24) were given a choice of 15 ug/ml of nicotine base in tap water with 2% saccharin, or tap water with 2% saccharin for 24 hours per day for 31 days. PKC epsilon null mice showed decreased nicotine preference (p=0.04) and decreased nicotine mg/kg consumption (p=0.0001) compared with wild-type mice. These differences were apparent by the second week and were maintained for the duration of the 31-day period. Water consumption was similar between genotypes at all times. These findings suggest that PKC epsilon enhances acute nicotine-induced analgesia but diminishes the depressant effect of nicotine on locomotor activity and the hypothermic effect of nicotine on skin temperature. PKC epsilon also facilitates nicotine consumption and preference.

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POS4-15 HISTAMINE H1 RECEPTOR ANTAGONISM AS A STRATEGY TO BLOCK NICOTINE SELF-ADMINISTRATION

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The brain is an organ of communication. Biobehavioral processes involve complex interactions among neuronal systems. Disruptions of normal brain function such as occurs with addiction involves a variety of disrupted neuronal circuits. Tobacco addiction is known to critically involve nicotinic acetylcholine receptors as well as dopaminergic innervation from the ventral tegmental area to the nucleus accumbens. However, other neural systems are involved as well and they may be useful targets for development of novel therapeutics for treating tobacco addiction. Nicotine stimulates a variety of neurotransmitters, which may be involved in tobacco addiction and its treatment. Prominently these include the monoamine transmitters. Clozapine, an atypical antipsychotic drug significantly reduces smoking. Clozapine blocks a number of different transmitter receptors including serotonin 5HT2 and histamine H1 receptors. In previous research we documented the involvement of serotonin in nicotine self-administration. We found that acute or chronic serotonergic 5HT2 receptor blockade with ketanserin significantly reduced nicotine self-administration in a rat model. In the current study, we studied the interactive role of histamine systems with nicotine self-administration. Young adult female Sprague-Dawley rats with IV catheters were trained to self-administer nicotine (0.03 mg/kg/infusion). Acute doses of 20 mg/kg of the histamine H1 antagonist pyrilamine significantly ($p<0.05$) reduced nicotine self-administration. In initial results from a follow-up experiment we found that repeated pyrilamine at 20 mg/kg also significantly ($p<0.025$) decreased nicotine self-administration with ten repeated doses. Further research is needed to determine the efficacy of histamine H1 antagonist for decreasing tobacco smoking and aiding cessation. Given that this class of antihistamines is widely available as a nonprescription medication, demonstration of efficacy for smoking cessation would add an important widely available new treatment.

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POS4-16 CHRONIC NICOTINE INDUCES RAT BRAIN CYP2B ENZYME ALTERING PROPOFOL-INDUCED SEDATION

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CYP2B is an enzyme that is expressed in the liver and brain that can metabolize nicotine, bupropion, selegiline and ecstasy. Human CYP2B6 is found at higher levels in the brains of smokers, and chronic nicotine treatment induces rat brain CYP2B, with no changes in hepatic levels. Case-reports suggest that smokers require higher doses of propofol for anaesthesia; CYP2B inactivates propofol and higher brain CYP2B among smokers might contribute to these observations. We hypothesized that (1) CYP2B induction by chronic nicotine treatment will be long lasting and will not be altered by nAChR blockade; (2) the induction of CYP2B by nicotine will reduce propofol sleep times; (3) central inhibition of CYP2B will block the reduction in sleep-time after nicotine; and (4) nAChR blockade will not change responses to propofol. Nicotine treatment (1 mg base/kg s.c. for 7 days) significantly induced brain CYP2B activity for >24h, and this induction was not altered by chlorisondamine pre-treatment (10 mg/kg s.c., quasi-irreversible nAchR blocker); Western blotting was used to assess CYP2B protein levels and activity was assessed by radio-labelling with an icv injection of tritiated irreversible inhibitor (^{3}H-8MOP). Nicotine treatment (7 days) also reduced propofol sleep time by ~60% ($p>0.01$); propofol (80 mg/kg i.p) induced sleep-times was measured before, and 24h after nicotine treatment in a within-animal design. The reduction in sleep-time due to nicotine-induced CYP2B was reversed by inhibiting brain CYP2B using an icv injection of C8-xanthate (0-80µg), an irreversible inhibitor of CYP2B. Propofol acts primarily on GABAA receptors, and possibly on nAchRs. nAChR blockade by chlorisondamine or mecamylamine pre-treatment did not affect CYP2B activity or propofol response; rats were pretreated with chlorisondamine (10 mg/kg s.c.) or mecamylamine (1 mg/kg s.c. 0.5h before propofol), and propofol responses were measured before and after nicotine (7 days). These results suggest that rat brain CYP2B is active in altering CNS metabolism of drugs and that its activity is induced by nicotine suggesting that smoking could also alter responses to neuro-acting substrates of CYP2B in humans.

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POS4-17 NICOTINE FACILITATES THE CONSOLIDATION OF REMOTE CONTEXTUAL MEMORY

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Nicotine enhances hippocampal-dependent contextual memory, which is an important factor when considering its abuse liability in humans. Additionally, the consolidation of long-term memory (i.e., remote memory) entails a shift from hippocampal dependence to cortical dependence and an accompanying loss of context specificity. The present study used a remote contextual memory paradigm to study the effect of nicotine on hippocampal-cortical interactions. Contextual fear conditioning was used to examine the effects of acute nicotine (0.09 mg/kg) administered at training only on remote memory assessed at 1, 7, 14, 21, 28 and 45 days post-training in C57BL/6J mice. Experiment 1 examined the effects of nicotine on the consolidation of remote memory by training and testing in the same context. Animals administered nicotine froze significantly more than animals administered saline. Moreover, there was significantly more freezing at later time points than at earlier time points. Animals administered nicotine froze more than animals administered saline at the 7 and 21-day time points. Experiment 2 examined the potential loss of context specificity inherent in remote memory consolidation by training in one context and testing in an altered context (i.e., generalized consolidation). Again, animals froze more at later time points than at earlier time points. Moreover, there was a significant drug by day interaction indicating that animals administered nicotine demonstrated increased generalization which may be indicative of cortical-dependent memory. Taken together, these studies suggest that nicotine increases the rate of consolidation of remote contextual memory and facilitates a loss of context specificity inherent to remote memory formation. Additional studies lesioning the hippocampus at various time points will allow for more precise conclusions regarding the neural circuitry subserving this effect. In general, these findings provide a new direction in assessing both the cognitive enhancing effects of nicotine and the role of these effects in nicotine addiction.

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POS4-18 EFFECTS OF BUPROPION ON THE PRIMARY REINFORCEMENT AND REINFORCEMENT ENHANCING EFFECTS OF NICOTINE

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Nicotine (NIC) acts as both a primary reinforcer capable of maintaining a behavior resulting in its delivery and a reinforcement enhancer, increasing behaviors reinforced by non-pharmacological stimuli. Bupropion (BUP) is a smoking cessation aid, but its mechanism of action remains unclear. BUP reduces smoking in humans, but increases NIC self-administration in animals. Previous BUP studies could not dissociate the two reinforcement-related effects of NIC. The current studies investigated whether BUP (30 mg/kg IP injection) altered the primary reinforcement of NIC, increased the reinforcement enhancing effects of NIC, and/or replaced the reinforcement enhancing effects of NIC during NIC extinction. Primary reinforcement was measured by responding for NIC (0.03 mg/kg/infusion); reinforcement enhancement was measured by responding for a visual stimulus (VS; one-sec cue light followed by one-min offset of a white house light). Study 1: Male Sprague-Dawley rats were allowed to respond on the active lever for presentation of the VS accompanied by IV SAL (VS-Only), delivery of IV NIC (NIC-Only), or simultaneous delivery of IV NIC and VS presentation (NIC+VS). Additional rats (2Lever) were allowed to respond on one lever to earn IV NIC and another to earn VS presentations. After stable responding was established, rats were injected with BUP 30 min prior to 8 additional experimental sessions. BUP pretreatment increased VS responding in all groups. BUP significantly increased responding in the NIC+VS group, but otherwise had no effect on NIC self-administration. Study 2: Rats were assigned to VS-Only, NIC-Only or 2Lever groups. After responding stabilized, NIC was replaced with SAL in the NIC-Only and 2Lever groups (i.e., extinction) for 10 sessions; BUP or SAL injections were administered 30 min prior to these sessions. As in study 1, BUP during extinction increased VS responding in the VS-Only and 2Lever groups. BUP had no effect on the extinction of NIC responding in NIC-Only or 2Lever groups. Conclusion: BUP has little effect on the primary reinforcing effects of NIC, but may increase cessation by replacing the reinforcement enhancement effects of NIC.

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POS4-19 THE NICOTINIC LIGAND AMOP-H-OH ('SAZETIDINE-A') HAS LONG LASTING ANTIDEPRESSANT-LIKE AND ANALGESIC ACTIVITY IN RODENT MODELS

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Nicotinic acetylcholine receptor (nAChR) agonists and antagonists reduce depressive symptoms in humans and have antidepressant-like effects in rodent models, suggesting a role for nAChRs in depression. We evaluated the action of the selective α4β2 partial agonist AMOP-H-OH (6-[5-(Azetidin-2-ylmethoxy) pyridin-3-yl]hex-5-yn-1-ol (aka Sazetidine-A)) in the forced swim test in mice. AMOP-H-OH produced a robust reduction in immobility in the forced swim test with superior potency and efficacy compared to the α4β2 partial agonist varenicline and the non-competitive nAChR antagonist mecamylamine. The antidepressant-like effect of AMOP-H-OH in forced swim was completely reversed by mecamylamine and the high affinity nAChR antagonist dihydro-β-erythroidine (DHβE), but not by the α7 nAChR antagonist methyllycaconitine (MLA). The effects of AMOP-H-OH in the forced swim test were long lasting, with efficacy observed up to 4 hours after treatment. This prolonged duration of action of AMOP-H-OH was completely reversed by mecamylamine. A pharmacokinetic study was carried out to determine if the duration of action of AMOP-H-OH could be correlated with plasma and brain levels. Mice were treated with 1 or 3 mg/kg of AMOP-H-OH and plasma and brains were collected 0.25, 0.5, 1, 2, and 4 hours after i.p. injection. Although plasma levels showed a dose response relationship 15 min after administration, levels were nearly non-detectable by 30. Brain levels of AMOP-H-OH reached only low levels 15 min after administration and were at or below detection limits at the later time points. Similar dissociations between pharmacokinetic and pharmacodynamic (PK/PD) profiles have been noted for other nicotinic compounds. In addition to its antidepressant-like properties, AMOP-H-OH was also analgesic in both the mouse formalin test of inflammatory pain and a rat sciatic nerve ligation test of neuropathic pain. The superior efficacy of AMOP-H-OH in forced swim compared to varenicline and mecamylamine combined with its analgesic properties suggests that this class of compounds may provide novel opportunities for the development of drugs to treat depression.

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POS4-20 GESTATIONAL NICOTINE ALTERS ADOLESCENT STRESS-SENSITIVE RESPONSES TO COCAINE

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Despite persistent public health initiatives, many women continue to smoke during their pregnancies. Maternal smoking has been linked to persisting neurobehavioral deficits in adolescent offspring, including ADHD, which is more prevalent in males, and substance abuse, which may be more prevalent in females. The present study uses a rodent model to determine whether chronic, low-dose gestational exposure to nicotine, the main psychoactive component of tobacco, changes the behavioral and neuroendocrine responses to cocaine in male and female adolescent offspring. Pregnant rats were implanted with osmotic minipumps that continuously infused nicotine (3mg/kg/day) (GN) or saline (GS) from gestational day 4-18. At birth, pups were cross-fostered with drug-naïve surrogate dams to minimize drug effects on maternal behavior. During adolescence (postnatal day 32), offspring were injected with cocaine (15 mg/kg, i.p.) or saline, with or without a saline pre-injection, in a novel environment and were monitored for locomotor activity. In both GS and GN adolescent males, cocaine induced a small but significant increase in locomotor activity. In females, GS animals showed robust cocaine-induced locomotion only in the absence of a prior saline injection; saline pretreatment significantly attenuated the cocaine effect. GN females, however, showed the opposite behavioral pattern with moderate activity from cocaine alone, but robust activity if a saline injection was given prior to cocaine. Further analysis revealed that cocaine increased plasma corticosterone in females, but not males, suggesting a sex difference in stress processing that is evident prior to puberty. Together these data imply that cocaine-induced locomotion in both GN and GS females is stress sensitive, but that GN treatment changes the interaction between stress circuitry and the catecholamine systems that mediate cocaine's locomotor effects. These results further suggest that altered stress responsivity may play a role in the increased substance abuse seen in female offspring of maternal smokers, and highlight the possibility of gender-specific therapies in this population.

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POS4-21 THE NICOTINIC ACETYLCHOLINE RECEPTOR ALPHA5 SUBUNIT PLAYS A CENTRAL ROLE IN ATTENTION

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Here we show that the presence of the nicotinic receptor alpha5 subunit substantially changes the excitation of prefrontal layer VI neurons by acetylcholine (ACh), and that the alpha5 subunit is required for normal performance in a visual attention task. Pyramidal neurons in layer VI of the medial prefrontal cortex are a major source of feedback projections to the thalamus and are thought to play a key role in attention. We have recently shown that these neurons are excited by alpha4beta2* nicotinic receptors that may contain the relatively rare alpha5 accessory subunit. This alpha5 subunit changes nicotinic receptor activation by ACh and nicotine in reduced preparations; however, its influence on receptor function within layer VI pyramidal neurons in an intact preparation is not known. We sought to answer this question using whole cell recording in acute brain slices from mice in which the nicotinic receptor alpha5 subunit (encoded by the CHRNA5 gene) has been genetically deleted. Layer VI neurons in alpha5 -/- mice showed a remarkable reduction in the maximal inward current elicited by ACh: their response was approximately one third of that observed in alpha5 +/+ mice. Similarly, these neurons in alpha5 -/- mice showed a greatly diminished response to a level of nicotine (300 nM) consistent with that seen in the blood of smokers. Furthermore, the layer VI neurons from the alpha5 -/- mice showed much greater desensitization after nicotine to subsequent application of ACh than this same population of neurons in alpha5 +/+ mice. Since layer VI pyramidal neurons play a critical role in attention, we next tested the contribution of the alpha5 subunit towards performance in the five-choice serial reaction time test for visual attention. In this test, the alpha5 +/+ mice performed with greater accuracy than the alpha5 -/- mice under challenging conditions when the stimuli were presented for only brief time periods. Results from this study suggest that the presence of nicotinic receptor alpha5 subunits in layer VI neurons is necessary for their normal response to acetylcholine, and that this nicotinic subunit is required for optimal attentional performance.

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POS4-22 VALIDATION OF A NEW ANIMAL MODEL OF SECOND-HAND NICOTINE EXPOSURE AND NICOTINE DEPENDENCE

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The purpose of this work was to develop a system of individual chambers through which controlled delivery of nicotine vapors allowed us to target blood nicotine levels in rodents that are similar to second-hand smoking and heavy smoking in humans. A second goal was to demonstrate that animals exposed to chronic nicotine vapors exhibit two key features of nicotine dependence: the emergence of somatic and affective signs of withdrawal after discontinuation of nicotine vapors. Wistar rats and C57BL6 mice were exposed to different durations of time and nicotine exposure levels in individual chambers. Nicotine was vaporized by bubbling air at 10 liters per minute through a gas-washing bottle containing a solution of pure nicotine. The highly concentrated nicotine vapors were diluted by the addition of 80 liters per minute of clean air in a glass flask. Nicotine air level was monitored using the ethanol-trapping technique and measured using UV spectrophotometry at 260nm. Nicotine blood level was measured using LC-MS. Results show that nicotine air level was stable and resulted in significant nicotine blood levels in mice and rats. Nicotine blood levels could be easily adjusted to reach nicotine blood levels similar to those observed during second-hand smoking (<5ng/ml) or heavy smoking (20-40 ng/ml). Moreover, rats chronically exposed to nicotine vapors (8 hr/day for 7 days) exhibited a robust mecamylamine-precipitated nicotine withdrawal syndrome 30 min and 16 h after cessation of nicotine exposure as well as increased anxiety-like behavior, suggesting that chronic-intermittent exposure to nicotine vapors induced nicotine dependence in rats. These results demonstrate that passive exposure to nicotine vapors offers a reliable, easy, high-throughput, cost-effective and safe means of exposing rats and mice to nicotine so that they reach clinically significant nicotine blood levels in the absence of any surgery or animal handling. The development of this new animal model will dramatically accelerate nicotine research on second-hand nicotine exposure and nicotine dependence in rats and mice.

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POS4-23 DOPAMINERGIC ALPHA4 CONTAINING NICOTINIC RECEPTORS ARE INVOLVED IN NICOTINE REWARD

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Nicotinic receptors (nAChRs) containing alpha4 and beta2 subunits, one of the major subtypes of nAChRs expressed in brain, have the highest affinity for nicotine and upregulate with chronic nicotine exposure in human smokers and animal models. Null mutation of beta2 eliminates both high affinity nicotine-binding sites across the brain and nicotine self-administration, suggesting that alpha4/beta2 nAChRs mediate the rewarding properties of nicotine. The mesolimbic dopaminergic pathway that mediates drug reward behaviors for many drugs of abuse has been shown to mediate the rewarding properties of nicotine. Together, these findings suggest that alpha4/beta2 nAChRs in mesolimbic dopaminergic neurons may mediate the rewarding effects of nicotine. To directly testing that hypothesis, we employed the Cre recombinase/loxP system to selectively eliminate alpha4-containing nAChRs from dopaminergic neurons. Alpha4 'floxed' mice were generated by inserting loxP recognition sequences on either side of a major exon (exonV) of the alpha4 gene. Deletion of alpha4 solely in dopaminergic neurons was then accomplished by breeding the alpha4 'floxed' mice with DAT-Cre mice expressing Cre recombinase under the dopamine transporter (DAT) promoter (Zhuang, Masson et al. 2005). In the resulting 'floxed' alpha4 x DAT-Cre mice, in situ hybridization studies demonstrated that alpha4 gene expression is eliminated only in dopaminergic neurons. The loss of high affinity receptors in dopaminergic regions was confirmed using autoradiographic epibatidine binding. These mice were then used to examine the role of alpha4-containing nAChRs in the drug reward pathway using the nicotine conditioned place preference (CPP) paradigm. Compared to wildtype littermates, mice with deletions of alpha4 in dopaminergic neurons, as well as alpha4 null mutants, have deficits in nicotine place preference. These experiments suggest a role for alpha4-containing nAChRs within dopaminergic neurons in nicotine reward.

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POS4-24 VARENICLINE DOSE-DEPENDENTLY ENHANCES RESPONDING FOR NON-PHARMACOLOGICAL REINFORCERS AND ATTENUATES THE REINFORCEMENT-ENHANCING EFFECTS OF NICOTINE

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Nicotine (NIC) has two reinforcement-related effects that may contribute to dependence: 1) NIC acts as a primary reinforcer and 2) NIC, non-associatively, enhances reinforcement from concurrently available non-pharmacological stimuli. Data suggest that varenicline (VAR), a partial agonist, is one of the most effective smoking cessation pharmacotherapies. Varenicline's therapeutic efficacy could be due to its ability to substitute for the reinforcement-enhancing effects of NIC and/or block the reinforcement-enhancing effects of NIC. The present study addressed both possibilities by assessing the effects of VAR alone and in combination with NIC while animals lever pressed for a moderately reinforcing visual stimulus (VS). Once responding stabilized on an FR2 schedule of reinforcement, rats were assigned to one of eight groups [saline, NIC (0.4 mg/kg), VAR (0.1, 0.3 or 1.0 mg/kg) or NIC+VAR (0.4 mg/kg NIC+0.1, 0.3 or 1.0 mg/kg VAR)] and received drug administration prior to each daily 1 hr session. Following 14 sessions on an FR2 schedule, a progressive ratio (PR) schedule was in force for 9 sessions. There was a dose-dependent effect of VAR alone on responding for the VS; the low-dose VAR group (0.1 mg/kg) demonstrated the highest rate of responding, showing similar levels of enhanced responding for the VS as NIC-treated animals on all schedules of reinforcement. In the NIC+VAR groups, VAR dose-dependently attenuated the reinforcement-enhancing effects of NIC on all schedules of reinforcement with the highest dose (1.0 mg/kg) exhibiting the greatest antagonist effects. The results of this study suggest that low doses of VAR have reinforcement-enhancing effects analogous to those of NIC, and that larger doses of VAR inhibit the reinforcement-enhancing effects of NIC. These findings are consistent with the partial agonist characteristics of VAR and support the assertion that the therapeutic efficacy of VAR may be related to its ability to partially replace the reinforcement-enhancing effects of NIC at lower doses, as well as inhibit the enhancing effects of NIC at higher doses.

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POS4-25 THE SPECIFIC PATTERN OF DOPAMINERGIC SIGNALING MEDIATES THE AVERSIVE MOTIVATIONAL RESPONSE TO NICOTINE WITHDRAWAL

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The mesolimbic dopamine (DA) system is implicated in the processing of the positive reinforcing effect of all drugs of abuse, including nicotine. However, we have also suggested that dopaminergic signaling is involved in the aversive motivational response to nicotine withdrawal. We previously demonstrated that signaling at DA receptors, specifically the D2 receptor, is necessary for the opponent motivational response to nicotine in dependent rodents. We next hypothesized that the specific pattern of signaling at DA receptors mediates the aversive response to nicotine withdrawal. Mice who have been made nicotine dependent will demonstrate an aversive motivational response to the withdrawal-paired environment in a modified place conditioning procedure. We report that conditioned withdrawal aversions were blocked in DA receptor knockout mice, and that administration of the DA receptor antagonist α-flupenthixol or the DA receptor agonist apomorphine prior to conditioning prevented conditioned withdrawal aversions. These results suggest that alterations in dopaminergic signaling either by an increase or decrease in signaling at DA receptors are sufficient to block the aversive motivational response to nicotine withdrawal from occurring. We propose that the specific pattern of signaling at DA receptors during withdrawal mediates the aversive response to nicotine withdrawal when an animal is in a nicotine dependent motivational state, and that any modification in this specific signaling pattern will block the motivational response to nicotine withdrawal.

CIHR.

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POS4-26 NICOTINIC PARTIAL AGONISTS AND CREB: INSIGHTS INTO THERAPEUTICS FOR AFFECTIVE DISORDERS AND NICOTINE ADDICTION.

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Alterations in nicotinic cholinergic signaling in the brain have been implicated in numerous diseases and disorders, including anxiety, depression, and nicotine addiction. Novel nicotinic drugs present a rich area of investigation for therapeutic potential in these diseases. In addition to exhibiting anxiolytic and antidepressant effects in the novelty-induced hyponeophagia (NIH) test, varenicline and sazetidine-A, two nicotinic α4β2 partial agonists with differential activity profiles, demonstrate potential in the treatment of nicotine addiction. Following nicotine withdrawal (24h), mice exhibit increases in anxiety compared to mice maintained on chronic nicotine or saline controls. This result was reversed with acute administration of the highly specific α4β2 nicotinic partial agonist sazetidine-A. In contrast, acute administration of varenicline during withdrawal did not ameliorate the anxiogenic response in the novel environment. While the activation and functional significance of the transcription factor CREB has been well documented in nicotine reward, a direct link between CREB, nicotine dependence and withdrawal has not been established. Therefore, the effects of varenicline and sazetidine-A during nicotine withdrawal have also been examined in CREBαΔmice. To investigate the functional ramifications of nicotine-induced alterations, hippocampal slices from both wildtype and CREBαΔmutant mice chronically treated with nicotine were examined using voltage-sensitive dyes. Activation of the CA1 neurons resulting from Schaffer collateral stimulation was altered in nicotine treated animals compared to saline controls. Additionally, application of sazetidine-A and varenicline differentially affected network activity in these animals depending on nicotine history. These findings would suggest that withdrawal from chronic nicotine induces behavioral effects, which can be modulated by nicotinic partial agonist administration and may be dependent on functional changes in the hippocampal circuitry.

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POS4-27 SELF-ADMINISTRATION OF THE TOBACCO CONSTITUENTS NORHARMAN AND NICOTINE ALONE AND IN COMBINATION

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Background: Nicotine is widely regarded as the principal addictive chemical in tobacco smoke, yet it has proven to be only weakly reinforcing in many drug self-administration studies. However, the tobacco constituent norharman (i.e., norharmane) was recently shown to dramatically enhance nicotine self-administration in adult rats. Here, we investigated whether norharman might have reinforcing properties of its own.

Methods: Adult rats were chronically implanted with a jugular vein catheter, and were subsequently given the opportunity to lever press in order to obtain intravenous infusions of norharman (7 doses between 0.005 and 0.4 μg/kg/inf) or nicotine (3 μg/kg/inf), or a combination of norharman (0.005, 0.015, 0.05 μg/kg/inf) and nicotine (3 μg/kg/inf). Each dose condition was tested in a different group of subjects. Rats were neither food deprived nor initially trained to respond for food. They were tested for 2 hours daily, on three schedules of reinforcement: 8 days of FR1, then 3 days of FR2 and finally 3 days of progressive ratio (PR). During each 30-sec drug or saline infusion, a cue light was illuminated above the "active" lever.

Results: The saline infusion group showed little or no preference for the active vs. inactive lever, suggesting that the cue light itself had little reinforcing effect. Nicotine alone was self-administered on all schedules, with clear discrimination between active and inactive levers. Norharman alone was self-administered only weakly, albeit significantly more than saline, at two doses (0.05 and 0.1 μg/kg), and there was evidence of discriminated responding on both the FR2 and PR schedules. The reinforcing effects of nicotine and norharman did not appear to synergize.

Conclusion: Under these experimental conditions, intravenous infusions of norharman appeared only weakly reinforcing when given either alone or in combination with nicotine.

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POS4-29 THE ASSOCIATION BETWEEN LEVEL OF EDUCATION AND PERCEIVED SOCIAL SUPPORT FOR SMOKING CESSATION IN FEMALE SMOKERS

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Both level of education and perceived social supports are factors that affect success rate of smoking cessation. This study assessed the association between the perceived social support for smoking cessation, level of education and smoking cessation outcomes. We aimed to (1) explore differences in perceived social support between women with lower and higher educational levels, and (2) inspect the relationship between perceived social-support and smoking cessation outcomes defined as the longest previous quit attempt by education group. Female smokers aged 18 to 40, not currently on hormones, and interested in participating in a tobacco study completed an enrollment survey on the phone, including data on smoking behavior, perceived social support and level of education. A median split classified participants into lower and higher education groups. T-tests and correlations were conducted using SAS 9.0. For participants (n=511), 281 (55%) self-reported education of high school graduate or less (lower-education) and 230 (45%) reported an education of some college or more (higher-education). They had a mean age of 28.0 (±6.9) years and smoked an average of 12.8 (±6.7) cigarettes per day. The lower-education group reported significantly less social support than the higher-education group (6.3 ± 3.1 vs. 7.4 ± 2.6; p<0.001). The longest number of days to relapse during a previous quit attempt and perceived social support showed a weak correlation, but did not reach statistical significance (r=0.0837; p-value=0.0978). The correlation between perceived social support and length of longest quit attempt differed significantly by education group (p-value<0.0001), such that the lower-education group had a weak positive correlation (r=0.123, p-value=0.088) while the higher-education group did not (r=0.025, p-value=0.728). The results suggest there may be a weak association between education level, perceived social support and smoking cessation outcomes. Future research is needed to confirm this work and explore ways this information could be used to support attempts at smoking cessation.

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POS4-30 TOBACCO INDUSTRY MANIPULATION MESSAGES IN ANTI-SMOKING PSAS: EFFECT OF EXPLICIT VERSUS IMPLICITLY DELIVERED MESSAGES

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The extent to which the content (e.g., tobacco industry manipulation, health effects) of the messages in anti-smoking Public Service Announcements (PSA) matters for determining their efficacy has been studied. However, whether the method of delivering PSA's anti-smoking content is important for determining efficacy has not been well studied. For example, message content can be delivered explicitly (directly with concrete statements) or implicitly (indirectly via metaphor). The former delivery method requires putatively less mature cognitive ability on the part of the audience, whereas the latter requires a more mature cognitive ability. As such, PSAs that deliver message content implicitly may not be as effective for younger (vs older) adolescents as content that is delivered explicitly. The purpose of this study was to conduct an initial test of this hypothesis, using tobacco industry manipulation PSAs. A 2 (age: 11-14 years old; 15-17 years old) X 2 (message delivery: implicit, explicit) mixed model design was used. PSA stimuli for the study were drawn from the catalogue maintained by the Centers for Disease Control. A sample of 11 tobacco industry manipulation PSAs were categorized by three independent raters as delivering their message implicitly or explicitly (interrater agreement = .85). Eight PSAs were classified as using implicit message delivery and three were classified as using explicit message delivery. A diverse sample of 110 adolescents (M age=14; 55% female; 62% minority) then viewed each of these PSAs and rated their smoking resistance self-efficacy after exposure to each PSA. The expected interaction between age and message delivery was not significant (p = .878). There were no significant main effects of age (p = .515). However, there was a significant main effect of message delivery (p < .0001): Tobacco industry manipulation PSAs that delivered their messages explicitly were associated with stronger levels of smoking resistance self-efficacy compared to tobacco industry PSAs that delivered their messages implicitly. These results suggest that message delivery factors should be taken into account when designing anti-smoking PSAs.

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POS4-31 HIGHER AND EARLIER NICOTINE PEAK IN SMOKERS WITH SCHIZOPHRENIA

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The increase in levels of blood nicotine that occur from smoking a single cigarette is referred to as nicotine boost. Greater nicotine boost may be linked to increased addictive potential and risk for relapse after a quit attempt. We hypothesize that smokers with schizophrenia have a greater nicotine boost from a single cigarette than controls without this disorder. Twenty-one subjects (11 schizophrenia, SCZ and 10 controls, CON) had repeated venous blood sampling from an indwelling catheter before, during and after smoking a single cigarette in a research lab after 12-hour abstinence in order to measure nicotine intake. Subjects had blood samples drawn at baseline (before smoking) and 1, 2, 4, 6, 8, 10, 20, 30 and 60, 90 and 120 minutes after the first puff. Groups were similar in baseline characteristics including gender, and total FTND score. All subjects smoked 18-22 cigarettes per day. Area under the serum nicotine concentration-time curve (AUC) was calculated for time up to 20 minutes after start of smoking using the trapezoidal rule. The mean difference in AUC for SCZ versus CON was 134.6 ng-min/mL, 95%CI= (0.5, 283.8). The slope of the nicotine intake curve for SCZ, modeled by cubic polynomial functions, was significantly different compared to controls (F value 3.8, p=0.025). This remained significant even when controlling for race and low socioeconomic status. Nicotine peaks derived from the estimated polynomial curve were 11.1 ng/mL higher for SCZ versus CON, 95%CI= (1.4, 22.1). Measured peaks were also higher for SCZ compared to CON (33.1 vs. 25.9 ng/mL, NSS) and time to peak was sooner in SCZ (4.8 vs. 6.4 min, NSS). This technique improves on methods, which draw only two blood specimens (pre and post) to assess nicotine peak. Understanding how nicotine boost differs in SCZ may explain, at least in part, low success rates with nicotine patch and help guide treatment development towards rapid release nicotine replacement products.

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POS4-32 CROSS-SECTIONAL ASSESSMENT OF DELAY DISCOUNTING IN SCHIZOPHRENIA: EFFECTS OF TOBACCO SMOKING STATUS

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Abstract: Background: Schizophrenia is associated with deficits in decision-making, and higher rates of cigarette smoking, in comparison to non-psychiatric controls. The aim of this study was to determine the effects of tobacco smoking status on delay discounting (a measure of impulsivity) in schizophrenia in comparison to non-psychiatric controls.

Methods: We used a cross-sectional design to compare delay-discounting across smoking and psychiatric status using the Kirby Delay Discounting Task (KDDT). We predicted that individuals with schizophrenia would have higher rates of delay discounting than controls; that non-smokers with schizophrenia would have higher rates of delay discounting than smokers; and that control smokers would discount future rewards more than non-smokers.

Results: Overall, we found no differences between patients with schizophrenia (n=45) and controls (n=39) collapsed across smoking status. Interestingly, smokers with schizophrenia exhibited higher delay discounting rates than non-smokers with schizophrenia. When parsing by tobacco smoking status, in the schizophrenia group, delayed discounting rates in former smokers (n=6) were similar to current smokers (n=24), and much higher than never smokers (n=15). There were no differences between controls who were current (n=17), former (n=4) and never smokers (n=18), who discounted at similar rates to smokers with schizophrenia.

Conclusion: The notion of beneficial effects of cigarette smoking on delay discounting in schizophrenia were not supported; However, our pattern of results in schizophrenia does suggest that deficits in delay discounting in these patients appears to be a trait rather than a state-dependent phenomenon, as deficits were observed in current and former, as compared to never smokers. Our results have implications for understanding the relationship between schizophrenia and delay discounting deficits, and the high vulnerability to tobacco addiction in schizophrenia.

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POS4-33 GENOMEWIDE ASSOCIATION STUDY OF DSM-IV NICOTINE WITHDRAWAL

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Genomewide association studies (GWAS) of addiction are becoming more common. However, we are unaware of reports that have specifically focused on the phenotype of Nicotine Withdrawal (NW). This Australian GWAS examined DSM-IV defined NW in unrelated individuals, and included smokers recruited from families associated with the Australian Twin Registry. Participants were selected from three ongoing studies: (1) the Nicotine Addiction Genetics (NAG) study ascertained families through index-cases with a lifetime history of heavy cigarette smoking and two interrelated Interactive Research Program Grant (IRPG) alcohol studies; (2) the Big-Sibships Study had families with 5 or more offspring sharing both biological parents and was unselected in regard to phenotype; and (3) the Extreme Discordant and Concordant Study focused on sibships extremely discordant or concordant for heavy drinking and alcohol dependence risk. The analyses contrasted unrelated regular smoking DSM-IV defined NW cases (N= 1058) and mutually unrelated regular smoking NW controls (N= 613, who did not meet criteria for NW) and tested for genetic association using over 300,000 autosomal SNPs in PLINK (Purcell et al., 2007). We found 39 SNPs with p-values< 1x10-4 associated with NW. One of these SNPs was located within DISC1, which in numerous studies has been associated with psychiatric disorders; one SNP was in DSCAML1, previously associated with smoking cessation (Uhl et al., 2008). Two SNPs were located in AK5; and one nonsynomous SNP in C6orf142. In addition, three SNPs on chromosome 11 with p values< 1x10-4 were in close proximity of previous linkage findings reported using the same NW phenotype in this cohort (Pergadia et al., 2009). Two of the top three SNPs were located within genes: TMEM62 and PCSK6. Interestingly, although the SNP rs1051730 (in CHRNA3) is highly associated with other measures of nicotine dependence (ND) in this sample, and widely reported from others studies of ND, we find no association with NW in these analyses (p=.79). While these findings will require expansion and replication, they suggest that genomic loci are associated with risk for nicotine withdrawal.

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POS4-34 PHARMACOLOGY VERSUS EXPECTANCY FACTORS IN SMOKERS' SUBJECTIVE RESPONSES TO NICOTINE AND PLACEBO INHALERS

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Although nicotine is widely believed to be the primary addictive component in tobacco, nicotine replacements therapies (NRTs) are not effective for the majority of smokers, and a growing body of evidence suggests that non-pharmacological factors such as expectancy may play an important role in smoking cessation outcomes using NRTs. This project examined the respective roles of nicotine pharmacology and expectancy factors in smokers' subjective responses to nicotine and placebo inhalers, using a mixed within/between-subjects design. Twenty-four adult smokers (12 male) completed two laboratory sessions following overnight abstinence from smoking. Participants were randomly assigned to receive either nicotine inhalers or placebo inhalers during both sessions but were told that they received a nicotine inhaler during one session and a nicotine-free inhaler during the other. In each session participants completed subjective assessments using Visual Analogue Scales and the Brief Questionnaire of Smoking Urges at baseline and following inhaler administration. While neither pharmacology nor expectancy significantly affected subjective cigarette craving associated with negative reinforcement (i.e., withdrawal relief), participants reported a greater reduction in positive reinforcement craving (i.e., intention to smoke) when told the inhalers contained nicotine than when told the inhalers were nicotine-free, regardless of actual nicotine content. Nicotine expectancy (but not pharmacology) also led to greater increases in several other subjective ratings (e.g., head rush, stimulated, dizzy, alert) following inhaler administration. Findings suggest that psychological factors such expectancy may play an important role in smokers' subjective responses to NRTs, the effectiveness of which cannot be solely attributed to the direct pharmacological effects of nicotine.

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POS4-35 HUMAN SENSORY PERCEPTIONS AND SMOKE MACHINE YIELDS OF CIGARETTES DESIGNED TO HIDE SECONDHAND SMOKE SMELL

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Objective: Products designed to lower human perceptions of SHS have been marketed to alleviate public concerns, but they may not reduce toxicity. There currently are no regulations governing the use of additives or product design modifications that are intended to hide or mask SHS emissions. Two so-called LSS (low smoke smell) products, which utilize differing design technologies (perfume additives to mask odor, and potassium/calcium additives to increase burn temperature) were compared with a conventional cigarette on machine yield mainstream and sidestream emissions and human sensory perceptions of SHS.

Methods: Human sensory perceptions of odor, visibility and irritation were rated by panels of smokers (n=32) and non-smokers (n=31) using a purpose-designed scale. SHS was generated using different smokers who were trained to puff according to the same puffing regimen. Nicotine, tar, CO, phenolic, carbonyl and PAH emissions were assessed using an intensive (Health Canada) machine yield regimen.

Results: Few differences in human sensory perceptions of SHS were observed between LSS and conventional products, regardless of smoker status or type of LSS product, and after controlling for smoker puffing style. In contrast, both LSS products revealed lowered (up to 30%) tar, carbonyl, volatile organic and PAH compound machine yield sidestream emissions compared with the conventional product, after controlling for puff count and tobacco weight. Phenolic compound emissions did not differ from the conventional product.

Conclusion: Contrary to expectations, sensory perceptions of SHS were not altered but machine yield emissions were lowered in LSS cigarettes compared with a conventional product. These findings underscore the importance of comprehensive disclosure and regulation of design changes and additives intended to alter product performance. Lowered sidestream emissions may suggest a less risky product, but the public health benefits of producing a still highly toxic product are not known and regulation to protect consumers from misleading health claims is needed.

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POS4-36 PRETREATMENT CRAVING AND CUE REACTIVITY AS PREDICTORS OF SMOKING TOPOGRAPHY

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There are a growing number of studies suggesting that real-world occurrences of craving are strong predictors of naturally occurring smoking behavior. By contrast, the predictive relationship between laboratory measures of craving and subsequent ad libitum smoking behavior has rarely been studied. With recent technological developments in measuring smoking topography, laboratory-based cue reactivity studies confer a special opportunity to assess whether craving to smoking cues is predictive of several objectively acquired measures of smoking topography. Therefore, the present ongoing study employs a sample of nicotine dependent female smokers to examine the predictive relationship between craving/physiological reactivity and select topographical features of smoking behavior obtained during a one-hour ad libitum smoking period. The participants, prior to participation in a treatment study, were assessed for craving, heart rate (HR) and skin conductance (SC) responsivity to control cues (i.e., candles & candleholder) and smoking-related cues (i.e., preferred brand of cigarette and lighter) and then were permitted to smoke using a CReSS Pocket, a self-contained battery operated device that measures & records ambulatory smoking behavior. The primary data analytic framework used in this study was stepwise multiple regression. Predictor variables consisted of craving, as measured with the Questionnaire of Smoking Urges–Brief (QSU-B), HR and SC; outcome measures were (1) number of puffs on the first cigarette, (2) mean peak flow for puffs on the first cigarette, (3) total number of cigarettes smoked, and (4) mean puff duration for all smoked cigarettes. Measures of nicotine dependence severity and cigarettes smoked per day were evaluated for inclusion in all models. Preliminary results (n = 43) indicate a) the smoking cues were effective elicitors of differential cue reactivity, and b) a significant positive predictive relationship was identified between craving (QSU-B factor 1) and total number of cigarettes smoked (model f=8.8, p<.01 and r square=.18). Implications of the findings for addictions research methodology and treatment will be noted.

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POS4-37 THE EFFECT OF VARENICLINE ON SMOKING REINFORCEMENT

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Retrospective data collected during clinical trials indicate that varenicline reduces the subjective rewarding and reinforcing effects of smoking. It has been suggested that this is one mechanism by which varenicline reduces the likelihood of relapse following a "slip" or lapse episode during a quit attempt. In the present outpatient laboratory study, participants were randomly assigned to receive varenicline (n=8) or placebo (n=12) for 1 week, and multiple measures of cigarette reward and reinforcement were obtained. Measures conducted before and after 6 days of medication included a progressive ratio task (PRT) in which participants could earn cigarette puffs by pressing a lever and a hypothetical Cigarette Purchase Task (CPT) in which participants indicate how many cigarettes they would purchase for consumption that day at different prices. On Day 7, after overnight abstinence, participants smoked 2 cigarettes in the lab and were then given the choice between receiving $2 or each of 3 additional cigarettes to smoke. Participants rated the subjective effects of smoked cigarettes. Due to the small sample sizes at this point, statistically significant effects were not observed, however, the following trends in the data were noted. Following medication administration for 1 week, lever presses completed in the PRT, and the number of cigarettes purchased in the CPT, were reduced in both groups, with slightly larger reductions observed in the group receiving varenicline. Participants who received varenicline reported feeling less pleasant, stimulated, buzzed, and dizzy after smoking compared with those who received placebo. All participants exclusively chose $2 over receiving any additional cigarettes. That varenicline is associated with reduced measures of cigarette reward and reinforcement in this prospective study is consistent with prior studies, but that similar effects were observed with placebo raises questions about the validity of this finding.

Pfizer Inc.

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POS4-38 A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED TRIAL OF VARENICLINE: CUE-REACTIVITY IN INDIVIDUALS WITH CONCURRENT TOBACCO DEPENDENCE AND HEAVY ALCOHOL USE

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BACKGROUND: Alcohol and tobacco consumption are highly comorbid disorders and heavy drinkers are more likely to be heavy smokers. Heavy drinkers are also more vulnerable to relapse following smoking cessation. Thus, more research is needed to further understand this common comorbid condition. Varenicline is a partial agonist at the alpha4beta2 nicotinic acetylcholine receptor that alleviates symptoms of craving and withdrawal while preventing nicotine from binding to the receptor, thereby reducing the reinforcing effects of nicotine. Recent studies have also shown varenicline to decrease alcohol self-administration in animal models and in one study of heavy-drinking smokers. AIMS: We assessed the effect of 2 weeks of treatment with varenicline vs. placebo on cue-induced craving for alcohol and tobacco in daily smokers with concurrent heavy alcohol use (n = 24).

METHODS: Eligible subjects participated in a total of three study visits over 21 days. On the first and last visit, repeated measures of self-reported questionnaires were given at four time-points: baseline; after one cigarette; neutral cue presentation; and tobacco-alcohol cue presentation. Participants also tracked their cigarette and alcohol consumption in a daily diary.

RESULTS: Preliminary analysis in 19 completers indicates an overall decrease in both alcohol and cigarette consumption over the study period, but there were no significant differences between treatment conditions. Cue-induced craving for cigarettes significantly decreased from baseline to post-treatment in the varenicline-treated group (n=10) (54.6 ± 19.1 to 32.1 ± 30;p=0.02) but not the placebo group (n=9) (41.4 ± 34 to 34.7 ± 34.1;p=0.5). There was no significant change in cue-induced craving for alcohol in either the varenicline group (2.9 ± 1.2 to 2.8 ± 1.0;p=0.78) or placebo group (3.3 ± 1.4 to 2.6 ± 1.7;p=0.16).

CONCLUSION: The interim analysis (n=19) shows that varenicline significantly reduced nicotine craving but had no effects on alcohol craving. The full analysis from the completed study (n=24) will be presented.

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POS4-39 THE REASONS THAT ACTORS SMOKE IN MOVIES MATTER TO ADOLESCENTS: A PRELIMINARY INVESTIGATION

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Increased exposure to smoking in movies is associated with an increase in adolescent smoking. However, little is known about the psychological mediators of this relationship or whether features of individuals or features of movies moderate this association. The current laboratory-based study was designed to help close this gap in the literature by examining whether the way that smoking is portrayed by characters in movies affects the association between exposure to smoking in movies and adolescents' future smoking intentions. In particular, we investigated whether exposure to smoking that is portrayed as helping characters facilitate social interaction is associated with smoking intentions differently than smoking that is portrayed as helping characters manage negative affect. A diverse sample of 77 middle school students (M age=12.8; 54% female; 60% Caucasian) viewed short clips from a number of popular movies that clearly portrayed smoking as helping with social interaction and as helping with managing negative affect. A third set of clips portrayed scenes where smoking had no clearly identifiable function. Finally, participants viewed a matched set of control clips where no smoking was present. After exposure to each clip, participants rated their future smoking intentions. Overall, clips with smoking were associated with stronger smoking intentions compared to non-smoking control clips (p=.002). Clips where smoking was portrayed as helping with social interaction and where smoking had no clear function were associated with a similar level of smoking intentions as a matched set of non-smoking controls (p's<.171). However, clips where smoking was portrayed as helping with managing negative affect were associated with significantly stronger smoking intentions compared to a matched set of non-smoking control clips (p=.024). These results provide preliminary evidence that the way that smoking is portrayed in movies is important for understanding how exposure to movie smoking affects adolescents. These findings may help improve prevention and media literacy interventions designed to help adolescents resist the influence of movie smoking.

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POS4-40 SERUM COTININE LEVELS AMONG AFRICAN AMERICANS AND WHITES BY TYPE OF CIGARETTES SMOKED

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BACKGROUND: Racial differences in serum cotinine concentration among smokers who report having smoked the same number of cigarettes per day have been well established, however, the reasons for these variations are not well understood.

OBJECTIVE: To determine if the type of cigarettes smoked is associated with higher or lower serum cotinine concentrations under natural smoking conditions.

METHODS: We assessed serum cotinine concentrations among non-Hispanic whites and non-Hispanic blacks by the type of cigarettes they smoked in the past 2 days using the 8 or 12 digits Universal Product Bar Code. We used a nationally representative sample of the U.S. non-institutionalized population using data from the National Health and Nutrition Examination Survey collected between January 2001 and December 2006. We matched UPC cigarettes data with Federal Trade Commission measures provided for nicotine yield, tar and carbon monoxide level. The analyses were adjusted for age, body weight, and the number of smokers who smoked inside the home in the past 7 days. Biochemical determination of tobacco exposure was performed by measuring serum cotinine levels in blood specimens obtained by venipuncture in the MEC.

RESULTS: Taking into account self-reported number of cigarettes smoked per day in the past 2 days, we found that within African Americans and also within non-Hispanic whites there were serum cotinine differences by tar levels (p<0.01), nicotine yield (p<0.01), and carbon monoxide levels (p<0.01). Among non-Hispanic white only, there were also cotinine differences strength (ultra-light and light combined, and full flavor) (p<0.01) of the cigarette brand smoked. No differences within each racial group were found in serum cotinine concentration for smokers of menthol or non-menthol cigarettes.

CONCLUSIONS: Tar, nicotine, and carbon monoxide levels were associated with differences in serum cotinine concentration between African American and non-Hispanic white adult smokers. Smoking menthol or non-menthol cigarettes made no difference in serum cotinine concentrations.

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POS4-41 PERCEIVED HARMS OF CIGARETTE SMOKING AMONG HOMELESS PERSONS

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Despite progress made in reducing cigarette smoking in the general population, smoking rates and related morbidity remain strikingly high among underserved populations. Among the 4 million homeless persons, the prevalence of cigarette smoking remains an alarming 70%. The national recession of the past year has led to a high rate of mortgage foreclosures and a further increase in the homeless population. We describe the perceived harms of smoking and exposure to environmental tobacco smoke (ETS), and the motivation and confidence to quit of homeless persons enrolled in an innovative clinical trial (N=428). The primary aim was to assess the effects of adherence-focused motivational interviewing (MI) counseling for smoking cessation among homeless smokers. To date, 74 participants have been enrolled with a mean age (SD) of 46.5 (8.8), 78% male, 65% African American, 3% were employed, 77% had at least a high school education, and 73% had a monthly income of less than $400. 87.8% smoked their first cigarette within 30 minutes of awaking, and they spent an average of $26.6 dollars per week on cigarettes. Although participants smoked an average (SD) of 22.1 (17.7) cigarettes per day (cpd), 43 % perceived a "great risk" to smoking less than half a pack a day, 47 % perceived a "great risk" to smoking a pack a day, and 61% perceived a "great risk" to smoking more than a pack a day. They reported high motivation (9.1 on 1-10 scale) to quit smoking and had made 2.4 serious quit attempts in the past year that lasted 24 hours or more. Forty-five percent perceived that exposure to ETS is "very harmful to one's health." These results show that despite the high level of nicotine dependence in this population, the majority of homeless persons have a relatively low perception of the harmfulness of smoking. Smoking cessation interventions in homeless populations should incorporate components addressing perceptions about the harmfulness of smoking.

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POS4-43 WATERPIPE TOBACCO SMOKING AND CIGARETTE SMOKING: A DIRECT COMPARISON OF SUBJECTIVE EFFECTS

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Tobacco smoking with a waterpipe (hookah) has spread worldwide. Many waterpipe smokers believe that, relative to cigarettes, waterpipes expose them to lower levels of toxicants and are less addictive or dependence inducing. Previously, waterpipe and cigarette toxicant exposure and subjective effects had never been compared directly as we do in this laboratory study. As we reported with a sample of 31, smokers who have completed a 45-minute waterpipe smoking session are exposed to at least as much nicotine (mean peak=10.2, SD=7.0 ng/ml) as after a single cigarette (mean peak=10.6; SD=7.7 ng/ml). This report (N=45) focuses on subjective effects. Forty-five participants (mean age=21.3 years, SD=2.2) reporting monthly waterpipe smoking (mean=5.2 uses/month, SD=3.9) and weekly cigarette smoking (mean=9.7 cigarettes/day, SD=6.4) completed two counterbalanced 45-minute sessions in which they smoked ad libitum their preferred brand/flavor of waterpipe tobacco or one tobacco cigarette. Outcomes included plasma nicotine levels and subjective measures. Waterpipe tobacco and cigarette smoking produced similar decreases in ratings of tobacco abstinence symptoms including "anxious," "craving," and "irritable" five minutes after product administration. In addition, participant ratings of one nicotine-related side-effect item ("dizzy") and numerous pleasurable subjective effect items (e.g., "taste good") increased five minutes after cigarette and waterpipe tobacco smoking. Waterpipe tobacco and cigarette smoking produce comparable plasma nicotine levels and many of the same subjective effects, including decreases in tobacco abstinence symptoms and pleasurable subjective effects. Overall, these similarities in nicotine exposure and subjective effects may indicate similar tobacco/nicotine dependence potential.

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POS4-44 CHANGES IN BIOMARKERS OF EXPOSURE IN SMOKERS SWITCHED TO LOW IGNITION PROPENSITY CIGARETTES

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Low Ignition Propensity (LIP) cigarettes were designed and various bodies have attempted to legislate cigarette 'fire safety' standards to address the public health concern that cigarette-caused fires are a leading preventable cause of unintentional fire injuries and deaths in the U.S. and Canada. However, decades ago, it was learned that cigarette designs can interact with smoker behaviors in ways that promote maintained or even increased risk. Therefore, it is plausible that LIP-cigarette smokers could alter their smoking topography in response to design factors used to reduce ignition propensity. Here, two parallel studies, each consisting of 4 visits, were conducted in Buffalo, NY (all participants using LIP-compliant cigarettes) and Boston, MA (participants switched to LIP-compliant version of their usual brands for the final 2 visits). Participants provided two breath samples each visit to make alveolar CO assessments (one before and one after smoking a cigarette), two saliva samples to be assayed for cotinine, and two urine samples to be assayed for carcinogen metabolites. Results showed that CO (p=0.907), cotinine (p=0.398) and PAH metabolites such as 1-naphthol (p=0.362) showed no significant differences across sites. For example, cotinine did not change substantially at either site (Buffalo M t1=336.299ng/mL(SE=0.108) vs. M t2=332.953ng/mL(SE=0.099); Boston M t1=220.743ng/mL(SE=0.125) vs. M t2=248.887ng/mL(SE=0.115)), while means for 1-naphthol changed in opposing directions (Buffalo M t1=12325.603pg/mg (SE=1237.129) vs. M t2=11133.121pg/mg(SE=1253.978); Boston M t1=11733. 500pg/mg(SE=1177.712) vs. M t2=12094.938pg/mg(SE=1193.751). Overall, this study has shown that in the short-term, switching to LIP cigarettes did not significantly alter exposure to CO, nicotine, or carcinogens in smokers.

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POS4-45 ACUTE EFFECTS OF "ELECTRONIC CIGARETTES"

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"Electronic cigarettes" consist of a battery, heater, and cartridge that contain nicotine in solution. They are marketed as nicotine delivery devices despite no published safety or efficacy data. This study's purpose was to examine their nicotine delivery and cardiovascular and subjective effects. This laboratory study involves four Latin-square ordered conditions, each preceded by >12 hours tobacco/nicotine abstinence and separated by 48 hours. Conditions differ by product used: own brand cigarettes, sham smoking (puffing an unlit cigarette), "NPRO" (NJOY, Scottsdale, AZ) with a 16 mg nicotine cartridge, or "Hydro" (Crown Seven, Scottsdale, AZ) with a 16 mg nicotine cartridge. In each session participants complete two, 10-puff smoking bouts and plasma nicotine level, heart rate, and subjective effects are assessed. Sixteen participants have completed the protocol (5 women; 8 non-white; mean age=29.8 years; mean cigarettes/day=18.5). Own brand cigarettes increased plasma nicotine significantly (mean peak change from baseline=14.8 ng/ml) while no significant increases were observed for NPRO (1.5 ng/ml), Hydro (0.1 ng/ml) or sham (0.0 ng/ml). Significant increases in heart rate were observed 5 and 15 minutes after bouts 1 and 2 for own brand only. Own brand decreased craving significantly at most post-administration timepoints, while NPRO decreased craving significantly 5 minutes after bout 2 only. Relative to a tobacco cigarette, two 10-puff bouts from an "electronic cigarette" with a 16 mg nicotine cartridge delivered little to no nicotine and suppressed craving less effectively. "Electronic cigarettes" and their nicotine-containing solution should be tested, regulated, labeled, and packaged in a manner consistent with a known harmful drug and consumers should be aware that, unlike FDA-regulated nicotine replacement products, these putative drug delivery systems have not been shown to deliver nicotine effectively.

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POS4-46 ACUTE EFFECTS OF WATERPIPE TOBACCO SMOKING: A DOUBLE-BLIND, PLACEBO CONTROL STUDY

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Tobacco smoking with a waterpipe (hookah) is a worldwide practice but there have been few controlled studies documenting its acute effects. This laboratory study used a placebo control design to examine the toxicant exposure and cardiovascular and subjective effects of a single waterpipe tobacco smoking episode. Thirty-nine participants (mean age = 21.2 years, SD = 2.4) reporting monthly waterpipe smoking (mean = 8.3 uses/month, SD = 8.4) for at least 6 months (mean 1.7 years, SD = 1.1) completed two double-blind, counterbalanced 2-hour sessions that differed by type of waterpipe product smoked: preferred brand/flavor of waterpipe tobacco or a flavor-matched tobacco-free herbal waterpipe product (placebo). Each session was preceded by at least 12 hours of tobacco abstinence. Within each session, participants completed a 45-minute ad lib waterpipe use period while blood was sampled and heart rate measured. In addition, before and after smoking expired air CO was measured and responses to a variety of subjective measures (nicotine/tobacco withdrawal; direct effects scale) were recorded. Results showed that smoking tobacco in a waterpipe significantly increased blood nicotine levels and heart rate while smoking the placebo product did not. Expired air CO increased by more than 20 parts/million in both conditions and did not differ across conditions. Similarly, both conditions significantly reduced symptoms of nicotine/tobacco abstinence symptoms including "urges to smoke" and "craving" and increased direct effects (i.e., "dizzy," "lightheaded," and "satisfy"). These subjective effects were largely independent of condition. These results from the first placebo control study of waterpipe tobacco smoking demonstrate that this form of tobacco use exposes users to physiologically active doses of nicotine and high levels of CO, while producing subjective effects similar to those observed after cigarette smoking.

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POS4-47 DISCREPANCY BETWEEN A PSYCHOPHYSIOLOGICAL INDEX OF EMOTIONAL REACTIVITY AND SELF-REPORT MEASURES OF AFFECT AMONG ABSTAINING AND NON-ABSTAINING SMOKERS

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BACKGROUND: Among smokers who quit, those who fail to maintain abstinence (lapsed or relapsed) report a higher level of negative affect than those who abstain. However, relatively few studies have investigated how abstinence status influences a smoker's psychophysiological emotional reactivity. This paper examined the acoustically elicited startle eyeblink and self-reported affective response of a group a smokers who sought treatment for smoking cessation.

METHODS: 47 smokers (55% females) completed four laboratory sessions (baseline, 2 days, 5 days, and 14 days post-quit) in which they viewed pleasant, unpleasant, neutral, and smoking-related pictures while startle eyeblink responses were measured. Participants also completed a battery of self-report affective measures during each laboratory session. Two-thirds of the participants (n=31) successfully achieved abstinence across all post-quit time periods. The rest (n=16) failed to abstain at each of the post-quit sessions.

RESULTS: Using linear multilevel modeling (LMM), we found a significant Picture Type by Session by Abstinence Status interaction effect on startle eyeblink responses. While non-abstaining smokers showed a significant decrease in startle responses to unpleasant pictures across sessions, abstaining participants' startle responses to unpleasant pictures did not change and remained consistently high across sessions. A separate LMM found a significant Session by Abstinence Status interaction effect on self-report of depressive symptoms, with non-abstaining smokers reporting a significant rise in depressive symptoms across sessions. No increase in depressive symptoms across sessions was found among abstaining participants.

CONCLUSIONS: Relative to smokers who failed to quit, successful quitters reported less negative affect but showed heightened emotional reactivity to unpleasant emotional cues during the post-quit period. Implications of the findings will be discussed.

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POS4-48 IMPACT OF PSYCHOLOGICAL MOTIVES FOR SMOKING ON DAYS TO RELAPSE IN WOMEN

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Women are more likely to relapse from a smoking cessation attempt compared to men. Research suggests that non-nicotine reinforcers (such as weight concerns, social support and negative affect) may be more significant factors for women than men during a smoking cessation attempt. The purpose of this study is to investigate an association between psychological motives for smoking during ad libitum smoking with days to relapse in a subsequent quit attempt among female smokers. Women between the ages of 18-40, who smoked at least 10 cigarettes per day, were motivated to quit smoking, and were not taking any hormones or psychotropic medications were recruited to participate in a study investigating menstrual phase effects on smoking relapse. A subset of this sample (n=183) who made a quit attempt and later relapsed were included in this analysis. Participants completed the Wisconsin Inventory of Smoking Dependence Motives (WISDM-68) form at their screening visit. The number of days to relapse was determined using continuous abstinence definition based on self-report and verified with carbon monoxide measurements. The 13 WISDM-68 subscales were correlated with the number of days to relapse using SAS 9.2. Participants were, on average, 29.8 ± 6.6 years of age with 13.6 ± 5.4 years of education and smoked a mean of 16.8 ± 5.6 cigarettes per day. Among the 13 WISDM-68 subscales assessed, one had a significant correlation with days to relapse [Craving ($r = -0.16$, $p = 0.03$)] and two showed a trend [Cognitive Enhancement ($r = -0.14$, $p = 0.06$); Negative Reinforcement ($r = -0.11$, $p = 0.08$)]. The results of this analysis suggest that women who smoke to improve cognitive functioning, in response to intense/frequent urges to smoke, or to eliminate negative symptomatology may relapse sooner. Further research is needed to confirm these relationships and explore how they may be used to create effective smoking cessation interventions.

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POS4-49 DELAYED REWARD DISCOUNTING IN SMOKERS AND INDIVIDUALS WITH OTHER ADDICTIVE DISORDERS: A META-ANALYSIS

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Delayed reward discounting (i.e., preference for small immediate rewards compared to larger delayed rewards; DRD) is a behavioral economic index of impulsivity that has often been found to be elevated in smokers and other individuals with addictive disorders compared to matched controls. However, the empirical literature is large and heterogeneous, with several ambiguities. In particular, the overall pattern of findings, differences between addictive disorders, and absolute magnitude of differences are unclear. The current study is a meta-analysis addressing these issues. Candidate studies were identified via PubMed searches (e.g., "discounting and smoking") and hand-searching reference sections of previous non-quantitative reviews. Studies comparing DRD in individuals who met a smoking or other addiction-related criterion and controls for which a Cohen's d effect size could be calculated were included (k = 36). The primary dependent variable used was the temporal discounting function, variably defined (e.g., k, AUC, ICR). Heterogeneity of effect size was evident ($Q = 118.09$, $df = 35$, $p < .001$; $I2 = 65.96$), therefore, a random-effects model was used. A significant difference was evident between criterion and control groups across studies (Cohen's d = .68, 95% CI = .51-.85, $p < .001$), of medium-to-large effect size. For studies of smokers and controls (k = 15), heterogeneity of effect size was also evident ($Q = 41.13$, $df = 15$, $p < .001$; $I2 = 70.36$) and a random-effects model revealed a significant difference between criterion and control groups across studies (Cohen's d = .59, 95% CI = .35-.82, $p < .001$), a medium sized effect size. These findings further affirm evidence of substantially greater impulsivity in smokers and individuals with other addictive disorders relative to controls. In addition, clear evidence of heterogeneity of effect size suggests meaningful sample- or methods-related moderating variables play a role in the observed differences. Greater DRD appears to commonly contribute to (or result from) addictive behavior and plausible chronological pathways will be discussed.

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POS4-50 EXPECTANCY PROCESSES IN THE COGNITIVE AND SUBJECTIVE EFFECTS OF NICOTINE

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Background: Cognitive enhancement has been reported as a motive for smoking (Gilbert et al., 2000). Cognitive enhancement by nicotine, as well as affective processes, may be influenced by nicotine expectancies (see Fucito & Juliano, 2007). Most research in this area to date has manipulated stimulus expectancies, i.e., beliefs about the nicotine content of a cigarette, as an indirect manipulation of nicotine expectancies (Perkins et al., 2008; Keleman, 2008). The present study attempted to directly manipulate nicotine expectancies to evaluate their causal role in cognitive and subjective effects of smoking.

Methods: Participants (N=69, 29% female, mean age = 32.1 years, smoke at least 6 cigarettes per day) abstained from nicotine overnight. They were then provided either a regular cigarette (.6 mg, 10 mg tar) or denicotinized cigarette (<.005mg, 10 mg tar) to smoke. Nicotine dose was crossed with instructions that nicotine would either enhance or impair performance in a 2 X 2 factorial design. Participants completed a task measuring vigilance (the Rapid Visual Information Processing task, or RVIP) and self-report measures of mood (POMS-SF) and somatic effects including headache.

Results: As expected, nicotine increased RVIP sensitivity (M=21.0, SD=33.2) compared to placebo (M=4.1, SD=21.1), $F(1,63)=5.3$, $p<.05$. There was no expectancy effect or nicotine-expectancy interaction for RVIP sensitivity. Impair instructions increased reports of headache (M=0.1, SD=0.5) compared to enhance instructions (M=-0.2, SD=0.6), $F(1,66)=5.1$, $p<.05$.

Conclusions: Manipulated expectancies about the effects of nicotine had an effect on subjective but not performance outcomes. The implications of the findings will be discussed.

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POS4-51 THE SUBJECTIVE IMPORTANCE OF SMOKING SURVEY (SIMS)

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The personal, subjective importance of cigarette smoking to a smoker has implications for understanding difficulty quitting smoking and characterizing inveterate smokers. A new survey to assess this understudied dimension of smoking, the Subjective Importance of Smoking Survey (SIMS), assesses personal facets of smoking such as, “Being a smoker is important to me,” “Holding a cigarette makes me feel like I’m in control,” and “I cannot see myself not smoking.” Participants were 103 smokers, (Mean age=30.39, SD=8.13; 66% Male; 90% White; years smoking Mean=12.73, SD=6.88) taking part in a single session, laboratory-based study investigating the effect of cigarette advertising on beliefs of harm exposure. As part of the procedures, participants completed 17 SIMS items (6-point scale) along with demographics, alcohol use, nicotine dependence (ND), need for cognition (NC), and other psychosocial variables. Analysis of item response distributions and an exploratory factor analysis (EFA) eliminated 3 items with predominantly extreme responses, and 3 items loading highly on several factors. The result was a 2-factor 11-item measure with one factor representing a self/identity and the second representing a soother function of smoking. We next conducted exploratory structural equation modeling (ESEM), a hybrid method of EFA and SEM, which like EFA permits items to load on all factors but like SEM also allows testing the effects of covariates on factors, and model fit. We used Mplus 5.2 software for the ESEM analysis. The two-factor ESEM model fit the data well, $\chi2(40,n=93) =50.10$, $p=.13$, CFI=.96, RMSEA=.05, WRMR=.72. Being male ($p=.02$), and ND ($p=.01$) were positively, whereas NC ($p=.04$) was negatively associated with a higher score on the self/identity factor. Regarding the soother factor, being male ($p=.01$), ND ($p=.02$), discomfort around non-smokers ($p=.05$), and alcohol use ($p=.02$) were positively, whereas NC ($p<.0001$) was negatively associated with higher scores on the soother factor. This was the first study to assess the factor structure and construct validity of a new survey assessing the subjective importance of smoking.

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POS4-52 BRIEF BUPRENORPHINE INDUCTION AND TAPER DOES NOT PROMOTE INCREASED CIGARETTE SMOKING AS MEASURED BY URINARY COTININE

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Over 300,000 patients have been maintained on buprenorphine (BUP) for the treatment of opioid dependence since 2002 and rates of cigarette smoking are very high in this population. Controlled laboratory studies report acute BUP administration can increase the reinforcing effects of cigarettes; however this relationship has not yet been examined in a natural setting. The current data is taken from a 12-wk randomized controlled trial that briefly inducted and tapered opioid-dependent subjects using BUP. Subjects (n=16) were urinalysis-verified to be opioid abstinent during treatment and were, on average, 69% male, 26 yrs old, 100% Caucasian, and had mean FTND scores of 4.6. They reported smoking 20.6 cigarettes/day when using and 11.5 cigarettes/day when not using illicit opioids. Subjects were stabilized onto a mean BUP dose of 12.5mg over an 11.3 day period before beginning a 1, 2 or 4-week double-blind outpatient taper. Self-report of smoking and urine samples tested for semi-quantitative cotinine were collected thrice weekly. Results showed mean cotinine levels at intake and during induction were 1987.6 ng/ml and 1748.2 ng/ml respectively. Cotinine values increased slightly in the 1 wk group and decreased slightly in the 2 and 4wk groups from induction to taper. A non-significant decrease in cotinine was observed in all groups following last BUP dose. Self-report of smoking revealed a similar pattern, with the 1 wk group reporting no change and the 2 and 4 wk groups reporting non-significant decreases in self-reported smoking from the induction to taper period, with no significant changes observed following last BUP dose. These results suggest a brief BUP induction and taper did not significantly change urinalysis-verified rates of cigarette smoking. Overall, this data provides a rigorous examination of smoking and suggests the presence or absence of BUP, as clinically administered in outpatient treatment settings, does not necessarily impact smoking status.

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POS4-53 TOBACCO DEMAND AND DELAYED REWARD DISCOUNTING IN NICOTINE DEPENDENT INDIVIDUALS WITH SERIOUS MENTAL ILLNESS AND CONTROLS

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Individuals with serious mental illness (e.g., schizophrenia) smoke at disproportionately high rates and the reasons for this high prevalence are not well understood. In this study, we examined two processes that may play a role, tobacco demand (i.e., cigarette consumption at escalating costs) and delayed reward discounting (i.e., reward devaluation based on delay). We compared smokers with schizophrenia or schizoaffective disorder (SCZ) to heavy-smoking non-psychiatric controls and predicted that the SCZ group would exhibit greater tobacco demand and more impulsive discounting. Twenty-two SCZ and 19 controls were enrolled in the study. No group differences were evident for age, education, income, years of smoking, age of first cigarette, or IQ estimate, but SCZ smoked more cigarettes/day ($p < .05$), had higher expired CO levels ($p < .05$), and tended to have higher FTND scores ($p < .10$). Preliminary data processing revealed low effort in four participants on the demand task and in three participants for the discounting task, with no group differences. Outlier analyses for the demand task using a criterion of $Z = 4$ revealed 10 data points (1%). Three individuals, all controls, were responsible for these outliers and were excluded from further analysis. No outliers were evident for delayed reward discounting. All demand curve metrics except intensity were logarithmically transformed. Significant differences were evident for demand intensity (consumption at zero cost; $p < .05$) and Omax (maximum expenditure; $p < .05$). Follow-up covariate analyses eliminated the group differences and suggest these differences were attributable to quantitative differences in cigarette consumption and nicotine dependence, respectively. Preliminary analyses indicated no significant between-groups differences for discounting. These findings suggest that, compared to lighter control smokers, individuals with severe mental illness exhibit greater tobacco demand, but that the difference is not attributable to disease status so much as differences in smoking behavior. These data indicate the potential validity and utility of using these measures in smokers with serious mental illness.

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POS4-54 ATTENTIONAL BIAS ACROSS ADDICTIONS: A CROSS-PRIMED STROOP TASK

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Extensive literature documents the existence of information-processing biases among users of a variety of substances, including alcohol and tobacco. One specific form that this bias can take is prioritizing of substance-related information by attentional systems, commonly referred to as attentional bias. Despite knowledge of the strong relationship between alcohol and tobacco, no attempts have been made to examine attentional bias for alcohol and smoking stimuli within the same task. The present study assessed attentional bias for both alcohol and tobacco using a single stroop task, and also examined substance-specific and cross-substance priming effects within the same task. That is, we were interested in whether brief picture presentations related to alcohol and/or smoking would increase attentional biases towards subsequent substance-related word stimuli. Participants (n = 42) identified the color of 3 different types of words (smoking, alcohol, and neutral) with reaction time as the dependent variable. Each word was preceded by a brief presentation of one of 3 different types of pictures (smoking, alcohol, and neutral). Participants had a wide range of alcohol and tobacco use patterns, and completed this task as part of a larger study designed to assess the effects of combined substance administration on cravings to drink and smoke. Surprisingly, main effects for picture type and word type did not reach significance. However, there was a significant picture type x word type interaction ($p < .05$). Follow-up testing revealed a significant effect of word type only when words were preceded by an alcohol picture prime ($p < .05$), where alcohol primes significantly increased the attentional bias effect for alcohol words ($P < .05$), but not for smoking or neutral words. In other words, priming with substance-related pictures during a modified stroop task increases attentional bias for alcohol, but not for smoking stimuli. Possible explanations for these findings are discussed, as well as implications for future attentional bias research.

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POS4-55 EFFECTS OF EXHALATION DURATION ON BREATH CARBON MONOXIDE OUTPUT: IMPLICATIONS FOR SMOKING CESSATION AND LABORATORY RESEARCH

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Researchers have used breath carbon monoxide (CO) cut-off values ranging from 4-10 ppm to define abstinence in smoking cessation research, and reductions in CO as a measure of acute abstinence in laboratory research. The current study used a reversal design to investigate effects of exhalation velocity on CO output in four groups (non-(N), light (L), moderate (M), and heavy (H) smokers; n = 20 per group). In one condition, participants were instructed to exhale as quickly as possible (fast condition), whereas in a different condition participants were instructed to exhale at a slow and constant pace (slow condition). Conditions were counterbalanced and repeated twice for each participant. Duration of exhalation was significantly longer during the slow condition (mean = 14.7s) than during the fast condition (mean = 4.3s; $F(1,146) = 554$, $p < 0.01$). CO output was significantly higher during the slow condition (means = 3 (N), 11 (L), 32(M), 47(H) ppm) than during the fast condition (means = 2 (N), 7(L), 22 (M), 33 (H) ppm; $F(1, 146) = 237$, $p < 0.01$). Using a cut-off criterion of 4ppm, 7 light smokers would have been classified as non-smokers during the fast, but only 2 during the slow condition. Using a cut-off of 10ppm, 16 light smokers would have been classified as non-smokers during the fast and 11 during the slow condition. Furthermore, switching from fast to slow resulted in a 33% and 30% reduction in CO for the moderate and heavy smokers, respectively. In both cases, such reductions would be consistent with more than three hours of acute abstinence. The results suggest that slow exhalation durations should be used to avoid incorrect conclusions regarding smoking status, whether breath CO is used for laboratory studies or for smoking cessation.

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POS4-56 THE EFFECTS OF STEADY-STATE BUPROPION ON ATTENTION AND INHIBITORY CONTROL IN TREATMENT-SEEKING SMOKERS

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Bupropion is an effective pharmacotherapy for smoking cessation, but long-term cessation rates remain modest. An improved understanding of the mechanisms by which bupropion works may lead to better outcomes. In addition to work on withdrawal/craving and affective/motivational processes, recent work has begun to examine neurocognitive processes. Acheson and de Wit (2008) found that a single dose of bupropion had limited effects, reducing lapses in attention in only a subset of non-treatment-seeking smokers and non-smokers and having no effect on measures of impulsivity (stop task, delay discounting, and Balloon Analogue Risk Task). In the present study, we tested the hypothesis that steady-state (2-3 weeks of standard dosing) bupropion would enhance attention and inhibitory control among adult treatment-seeking smokers enrolled in a randomized double-blind cessation trial. The first of two sessions was a pre-drug baseline; the second session occurred 3 weeks later (1-2 weeks prior to the target quit day) following treatment with either placebo (n=17) or bupropion (n = 19). Testing took place under minimal deprivation (45 minutes) and assessed attention with a simple two-choice reaction time task and inhibitory control with the stop task. Preliminary Group (bupropion v. placebo) x Session (pre v. post) analyses provided no support for the hypothesis that bupropion reduced lapses in attention or improved response inhibition. Supplemental analyses will explore potential subgroups (e.g., those high and low in baseline performance) and the role of diminished smoking between visits, which tended to be greater among the bupropion group. Our results suggest that steady-state bupropion does not enhance attention or inhibitory control in minimally withdrawn smokers trying to quit.

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POS4-57 SMOKING ABSTINENCE AND IMPULSIVE BEHAVIOR: A MULTI-PROCESS MODEL

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Based in a self-medication model, we predicted abstinence-induced impulsive behavior would be greater among persons with high levels of ADHD symptoms. To test these hypotheses, adult smokers (mean cigarettes/day = 18) were selected from a community sample based on scores in the upper and lower quartile (within sex and age group) of the DSM-ADHD scale of the Connor's Adult ADHD Rating Scale (CAARS-SV) for the High (n=34, 16 female) and Low (n=31, 17 female) ADHD symptom groups. To examine abstinence effects, participants completed two sessions separated by a week: one after 12 hours abstinence and one non-abstinent (order counterbalanced). Contrary to hypotheses, the Low ADHD group demonstrated significant increases in impulsivity (i.e., greater discounting of hypothetical monetary rewards) and greater RT variability on the stop task during abstinence compared to non-abstinent, but the high ADHD group did not; interaction ps < .05. More consistent with predictions, the Low ADHD group tended to slow more following errors on the Stop task, $p = .06$, took longer to complete the delay discounting task, $p < .05$, and tended to have smaller baseline startle responses, $p = .1$, but these effects did not interact with abstinence. Physiological measures (e.g., startle eyeblink) were assessed during the CPT. Abstinence reduced prepulse inhibition of startle to targets, $p < .01$, but had no effect on non-targets, $p = .6$, suggesting reduced interference control or selective attention. Significant abstinence-induced increases were found among self-reported craving, withdrawal, and negative affect, as well as overall startle magnitude, ps < .05. ADHD group moderated abstinence-induced increases in self-reported ADHD symptoms such that the High group reported an increase in hyperactive/impulsive symptoms during abstinence, $p < .05$. The present study generally supported the predictions that abstinence increased impulsivity and that the high ADHD group was more impulsive than the low ADHD group. However, the results generally failed to support the prediction that abstinence-induced increases in impulsivity would be heightened among more impulsive individuals.

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POS4-58 A LONGITUDINAL STUDY TO TRACK CHANGES IN SMOKING BEHAVIOUR OF SMOKERS OF 10MG ISO TAR CIGARETTES IN GERMANY

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The long-term health effects of cigarette smoking have been extensively investigated and are well known. Some studies have investigated subjects' smoking behaviour and whether nicotine uptake changes during the short- or long-term (compensation). However, few long-term studies have been conducted recently involving the monitoring of cigarette consumption, uptake of nicotine and other smoke constituents as well as spontaneous switching. In most cases smoking behaviour was only assessed at the start and finish of the study, and so the causes of changes in smoking behaviour were not well understood. A longitudinal study (clinical trial number ISRCTN95019245) comprising over 1,000 10mg smokers is being conducted to monitor smoking behaviour over 5 years, with six-month follow-up. Results available from the first time point include:

- Cigarette consumption determined by counting smoked filters from cigarettes consumed during a 24-hour period, mean 15.4 cigarettes/day, standard deviation 6.5.
- Mouth level exposure of nicotine measured by filter tip analysis, mean 23.4mg/day, standard deviation 12.8mg/day.
- Mouth level exposure of tar measured by filter tip analysis, mean 277mg/day, standard deviation 150mg/day.
- Nicotine uptake, based on nicotine + 5 metabolites in 24-hour urine, mean 13.9mg/day, standard deviation 8.9mg/day.
- Nicotine uptake from measurement of salivary cotinine, mean 265ng/mL, standard deviation 166ng/mL.

Six-month follow-ups will assess smoking behaviour and smoke uptake, product switching and cessation, and will include reasons for switching and the SF-36v2 Health Survey questionnaire.

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POS4-59 PRELIMINARY ADAPTATION OF A PRELOAD TASTE-TEST PARADIGM FOR SMOKERS

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The preload taste-test (PTT) paradigm has been widely used to test regulation of consummatory behaviors such as eating and alcohol drinking; however, it has never been used to study regulation of smoking. In a traditional PTT, dieters are forced to break their diets with a large preload of food designed to induce a sense of overeating; they then complete a "taste-test" where the quantity tasted is surreptitiously recorded. Regulation failure is thought to occur when participants do not compensate for the preload by tasting less than no-preloaded controls. In this study, we tested the feasibility of using a smoker-adapted PTT paradigm to illustrate regulation and regulation failure of smoking behavior. Participants were 95 daily smokers (15-20 CPD) who were actively limiting their smoking. Procedures included one hour of nicotine deprivation, randomization to either a control, water-drinking preload (WP) or to a two-cigarette preload (CP), followed by a cigarette taste-test. Results suggest that the PTT was sensitive to regulation of smoking: participants took 17% fewer total puffs (p=.10) and puffed for 19% less time (p=0.05) on the tasting after the CP than the WP. The PTT also appeared to be sensitive to regulation failure: participants who perceived that their smoking limits were intact after the CP took 24% fewer puffs during the tasting than controls (p=0.02), while participants who perceived the CP as limit-violating did not (compensation <1%, ns). However, PTT procedures were not well-tolerated by some participants: n=3 did not complete the PTT due to vomiting, n=5 required a break in procedures due to nausea or dizziness, and 23% of participants reported some symptoms of over-smoking (e.g., sweating, dry mouth) post hoc. In sum, data suggest that the PTT can be used to illustrate smoking regulation and regulation failure, however the feasibility of a smoker-PTT should be carefully considered against the risks of participant discomfort, as well as how participant discomfort could affect intake during the tasting. Future studies should consider modifications to the design that could reduce adverse effects, such as personalized preload doses.

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POS4-60 NICOTINE AND FOOD DEPRIVATION DECREASE THE ABILITY TO RESIST SMOKING

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Attempting to simultaneously control both food intake and smoking may lead to smoking cessation failure (Perkins et al., 2001). Using a human laboratory model designed to model smoking lapse behavior (McKee, 2009), we examined the combined effect of nicotine and food deprivation, compared to nicotine deprivation alone, on the ability to resist smoking, and on subsequent ad-libitum smoking behavior. A goal of this study was to increase our understanding of the mechanisms underlying this behavior. We hypothesized that the addition of food deprivation to nicotine deprivation would reduce the ability to resist smoking and increase the number of cigarettes smoked. Using a within-subject design, daily smokers (N = 30) were deprived of nicotine for 18 hours and were either food deprived (12 hrs) or not across two laboratory sessions. Following exposure to individualized food cues, participants had the option of initiating a tobacco self-administration session or delaying initiation for up to 50 minutes in exchange for monetary reinforcement. Subsequently, the tobacco self-administration session consisted of a one-hour period, in which subjects could choose to smoke their preferred brand of cigarettes or receive monetary reinforcement for cigarettes not smoked. Given a significant order effect, only results from the first laboratory session were analyzed. Smokers who had been deprived of both nicotine and food were less able to resist smoking and smoked more when compared to those who were only deprived of nicotine. There were no effects of gender on these primary outcomes. Nicotine withdrawal, food craving and hunger ratings were greater in the combined deprivation group while they were trying to resist smoking. Predictors of the ability to resist smoking will be reported. These findings confirm the hypothesis that food deprivation can undermine a smoker's ability to resist smoking. Symptoms associated with nicotine withdrawal, food craving and hunger are possible mechanisms underlying this effect. These results suggest limiting food intake during a smoking cessation attempt may decrease the likelihood of success.

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POS4-61 COMPARISON OF BREATH CARBON MONOXIDE, SEMI-QUANTITATIVE COTININE ASSAYS, AND LCMSMS ANALYSIS OF NICOTINE AND METABOLITES IN URINE AND ORAL FLUID (SALIVA) IN SMOKERS AND NONSMOKERS

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Smoking can be biochemically verified by breath carbon monoxide (CO), semi-quantitative analysis of cotinine (urine and saliva NicAlert® strips), and LCMSMS quantitative analysis of nicotine and metabolites, which is the "gold standard." However, the relative sensitivities and specificities of breath CO and NicAlert® to differentiate smokers and nonsmokers have not been compared to LCMSMS results in the same group of participants. In addition, there is disagreement over the breath CO cutoff value that optimally differentiates these groups. In this study, smokers reporting ≤10 (n=18, targeted n for each group is 45) or >10 (n=38) cigarettes per day and nonsmokers reporting no environmental tobacco exposure (n=26) or regular environmental tobacco exposure (n=3) provided breath CO, oral fluid (saliva), and urine specimens. Saliva and urine specimens were analyzed for cotinine by NicAlert® test strips and nicotine, cotinine, trans-3'-hydroxycotinine, and norcotinine by a validated LCMSMS method. In a preliminary analysis, self-reported smoking status of all participants (n=85) was confirmed by urinary LCMSMS. Saliva NicAlert® testing provided 87.5% sensitivity and 89.7% specificity, whereas urine NicAlert® provided identical sensitivity and 100% specificity, as compared to LCMSMS. A ROC analysis indicated that a breath CO cutoff of 4 ppm provided 94.5% sensitivity and 96.6% specificity, as compared to LCMSMS. The data indicate that saliva and urine NicAlert® had equal sensitivity, whereas urine NicAlert® had greater specificity. Breath CO at a provisional cutoff of 4 ppm had greatest combined sensitivity and specificity in differentiating smokers and nonsmokers.

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POS4-62 EFFECT OF STRESS AND BUPROPION ON CRAVING, WITHDRAWAL SYMPTOMS AND MOOD IN SMOKERS

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Studies suggest that in smokers attempting to quit, the occurrence of stressful events is associated with smoking relapse. The purpose of this study was to determine the effect of bupropion (an agent known to increase smoking cessation rates) on the craving, withdrawal and mood response to stressful tasks. Response to three tasks (a speech, math and cold pressor task) was measured in 65 smokers during ad libitum smoking. Smokers were then randomized to either bupropion or placebo. Fourteen days after starting medication, 43 subjects (28 receiving bupropion; 15 receiving placebo) quit smoking and laboratory procedures were repeated on the third day of abstinence. Prior to cessation, stressors presented in a laboratory setting increased craving, nicotine withdrawal symptoms and subjective distress but decreased positive affect (p values < 0.001). Thirty minutes of relaxation after the final stressor did not result in these measures returning to pre-stress levels. During the nicotine withdrawal period, stress induced changes in subjective measures were generally smaller than during the pre-cessation period. Bupropion (relative to placebo) reduced overall levels of craving and withdrawal symptoms but did not have significant effects on response to stress during the nicotine withdrawal period. This study demonstrates that stress results in increases in craving and withdrawal symptoms and changes in mood symptoms and that bupropion affects overall levels of these symptoms. Further research is needed to determine if modifying response to stress is predictive of an effective treatment for facilitating smoking cessation.

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POS4-63 EFFECT OF VARENICLINE VS. PLACEBO ON REACTIVITY TO TOBACCO AND ALCOHOL CUES IN SMOKERS WHO ARE LIGHT DRINKERS

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Varenicline, a partial agonist of the alpha4beta2 nicotinic acetylcholine receptor, is the most recently approved drug for the treatment of nicotine dependence. It has been shown to attenuate nicotine craving associated with withdrawal and has recently been shown to decrease alcohol self-administration in both rats and humans in a laboratory setting. However, studies investigating the effect of varenicline treatment on tobacco cue-induced craving have not been done, nor have studies of cue-induced craving for alcohol. Therefore, the aim of this double-blind, randomized, placebo controlled trial was to investigate the effect of a two-week course of varenicline (standard titrated dosing) on tobacco cue-induced craving and as a secondary outcome, alcohol consumption and cue-induced craving for alcohol in daily dependent smokers who are light drinkers (<14 drinks/wk for males and <9 drinks/wk for females). The Questionnaire of Smoking Urges (QSU) and the Alcohol Craving Questionnaire (ACQ) were used to assess tobacco and alcohol craving respectively at baseline and after 2-weeks treatment. Sixteen subjects (10M:6F), 31.3±10.6 (mean±SD) years, who smoked an average 14.6±5.2 cigarettes per day (FTND 5.1±1.6) and drank an average of 9.5±3.2 drinks per week have completed the study to date. Preliminary findings suggest that the baseline cue presentation paradigm used was effective at inducing craving for tobacco after presentation of tobacco/alcohol vs. neutral cues as observed in the Desire to Smoke and Anticipation of Positive Outcomes subscales of the QSU (40.3±12.0 vs. 34.9±10.9, p=0.014 and 40.1±10.1 vs. 35.8±7.9, p=0.021, respectively), the factor 2 scale (39.8±13.9 vs. 33.8±12.0, p=0.01) and the VAS question "I crave for a cigarette" (64.6±24.8 vs. 52.9±23.8, p=0.011). Craving for alcohol was also increased as observed through the Total Score of the ACQ (2.3±1.0 vs. 2.0±0.7, p=0.037). Data from the completed randomized trial (n=24) will be presented and will provide the first evidence of the effect of varenicline on cue-induced craving for cigarettes and alcohol in a light drinker tobacco dependent population.

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POS4-64 ASSOCIATIONS BETWEEN PAIN AND SMOKING STATUS AMONG CANCER PATIENTS

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There is growing empirical and clinical interest in purported associations between smoking and the aggravation of cancer symptoms and treatment side effects, such as pain. Both pain and smoking are highly prevalent among persons with cancer, and there is recent evidence to suggest that cancer patients who continue to smoke despite their diagnosis experience greater pain than nonsmokers. Smokers also tend to report greater motivation to smoke tobacco when in pain, suggesting that recurrent pain may represent a significant barrier to quitting smoking. These considerations underscore the importance of examining the influence of common symptoms and side effects, such as pain, when tailoring smoking cessation interventions for cancer patients. Accordingly, the main goal of this cross-sectional study was to examine associations between multiple levels of smoking status and several pain-related outcomes among a sample of 224 cancer patients. Results indicated that persons who continued to smoke despite being diagnosed with cancer reported more severe pain as compared to never smokers. Current smokers also reported greater interference from pain than either former smokers or never smokers. No differences in pain-related distress as a function of smoking status were observed. Among former smokers, results did reveal an inverse relation between pain severity and the number of years since quitting smoking. Clinical implications and directions for future research are discussed.

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POS4-65 EFFECT OF SINGLE USE OF ELECTRONIC CIGARETTE (E-CIGARETTE) ON SMOKING TOPOGRAPHY AMONG REGULAR SMOKERS

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Objectives: Electronic cigarettes (e-cigarettes) are battery-powered devices that provide inhaled doses of nicotine by delivering a vaporized propylene glycol/nicotine mixture. They are advertised as an alternative to smoked tobacco products. However, there is no evidence yet about the health effects of their long-term use, nor of their efficacy, if any, as smoking cessation aids. The aim of the study was to evaluate effect of single use of e-cigarettes on smoking topography among regular smokers.

Methods: Nine regular smokers (aged 35±20 years, 8 males, average FTND score of 2.1±2.7, average CPD of 12±12) were recruited for a randomized double-blind study. Subjects were randomly assigned to e-cigarette containing cartridge with or without (placebo) nicotine. Smoking topography of regular cigarette and e-cigarette (puff count, puff volume, average flow, puff duration, and intervals between puffs) was measured using CressMicro portable monitors (Plowshare, USA).

Results: Smokers who used e-cigarettes with nicotine took more puffs (12.0±5.8 vs. 11.0±4.5) and inhaled more deeply (71.5±68.9 vs. 54.9±13.8 mL) when compared with smoking regular cigarettes (p=0.0796). Moreover, they inhaled more frequently: intervals between puffs decreased from 13.1±17.4 to 6.6±13.3 sec. (p=0.0431). We did not find any significant differences between study and placebo groups (p<0.1).

Conclusions: Our results showed that regular smokers tend to use e-cigarettes more intensively than they smoke their regular cigarettes. This might suggest that smokers try to compensate delivered nicotine dose by puffing more frequently and by taking deeper puffs.

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POS4-67 EFFECTS OF EXPECTANCIES AND COPING ON PAIN-INDUCED MOTIVATION TO SMOKE

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The prevalence of tobacco smoking among persons with recurrent pain is approximately twice that observed in the general population. Smoking has been associated with the development and exacerbation of several chronically painful conditions. Conversely, there is both experimental and cross-sectional evidence that pain is a potent motivator of smoking. A recent study provided the first evidence that laboratory-induced pain could elicit increased craving and produce shorter latencies to smoke (Ditre & Brandon, 2008). To further elucidate interrelations between pain and smoking, and to identify potential targets for intervention, the current study tested whether several constructs derived from social-cognitive theory influence the causal pathway between pain and increased motivation to smoke. Smokers (N = 132) were randomly assigned to one of four conditions in this 2 X 2 between-subjects experimental design. Results indicated that manipulations designed to (a) challenge smoking-related outcome expectancies for pain reduction, and (b) enhance pain-related coping, each produced decreased urge ratings and increased latencies to smoke, relative to controls. An unexpected interaction effect for the urge variable revealed that the smoking-related outcome expectancy challenge was the prepotent manipulation. These findings were integrated with those of the extant literature to conceptualize and depict a causal pathway between pain and motivation to smoke as moderated by smoking-related outcome expectancies, and mediated by the utilization of pain-coping behaviors.

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POS4-68 EFFECTS OF NICOTINE WITHDRAWAL ON THE BRAIN RESPONSE TO A VERBAL WORKING MEMORY CHALLENGE

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Previous literature has reported the negative impact of nicotine withdrawal on brain function during cognitive tasks such as verbal working memory (VWM). Mechanisms of these withdrawal effects have not been clearly identified. Functional neuroimaging offers an objective method to examine brain mechanisms responsible for observable behavior and subjective reports. To investigate these mechanisms, 12 dependent smokers (7 women; mean age = 38.67; mean cigarettes per day = 13.42) were administered a 2-Back VWM challenge during two FMRI assessments. Participants abstained from smoking prior to both sessions; however, they applied a nicotine patch before one FMRI session and a placebo patch and prior to the other. Nineteen regions exhibited a significant (two-tailed $p < .001$) response to the 2-Back during either condition. In three out of five regions that exhibited deactivation, withdrawal was associated with significantly greater deactivation in left ($p = .013$) and right ($p = .004$) temporal pole and left medial frontal gyrus ($p = .009$). Differences in activation and deactivation between nicotine conditions were significantly related to craving in the majority of regions that responded to the task. Variance in individual brain responses was significantly greater during the withdrawal condition in these regions. Results suggest that differences in brain response to a working memory challenge in a state of withdrawal may be attributed to increased craving. Further deactivation of relatively deactivated regions also suggests further suspension of default network processing, possibly to compensate for more inefficient processing.

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POS4-70 SMOKING AND THE IOWA GAMBLING TASK: ARE SMOKERS POOR LEARNERS IN A TASK INVOLVING MONETARY REWARD?

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Nicotine stimulates midbrain dopamine neurons, which is thought to enhance the rewarding effects of salient environmental stimuli as well as the drug itself. The current study compared performance on the Iowa Gambling Task (IGT) in a group of smokers to a group of non-smokers. The IGT is commonly used to examine decision-making and has been shown to be sensitive to deficits in reward processing. It was hypothesized that smokers would be more likely to respond to high yielding disadvantageous decks A and B than non-smokers, and would be less likely to learn that low yielding decks C and D lead to an advantageous outcome. Deck preference across the task (5 blocks of 20 trials) was examined for both groups. Smokers and non-smokers both displayed a marked preference for disadvantageous deck B over all other decks that was stable throughout the task. This preference is consistent with previous findings on what has been referred to as the "deck B phenomenon" where it is thought that the high frequency gain and low frequency loss of deck B make it particularly appealing to participants. To examine learning across the task, t-tests were performed to compare preference to remaining decks A, C and D in block 1 to block 5. These findings revealed that both smokers ($t(46)=1.93$, $p=.06$) and non-smokers ($t(30)=2.10$, $p=.04$) displayed a similar decrease in responses to disadvantageous deck A by block 5, but failed to increase responses to good deck C: smokers, $t(46)=-.410$, $p=.68$; non-smokers, $t(30)=.461$, $p=.65$. In addition, non-smokers also learned that good deck D was advantageous by block 5, $t(30)=-3.09$, $p=.004$, in contrast to smokers, who did not increase responses to deck D, $t(46)=-.844$, $p=.403$ by block 5. These analyses show that despite a preference for deck B, learning occurred for bad deck A and good deck D for non-smokers but only to bad deck A in smokers. Failure to learn that low yielding deck D was advantageous may suggest that smokers are more driven than non-smokers to seek reward even when the consequence is negative. This reward-driven behavior may lead to shortsighted decision making, putting the substance user at risk for additional substance abuse.

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POS4-71 SALIENCE EVALUATION OF CIGARETTE STIMULI IN SMOKERS AND NON-SMOKERS

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Cigarette smokers differentially attend to smoking-related stimuli. According to Robinson & Berridge's (1993) incentive salience model, drugs-of-abuse sensitize the motivational evaluation of drug cues via their impact on the dopaminergic (DA) system. ERPs (event-related potentials) have been used to assess attention to smoking cues in smokers but, to our knowledge, no research has examined an ERP component specifically associated with DA-mediated attention. In the current study, the DA-related P2a ERP component, as well as the P300, were compared in smokers (N=21) and non-smokers (N=22) during a visual target-detection task. Images from 4 categories (cigarette-related and 3 neutral categories) were each presented twice (960 trials total) randomly and equiprobably. On each trial, one category was randomly designated as the target and participants were instructed to press a key whenever they saw an image from the target category. We predicted that the P2a and P300 would be larger to targets than non-targets, but larger to non-target cigarette images than non-target neutral images in the smokers only, reflecting smokers' evaluation of smoking stimuli as relevant even when they were non-targets. Behaviorally, smokers had more false alarms to cigarette images (responding to cigarette images when a neutral image category was the target) than non-smokers, indicating differential salience evaluation of the cigarette images by the smokers. Both smokers and non-smokers showed target-detection ERP effects with larger P2a and P300 to instructed targets. Smokers had a larger P2a and P300 to non-target cigarette images compared to non-target neutral images; however, contrary to hypothesis, non-smokers showed the same pattern, and this effect did not differ between smokers and non-smokers. Thus, while smokers showed behavioral evidence of differential salience evaluation of the cigarette images compared to non-smokers, this difference was not reflected in brain activity. It appears that both smokers and non-smokers responded differentially to the smoking stimuli, perhaps because individuals from both groups were aware that the aim of the study was related to smoking.

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POS4-72 CUE-INDUCED AND ABSTINENCE-INDUCED CRAVING IS ASSOCIATED WITH NICOTINE DEPENDENCE AMONG WOMEN BUT NOT MEN

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Recent evidence suggests that substantial variability in nicotine dependence is unexplained by smoking history (i.e., frequency and duration of use), and this variance may reflect important underlying individual differences, which could influence the ability to quit smoking. Here, we examined the relationship between residual variance in multiple measures of nicotine dependence, controlling for smoking history, and cue-induced and abstinence-induced craving. Furthermore, as women have been shown to experience greater craving following cue exposure or deprivation from nicotine, we evaluated the moderating influence of gender on the relationship between dependence and craving. Subjects (27 men, 26 women) were assessed for nicotine dependence (Nicotine Dependence Syndrome Scale, NDSS; Fagerström Test for Nicotine Dependence, FTND; Wisconsin Inventory of Smoking Dependence Motives; WISDM) and smoking history (cigarettes per day, age first puff, years smoking). Subjects then completed two laboratory sessions after 12 h abstinence or ad-libitum smoking, during which they viewed a series of smoking and neutral cues. Subjects reported greater craving after smoking cues compared with neutral cues (cue-induced craving; $p < .001$), and during abstinence compared with non-abstinence (abstinence-induced craving; $p < .001$). Women reported greater abstinence-induced craving than men ($p < .05$); there were no gender differences for cue-induced craving. After controlling for smoking history, there were no main effects of nicotine dependence on cue or abstinence-induced craving. However, significant gender by dependence interactions were observed. Among women, higher WISDM dependence was related to greater cue-induced craving ($p < .01$) and higher NDSS dependence was related to greater abstinence-induced craving ($p < .01$). There were no associations between any measure of dependence and craving for men. These findings replicate previous studies demonstrating gender differences in craving and suggest that magnitude of both abstinence and cue-induced craving may partially determined by the degree of nicotine dependence among women but not men.

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POS4-73 SALIVARY COTININE SAMPLING AMONG HABITUAL CIGARETTE SMOKERS AND CHIPPERS: CAN NICALERT COTININE TEST STRIPS DETECT ACUTE NICOTINE TRANSDERMAL ADMINISTRATION AND NICOTINE ABSTINENCE?

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NicAlert™ cotinine test strips (NCTS) have been found to be both reliable and valid when examining cigarette smoking status (Cooke et al., 2008); however, its testing has been focused primarily on chronic (2-3 day) nicotine exposure/abstinence as compared to acute. However, many studies, which examine cardiovascular responses after acute nicotine administration/abstinence are in need of a tool to measure cotinine levels; therefore, the present study was designed. Eighty males: habitual smokers (HS, $n = 38$; ≥10 cigs. per day), or chippers (CH, $n = 42$; ≥2 days per week, ≤5 cigs. per day) were tested. Participants attended both a pre-testing session and a testing session scheduled after a 12-hour overnight smoking abstinence period. During pre-testing, participants were assigned to wear either a 21mg nicotine patch or a placebo patch (nicotine abstinence). Salivary cotinine was measured using the NCTS at both sessions. Results indicated that pre-testing cotinine levels were positively correlated with self-report of the number of cigarettes consumed over the previous 24 hours for both HS and CH ($p's < .03$). Independent samples t-tests conducted to examine within-group Condition differences during the testing session indicated that HSn had greater cotinine levels than HSna ($p < .0001$) and the same pattern was also shown for CH ($p < .02$). Repeated measures ANOVA's were also conducted to examine within-group Condition effects across testing sessions. For HS, a Session x Condition interaction indicated that HSn had greater cotinine level changes that HSna ($p < .0001$). For CH, a Session x Condition interaction was also found such that CHn had greater cotinine level changes than CHna. Interestingly, analyses conducted to examine between-group Condition effects revealed a Session x Group interaction such that CHn had greater cotinine level changes than HSn ($p < .01$). No significant interactions within or between groups were demonstrated for the nicotine abstinence condition. Salivary NCTS may be an inexpensive and quick way to examine acute transdermal nicotine administration within both HS and CH; however more testing is needed to examine acute nicotine abstinence.

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POS4-74 EFFECT OF SMOKING TOPOGRAPHY ON EXPOSURE TO CARBON MONOXIDE AMONG REGULAR SMOKERS

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Objectives: Measurement of carbon monoxide concentration in exhaled air (COex), which is highly correlated with blood carboxyhemoglobin (HbCO), is a quick, non-invasive, and cheap screening method for assessing the exposure to tobacco smoke. Level of HbCO depends to the amount of CO inhaled by a smoker. CO yields in tobacco smoke might be affected by the smoking topography: puff volume, puff duration, puff frequency, puff intervals and the number of puffs taken per cigarettes. The aim of the study was to examine the effect of smoking topography on the COex.

Methods: We examined 103 regular smokers (54 women and 49 men, aged 41±14 and 31±11 years, average Fagerström score (FTND) of 4.0±2.7 and 4.3±2.8, respectively), who declared smoking at least 10 cigarettes per day. Smoking topography was measured using CressMicro portable monitors (Plowshare, USA). Smokers smoked their usual brands of cigarettes in a series of five. COex was measured 30 min after smoking last cigarette using MicroCO monitor (CareFusion, UK).

Results: Among six analyzed smoking topography parameters, only puff duration and the number of puffs had a significant effect on COex ($p<0.05$). COex was negatively correlated with a mean duration of puffs and negatively correlated with average number of puffs ($p<0.05$). COex was also positively correlated with the level of nicotine dependence as described by Fagerström Test for Nicotine Dependence (FTND), the age of smokers and the number of cigarettes smoked per day ($p<0.05$).

Conclusions: Although COex depends on smoking topography and might be biased by the way smoker smokes his cigarettes; it remains an accurate way to screen for tobacco exposure and also for nicotine dependence.

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POS4-75 EMOTION REGULATION STRATEGIES AND CIGARETTE SMOKING

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Negative affect is an important psychological factor in the promotion and maintenance of cigarette smoking, though the underlying factors that account for this relationship remain to be determined. One possible mechanism may be smokers' poor emotion regulation skills. Gross (2002) categorized emotion regulation strategies into either (1) antecedent-focused (e.g., cognitive reappraisal) or (2) response-focused (e.g., expressive suppression). Preliminary research in young adults and adolescents suggests that greater utilization of expressive suppression versus cognitive reappraisal is associated with an increased likelihood of being a smoker, earlier smoking initiation, and greater smoking frequency. There is limited research, however, on emotion regulation skills in adult smokers. This is a secondary data analysis of the associations among emotion regulation skills, smoking characteristics, and behavioral and subjective reactions assessed in a laboratory study reported previously (Fucito & Juliano, in press). Higher cognitive appraisal scores were associated with lower daily cigarette intake and depression scores as well as weaker expectancies that smoking alleviates unpleasant states. Smokers with higher cognitive appraisal scores also exhibited greater positive mood across all assessment points compared to smokers with lower scores. Higher expressive suppression scores were related to a longer smoking history, stronger beliefs that smoking does not result in addiction, and greater attentional bias to smoking cues as compared with lower expressive suppression scores. The results provide preliminary support that adult smokers' emotion regulation skills are related to smoking characteristics and motivational correlates of smoking.

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POS4-76 RELATIONSHIP BETWEEN SMOKERS' CRAVING AND AFFECT IN CUE REACTIVITY

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Historically, cigarette craving has been associated with both positive affect (PA) and negative affect (NA). Cue-reactivity methods elicit cravings by exposure to smoking cues or by the manipulation of affect. While the main effects of these methods are well documented, the relationship between affect and craving in such settings is not well studied. We examine the relationship between cue-induced craving and changes in NA and PA in response to exposure to various cues. Across six sessions, daily smokers (N = 159) were exposed to six sets of still images, each presenting different cues (Smoking, Alcohol, Non-Smoking, PA, NA, and Neutral). Craving (Questionnaire of Smoking Urges, QSU) and affect (The Affect-Adjective Scale) were assessed before and after each cue exposure. Linear regression models were used to derive outcome measures (separately for craving and affect) that controlled for baseline levels of craving and affect, and for reactivity to a neutral control cue. For Positive Cue sessions, increased craving was associated with increased NA (QSU Total: standardized beta=0.20, $p < 0.05$; Factor 1: standardized beta=0.18, $p < 0.05$; Factor 2: standardized beta=0.18, $p < 0.05$) but not PA. In the Negative Cue sessions, only increases in QSU Factor 2 craving scores were associated with increased NA (standardized beta=0.18, $p < 0.05$). Craving changes were not associated with changes in affect for any other cue sets. Results suggest that cue-induced craving is associated with changes in NA only when craving is elicited by affect-specific cues. This implies that the affective response to such cues mediates the craving response. Otherwise, affective changes do not appear to have a systematic role in cue-elicited craving.

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POS4-77 IMPULSIVITY IN SMOKERS WITH AND WITHOUT A HISTORY OF SUBSTANCE USE DISORDER

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Previous research has found that cigarette smokers are more impulsive than non-smokers. Impulsivity encompasses a range of traits associated with impaired self-regulation, such as risk-taking and inability to inhibit behavior. However, tobacco use is highly comorbid with other substance use disorders (SUDs), and other SUDs are also associated with elevated impulsivity. Smokers in previous research were not thoroughly assessed for current or past SUDs. In the present analysis, impulsivity was compared among smokers with and without a history of another SUD and non-smokers with no SUD history. Adult smokers (N=41) and non-smokers (N=25) who were interested in participating in a larger study and who had denied current or past problematic other substance use during an initial phone screen attended an in-person assessment during which they completed several self-report impulsivity scales (BIS-11, UPPS, I-7) and a structured interview (SCID) to confirm that they met inclusion criteria (i.e., no lifetime SUD history). Despite passing the initial phone screen, 39% (N=16) of smokers were disqualified from further participation based on the SCID (N=13 current or past SUD, N=3 for other reasons but also had probable current or past SUD). No non-smokers were disqualified. Results indicated no impulsivity differences between qualified (Q) smokers and non-smokers. However, disqualified (DQ) smokers had significantly higher impulsivity scores compared to both Q smokers and non-smokers. DQ and Q smokers differed on some demographic and smoking-related variables, most notably gender (88% of DQ smokers were male versus 56% of Q smokers), but these differences did not appear to account for the differences in impulsivity. Implications of these findings include: (a) brief phone interviews or other self-report scales may not be sufficient to screen out smokers with a history of SUD, (b) SUD history may contribute to impulsivity differences between smokers and non-smokers, (c) when comparing smokers and non-smokers, researchers should carefully assess for lifetime comorbid conditions in smokers that may serve as confounds.

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POS4-78 COGNITIVE CONFLICT FOLLOWING APPETITIVE VERSUS NEGATIVE CUES PREDICTS SMOKING CESSATION FAILURE

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RATIONALE: Attentional biases and executive function deficits may play a role in relapse following smoking cessation.

OBJECTIVE To determine whether smokers' pre-quit reaction times on a computerized modified Simon task (which assesses attentional biases and executive function deficits) predict abstinence following a quit attempt.

METHODS: Participants (N = 365) in a larger smoking cessation clinical trial completed the modified Simon task twice (while 10-hour nicotine deprived vs. not deprived). In the task, two photographic images (i.e., two digital slides), oriented horizontally to the left and right of a fixation cross, were displayed on a computer screen. One slide was always neutral; the other was positive, negative, smoking-relevant, or neutral. A probe (<<< or >>>) then appeared to the left or right of fixation, and participants indicated the arrow's direction, which was either congruent or incongruent with the arrow's location on the screen. The incongruency effect, a measure of executive function, was calculated by subtracting the reaction time to congruent probes from the reaction time to incongruent probes.

RESULTS: A pattern of large incongruency effects after viewing appetitive (positive and smoking) slides and smaller incongruency effects after viewing negative slides predicted poor cessation outcomes across four indices (achieving initial cessation for at least 1 day, abstinence at 1 week post-quit, days smoked in the first week post-quit, and abstinence at 8 weeks post-quit). In general, participants with poor cessation outcomes showed little effect of congruency/incongruency with regards to probes following negative slides.

CONCLUSIONS: Results suggest that participants with poor cessation outcomes processed negative slides quickly, possibly due to affective priming or due to a defensive processing style that avoids the processing of negative or threatening material. Such participants may also have found the appetitive slides particularly distracting and difficult to shrug off. Differences in relatively automatic responses to affective cues distinguish smokers who are successful and unsuccessful in their smoking cessation attempts.

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POS4-79 PATTERNS OF CONSUMPTION OF SMOKELESS TOBACCO AND NICOTINE REPLACEMENT PRODUCTS AS ALTERNATIVES TO CIGARETTES

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There is merit in understanding how smokers might use alternative nicotine delivery systems. A pilot study gave participants (N=59) the opportunity to use alternative products for 2 weeks (a week supply of Camel Snus, Marlboro Snus, Commit lozenges, and Stonewall pieces given visit 2 and a week supply of their favorite product given visit 3) to see if using such products reduced or eliminated cigarette use. Participants liked Commit lozenges most (32.8%), least liked Stonewall (29.9%). Participants thought Camel Snus had the most nicotine (31.3%). Overall, a plurality (28.4%) chose Commit as their preferred product to take home week 3. During the sampling phase, participants smoked an average of 78 cigarettes, but used only 25% as many alternative products (18). During the trial phase, participants used an average of 69 cigarettes as opposed to 29 alternative products. However, some participants smoked slightly fewer cigarettes, but increased alternative product consumption so much that they exceeded their tobacco consumption before study. Over the course of the 7-day trial phase, daily cigarette use decreased from 11.7 to 8.9 cigarettes on average, while alternative product use increased slightly, from 4.4 to 4.8 units. Participant ratings of 'need' for their cigarettes and alternative products followed similar patterns. At visit 3, 34.3% said they were 'somewhat likely' to use their favored product instead of their usual cigarettes and 29.9% said the same after a one week trial. This pilot study showed that smokers might be willing to use alternative products in the short term as temporary substitutes for smoking, but not necessarily as a permanent alternative nicotine source. In particular, smokers seemed more willing to use a medicinal nicotine product over a tobacco-based product.

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POS4-80 SMOKING TOPOGRAPHY INSIDE AND OUTSIDE THE LABORATORY

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A common question in smoking behavior research is whether laboratory results are indicative of natural behaviors. Here, we examined the differences between lab and field smoking topography measures in a cohort of subjects providing multiple measurements. Data were collected over a two-week period of four lab visits and two field collections as part of a larger study of low ignition propensity cigarettes. Participants (N=83) completed two laboratory visits two days apart, with a cigarette smoked at each visit using the CReSSmicro® device. For the two days between lab visits, the participants took the CReSSmicro® unit home and smoked at least 5 cigarettes per day through the device. The cycle repeated the following week, for a total of 4 lab visits and two 2-day field measurements. A paired samples t-test revealed that lab cigarettes were smoked more intensely than field cigarettes on every topography measure ($p<0.05$). Further investigation of TotalVolume adjusted for demographics illustrated that the relative difference in means between the two settings did not vary from the unadjusted values (unadjusted M=710mL(SE=21) lab vs. 540mL(SE=17) field; adjusted M=689mL(SE=33) lab vs 545mL(SE=28) field, $p<0.05$). This indicates that cigarettes were smoked dissimilarly and more intensely in the lab than in the field. There are several reasons for the difference in smoking behaviors. In the lab, participants waited approximately 45 mins before smoking. It is possible that participants began to experience withdrawal symptoms and thus smoked more intensely to help alleviate them. Due to NYS clean air laws and RPCI's smoke-free policy, participants smoked outdoors off campus. Thus, participants may have smoked more quickly and intensely to escape the harsh winter weather. Conversely, in the field, participants smoked ad lib in their natural smoking environment. Therefore, field measures may provide a more accurate depiction of the smokers' actual behaviors.

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POS4-81 EVALUATING ACUTE TOBACCO REACTIVITY AS A PHENOTYPIC MARKER OF DEPENDENCE: PREDICTING WITHDRAWAL AND RELAPSE

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Introduction: Preclinical research suggests variations in the reward and reinforcement value of nicotine after a period of abstinence may be mediated by different genetic, cellular, and neurological mechanisms. Objective measures of reward and reinforcement in humans have yet to be developed. However, subjective reports can reliably assess both positive mood effects and negative reinforcing value (decreased negative mood) of acute tobacco reactivity. We aimed to: (1) evaluate the strength of relationships between subjective reactions to tobacco; (2) prospectively assess the relation between acute tobacco reactivity and subsequent cessation-related withdrawal trajectories; and (3) investigate how acute tobacco reactivity influenced cessation outcomes.

Method: We studied 183 chronic smokers who were interested in smoking cessation. Mean age was 42.8 years, 55% were female and 95% were Caucasian. Participants averaged 25.8 cigarettes per day and reported regular smoking for 24.6 years. Before an unaided quit attempt and after 12 hours of overnight abstinence, they rated subjective effects before and immediately after smoking a 1mg nicotine cigarette. Post-quit assessments occurred at 0, 2, 7, 14, and 30 days.

Results: After the cigarette challenge, decreases in urges were not related to changes in mood reactivity measures (r's= -0.06, 0.13). Concurrent positive and negative mood reactivity to the cigarette challenge were moderately associated ($r=-0.22$, $p < .01$). Tobacco reactivity during the cigarette challenge predicted withdrawal symptom trajectories after cessation (p's $< .02$). Those symptom trajectories predicted relapse to smoking (p's $< .01$). Less positive mood after overnight abstinence (RR=0.89, $p < .07$) predicted relapse (smoking on 7 consecutive days). Interestingly, greater increases in positive mood after smoking the first cigarette also predicted relapse (RR=1.25, $p < .001$).

Conclusion: These prospective data suggest that acute tobacco effects on positive mood may represent phenotypes predictive of both acute withdrawal symptoms and relapse after cessation, two key indices of tobacco dependence.

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POS4-82 RELATIONSHIP BETWEEN RESPIRATORY FUNCTION, BLOOD PRESSURE, HEART RATE AND SMOKING TOPOGRAPHY

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Objectives: There are a limited number of studies concerning the effects of different factors (physiological, genetic, and social) on smoking topography. In this study, we tested hypothesis that diversity of smoking topography among regular smokers might be due to their physiological characteristics, such as functions of respiratory or cardiovascular systems, age, weight and coexisting diseases. The aim of the study was to characterize smoking topography and its diversity in a selected group of regular smokers, and to assess the impact of their physiological characteristics on the smoking profile.

Methods: We examined 103 of active smokers (54 women and 49 men, aged 41±14 and 31±11 years, average Fagerström score (FTND) of 4.0±2.7 and 4.3±2.8, respectively), who declared smoking at least 10 cigarettes per day. Smoking topography was measured using CressMicro portable monitors (Plowshare, USA). Smokers smoked their usual brands of cigarettes in a series of five. Spirometry tests were carried out 30 minutes after smoking last cigarette using MicroLoop portable spirometer (CareFusion, UK). Following features were monitored: Vital Capacity (VC), Forced Expiratory Volume in One Second (FEV1), FEV1/VC, and Forced Vital Capacity (FVC). Blood pressure and a heart rate were also measured using M3 monitor (Omron, Japan).

Results: We found that among all studied physiological characteristics, only VC had a positive effect on puff volume and its duration ($p<0.05$). The average number of puffs taken by smokers negatively correlated with VC ($p<0.05$). We did not find any correlation between smoking topography and blood pressure or heart rate.

Conclusions: Physical characteristics of smokers seem to have minor effect on their smoking topography. There is a need for future studies to evaluate simultaneously various factors that might affect the way smokers smoke their cigarettes.

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POS4-83 SMOKING WITHDRAWAL IS ASSOCIATED WITH INCREASES IN BRAIN ACTIVATION DURING DECISION MAKING AND REWARD ANTICIPATION

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Smoking withdrawal is associated with disruption of mood, executive function and reward processes. We sought to evaluate the effects of smoking withdrawal on brain function during reward-based decision making by fMRI scanning smokers following 24 hrs of smoking abstinence and after smoking as usual. During scanning, participants (n=13; mean cigarettes per day=16.85, SD=3.98; mean age=30.69, SD=9.7) completed a Wheel of Fortune task comprised of 3 phases. During the selection phase, participants chose between two probable outcomes (e.g., 10% chance of winning $7 v. 90% chance of winning $1). During the anticipation phase participants rated their confidence in their selection. Last, during the outcome phase participants were notified whether they had won or not and rated their hedonic response to the outcome. Control trials during which no decision was made were also presented. Analysis of behavioral responses indicated that smoking abstinence significantly slowed decision-making ($p < .05$), and increased risk preference on moderate but not high-risk choice trials ($p = .068$). fMRI data were preprocessed and analyzed with FSL 4.1.4. During reward selections, decision-making was associated with greater activation in the abstinent compared to satiated condition in central and frontal cortices (BAs 6, 31 and 47), and right ventral striatum (vSTR). During the reward anticipation phase, greater activation was observed in left insula in the abstinent compared to satiated condition. During the outcome phase, gains (compared to no gains) resulted in significant activation in the right orbitofrontal cortex in the satiated compared to abstinent condition. Findings suggest that smoking abstinence (1) increases the salience of cues representing probabilistic monetary outcomes; (2) increases physiological arousal during the anticipation of outcomes; but (3) disrupts processing of reward outcomes. These results provide novel insights into the effects of withdrawal on neural processing of non-drug rewards and will be discussed in the context of smoking dependence and relapse.

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POS4-84 EFFECTS OF 24 HOURS OF TOBACCO WITHDRAWAL AND SUBSEQUENT TOBACCO SMOKING IN MALE AND FEMALE SMOKERS

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Previous research has demonstrated that women may be more susceptible to the effects of smoking after a period of withdrawal. This study examined the effects of 24 hours of tobacco deprivation and subsequent smoking of an experimental cigarette in male and female smokers. Twenty healthy tobacco-smoking volunteers, ages 18-38 (10 female), completed two consecutive test days per week for three consecutive weeks. Each week, assessments were completed during ad libitum smoking, as well as before and after the paced smoking of a tobacco cigarette following 24 hours of tobacco abstinence, verified via CO level. The tobacco cigarette contained one of three nicotine yields (0, 0.6, or 0.9 mg), with nicotine yield presented randomly across weeks under double-blind conditions. Assessments consisted of psychomotor and cognitive task performance, cardiovascular assessment, and subject-ratings. Male and female smokers were comparable in age, smoking history, and personality. Sex differences were found on cardiovascular function and subject-ratings following tobacco deprivation, with females showing greater decreases in heart rate and blood pressure and increases in tobacco withdrawal (i.e., MNWS irritated and restlessness scales). Sex differences were also observed in the subsequent effects of tobacco smoking, with females reporting greater subject-rated increases in drug effects and decreases in negative mood (i.e., POMS anxiety and anger, and MNWS irritated) as a function of nicotine yield. No sex differences were observed on psychomotor or cognitive task performance. These data suggest that females may be more sensitive to the effects of smoking a cigarette containing an active nicotine-yield following tobacco deprivation.

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POS4-85 SMOKER SELF-IDENTIFICATION AMONG DAILY AND NON-DAILY SMOKERS

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Introduction: People who smoke differ in whether they see themselves as "smokers." Little research has examined correlates of smoker identity among daily (DS) and non-daily smokers/intermittent smokers (ITS).

Method: Non-treatment seeking self-reported DS (n=119; self-report smoking "Every Day") and ITS (n=110; smoking 4-26 days per month) were recruited to take part in a study of smoking patterns. Smoker identity was calculated as the average score on a 7-item scale (e.g., "Smoking is part of my self-image"). Each question was scored on a ten-point scale (1=Strongly Disagree, 10=Strongly Agree). All subjects answered questions about smoking characteristics, including dependence.

Results: ITS smoked 4.08 (SD=1.59) days per week (DPW) on average and 5.17 (SD=3.94) cigarettes per day (CPD) on days that they smoked. In contrast, DS smoked 6.88 (0.52) DPW and 15.33 (6.74) CPD. Linear regression was used to model correlates of smoker identity. As expected, DS identified as smokers more than did ITS (Mean: 5.85[SD=2.10] vs. 3.17[SD=3.07], $p < 0.001$). The wide range in reported smoking identity overlapped for DS (1.3–10) and ITS (1-9.3), but there was greater variability among ITS (coefficient of variation [CV]=56.53) than DS (CV= 35.72). Smoker type accounted for 32.68% of variance in identity. Within smoker type, consumption variables accounted for 22.21% (ITS) and 18.56% (DS) of variance in identity. When NDSS total dependence score was added to the model (controlling for consumption), it accounted for a significant proportion of variance in overall ($sr2=0.743$; $B= 0.79$, $p < 0.001$), and within smoker types (ITS: $sr2=0.138$; $B=1.05$, $p < 0.001$; DS: $sr2=0.098$; $B=0.61$, $p < 0.001$). Separately, FTND did not account for any incremental variance overall or within smoker type.

Conclusion: As expected, ITS were less likely to have strong identities as smokers. However, there was variability within ITS and DS as well, and overlap between the groups. Factors beyond frequency of consumption, particularly level of dependence, are related to smoker identity. Understanding more about smoker identity could augment the behavioral and psychological profiles of individuals who smoke.

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POS4-86 TECHNICAL APPROACHES AND CHALLENGES TO IDENTIFICATION OF PUFF-ASSOCIATED INHALATIONS IN LABORATORY AND AD LIB SMOKING

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Exposure to tobacco smoke has usually been described using variables that define puffing – bringing mainstream smoke from the burning cigarette rod into the mouth. Indeed parameters for machine smoking of cigarettes defined by the Federal Trade Commission (FTC) and the International Standards Organization (ISO) were derived from puffing behavior. However, thoracic exposure to cigarette smoke is the result of inhalation – bringing smoke into the lungs and the lower respiratory tract where nicotine absorption occurs, volatile and nonvolatile smoke components deposit and pathology develops. We have begun experiments to determine whether puff or inhalation measures are better predictors of exposure. These experiments have challenged us and others to distinguish inhalations associated with smoking from normal breathing. We will present practical solutions by describing an algorithm developed from inhalation and puff recordings from 19 individuals smoking on three occasions each. The algorithm uses a least squares best-fit solution of intervals between puffs, inhalations, and subject-activated puff event markers. The output graphically illustrates the inhalation profile and provides a tabular summary of (volume and velocity) individual puffs and their associated inhalations. When applied to the data set for three conditions of smoking (879/963) 91.2% of the puff associated inhalations were identified immediately; the other 8.8% required operator decision. The individual smoking inhalation pattern appears to influence successful automation--3 of the 19 participants accounted for 63% of the data that required operator decision. The algorithm robustly facilitates post hoc synchronization of data from independent puff and inhalation instruments. This synchronization work paves the way for identification of smoking-associated inhalations without concomitant puff data, making possible smoke exposure measurements outside the laboratory in various postures and behavioral circumstances and with products that are not amenable to puff measures (e.g., roll your own cigarettes, marijuana joints, hookah)

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POS4-87 DEEP BRAIN STIMULATION OF THE VENTRAL CAPSULE/VENTRAL STRIATUM AND EXPERIENCED REWARD IN TWO DEPRESSED SMOKERS

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The impact of persistent smoking on reward systems in individuals with mood disorders remains unclear. Dysfunction in reward systems has been cited as potential cause of persistent anhedonia. Further, chronic smoking may leave reward systems less responsive (Kenny & Markou, 2001). These dysfunctions in reward systems may increase the hedonic value of smoking and sustain dependence. Incentive sensitization models (Robinson & Berridge, 2001) broaden the concept of nicotine dependence in suggesting separable neural substrate systems that parse the core hedonic 'liking' effects of nicotine from cognitive and conditioned 'wanting' that motivates smoking behavior. Although objective measures have not been developed for humans, subjective assessments of wanting to smoke, relief from craving, and negative reinforcing value of smoking can be used to explore functional impacts on reward and reinforcement systems. Deep brain stimulation (DBS) of the ventral striatum and adjacent ventral capsule (the VC/VS), while clearly improving positive affect in patients with either OCD or major depression (Nuttin et al., 2008; Greenberg et al., 2008; Malone et al, 2009) is not itself clearly rewarding or aversive in humans (Strum et al, 2003; Schlapfer, 2008). The literature to date suggests that DBS in this region is unlikely to promote drug craving directly, and a case report has described how DBS of this circuitry decreased the rate of hazardous drinking (Kuhn et al, 2007). This impression is reinforced by a study in rats, which found that DBS-like stimulation of the VS reduced reinstatement of cocaine seeking after abstinence (Vassoler et al., 2008). Given the theoretical importance of the wanting/liking distinction in understanding addiction, and the ability to directly modulate reward circuitry with DBS, we systematically assessed these features in two chronic smokers who received DBS for otherwise intractable affective illness. There have been to our knowledge no reports about how drug "wanting" and "liking" change after DBS to the VC/VS in humans. We present two cases where these features of chronic cigarette smoking changed during DBS to reward circuitry and adjacent regions.

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POS4-88 MOUTH LEVEL NICOTINE AND URINARY METABOLITES AMONGST SMOKERS OF CIGARETTES IN DIFFERENT YIELD CATEGORIES

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As part of an ongoing study approved by CDC and Battelle Institutional Review Boards we are assessing the body burden of smoke toxicants associated with smoking cigarettes across a wide range of yield categories (ultralight, light, and full flavored cigarettes). These preliminary data report on smoking characteristics for all completed participants (n = 233) and mouth level delivery of nicotine and select urine metabolites for a subset of participants: light cigarette smokers (n = 73), full-flavor menthol smokers (n = 91) and full-flavor non-menthol smokers (n = 57). All participants had smoked their current cigarette brand for at least 3 months. Participants smoked their usual cigarette brand ad libitum between and during two clinic visits (AM and PM) on consecutive days. Each participant kept a smoking diary that recorded time, mood, activity, location, cigarette type, cigarette size, race, gender, years as a smoker, and other information. Participants provided a urine sample at each clinic visit and cigarette butts from all cigarettes smoked between clinic visits. Among all participants, menthol smokers smoked 14.4 cigarettes per day (CPD) and non-menthol smokers smoked 18.6 CPD. Controlling for sex, cigarette type, and other cigarette characteristics, white participants smoked a mean of 18 CPD while black/African Americans (black) smoked 12.6 CPD. Mouth level exposure to nicotine was calculated from solanesol levels in the cigarette filter. Mean mouth level nicotine per cigarette was significantly different between full flavored menthol (1.31 mg/butt) or full flavored non-menthol (1.23 mg/butt) and light (0.96 mg/butt) cigarettes. Black smokers had higher calculated mouth level nicotine (1.47 mg/butt) than white smokers (1.07 mg/butt). Participants craving a cigarette "very much" had significantly higher mouth level nicotine than those not craving a cigarette at the time the cigarette was smoked. Data will be presented for urine metals and urine metabolites of polynuclear aromatic hydrocarbons and volatile organic compounds.

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POS4-89 EFFECTS OF LOW DOSE NICOTINE ADMINISTRATION AND NICOTINE ABSTINENCE ON STRESS-INDUCED CARDIOVASCULAR REACTIVITY IN A SAMPLE OF CHIPPERS

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Cigarette smoking is the number one modifiable risk factor for cardiovascular disease and thus has prompted researchers to further investigate the pathophysiological mechanisms by which nicotine leads to mortality and morbidity. Because nicotine affects the body by way of the sympathetic nervous system (SNS) much like psychological stress does, several researchers have investigated the effects of nicotine and stress together. Approximately 5-10% of adult smokers are light or occasional smokers (CDC, 1989) and they are becoming an important group to study. Previous research has demonstrated that chippers show greater myocardial reactivity to psychological stress under the influence of nicotine (21 mg patch) as compared to chippers in a nicotine abstinence period (VanderKaay & Patterson, 2007). While this finding is important, it may not be ecologically valid as chippers rarely consume this amount of nicotine. Therefore, the present study assessed the effects of low dose nicotine administration (7 mg patch) and sixteen-hour nicotine abstinence (placebo patch) on stress-induced cardiovascular reactivity among chippers. Sixteen healthy chippers (11 males, 5 females, M = 21.4 years of age, SD = 2.22), received either a 7 mg nicotine patch (n = 9) or a placebo patch (n = 7), which they wore during a 16-hour cigarette smoking abstinence period. After the overnight abstinence period, cardiovascular reactivity (HR, SV, CO, SBP, DBP, TPR) was recorded during a 10-minute seated baseline period, a 5-minute Star Mirror Trace Task (SMTT), and a second 10-minute recovery period. Repeated measures analyses revealed significant Task main effects were demonstrated for HR, SV, SBP, DBP, and TPR (p's < .01), such that HR, SBP, DBP, and TPR increased from baseline to SMTT and SV decreased. However, no differences in baseline cardiovascular functioning, Condition main effects, or Task x Condition interactions were demonstrated. Consequently, wearing a 7 mg nicotine patch did not alter cardiovascular reactivity to psychological stress in this sample of chippers. More research is needed to further demonstrate the biological mechanisms by which cigarette smoking can lead to disease.

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POS4-90 RELATIONSHIPS BETWEEN INHALATION AND PUFF VARIABLES ON TOBACCO SMOKE EXPOSURE

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In the present study, we compared puffing and inhalation measures under three smoking conditions: C1) own brand without restrictions, C2) own brand after overnight tobacco abstinence and C3) Quest #3 (low nicotine cigarette). We determined the consequent effects of puffing, inhalation, plasma nicotine boost, and carbon monoxide (CO) boost. Participants were 19 men (11 men) and women with a mean age of 39.3 yr. CO boost in C1, C2, and C3 averaged 5.0 ppm, 5.4 ppm, and 5.1 ppm, respectively. Nicotine boost averaged 14.3 ng/ml, 14.9 ng/ml, and a negative "boost" of -0.1 ng/ml for C1, C2, and C3, respectively. There were concomitant changes in puff topography induced by C2 or C3. For example, puff volume averaged 115, 115, and 126 ml in C1, C2, and C3, respectively while total puff volume averaged 1894, 1909 and 1578 ml. The ratios of the total puff volume to the total inhalation volume for C1, C2, and C3 were 7.7, 8.9, and 7.8, respectively. The increase in the ratio in C2 was due to a proportionately larger increase in the total inhalation volume relative to the puff volume. Similarly puff duration (2.0 to 2.3 sec) and puff velocity (76.2 to 77.7 ml/min) varied slightly between conditions. C1 differed from C3 smoking by more puffs per cigarette (16.7 vs. 13.2) and total puff volume (1894.0 vs. 1577.9 ml). C1 smoking differed from C2 smoking by a decrease in puff duration (2.1 vs. 2.0 sec) and an increase in inhalation velocity (354.7 vs. 443.6 ml/sec). Significant correlations occur (r = 0.70, 0.46) between puff and inhalation measures of volume and between measures of duration (r = 0.50) in C1. There were no significant correlations among measures of velocity. These data suggest a relationship between puffing and inhalation volume and duration that is diminished after tobacco abstinence. Neither puffing nor inhalation variables significantly correlated with measures of exposures (CO and nicotine boosts). This analytic approach is being extended to a larger data set with participants smoking cigarettes of various tar levels.

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POS4-91 PRENATAL EXPOSURE TO MATERNAL CIGARETTE SMOKING INTERACTS WITH A POLYMORPHISM IN THE β NICOTINIC ACETYLCHOLINE RECEPTOR GENE TO INFLUENCE DRUG USE AND STRIATUM VOLUME IN ADOLESCENCE

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In the United States, over 700,000 newborns are exposed in utero to maternal cigarette smoking each year. Prenatal exposure to maternal cigarette smoking (PEMCS) has been associated with a number of molecular, neuroanatomical and behavioral modifications in the human and animal. We have shown previously that PEMCS increases adolescent substance use in relation to the thinning of the orbitofrontal cortex. We now extend these studies to demonstrate that PEMCS interacts with a single nucleotide polymorphism in the α6 nicotinic acetylcholine receptor (nAChR) subunit to increase the likelihood of adolescent cigarette smoking and substance use as well as to modify the volume of dopamine-rich regions of the striatum. In a population of 423 adolescents, we have collected unique behavioral, genetic and structural brain imaging data from the ongoing Saguenay Youth Study aimed at evaluating the effects of PEMCS on the brain and behavior of adolescent offspring. Our data illustrates that PEMCS interacts with a single nucleotide polymorphism (SNP) in the 3' untranslated region (UTR) of the α6 nAChR subunit gene to mediate an increase in substance use and influence morphological changes in the volume of the striatum, a dopamine rich region of the brain that mediates reward. Adolescents that have the GG, versus C-carrier, genotype of the α6 SNP are influenced by PEMCS, marked by increased drug intake and larger striatal volumes. These findings suggest that the developing brain is distinctively sensitive to nicotine-induced adaptive neural plasticity and highlight a putative role of the 3'UTR of the α6 gene in mediating, at least in part, these effects.

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POS4-92 THE EFFECTS OF SWEDISH SNUS ON CIGARETTE CRAVING AND SELF-ADMINISTRATION IN DAILY SMOKERS

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Swedish snus has recently garnered controversy for its proposed use as a smoking cessation aid. This study sought to directly compare the effects of snus and nicotine on symptoms of tobacco craving and withdrawal in smokers. During four double-blind placebo-controlled randomized sessions 15 smokers (8 male) sampled traditional Swedish snus, tobacco/nicotine-free snus, a nicotine-containing lozenge or placebo lozenge for 30 minutes and were then given the opportunity to self-administer their preferred cigarettes over the next 60 minutes using a computerized progressive ratio task. Swedish snus reduced significantly symptoms of craving relative all other products ($p < 0.05$) as well as significantly increased the latency to self-administration among males ($p < 0.05$). The present data suggest that Swedish snus may be more effective in relieving tobacco abstinence symptoms than standard nicotine replacement therapy and its therapeutic potential should be further assessed.

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POS4-93 CUE-REACTIVITY IN THE NATURAL ENVIRONMENT OF CIGARETTE SMOKERS: A COMPARISON OF PHOTOGRAPHIC AND IN VIVO SMOKING STIMULI

Jennifer M. Wray*, Stephanie A. Godleski, and Stephen T. Tiffany

The cue reactivity paradigm has been used extensively in laboratory settings to assess craving, but has only been used in one study to measure craving in the addict's natural environment (Warthen & Tiffany, 2009). The present study utilizes ecological momentary assessment to assess cue reactivity in smoker's natural environments (CREMA) as a further validation and replication of this procedure. Participants were 68 daily cigarette smokers (41 female, 27 male) with an average age of 42 years, an average expired carbon monoxide level of 31.7 ppm, and an average number of cigarettes smoked per day of 20. Participants carried a personal digital assistant (PDA) for an eight-day period and were asked to respond to PDA alarms, which signaled the start of a CREMA trial. On average, they responded to 29 (out of a possible 32) cue reactivity trials. In vivo trials involved participants taking out and looking at a cigarette or neutral object, while photographic trials involved participants looking at a smoking related or neutral photo on the PDA. Baseline craving and mood was assessed, as well as craving, mood, distraction and focus after cue presentations. Participants were also instructed to log each cigarette smoked over the course of the study. Cues were also presented in the laboratory both before (Lab I) and after (Lab II) the eight-day CREMA procedure. Initial analyses indicated that smoking cues produced stronger craving than neutral cues in both the laboratory and real world setting, with smoking photos producing the strongest craving effects across all three session types. In addition, cue-specific craving was more pronounced during the Lab I and real-world sessions than in the Lab II sessions, with ratings dropping during the Lab II session across all trial types. Additional analysis on time since last cigarette and latency to next cigarette after each type of trial in the natural environment, as well as further analysis of mood, distraction, and focus ratings will be presented to clarify the findings. The continued development of the CREMA procedure for studying craving processes in natural settings will be discussed.

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POS4-94 INDEPENDENT AND COMBINED EFFECTS OF ALCOHOL AND NICOTINE ON MOOD

Jason A. Oliver*, Andrea Elibero, Diana Diaz, and David J. Drobes

Mood is thought to play a prominent role in both the development and maintenance of alcohol and tobacco use. Despite extensive documentation of the strong associations between alcohol and tobacco use, research examining the effects of combined use on mood is scarce. The present study sought to fill that gap by examining both the separate and combined effects of alcohol and nicotine on mood. Participants ($n = 87$) with a wide range of alcohol and tobacco use patterns attended 4 laboratory sessions. At each session, they consumed two beverages containing either alcohol or placebo, and smoked one nicotinized or denicotinized cigarette in a fully crossed and counterbalanced 2 x 2 design. Mood was assessed both before and after consuming the drinks and smoking the cigarette, as well as approximately 20 minutes later, following a computerized cue-reactivity assessment. Results revealed that nicotine significantly increased positive mood ($p < .05$) but alcohol did not regardless of whether it was accompanied by nicotine. This effect did not differ as a function of either alcohol or nicotine dependence level. The degree to which participants reported positive reinforcement as a significant motivator to smoke also did not influence this effect. In addition, nicotine significantly decreased negative mood ($p < .01$), but again, no effects for alcohol were found. While this effect did not differ as a function of alcohol dependence, nicotine dependence did influence this effect at the trend level ($p < .06$), with participants higher in nicotine dependence experiencing a greater decrease in negative mood. In contrast to the findings for positive mood, participants who reported negative reinforcement as a motivator to smoke did experience a significantly greater reduction in negative mood ($p < .05$). Despite a substantive literature documenting the mood effects of alcohol consumption, findings from the present study indicate that when smoking and drinking are done together, changes in mood are driven by the effect of nicotine, not alcohol.

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POS4-95 STRESS EXPOSURE IN ADOLESCENTS DIFFERENTIALLY ALTERS RISK-TAKING IN ABSTINENT AND NON-ABSTINENT SMOKERS AND IMPULSIVITY IN SMOKERS AND NON-SMOKERS

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Impulsivity appears to be important in adolescent smoking, with data indicating that impulsive smokers attempting cessation are at greater risk of relapse to smoking (Krishnan-Sarin et al., 2007). We studied the relationship between stress, smoking status and abstinence through the use of personalized stress imagery (Sinha et al., 1999) in adolescents participating in a 4-week CM/CBT smoking cessation protocol (Krishnan-Sarin et al., 2006). 12 smokers (mean age = 17.2 ± 0.84) and 15 non-smokers (mean age = 15.7 ± 1.10) participated in a two-session protocol assessing change in impulsive or inattentive responding (Continuous Performance Test – II; CPT-II), risk-taking (Balloon Analogue Risk Task; BART), nicotine withdrawal symptoms (Minnesota Nicotine Withdrawal Scale; MNWS) and self-reported stress (Visual Analogue Scale; VAS) before and after stress induction. Analyses utilized repeated measures ANOVA. From pre- to post-stressor, participants endorsed increases in stress on the VAS ($p = .002$), anger ($p < .001$), depression ($p < .001$) and anxiety on the MNWS ($p = .033$). Only smokers evidenced an increase in tobacco craving (mean difference = .67), with all non-smokers denying tobacco craving across time-points. A main effect of smoking status was observed for CPT-II inattention ($p = .015$) and impulsivity ($p = .074$), with greater inattention or impulsivity across timepoints in smokers. A trend level interaction of smoking status by time was observed for CPT-II impulsivity ($p = .073$); here, non-smokers' impulsivity decreased by 3.44 T-score points after stress exposure, whereas smokers' impulsivity increased by 2.31 points. When examining end of treatment abstinence within smokers, an interaction of abstinence status and time was observed on the BART ($p = .012$). Specifically, abstinent smokers decreased their risk-taking by 4.5 balloon pumps after stress exposure, while smokers increased their risk taking by 3.5 pumps. Overall, it appears that impulsivity is differentially altered by stress exposure in adolescent smokers and non-smokers and that adolescent smoking cessation success may be associated with decreased risk-taking in the face of stressors.

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POS4-96 ARE THERE AGE-DEPENDENT DIFFERENCES IN THE MECHANISMS THAT MEDIATE NICOTINE DEPENDENCE?

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Clinical studies suggest that adolescents are more vulnerable to tobacco abuse and this causes a greater risk of long-term heath deficits for persons who begin using tobacco during the adolescent period of development. Pre-clinical studies have shown that there are fundamental differences in the mechanisms that drive nicotine abuse in adolescents and adults. Specifically, recent rodent studies suggest that enhanced tobacco abuse during adolescence is driven by two factors: (1) the positive effects of nicotine during adolescence are greater than in adults and (2) the negative effects associated with nicotine and withdrawal from this drug are substantially lower than those experienced by adults. The overall result is that adolescents seek nicotine because the enhanced positive effects they experience are inadequately balanced against minimal negative effects. Behavioral evidence from animal studies will compare the positive and negative effects of nicotine in adolescent and adult rats. A theoretical framework will also be presented to explain why adolescents are different from adults with regard to neurochemical mechanisms involving enhanced excitatory and underdeveloped inhibitory influences on dopamine transmission in the mesolimbic reward system. Lastly, the clinical implications of our hypothesis will suggest that the current diagnostic criteria for nicotine dependence that was developed for adults may be inappropriate for adolescents who experience less withdrawal, and as a result, may be less responsive to tobacco cessation treatments that focus on reducing withdrawal.

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POS4-98 IN VIVO AND IN VITRO NICOTINE METABOLISM AND COTININE FORMATION IN ZEBRA FINCHES

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Nicotine has been shown to be beneficial for patients diagnosed with a neurodegenerative disorder, such as Alzheimer's Disease and schizophrenia. Scientific evidence from both human and experimental animal research shows that cognitive processes are improved while using nicotine. The zebra finch is considered as a high order model for cognition. The Cappendijk lab designed an in vivo nicotine treatment regimen for the zebra finch and observed a dose-dependent effect on song production and locomotor activity in the first two hrs after nicotine exposure. In addition, nicotine and cotinine was present in fecal samples. This latter finding did not give insight in to the in vivo and in vitro metabolism of nicotine in the zebra finch. The goal of this study was to examine if cotinine can be made under in vivo and/or in vitro conditions. In vivo experiment: Male zebra finches received a single injection of nicotine (0.18 mg/kg, sc) and blood samples were drawn by cardiac puncture 20 minutes later. Both nicotine and cotinine were detected indicating the in vivo formation of cotinine in finches. In vitro experiment: Finches (N=4/group) dosed with saline or 0.18 mg nicotine/kg sc for 1 or 7 days were sacrificed 30 min after the last injection. The livers were weighed and flash frozen. The velocity of cotinine formation (pmol/min/mg protein) from nicotine was measured in liver microsomes. All animals made cotinine from nicotine in vitro. Initial assessments of cotinine formation from a high (»Vmax) concentration of nicotine (480 μM) indicated that the metabolism was faster in animals exposed to a single nicotine injection vs. the group of finches exposed to multiple nicotine injections (32±16 vs. 13±8, resp.). This suggests reduced metabolism following chronic nicotine exposure, as seen in humans and monkeys. Following 24 hr withdrawal from chronic nicotine the cotinine formation returned to levels seen in the saline group (23±13 vs. 21±2 resp.). This study lays the foundation for understanding the impact of in vivo nicotine exposures in the zebra finch and will help us interpret nicotine pharmacological studies in this innovative animal model.

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POS4-99 RACIAL AND GENDER DIFFERENCES IN TOTAL NICOTINE METABOLITES IN SMOKERS URINE

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There are a number of clear differences between male and female smoking behaviors. For example, males tend to smoke more cigarettes per day (CPD), start smoking earlier in life, and are more successful in their attempts to quit. Likewise, there are substantial differences in smoking behaviors among ethnic groups. For example, African Americans (AA) and Asians demonstrate lower rates of current smoking than Caucasians (CAU) and Hispanics; however, CAU are more likely to be successful in their attempts to quit smoking. Despite knowledge of these differences, the specific mechanism for these differences remains unclear. The present study explores one potential factor that may contribute to these differences: variation in the biological processing of nicotine. Total nicotine intake per cigarette smoked was assessed via a range of nicotine metabolites in the urine of AA and CAU male and female smokers, controlling for CPD. For lighter smokers (<20 CPD), CAU females had 52% more overall nicotine intake per cigarette than CAU males ($p < .05$). There was a non-significant difference between AA and CAU females. AA females had 44% more nicotine intake per cigarette than AA males ($p < .01$), and 82% more nicotine intake per cigarette than CAU males ($p < .01$). For heavy smokers (≥20 CPD), there were no gender or ethnic differences in total nicotine intake per cigarette smoked. This is likely due to a plateau effect in levels of nicotine metabolites observed in those who smoke more than 20 cigarettes per day. These data show that there are clear differences in smoking behavior patterns between racial groups and gender in lighter smokers (<20 CPD), a pattern not observed in heavier smokers (≥ 20 CPD). These findings suggest one important pathway that may account for differences in smoking behavior, and further research is warranted.

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POS4-100 THE NEUREXIN-1 GENE AND TOBACCO DEPENDENCE: ASSOCIATION WITH EARLY AGE-AT-ONSET AND PREVIOUS QUIT ATTEMPTS

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Background: Neurexins are cell adhesion molecules involved in synaptic formation and maintenance particularly of reward pathways. These reward circuits may be affected by NRXN gene variants. Candidate gene studies and genome wide association studies have both associated NRXN1 and NRXN3 gene variants with different nicotine dependence variables such as smoking quantity and heaviness of smoking. The purpose of this study was to genotype SNPs across the NRXN1 gene to examine associations with genotype and age-at-onset of daily smoking and number of past quit attempts as measures of nicotine dependence.

Methods: We used a sample of 380 (213 males; 167 females) daily dependent smokers of European Caucasian descent who participated in a smoking cessation study using nicotine replacement therapy. Ten SNPs with a minor allele frequency greater than 0.1 were selected along the NRXN1 gene and were genotyped using the TaqMan genotyping assay protocol on the ABI7500 automated genotyper. Statistical analysis was performed on SPSS v15 using ordinal logistic regression (number of past quit attempts x genotypes) and ANOVA (age at onset x genotypes). Haplotype analysis was performed using the software Haploview.

Results: The G/G genotype of the rs6721498 was associated with a fewer past quit attempts (2 or less quit attempts) (p=0.02) and with a later age at onset of daily smoking (17.63 +/- 0.5) compared to the A/A genotype (15.93 +/- 0.4) (p=0.03). No further associations were found with age at onset when haplotype analysis was performed.

Conclusions: Since early age at onset and numerous previous unsuccessful quit attempts are both associated with a high level of tobacco dependence, these data support previous reports of the positive association of the NRXN1 gene with measures of tobacco dependence severity.

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POS4-101 ASSOCIATION BETWEEN NICOTINIC ACETYLCHOLINE RECEPTORS AND NICOTINE INTAKE

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The physiological effects of nicotine are largely mediated by nicotinic acetylcholine receptors (nAChRs). Our previous study showed that a cluster of three nAChR subunit genes residing on chromosome 15 (CHRNA5/A3/B4) is more strongly associated with the serum cotinine level than with self-reported smoking quantity (Keskitalo et al. Hum Mol Genet, 2009). The aim of this study was to examine the association between the remaining neuronally expressed nAchR subunit (alpha2,4,6,7,9,10, beta2,3,gamma,delta) genes. The sample was drawn from a GWA-scanned subpopulation of the nationally representative Health2000 study. The genotyped sample included 485 current smokers (59% males). The phenotypes of interest were smoking quantity (CPD, cigarettes per day) and serum immunoreactive cotinine level. Association of these variables with SNPs residing in the nAChR subunit genes was examined using linear regression for cotinine levels and Poisson regression for CPD. The strongest association was observed between CPD and several SNPs residing in CHRNA7 (top SNP rs7175581, p=2.01*10-7) and CHRNA2 (SNP rs747111, p=1.91*10-5). In addition, CPD showed modest association with CHRNA9 (rs10021263, p=0.0018) and CHRNB2 (rs3811450, p=0.0067). Interestingly, the serum cotinine level did not show significant association (FDR p-value<0.05) with these genes, but was associated with CHRNG (rs1190452, p=0.0006). Our results imply that some of the nAChR subunit genes are associated with smoking quantity and nicotine intake but partly different mechanisms appear to underlie these phenotypes.

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POS4-102 EFFECT OF NICOTINE ON HYPEREXCITABILITY OF COLONIC SENSORY NEURONS IN MICE MODEL OF ULCERATIVE COLITIS

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Controlled clinical trials suggest an involvement of neuronal nicotinic acetylcholine receptors (nAChRs) in ulcerative colitis (UC). UC has been found to occur largely in nonsmokers and a remission in the disease can be induced by administration of nicotine patch. Notable improvements occur in both global clinical grade as well as in abdominal pain. To better understand the role of nAChRs in the sensory regulation of colonic inflammation, we examined an activation of nAChRs and the effect of nicotine on action potential (AP) firing in colonic neurons in the mice model of UC. Based on disease activity index dose-response, adult C57Bl/J6 and alpha7 knockout male mice were treated for 7 days per os with 5% and 2.5% dextran sodium sulphate (DSS), respectively. After 7 days of the DSS treatment the mice showed a significant loss of weight, signs of diarrhea and rectal bleeding. Dorsal root ganglia of colonic origin were isolated and prelabeled colonic neurons were tested using whole-cell current-clamp and voltage-clamp recording. Neurons from control C57Bl/J6 mice consistently showed <20% of cells responding to 1mM ACh. In contrast, the majority of the neurons isolated from the DSS treated C57Bl/J6 mice developed a current in response to application of 1 mM ACh. While ACh-induced currents in control neurons were heterogeneous with respect to their kinetics and sensitivity to nAChR subtype-selective antagonists, the currents in the inflamed neurons were fast and inhibited in the presence of selective alpha7 nAChR antagonist, methyllycaconitine (MLA). Application of 1 microM nicotine gradually suppressed evoked APs in inflamed colonic neurons from the DSS treated C57Bl/J6 mice. However, this effect of nicotine failed in the presence of MLA or when was tested in the DSS treated alpha7 knockout mice neurons. These data suggest that DSS-induced colon inflammation is accompanied by alterations in nAChRs expressed in colonic sensory neurons with an increased and predominant activity of alpha7 nAChR subtype and that nicotine interaction with alpha7 nAChRs mediates a suppression of the hyperexcitability of these inflamed neurons.

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POS4-103 GESTATIONAL NICOTINE EXPOSURE MODIFIES MYELIN-RELATED GENE EXPRESSION IN ADOLESCENT RAT BRAIN IN A SEX-DEPENDENT WAY

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Maternal smoking during pregnancy (MS) has long-lasting neurobehavioral effects on the offspring. Many MS-associated psychiatric disorders begin or change symptomology during adolescence, a period of continuous development of the central nervous system. Sex differences are often observed in the effects. The underlying neuronal mechanisms are largely unknown. Given that deficits in central myelination are convergently observed in many psychiatric disorders, we hypothesized that myelin is impaired by gestational treatment with nicotine (GN), the major psychoactive component in tobacco, in adolescent brains. Pregnant Sprague Dawley rats were treated with nicotine (3 mg/kg/day) or saline via osmotic minipumps from gestational days 4 to 18. Offspring were sacrificed on postnatal day 35, and the prefrontal cortex (PFC) and caudate putamen (CPu) were dissected for evaluation of gene expression using quantitative RT-PCR. GN significantly modified myelin-related gene expression depending on the brain region and sex. In the PFC, myelin genes, including those encoding major myelin proteins and lipid-related enzymes, were significantly upregulated by GN in males. In contrast, these genes were downregulated in females. In the CPu, most myelin genes were upregulated in both males and females, with more genes affected in males. To further evaluate the molecular mechanisms, we examined myelin regulatory factors such as transcriptional factors (TFs), neurotrophic factors (NFs), and cell adhesion molecules (CAMs). TFs were changed in the same direction as were the myelin genes. In contrast, NFs and CAMs were variously altered by GN, depending on the gene families. In conclusion, GN impaired myelination in a brain region- and sex-dependent way. These deficits may be caused by myelin regulatory factors, which were also modified by GN. Abnormal myelination may contribute to MS-linked psychiatric disorders. Furthermore, our study underscores that low doses of nicotine produce substantial and long-lasting changes in the brain, implying that nicotine replacement therapy during pregnancy may carry many of the same risks to the offspring, as does MS.

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POS4-104 UTILITY OF BIOMARKERS OF SMOKING IN AFRICAN AMERICAN LIGHT SMOKERS

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Two common biomarkers of cigarette smoking are expired carbon monoxide (CO) and plasma cotinine. Cotinine is the main metabolite of nicotine (NIC), and it is further metabolized to trans-3-hydroxycotinine (3HC). Both reactions are mainly mediated by the enzyme cytochrome P450 2A6 (CYP2A6). The correlation coefficients of CO and cotinine with self-reported cigarette consumption (CPD) range from 0.3 – 0.8 in Caucasian smokers. However, it is unknown whether these biomarkers will be good correlates of smoking in light smokers (≤ 10 CPD). Further, some light smoking populations such as African Americans also have slower rates of cotinine metabolism that may alter these relationships. In this study, we examined whether CO and cotinine levels derived from ad libitum smoking are correlated with CPD in African American light smokers, and whether variables such as gender, age, BMI, smoking mentholated cigarettes or rate of CYP2A6 activity, as determined by genotype and phenotype measures (3HC/cotinine), influence these relationships. Participants (n = 700) were recruited for a smoking cessation clinical trial. Demographic data, smoking history and biochemical measures (exhaled CO, plasma NIC, cotinine and 3HC) were collected at randomization. Many participants (42%) exhaled CO ≤10 ppm while few (3.1%) had cotinine below ≤14 ng/ml, traditional cutoffs for defining smokers. Thus, cotinine appears to be a better biomarker of smoking status in this population. CPD was weakly correlated with CO and cotinine ($r = 0.32 – 0.39$, $p < 0.001$), and the correlations were not greatly increased when analyzed by rate of CYP2A6 activity, smoking mentholated cigarettes or age. However, the correlations between CPD and CO, but not CPD and cotinine, appeared stronger in females compared to males ($r = 0.38$ vs. 0.21, $p < 0.05$) and in obese compared to non-obese individuals ($r = 0.38$ vs. 0.24, $p < 0.05$). Together, these results suggests that CO and cotinine are weakly associated with self-reported cigarette consumption in African-American light smokers, and that these relationships are not greatly improved when variables previously reported to influence these biomarkers are considered.

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POS4-105 RELATIVE SENSITIVITY OF MULTIPLE NACHR SUBTYPES FOR NICOTINE AND VARENICLINE

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Results from smoking cessation trials with nicotine (NRT) and varenicline, both acting as agonists of high affinity α4β2 neuronal nicotinic acetylcholine receptors (nAChRs), demonstrated differences in clinical efficacy. While varenicline's capacity to attenuate the reinforcing effects of inhaled nicotine by competing for the high affinity α4β2 nAChR binding sites likely contributes to increased efficacy, little is known about the activation and desensitization profiles of these two compounds at other nAChR subtypes. Although the α4β2 nAChR subtype is probably the most widely expressed receptor in the brain, other subtypes such as α6 containing receptors are supposed to be specifically expressed in the mesolimbic system and related network circuits. These and additional receptor subtypes could predominantly, determine a compound's efficacy as a smoking cessation aid. Moreover, experimental evidences suggest that expression in higher mammals may differ from that of rodent. As most animal experiments have been carried out in rodents, it is of value to evaluate additional nAChR subtypes, such as the α2β2, which was shown to be expressed in the frontal cortex of monkey. The aim of this work was to characterize the activation and desensitization profiles of nicotine and varenicline at a series of nAChRs subtypes in an attempt to identify the most relevant receptors to target for the development of compounds as smoking cessation aids. Electrophysiological recording carried out at human nAChRs expressed in Xenopus oocytes clearly revealed physiological differences between receptor subtypes, as well as pharmacological differences, e.g. in sensitivities to nicotine and varenicline. When put in perspective of estimated efficacious brain concentrations, these results suggest additional mechanisms by which nAChR agonists may help relieve nicotine craving and open new strategies for the design of compounds as smoking cessation treatments.

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POS4-106 NICOTINIC RECEPTOR UP-REGULATION BY NICOTINIC AGONISTS AND TNF-ALPHA

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Up-regulation of brain nicotinic acetylcholine receptors (nAChRs) is a characteristic possibly linked to nicotine addiction. Numerous studies demonstrate that nicotine, as well as other nAChR agonists, significantly increase the number of alpha4 beta2 nAChRs both in vitro and in vivo. The mechanism of nicotine-induced up-regulation is thought to be independent of protein synthesis, and thought to be related to enhanced nAChR assembly and/or decreased receptor degradation. Interestingly, a recent study using stably transfected cell lines found that tumor necrosis factor-alpha (TNF-alpha) also up-regulates alpha4 beta2 nAChRs by activating the p38 MAP kinase pathway in a protein synthesis dependent manner (Gahring et al., J. Biol. Chem., 283:693, 2008). TNF-alpha was additionally observed to up-regulate alpha4 beta2 receptors synergistically when cells were co-treated with nicotinic agonists. To further these studies, we demonstrated that TNF-alpha up-regulates both rat and human alpha4 beta2 receptors expressed in HEK and TsA cells, respectively. We then generated dose-response curves for up-regulation of alpha4 beta2 nAChRs by both nicotine and carbachol. Surprisingly, we found that after 24-hour treatment, both carbachol and nicotine exhibited a higher potency to up-regulate human alpha4 beta2 nAChRs expressed in TsA cells compared to rat alpha4 beta2 nAChRs expressed in HEK293 cells. For nicotine, we observed an EC50 of 0.35 ± 0.13 uM for human alpha4 beta2 receptors and an EC50 of 0.87 ± 0.09 uM for rat alpha4 beta2 receptors ($p<0.05$). For carbachol, we observed an EC50 of 51.4 ± 19.5 uM for human alpha4 beta2 receptors and an EC50 of 192 ± 20 uM for rat alpha4 beta2 receptors ($p<0.02$). In addition, and unexpectedly, carbachol appears to be more efficacious than nicotine for up-regulating rat alpha4 beta2 nAChRs in HEK293 cells ($p<0.01$). Further studies are ongoing to explore this up-regulation of both rat and human alpha4 beta2 nAChRs by agonists, as well as to investigate receptor up-regulation by TNF-alpha.

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POS4-107 WHY DOES VARENICLINE, AN A4B2 NICOTINIC ACETYLCHOLINE RECEPTOR PARTIAL AGONIST, DECREASE ALCOHOL CONSUMPTION?

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Activation of neuronal nicotinic acetylcholine receptors (nAChRs) is hypothesized to underlie the reinforcing properties of ethanol, yet the specific nAChR subtype(s) critical for this process is unknown. Identification of these receptors will not only provide insight into the pathophysiology of alcoholism, but also help identify potential therapeutic targets for alcohol cessation. Recently, Varenicline, a partial agonist selective for a4b2 nAChRs, was shown to reduced alcohol consumption and seeking in rats. We evaluated Varenicline to determine if the effects of the drug were mediated by a4-containing (a4*) nAChRs, molecules known to be critical for nicotine dependence. Utilizing two different nAChR mouse models, we evaluated the effect of Varenicline on a recently described restricted access ethanol self-administration assay termed “Drinking in the dark” (DID). The first mouse line does not express the gene encoding the a4 subunit, Chrna4 (a4 KO) while the second mouse contains a single Leucine to Alanine point mutation at the 9’ position of the a4 subunit transmembrane 2 pore-forming domain (L9’A), which renders a4* nAChRs 50-fold more sensitive to nicotine and endogenous acetylcholine. Immediately prior to the two-hour ethanol drinking session, mice were i.p. injected with Varenicline. We found that an acute dose of Varenicline (0.1 or 0.3 mg/kg) significantly decreases ethanol intake compared to a saline injection in WT mice but the same dose has no effect in a4 KO mice. This suggests that a4* nAChRs are necessary for Varenicline’s effect on ethanol consumption. Interestingly, L9’A mice, when given much lower doses of Varenicline (0.0125 or 0.05 mg/kg), drink significantly less ethanol compared to a saline injection while neither of these low doses reduce ethanol drinking in WT mice, suggesting that a4* nAChRs are sufficient for Varenicline’s effect. Importantly, no doses of Varenicline reduced voluntary sucrose intake in either mouse line. This dose and mouse line dependent effect demonstrates that a4* nAChRs are both necessary and sufficient for Varenicline’s effects on alcohol consumption.

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RAPID COMMUNICATIONS ABSTRACTS

POS5-1 CONVERGENT EVIDENCE THAT CHOLINE ACETYLTRANSFERASE GENE VARIATION IS ASSOCIATED WITH PROSPECTIVE SMOKING CESSATION AND NICOTINE DEPENDENCE

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The ability to quit smoking is heritable, yet few genetic studies have investigated prospective smoking cessation. We conducted a systems-based genetic association analysis in a sample of 472 treatment-seeking smokers of European ancestry following eight weeks of transdermal nicotine therapy for smoking cessation. The genotyping panel included 169 SNPs in 7 nicotinic acetylcholine receptor subunit genes and 4 genes in the endogenous cholinergic system. The primary outcome was smoking cessation (biochemically confirmed) at the end of treatment. SNPs clustered in the choline acetyltransferase (ChAT) gene were individually identified as nominally significant, and a 5-SNP haplotype (block 6) in ChAT was found to be significantly associated with quitting success. Single SNPs in ChAT haplotype block 2 were also associated with pre-treatment levels of nicotine dependence in this cohort. To replicate associations of SNPs in haplotype blocks 2 and 6 of ChAT with nicotine dependence in a non treatment-seeking cohort, we utilized data from an independent community-based sample of 629 smokers representing 200 families of European ancestry. Significant SNP and haplotype associations were identified for multiple measures of nicotine dependence. Although the effect sizes in both cohorts are modest, converging data across cohorts and phenotypes suggest that ChAT may be involved in nicotine dependence and ability to quit smoking. Additional sequencing and characterization of ChAT may reveal functional variants that contribute to nicotine dependence and smoking cessation.

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POS5-2 IMPAIRMENTS IN VISUOSPATIAL WORKING MEMORY INDUCED BY CIGARETTE SMOKING ABSTINENCE ARE CORRELATED WITH CHANGES IN PLASMA NICOTINE LEVELS IN SMOKERS WITH SCHIZOPHRENIA

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Tobacco smoking improves cognitive deficits in schizophrenia, such as attention and working memory, which may in part explain the higher rates of smoking in persons with schizophrenia compared to the general population. The aim of this secondary analysis was to examine the relationship between plasma nicotine levels and performance on cognitive tasks during smoking abstinence and reinstatement in smokers with schizophrenia as well as the effects of mecamylamine, a nicotinic receptor (nAChR) antagonist, on cognitive function (Sacco et al. 2005, Arch Gen Psychiatry. 62, 649-659). Neuropsychological assessments were performed and plasma nicotine levels determined at smoking baseline, after overnight abstinence, and after smoking reinstatement, in smokers with schizophrenia (n=22) and control smokers (n=22). Correlation analyses of the change in cognitive performance produced by abstinence and smoking reinstatement and baseline and the change in plasma nicotine levels were conducted. In smokers with schizophrenia the impairment in visuospatial working memory (VSWM) produced by overnight abstinence was found to be positively correlated with baseline plasma nicotine levels ($r=0.472$, $p=0.026$) and the reduction in nicotine following abstinence ($r=0.530$, $p=0.017$). Mecamylamine (5 & 10 mg/d) did not affect nicotine levels but did disrupt these correlations. Smoking abstinence did not alter VSWM in control smokers and there was no correlation with nicotine levels. Hit rate on the Continuous Performance Test (CPT) was reduced by smoking abstinence in all smokers but this was not correlated with nicotine levels. Interestingly during reinstatement, no correlations between nicotine levels and cognitive performance were found. The VSWM deficits produced in smokers with schizophrenia by abstinence appear to be related to plasma nicotine levels (the greater the magnitude of change in nicotine levels the greater the impairment in VSWM) and may depend on stimulation of central nAChRs. These findings appear to be specific to smokers with schizophrenia and taken together suggests a critical role of nAChRs in modulating the precognitive effects of cigarette smoking in this population.

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POS5-3 WHAT IMPACT IS THERE ON QUIT RATES IF SMOKERS ARE ALLOWED TO CHOOSE THEIR OWN NRT: FINDINGS FROM THE SONIQ TRIAL

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Background: Increasing user access to nicotine replacement therapy (NRT) and choice of product may improve smoking cessation, by allowing smokers to gain confidence and a sense of control over the quitting process. Increased familiarisation also provides for user preferences as each NRT type differs in usability and nicotine delivery.

Aim: To determine whether smokers who have more choice over which NRT products they use are more likely to stop smoking at 6 months, than smokers with limited choice.

Method: Participants were identified through a telephone-based Quitline cessation service, and randomised to receive a selection box of NRT (21mg patch, 4mg gum, 10mg inhalator, 2mg sublingual tablet, and 4mg pouch) or usual care (patches and/or gum or lozenges). Participants in the intervention group were asked to try each product over a week prior to their quit attempt, then choose 1 or 2 preferred products to use for 8 weeks after their quit day. Participants in the usual care group were posted a voucher, which they redeemed for the allocated NRT at a local pharmacy. Both groups received behavioural support from the Quitline for 8 weeks.

Results: 1,410 smokers were randomised (706 intervention vs. 704 usual care). Participants were moderately dependent (mean Fagerström=6.3, SD=1.6) and smoked on average 20 cigarettes per day (SD=9). The selection box concept was highly acceptable to users, with the patch and inhalator combination the most popular choice (34%). Although there was no difference between the groups for the 7-day point prevalence abstinence rate at 6-months (31% intervention vs. 29% usual care, RR=1.06, 95%CI=0.90-1.25, p=0.47), smokers allocated to the intervention group were more likely to have quit smoking at 3 months (7-day point prevalence, RR=1.17, 95%CI=1.02-1.35, p=0.03), used more units of NRT over time, and had approximately twice the estimated median time to relapse (p<0.01) compared to smokers allocated to usual care.

Conclusion: Although long term quitting was not sustained, increased access, familiarisation and user choice of NRT is not only acceptable to smokers trying to quit but increases their use.

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POS5-4 CAN FAX-TO-QUIT ENCOURAGE CESSATION AMONG WEST VIRGINIA PREGNANT SMOKERS?

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West Virginia (WV) women have high unmet need for smoking cessation, with disparities including low SES, education, and rural access to care. Although health risks of smoking before, during, and after pregnancy are well-established, 45.8% of West Virginia women reported smoking 3 months pre-pregnancy and 31.9% during pregnancy from 2005 PRAMS data. Fax-to-Quit uses provider faxed referrals to engage pregnant smokers and connect them with cessation services through the WV Tobacco Quitline. A 12-month feasibility evaluation of this process was conducted to: establish a collaborative of stakeholders; develop a Fax-to-Quit protocol and pilot it among WV pregnant smokers; assess feasibility and impact in this underserved rural population; and disseminate findings to guide future cessation interventions. In February 2009, providers and staff from three OB/GYN clinics in three adjoining WV counties were recruited to implement this study with adult pregnant smokers receiving prenatal care. Intensive training, including brief smoking cessation intervention training and on-site monthly follow-ups, was conducted with providers and staff. Clinics screened pregnant women for smoking, assessed readiness-to-quit, and enrolled consenting participants in Fax-to-Quit. WV Quitline staff are monitoring referrals and gathering quitting data from participants. To date, all three clinics have successfully recruited pregnant smokers to participate in Fax-to-Quit: 58 women agreed to faxed referrals, and 16 women enrolled in WV Quitline services (27.6%). Key components of successful implementation have been identified and include the following: coordination among office staff and providers; monthly site visits to all clinics; and frequent communication between a key clinic contact person and Fax-to-Quit project staff. Preliminary findings indicate Fax-to-Quit is a feasible option to engage providers and pregnant smokers with the WV Quitline, and suggest this method may begin to bridge the cessation gap among underserved pregnant smokers in this rural population.

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POS5-5 SOCIOECONOMIC VARIATION IN TOBACCO USE AND SUPPORT FOR TOBACCO CONTROL POLICIES IN HUNGARY

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Recent WHO data reveal that Hungary has the highest percentage of smoking-related deaths in the European Union (21%). Despite improvements in tobacco control measures over the past several years, cigarette smoking remains the leading, preventable risk factor for premature death and disability in Hungary. The country plans to implement key provisions of the Framework Convention and to increase tobacco taxes in the near future. In anticipation of these policy changes, this study was designed to describe current smoking and quitting patterns in the Hungarian adult population, as well as attitudes towards smoking and tobacco control policies. The study also tests how tobacco-related behavior and attitudes differ as a function of demographic, social, economic and health-related factors. In early 2009, 2,345 adults drawn from a nationally representative sample of 47 settlements (municipalities) completed a self-administered questionnaire that was hand-delivered by project staff (response rate 59.8%). Among the overall sample, 34.1% of respondents were current smokers (29.9% smoked every day, and 4.2% occasionally), 16.7% were ex-smokers, and 49.2% had never smoked regularly. The prevalence of smoking is significantly higher in lower educated and poorer people. The majority of respondents expressed support for tobacco control policies, including bans on smoking in closed common places (79.8%) and outdoor public places (78.5%), as well as limitations on smoking in workplaces (77.6%) and fines for retailers selling tobacco to minors (90.6%). Support for tobacco control policies is significantly lower among smokers (e.g., outdoor public smoking bans are supported by 64.5% of smokers vs. 87.7% of never smokers; p<0.001), and among people with lower socioeconomic status (e.g., fines for sales to minors are supported by 80.9% of poorer vs. 96.6% of wealthier respondents; p<0.001). Our data indicate the necessity of a differentiated approach in designing tobacco control policy and programmatic interventions to address the specific needs of socially and economically disadvantaged population groups in Hungary.

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POS5-6 IN VIVO EVIDENCE THAT β-CARBOLINES FOUND IN TOBACCO SMOKE INHIBIT MAO

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Cigarette smokers are known to have suppressed activity of monoamine oxidase (MAO) A and B in the brain. The constituents of tobacco smoke responsible for MAO inhibition are unknown, but nicotine is probably not involved. β-carbolines, like harmane and norharmane, are tobacco pyrolyis products that afford potent inhibition of MAO in vitro. However, few studies have examined whether harmane and norharmane are capable of inhibiting MAO activity in vivo. In the present experiments, we assessed the effects of harmane (3-20 mg/kg i.p.) and norharmane (3-20 mg/kg, i.p.) on monoamine metabolism in mouse brain as a method for assessing MAO activity in vivo. We hypothesized that β-carbolines would decrease concentrations of MAO products dihydroxyphenylacetic acid (DOPAC) and 5-hydroxyindoleacetic acid (5-HIAA). Male Swiss-Webster mice received drug or saline vehicle and were decapitated 30 min later. Cortex and striatum were dissected on ice, and tissue concentrations of dopamine (DA), serotonin (5-HT) and their acid metabolites, DOPAC and 5-HIAA, were quantified by HPLC-ECD. Harmane dose-dependently reduced DOPAC and 5-HIAA in cortex, while reducing only DOPAC in striatum. Norharmane had similar effects but was much less potent. Our data are consistent with in vivo inhibition of MAO by β-carbolines, and suggest that harmane and norharmane may contribute to suppression of MAO in human cigarette smokers. Further research will be required to verify this hypothesis.

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POS5-8 NATIONAL ATTIDUTES ABOUT FDA'S POTENTIAL REGULATORY ACTIONS IN THE FAMILY SMOKING PREVENTION AND TOBACCO CONTROL ACT OF 2009

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Background: The Family Smoking Prevention and Tobacco Control Act of 2009 grants FDA authority to regulate tobacco. However, public support for future regulatory measures is unknown.

Objective: To assess levels of public support for provisions of the Tobacco Control Act of 2009.

Design/Methods: Data were collected by a national random digit dial telephone survey in November 2009. The sample is weighted by race and gender based upon 2008 U.S. Census estimates to be representative of the U.S. population.

Results: Among respondents, 82.6% were non-smokers and 17.4% were smokers. Support for the following regulatory actions was higher among non-smokers than smokers: tobacco products should be regulated as a drug by a government agency such as the Food and Drug Administration (71% vs. 45%); government should reduce the amount of nicotine in cigarettes so that kids do not become addicted (77% vs. 63%); government should reduce the amount of nicotine in cigarettes to help smokers quit (75% vs. 60%); government should put larger warning labels covering half of the front of a pack of cigarettes to discourage people from smoking (56% vs. 37%); cigarette advertising increases the chance that a child starts smoking (79% vs. 58%); cigarette advertising that increases the chance that children will start smoking should be prohibited (85% vs. 74%); cigarettes with added flavorings should be prohibited (76% vs. 43%). Support for regulatory actions was higher among non-smokers than smokers $P<.05$ for each, although large numbers of smokers themselves endorsed the potential regulatory actions. Overall, a majority of Americans say they would support these potential FDA actions.

Conclusions: High levels of support for regulatory provisions of the Family Smoking Prevention and Tobacco Control Act by both smokers and non-smokers may enable FDA to quickly implement provisions in the Act, without risk of widespread public backlash against greater tobacco regulatory rules.

FAMRI;Legacy.

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POS5-9 EFFICACY OF A SUPPORT PERSON INTERVENTION TO PROMOTE SMOKER UTILIZATION OF THE QUITPLAN HELPLINE

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Quitlines and other evidence-based cessation methods are greatly underutilized by smokers. Only about 1.5% of smokers in Minnesota utilize the state-funded QUITPLAN Helpline. Substantial evidence exists on the role of social support in cessation. This study examined the efficacy of an intervention for adult nonsmoking support persons to motivate and encourage a smoker to call the Minnesota QUITPLAN Helpline. A total of 534 support persons (91% female, 93% Caucasian) were randomly assigned to a control condition (written materials only, n=237) or to the intervention (n=237). The intervention consisted of written materials and three consecutive, weekly, 10-30 minute telephone sessions. The conceptual basis for the intervention was Cohen's theory of social support. Support persons completed mailed assessments at weeks 0 (baseline), 4 (end of treatment), and 26. Supportive behaviors provided were assessed using the Support Provided Measure (SPM). Smoker calls to the QUITPLAN Helpline were documented by intake staff through week 26. The proportion of smoker calls to the QUITPLAN Helpline was significantly (p=0.012) greater for support persons receiving the intervention (16.1%; 43/267) than for support persons assigned to the control group (8.6%; 23/267). In a logistic regression model adjusting for support person gender and residing with the smoker, smokers linked to support persons receiving the intervention were twice as likely to call the QUITPLAN Helpline than for those in the control group (OR=2.09; 95% CI 1.22-3.59; p=0.008). After adjusting for the baseline score, SPM scores at week 4 (p=0.002) were significantly higher for those who received the intervention than for those in the control condition. The findings suggest there is potential for increasing the reach of quitlines by targeting the social network of smokers.

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POS5-10 RESULTS OF THE MID-TERM AND FINAL EVALUATIONS OF THE DC TOBACCO FREE FAMILIES (DCTFF) CAMPAIGN

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The DC Tobacco Free Families (DCTFF) is a multi-component tobacco use prevention and cessation campaign. DCTFF has implemented a coordinated multimedia campaign, educational and treatment programs through community partners, counseling and free nicotine replacement therapy (NRT), training for public health care providers, and district-wide efforts to create tobacco-free hospital and higher education campuses. DCTFF specifically targets minority and underserved communities, which often have higher smoking rates, do not respond positively to conventional anti-tobacco messages, and may not be able to afford counseling or nicotine replacement therapy. An independent consultant group conducted a process and outcomes evaluation of the DCTFF campaign. Evaluators documented implementation of program components such as focus groups on targeted media campaign messages, health care provider trainings, quitline calls and follow-up referrals to counseling and NRT, and community partner programs. The American Cancer Society interviewed quitline callers 3, 6, and 12 months after about quit rates. Mid-term data show that the program was implemented as planned. Quantitative data show that quitline calls increase dramatically when the media campaign is in effect. Smoking prevalence decreased 20% over 3 years since campaign inception. The media campaign resonates with targeted audiences; and community partners are strongly invested in the campaign's success. Coordinated services- including strong collaboration with partners serving underserved DC residents, a media campaign designed to address these residents, and free evidence-based cessation services- have effectively increased quit attempts and reduced smoking prevalence in the District of Columbia.

The American Lung Association of DC provided funding for the evaluation study.

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POS5-11 CIGARETTE SMOKING IN PERSONS WITH SERIOUS PSYCHOLOGICAL DISTRESS: A POPULATION-BASED STUDY FROM CALIFORNIA

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OBJECTIVES: California's smoking prevalence was 14% in 2008, the second lowest of any state in the US. To meet the Healthy People 2010 goal of reducing adult smoking to less than 12%, tobacco control efforts need to target subpopulations that smoke the most. National data have indicated a particularly high prevalence of tobacco use among persons with mental illness. The objective of this study was to examine smoking behavior among persons with serious psychological distress (SPD) using California population-based data.

METHODS: We analyzed cross-sectional data for 50,880 respondents aged 18 years and older from the 2007 California Health Interview Survey to compare smoking prevalence (lifetime and current smoking), smoking intensity, and quit behavior between persons with and without SPD. The K6 scale developed by Kessler et al. (2002) was used to screen SPD.

RESULTS: In 2007, 3.8% of California adults screened positive for SPD in the past 30 days (acute SPD), and 4.8% screened for SPD in the past year but not past 30 days (less acute SPD). Lifetime smoking prevalence was 37.0%, 45.4%, and 52.4% for persons with no SPD, less acute SPD, and acute SPD, respectively. Current smoking prevalence was 13.1%, 27.2%, and 30.1%, respectively. After controlling for confounders, adjusted odds ratios (AOR) for current smoking were 2.54 (95% CI 2.02 to 3.19) for persons with acute SPD and 2.20 (95% CI 1.79 to 2.71) for persons with less acute SPD relative to persons without SPD. Current smokers with acute SPD were more likely to smoke at least 20 cigarettes per day than those without SPD (27.7% vs. 17.6%; AOR=1.59, 95% CI 1.06 to 2.39). Lifetime smokers' quit rates were significantly lower for persons with acute SPD (adjusted OR=0.46, 95% CI 0.35 to 0.62) or less acute SPD (AOR=0.55, 95% CI 0.42 to 0.71) relative to persons without SPD.

CONCLUSIONS: Among California adults, those with SPD were more than twice as likely to be current smokers as those without SPD, more likely to smoke heavily, and less likely to quit. The findings underscore the importance of effective smoking cessation programs targeting this vulnerable group.

This study was funded by grant from the Tobacco-Related Disease Research Program (TRDRP) #18XT-0092.

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POS5-12 ATTENTIONAL BIAS TO SMOKING RELATED CUES: A COMPARISON OF HEAVY SMOKERS, SOCIAL SMOKERS AND NON-SMOKERS

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Smokers, compared to non-smokers, show enhanced attentional processing of smoking-related cues as measured by the dot probe task. It is important to establish this as a robust effect and determine the stage of attention these biases operate in. Daily smokers (n = 24), social smokers (n = 24), and non-smokers (n = 24), were recruited from the general population. Daily and social smokers were required to smoke a cigarette within 30 minutes of testing. All participants completed a cognitive battery comprising four versions of the dot probe task, which included a stimulus set frequently used in the nicotine literature, a newly developed stimulus set, a picture presentation time of 150ms and also 500ms. Task order was counterbalanced across participants. Participants were also randomised to receive a picture-rating booklet designed to expose participants to the newly developed stimulus set either before or after the cognitive battery. Reaction time data, with stimulus set (existing, new), presentation time (150ms, 500ms) and picture type (smoking, neutral) as within-subject factors and smoking status (daily, social, non) and booklet exposure (before, after) as the between-subject factors, revealed a significant main effect of picture type ($F[1, 65] = 10.65$, $p = 0.002$), reflecting faster reaction times to probes replacing smoking pictures. This was qualified by a picture type x smoking status interaction ($F[1, 65] = 4.73$, $p = 0.012$), indicating faster reaction times to probes replacing smoking pictures for daily smokers ($p = 0.015$) but not for social smokers ($p = 0.32$) or non-smokers ($p = 0.72$). The main effect and interaction were not further qualified by interactions involving stimulus set, presentation time or booklet exposure (ps > 0.10). These data suggest that attentional bias for smoking related information is present in daily smokers only, and can be measured across a range of stimulus sets suggesting it is a robust construct. Bias does not appear to be exclusive to either initial orientation or maintained attention, but may function across both stages. Together, these findings provide support for the incentive-sensitization theory of drug addiction.

ESRC.

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POS5-13 YOU CAN AFFORD TO QUIT: MEDICAID COVERS IT. FINDINGS FROM A CAMPAIGN TO INCREASE CONSUMER DEMAND FOR CESSATION TREATMENT

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Smoking prevalence among Medicaid enrollees is higher than among the general population, but use of evidence-based cessation treatment by Medicaid enrollees is low. We evaluated whether a communications campaign targeting Wisconsin Medicaid HMO enrollees and clinicians improved cessation treatment utilization. The campaign consisted of print materials for clinicians and consumers that were distributed to 13 health maintenance organizations (HMO) serving Medicaid HMO enrollees in Wisconsin. Wisconsin Medicaid pharmacy claims data for smoking cessation medications were analyzed for 12 months before and 12 months after the campaign. Medicaid HMO enrollees were the intervention group and Medicaid fee-for-service enrollees served as a quasi-experimental comparison group. Quit Line utilization data were also analyzed. Pre-campaign, smoking cessation pharmacy claims declined for the intervention group and increased slightly for the comparison group ($t = 2.29$, $p = 0.03$). Post-campaign, there was a significant, linear increase in smoking cessation pharmacy claims in both groups. However, the rate of improvement in the intervention group was significantly greater than in the comparison group ($t = -2.2$, $p = 0.04$). A statistically significant increase was also seen in the average monthly number of Medicaid enrollees that registered for Quit Line services post-campaign compared to pre-campaign ($F (1,22) = 7.19$, $p = 0.01$). This natural experiment demonstrated statistically significant improvements in both pharmacotherapy claims and Quit Line registrations among Medicaid enrollees who were exposed to a targeted communications campaign. These findings may help inform other states' efforts to improve cessation treatment utilization.

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POS5-14 A LABORATORY STUDY OF SMALL CIGAR (BLACK & MILD) SMOKING

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There has been an increasing use of small cigars among urban, African American youth with a popular brand choice being Black & Mild (B&M) little cigars. Survey data indicate that users "freak" or "hype" the B&M by removing the paper liner of the cigars and repacking the tobacco in the belief that the inner paper causes cancer and the addiction. In this study, 12 volunteers (all African American, 10 men) who ordinarily smoke both cigarettes and B&M participated in laboratory sessions where they smoked (ad lib) B&M cigars with and without (amended) the paper liner and their usual brand of commercial cigarette. Carbon monoxide (CO), nicotine boost, and heart rate change were compared to determine toxin exposure in the conditions. Participants completed an extensive interview on smoking history and habits of cigarettes and B&M use. Their average age was 43.7 yr (range: 29-55). Three participants reported ordinarily smoking the entire B&M at one time; the others reported smoking a portion of the B&M (33 to 80%) and saving the remainder for later consumption. In the lab, they smoked only that portion of the B&M that they reported ordinarily smoking. Exhaled CO significantly increased ($p<.01$); CO boost averaged: cigarette smoking, 7.2 ppm; B&M, 26.9; B&M (amended), 13.5. Heart rate increased with each smoking condition as follows: cigarette smoking, 4.9 bpm; B&M, 7.9; B&M (amended), 6.4. Plasma nicotine levels significantly ($p<.02$) increased after each smoking condition as follows: cigarette smoking, 25.1 ng/ml; B&M, 10.5; B&M (amended), 11.8. Unlike typical cigar smoking where the product is puffed, all participants reported that they inhaled the smoke of the B&M. This was verified by the substantial CO boost. These data suggest that B&M smoking is associated with significant toxin exposure and changes in resting heart rate. Contrary to popular belief, it does not appear that removing the paper liner of the B&M cigar changes the toxin exposure.

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POS5-15 ENHANCED RESPONSES TO PAIN SENSITIVITY IS ASSOCIATED WITH EARLY SMOKING RELAPSE

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Accumulated evidence suggests that cigarette smoking increases pain tolerance. However, the extent to which pain perception prior to a quit attempt is associated with early smoking relapse has not been investigated. Ninety-one participants (46 women and 45 men) completed a laboratory session, which included the cold pressor test (CPT). Participants were asked to rate their pain every 15 seconds throughout the 90-second exposure to the CPT and the 90-second recovery period. After the session, participants quit smoking and attended 4 weekly follow-up assessment sessions. Time to relapse was calculated based on the prolonged abstinence (i.e., smoked every day at least for a week). High and low pain groups were calculated based on median split of participants' pain ratings after the CPT. Logistic regression analysis revealed greater risk for relapse (odds ratio of 2.7) among smokers who reported high pain ratings compared with smokers in the low pain group ($p < .05$). Also, log-rank test using Kaplan-Meier estimates revealed a trend that the high and the low pain groups had different survival distributions of time to relapse ($p = .06$), suggesting that the high pain group relapsed earlier than the low pain group. When comparing participants who relapsed within the four-week follow-up period versus those who maintained abstinence, we found greater pain after the CPT among relapsers ($p < .01$). These findings suggest that pain sensitivity (prior to smoking cessation) is potentially useful in identifying smokers who are at greater risk of early smoking relapse.

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POS5-16 CHINESE ANESTHESIOLOGISTS AND TOBACCO INTERVENTIONS IN THE PERIOPERATIVE PERIOD

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Background: The prevalence of cigarette smoking in China is high. Surgery provides an excellent opportunity for patients to quit smoking, and anesthesiologists can play an important role in tobacco control. However, little is known about Chinese anesthesiologists' practices, knowledge, and attitudes regarding perioperative tobacco interventions.

Methods: Chinese anesthesiologists were surveyed at a national meeting in 2009, with written questionnaires distributed to 800 practicing anesthesiologists.

Results: The survey response rate was 60.3%, and 10% of respondents, themselves, smoked cigarettes (18.4% of males and 3.9% of females). Most (73%) frequently or almost always asked about smoking status; 51% advised about the health risk of tobacco use; and 60% advised patients to quit. However, few respondents provided counseling or other resources to help their patients quit, and few provided follow up services. Compared to nonsmokers, smokers were significantly less likely to advise about health risks of smoking (40% vs. 52%, p=0.027) and advise patients to quit (34% vs. 63%, p=0.001). A high proportion of respondents had accurate perceptions of perioperative and long-term health risks of smoking. Although most respondents agreed that advising patients to quit is anesthesiologists' responsibility and the perioperative period is a good time to help patients quit smoking, few knew how to counsel about smoking or help patients get the help they need to quit. Nonetheless, most of respondents were willing to learn about perioperative interventions and to spend an extra five minutes to help patients quit smoking.

Conclusions: Given their adequate knowledge of health risks of smoking, strong perception of responsibilities, and willingness to participate in tobacco control, Chinese anesthesiologists are poised to play a significant role in tobacco control in China that could improve perioperative outcomes and promote long-term health. Interventions need to be designed for surgical patients in China.

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POS5-17 THE EFFECT OF MENTHOLATED CIGARETTES ON BIOMARKERS OF POTENTIAL HARM

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It has been hypothesized that the addition of menthol to cigarettes may increase smoking related disease risks. In the Total Exposure Study (TES), numerous biomarkers of potential harm (BoPH) were measured in 3,585 adult smokers. Among these smokers, 1,104 smoked menthol cigarettes and 2,481 smoked non-menthol cigarettes. The effect of menthol status on markers of endothelial function (von Willebrand factor, microalbumin, soluble intercellular adhesion molecule-1, soluble vascular cell adhesion molecule-1); inflammation (white blood cells, fibrinogen, C-reactive protein, monocyte chemotactic protein-1, interleukin-6); oxidative stress (8-epi-prostaglandin-F2α, 8-isoprostaglandin F2α-VI); coagulation (platelets, fibrinogen, von Willebrand factor, 11-dehydrothromboxane-B2) lipid metabolism (triglycerides, LDL cholesterol, total cholesterol, HDL cholesterol, oxidized low-density lipoprotein, lipoprotein-associated phospholipase A2; and metabolism (glucose, total adiponectin, leptin) were investigated. Menthol had no statistically significant effect on any of the BoPH and there were no statistically significant menthol related interaction terms. Variables that had the greatest impact on BoPH were BMI, age and gender. The number of cigarettes smoked per day and number of years smoked were also statistically significant for some BoPH. These results do not support the hypothesis that menthol cigarettes increase the risk of smoking related diseases.

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POS5-18 APOLIPOPROTEIN EPSILON 4 AND SMOKING: A GENE x ENVIRONMENT EFFECT ON VIGILANCE

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There is support that the Apolipoprotein epsilon 4 (APOE ϵ4) allele and cigarette smoking synergistically reduce cognitive functioning. The goal of the current study was to investigate the gene by environmental interaction between APOE and smoking on reaction time to an attention task. Genotyping was conducted on 246 adult community-based volunteers from the Brain Resource International Database (BRID). General linear modeling of gene and smoking status revealed a significant interaction. Smokers with the allele were significantly slower than smokers without the allele; however, in non-smokers there were relatively no genotypic effects.

This work was done in collaboration with the Brain Resource International Database (www.brainresource.com) for data acquisition and methodology. In addition, partial support was provided by National Institutes of Health Transdisciplinary Tobacco Use Research Center award P50 CA084719.

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POS5-19 THE EFFECT OF MENTHOLATED CIGARETTES ON MEASURES OF NICOTINE DEPENDENCE

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Numerous studies have found no increased risk of nicotine dependence related to menthol status; however concerns continue to be raised that menthol may increase the nicotine dependence of cigarettes. The Total Exposure Study (TES), a cross-sectional study of more than 3,585 adult smokers, included the Fagerström Test for Nicotine Dependence (FTND) as a measure of dependence. Responses to each question and overall scores for 1,104 menthol smokers and 2,481 non-menthol smokers were examined. Logistic regression models were used to examine the effect of menthol on FTND. When adjusted by race, gender, age, machine-derived tar yield category, income and education, menthol status had no statistically significant effect on any single item of FTND or on the overall scores. Menthol smokers had no increased odds of having higher FTND scores as compared to non-menthol smokers (odds ratio, 0.97; 95% confidence interval, 0.83 -1.13). Our results add to the existing body of evidence that menthol does not increase nicotine dependence.

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POS5-20 PREDICTORS OF LATE EXPERIMENTATION WITH SMOKING IN BUDAPEST ADOLESCENT SMOKING STUDY

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BACKGROUND: Adolescents trying smoking after age 14-15 are defined as late experimenters. Understanding the predictors of late experimentation could inform tailoring of prevention programs for this population.

AIMS: The goal of the current report is to examine the personality, cognitive, social and behavioral factors that predict experimentation during the first high school year.

PARTICIPANTS: 9th grade students (N=886) who reported that they had not tried a cigarette in the first wave of the Budapest Adolescent Smoking Study and who also participated in the second wave of the study.

MEASURES: Sensation seeking, susceptibility to smoking, perceived peer smoking, parental smoking, parental permissiveness, alcohol use, and reinforcement expectancies related to smoking. The outcome variable was experimentation with smoking (yes=1; no=0) in the second wave of the study.

STATISTICAL ANALYSIS: Path analysis with a dichotomous outcome variable performed with MPLUS 5.2.

RESULTS: 196 (22.1%) students had tried smoking by Wave 2. The model fit was excellent CFI=.961 TLI=.981 RMSEA=.034. Experimentation with smoking was significantly predicted by susceptibility to smoking, perceived peer smoking, and alcohol use (R2=.24). Susceptibility to smoking was predicted by sensation seeking, reinforcement expectancies, parental permissiveness, alcohol use, age and gender (R2=.14). Although there were not significant direct paths from sensation seeking, reinforcement expectancies, and parental smoking to experimentation with smoking, there were several significant indirect paths, in which susceptibility to smoking served as a mediator variable.

CONCLUSION: Alcohol use and perceived peer smoking are important direct predictors of experimentation with smoking. Susceptibility to smoking can also be regarded as a common pathway of many distal variables (sensation seeking, parental permissiveness, and expectancies regarding smoking) predicting late experimentation with smoking. Prevention efforts aimed at reducing susceptibility to smoking (and its predictors), alcohol use, and misperceptions of peer smoking may decrease the probability of late experimentation.

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POS5-21 WEB-ASSISTED TOBACCO INTERVENTIONS WITH SOCIAL NETWORKS HAVE POTENTIAL TO FACILITATE CESSATION: AN EXAMPLE FROM SMOKERS' HELPLINE ONLINE

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Introduction: Smoking is the leading cause of death in Canada, yet 18% of Canadians 15 years or older continue to smoke. Web-Assisted Tobacco Interventions (WATIs) with social networks (support groups) have considerable potential to facilitate cessation and anonymous peer support, with 24-hour accessibility. The Canadian Cancer Society (Ontario Division) operates Smokers' Helpline Online (SHO: http://www.smokershelpline.ca), an interactive WATI based on the Stages of Change.

Method: SHO is comprised of 3 self-directed programs tailored to quitter type (current smoker, recent quitter, social smoker). Each program has 6 interactive modules with exercises intended to plan or maintain a quit as appropriate. This analysis examines self-reported data from users who registered for the program between Jan. 1, 2008 – Sept. 1, 2009, who also had access to a moderated social network. The purpose of this analysis is to determine program usage patterns for future development.

Results: 11,870 smokers registered, with 34.7% male (n=4,124) and 65.2% female (n=7,740). Program utilization statistics revealed that at registration 86.4% (n=10,255) were identified as current smokers, 12% (n=1,421) as recent quitters, and 1.6% (n=194) as social smokers. Program usage data indicated that amongst all quitter types, the most popular self-selected exercises were "Your Daily Progress" (86.7%), "Start Here" (72.3%), and "How Does this Program Work" (73%). Positioned in Module 5, choosing a Nicotine Replacement Therapy (49.5%). The least utilized exercise was "Your Final Countdown Plan" (10.2 %). In addition, 66,446 posts were made in the social network and 91% (n = 10,785) of registrants received motivational emails. Discussion: Members of this WATI tend to utilize exercises that instruct them on how to use the program. Although, it is recommended that users progress linearly through the program, members have the flexibility to select exercises of interest such as charting their daily progress and decision making for NRT. Moreover, the programs support group and emails are actively utilized and are valued aspects of SHO. Further usage patterns will be illustrated.

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POS5-22 CHALLENGES IN IDENTIFYING PRIORITY GROUPS OF SMOKERS FOR RESEARCH AND POPULATION-BASED TOBACCO CONTROL INTERVENTIONS

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Objectives: Although the term "high-risk" is used often in the health literature and discourse, and by policy makers, researchers and practitioners, it has been used ambiguously. This study examines two methods for identifying "high-risk" groups of smokers and discusses implications of the findings.

Methods: The 2005 Canadian Community Health Survey (CCHS) was used to identify "high-risk" groups in terms of prevalence and absolute numbers of current smokers. Current smoking was analyzed by socio-demographic characteristics, immigration history, language, chronic disease risk factors and province. Data were weighted to be representative of the target population.

Results: Groups identified with the highest smoking prevalence were those living in Yukon/Northwest/Nunavut Territories (35.8%, n=27,500), diagnosed with mood disorder (33.2%, n=501,900), from a household with annual family income less than $15,000 (30.6%, n=393,100), males aged 25-34 (30.3%, n=619,500) and males aged 20-24 (29.9%, n=349,200), whereas the five groups with the largest number of smokers were those without heart disease (n=5,340,200, 20.7%), without mood disorder (n=5,036,600, 19.7%), without high blood pressure (n=4,866,500, 21.2%), White (n=4,740,500, 21.6%) and speaking English (n=4,706,800, 20.4%). Although the prevalence of smoking is 1.7 times higher in those living in Yukon/Northwest/Nunavut Territories compared to those without heart disease, the absolute number of smokers is 194 times larger in the latter group.

Conclusions: "High-risk" measures based on prevalence and absolute numbers resulted in very different pictures of groups in need of attention to reduce the burden of smoking. Applying an equity lens might be useful in linking these two measures (prevalence and absolute numbers) to identify priority groups for population intervention research and practice.

Ministry of Health Promotion.

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POS5-23 INDICATORS OF CHANGE IN PATIENT BEHAVIOR FOLLOWING IMPLEMENTATION OF A SMOKE-FREE POLICY IN A PSYCHIATRIC HOSPITAL

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Background: Prior to implementation of a smoke-free policy in psychiatric settings, some staff report concerns that not permitting smoking will lead to increased stress and anxiety among patients, and provoke verbal and physical aggression. Reviews of the literature have not found evidence for any long-term increased aggression or other behavioral problems following implementation of a complete indoor smoking ban. However, research examining the impact of smoke-free policies on patient behavior has been conducted primarily in inpatient settings, and thus it is not evident whether these findings extend to other settings.

Objective: To examine the impact of implementation of a complete indoor and partial outdoor smoke-free policy on patient behavior across inpatient, outpatient, and emergency settings in Canada's largest public mental health and addiction teaching hospital (Centre for Addiction and Mental Health, Toronto, ON).

Method: Objective indicators of patient behavior were collected in the form of number of emergency code whites (aggressive behavior) and code reds (fire) called in the one-year period preceding and two-year period following smoke-free policy implementation.

Results: There was a significant decrease in the number of code whites in inpatient settings from 1 year pre-implementation (n=187) to 1 year post-implementation (n=139, $p<.05$) and 2 years post-implementation (n=135, $p<.05$). Conversely, the number of code whites in outpatient settings significantly increased in the short-term from 1 year pre-implementation (n=24) to 1 year post-implementation (n=59, $p<.001$). By the second year after policy implementation the number of code whites in outpatient settings had decreased (n=40) and was only marginally significant ($0.10>p>0.05$) when compared to pre-implementation numbers. There was no significant change in number of code whites in emergency settings or in number of code reds across all settings.

Conclusion: Current findings suggest that the impact of a smoke-free policy on patient behavior may differ by type of patient setting, with implications for both future research and organizations planning for implementation of a smoke-free policy.

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POS5-24 SIGNIFICANT ASSOCIATIONS OF VARIANTS IN CHRNA5/A3/B4 GENE CLUSTER WITH SMOKING INITIATION, NICOTINE DEPENDENCE, AND SMOKING CESSATION IN A KOREAN POPULATION

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Multiple genome-wide and targeted association studies reveal a significant association of variants in the CHRNA5-CHRNA3-CHRNB4 (CHRNA5/A3/B4) gene cluster on chromosome 15 with nicotine dependence (ND), the subjects used for most of these studies had a European origin. However, considering the distinct linkage disequilibrium patterns in European and other ethnic populations, it would be of great interest to determine whether such associations exist in other populations, such as Asian. In this study, we performed comprehensive association and interaction analyses for 32 SNPs in the CHRNA5/A3/B4 cluster with smoking initiation (SI), nicotine dependence (ND), and smoking cessation (SC) in a population-based sample from the Korea Association Resource (KARE) project (n = 8,842). We found significant associations of 7 SNPs with at least one smoking phenotype in the KARE total sample (SI: P = 0.015~0.023; ND: P = 0.008~0.028; SC: P = 0.018~0.047) and the male sample (SI: P = 0.001~0.023; ND: P = 0.001~0.046; SC: P = 0.01). Furthermore, we found that a series of haplotypes formed by three consecutive SNPs located between rs16969948 in CHRNA5 and rs6495316 in the intergene region downstream from the 3'-end of CHRNB4 are associated with the three smoking phenotypes in both the KARE total and male samples. However, associations of these variants and haplotypes with SC appear to be much weaker than those with SI and ND. In addition, we performed interaction analysis of SNPs within the CHRNA5/A3/B4 cluster using the generalized multifactor dimensionality reduction method and found a significant interaction of SNPs rs7163730 in LOC123688, rs6495308 in CHRNA3, and rs7166158, rs8043123 and rs11072793 in the intergene region downstream from the 5□end of CHRNB4 influencing SI in the KARE male sample. Considering that less than 5% of the female participants were smokers, we did not perform any analysis on female smokers because the sample was too small. Together, these results indicate that variants within the CHRNA5/A3/B4 gene cluster on chromosome 15 contribute greatly to the etiology of SI, ND, and SC in the Korean smoker population.

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POS5-25 COMMUNITY-BASED TRAINING CURRICULUM FOR PROMOTORES DE SALUD

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Introduction: Promotores de salud (lay health advisors) are widely used for effectively delivering health messages to Latinos and improving access to medical services, including smoking cessation.

Objective: To develop and implement a community-based training curriculum for promotores de salud to enhance knowledge, skills and self-efficacy to promote smoking cessation among Latinos.

Methods: Fourteen Spanish speaking promotores de salud (1 male and 13 females), between ages 30 and 50, recent immigrants completed the training. During seven, 2-hour sessions, promotores learned about: cigarette contents and its health effects, counseling and motivational interviewing, and quit smoking medications. We assessed 16 items on knowledge, skills and self-efficacy pre and post training.

Results: Before training, the majority reported limited knowledge on: evaluating nicotine dependence, quit smoking medications and developing a personalized quit plan. They also showed limited skills on: using reflective listening techniques and dealing with relapse and withdrawal symptoms. After the training, we identified a significant increase in knowledge, skills and self-efficacy to promote smoking cessation. The promotores each identified approximately 10 smokers within their social network to promote smoking cessation, particularly the use of quitline and quit smoking medications. They conducted 5 small youth tobacco prevention sessions and smoking cessation sessions among 15 Latino families.

Conclusion: When using community-based smoking cessation training with promotores de salud there is an increased possibility to successfully deliver health messages to Latinos.

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POS5-26 SMOKER'S VOICE: CAN VOICE CHANGES AFTER QUITTING BE USED TO VERIFY SMOKING STATUS? FINDINGS FROM THE RASP FEASIBILITY STUDY

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Background: Smokers' voices tend to be deeper and rougher due to laryngeal damage from cigarette smoke. When smokers quit, their voices may gradually change in quality. We hypothesised that if this change could be detected over the telephone, it could be used as an alternative to face-to-face methods for verifying self-reported smoking abstinence.

Aim: To assess if there is a change in voice quality up to 6 months after quitting, and whether it is possible to validate self-reported smoking abstinence using smokers' voices recorded over a landline telephone.

Method: Smokers who wished to quit smoking participated in a 12-week smoking cessation programme involving NRT plus behavioural support. Participants called a telephone number to record their name and a standard phrase prior to, and at regular intervals for up to 6 months after their quit date. At 6 months participants' smoking status was biochemically verified using NicAlertTM cotinine test strips. Acoustic software was used to assess a range of parameters of each person's recorded voice messages, with changes in these parameters compared over time and according to quit status.

Results: 89 smokers were recruited (mean age=48 yrs, SD=13), of whom 58% were female. Participants were moderately dependent (mean Fagerström score=4.8, SD=2.2) and smoked an average of 18 cigarettes per day (SD=7). No difference was found in the fundamental frequency, spectral slope or jitter between quitters and non-quitters, however the data had wide variability. Acoustic analysis of the voice recordings proved to be problematic due to background noise and voice distortion in the telephone recording system. Practice effects and the large amount of missing data due to participant dropout also made statistical analyses difficult.

Conclusion: Further research involving improved methods of reducing within-individual variability and cleaner voice recordings is required before a determination of the merits of this area of enquiry can be drawn.

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POS5-27 EVALUATION OF AN INTERVENTION TO ENHANCE INTEREST IN SMOKE-FREE POLICIES AMONG MULTI-UNIT HOUSING OPERATORS

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BACKGROUND: Personal living areas are a major source of secondhand smoke for many individuals and those who reside in multi-unit housing are particularly susceptible to exposure. Accordingly, this study assessed the efficacy of an intervention to enhance interest in smoke-free policy implementation among multi-unit housing operators (MUHO).

METHODS: A pre-post quasi-experimental design was used to evaluate a mail-based educational intervention among New York State (NYS) MUHO. From March-July 2008, telephone and mail-based surveys were administered to MUHO identified through the Standard Industrial Classification System. A total of 128 MUHO from Erie and Niagara Counties were sent informational packets, while 154 MUHO from the rest of NYS received no intervention. A total of 59 (46.1%) intervention participants and 95 controls (61.7%) were followed-up from March-July 2009. Logistic regression was used to assess predictors of policy interest, concern, and implementation. Predictors included intervention group, baseline status, respondent smoking status, survey type, government-subsidy status, quantity of units operated, and average building size, construction type, and age.

RESULTS: Among respondents with no smoke-free policy at either baseline or follow-up, intervention participants were more likely to report interest [OR: 6.49, 95% CI: 1.44-29.2] and less likely to report concern [OR: 0.16, 95% CI: 0.04-0.66] toward policy implementation at follow-up. No association was observed between actual policy implementation and intervention status at follow-up.

CONCLUSIONS: A short-term, mail-based educational intervention appears to increase interest in smoke-free policies and decrease concerns about policy implementation among MUHO. However, more time-intensive interventions may be required to generate actual policy implementation.

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POS5-28 MORE MAY NOT BE BETTER WHEN IT COMES TO GIVING OUT FREE NRT

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Research has demonstrated that the offer of free nicotine replacement therapy (NRT) can be a cost-effective marketing strategy to induce large numbers of smokers to call a telephone quitline. Manufacturers of nicotine medications recommend that smokers use the medication for at least eight to 12 weeks for maximal benefit. Providing free NRT to smokers who call a telephone quitline is costly, so it is reasonable for quitlines to ask whether varying the amount of NRT sent to smokers might differentially impact usage patterns and quit rates. In this late breaker session we will present the results of a recently completed randomized trial where smokers of 10 or more cigarettes per day who called the New York State Smokers' Quitline (NYSSQL) were sent different amounts of nicotine patches. The study evaluates patch usage and quit rates in three conditions: (1) 2-week free supply of nicotine patches; (2) 4-week supply of patches; and (3) 6-week supply of free patches. In addition to the free nicotine patches, study participants received a free stop smoking guide and one proactive follow-up call conducted 2-weeks after contacting the NYSSQL. A total of 2,806 smokers were randomized into the study and re-contacted by phone 7-months from their initial intake with the Quitline to assess their use of the NRT sent to them and smoking status. Of the 2,806 enrolled participants, 1,682 completed the 7-month follow-up; response rates were similar between the three groups. Most respondents (87%) reported using the nicotine patches sent to them, although amount of NRT used varied with greater use reported among those who received more patches. The 7-day nonsmoker prevalence rate measured at 7-months follow-up was 25.5% for those in the 2-week group, 27.7% in the 4-week group, and 29.1% in the 6-week group. While the observed quit rates trended slightly higher for those who received more free patches, quit rates and the cost per attributable quit 95%-confidence intervals overlapped between experimental groups. Based on these results we conclude that sending out more than a free 2-week supply of nicotine patches to smokers who contact a quitline is not cost-effective.

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POS5-29 THAI TAB INFO 2009 PROTEST SIGNALS LOSS OF TOBACCO INDUSTRY CREDIBILITY AND ENTITLEMENT

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The tobacco industry regularly holds 'trade meetings' in countries with increasing tobacco sales and customers. From November 11-13, the tobacco industry chose to have their 2009 Asian exhibition and congress in Bangkok, Thailand, even though Thailand has strong anti-smoking laws. Though their meeting was billed as a private business meeting, their purpose was far from harmless to the public. It included exhibits that showed how to better produce, market and distribute their deadly products using new technologies, and presentations on how to control the regulatory environment. In response to their plans, tobacco control advocates from ASH Thailand, SEATCA, Thai Health Promotion Foundation, and TRC planned a petition drive, student protest, support-mobilizing website, and monitoring and enforcement action to counter the industry. Researchers with expertise in tobacco control issues provided evidence of the exploitive nature, corrupt strategies, and longstanding misdeeds of the industry on counteringtabinfo.org. Combined efforts resulted in publicity for youth protesting the industry's presence, the withdrawal of the Thai Tobacco Monopoly's display of tobacco products at the exhibit, government officials not participating in the industry event, and the arrest and fining of tobacco companies for violation of Thai law forbidding display and promotion of tobacco products. This is the first time that industry officials have been arrested at such an exhibit, and where tobacco control activists have used a protest for training and establishing a surveillance system of the industry to control their interference through Article 5.3 guidelines of the WHO Framework Convention on Tobacco Control (FCTC). This collaborative effort galvanized government authorities and youth against the tobacco industry. It enlisted support for future monitoring and surveillance of the industry in South East Asia, and exposed industry techniques like sponsorships and 'corporate social responsibility'. This protest signaled the beginning of a new FCTC era where industry credibility and entitlements were replaced with notice of accountability as the future norm for the industry.

Funding of the countertingtabinfo website provided by the Tobacco Control Research and Knowledge Management Center. Other activities funded by the Thai Health Promotion Foundation.

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POS5-30 SMOKING AND ETS EXPOSURE AMONG WOMEN WHO GAVE BIRTH TO PRETERM AND LOW BIRTHWEIGHT BABIES IN EASTERN HUNGARY

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In Szabolcs-Szatmár-Bereg County, Hungary, more than 1 in 10 babies are born pre-term (<37 weeks of gestation) or low birth weight (<2,500 grams). Smoking is a well-documented risk factor of pre-term birth (PTB) and low-birth weight (LBW) with prevalence of LBW almost double for women who smoke cigarettes throughout pregnancy. This study evaluated the prevalence of smoking immediately prior to and during pregnancy, as well as exposure to environmental tobacco smoke during pregnancy among women who gave birth to a singleton PTB and/or LBW baby in Szabolcs-Szatmár-Bereg County during 2008 (n=300). 55% of all women reported regular or sporadic smoking immediately prior to pregnancy. Prevalence of smoking was higher among Roma than non-Roma women (67% vs. 44%, p<.01). Among smokers, only 7% and 30% of Roma and non-Roma women, respectively, quit during pregnancy (p<.01). In addition to smoking, 64% vs. 25% of Roma and non-Roma women reported frequent exposure to environmental tobacco smoke (ETS) during pregnancy. Maternal education moderated the relationship between ethnicity and smoking on all tobacco-related variables, with higher education playing a critical role in abstinence and reduced ETS exposure, particularly among the Roma. A long-term solution to the high tobacco use rates among pregnant women is to strongly encourage girls to remain in school beyond the mandatory 8 grades (or 16 years of age). In the short-term, smoking cessation programs could be integrated into the well-attended prenatal program. The vast majority (>99%) of Roma and non-Roma women sought prenatal care at least once and 84% sought prenatal care 5 or more times. Public health and medical professionals in Hungary could capitalize on the excellent prenatal care infrastructure to reach the vast majority of pregnant women for smoking cessation.

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POS5-31 BUILDING CAPACITY FOR TOBACCO RESEARCH AND CONTROL IN HUNGARY

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The International Tobacco and Health Research and Capacity Building Program (RFA-TW-06-006) supports trans-disciplinary and capacity building projects to reduce the burden of tobacco consumption in low- and middle-income countries (2007-2012). "Building Capacity for Tobacco Research in Hungary," funded through this initiative, aims to reduce the burden of tobacco use in Hungary by: (1) creating institutional capacity that will support scientists and advocates engaged in tobacco research; (2) conducting mentored research that has the potential to significantly reduce tobacco use at the local and national level; and (3) building individual capacity among Hungarian and U.S. research partners through formal in-country training and mentored research projects. The capacity building model has evolved through the use of organizational capacity and community organizing principles, while the research program is grounded in evidence-based tobacco control strategies. Eleven Hungarian teams have launched tobacco research projects on the epidemiological, clinical, educational, economic, legal, and policy influences of tobacco consumption. Data from these projects will form the locally relevant, scientific basis for high-impact tobacco programs and policies to reduce the burden of tobacco in Hungary. To date, scientists have presented 8 oral presentations, 4 posters, and 5 publications and have issued 6 media releases. The Ministry of Health has recognized this initiative as the tobacco program in the country. Scientists have also built new research partnerships within and outside the team (e.g., other scientists, community partners, NGOs) with key internal leaders emerging. The majority of Hungarian scientists indicate that tobacco research is "highly" important to impact tobacco policy and that they expect to conduct tobacco research in the future. Mid-project evaluation shows early success in the teams' ability to conduct high quality, locally relevant tobacco research. Strategic thinking with emphasis on dissemination and sustainability will be the guiding principles during the second-half of this initiative.

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POS5-32 TOBACCO USE AND INTEREST IN SMOKING CESSATION AMONG LATINOS ATTENDING COMMUNITY HEALTH FAIRS

Susan Garrett, B.A.*, A. Paula Cupertino, Ph.D., and Lisa Sanderson Cox, Ph.D.

Introduction: Health fairs are a vital avenue for reaching medically underserved Latinos and providing access to health services, including smoking cessation. While the literature exploring tobacco use among Latinos is increasing, few studies have addressed the use of community health fairs as an avenue for promoting smoking cessation among Latinos.

Objective: To describe tobacco use and interest in smoking cessation intervention among Latino smokers attending community health fairs.

Methods: We assessed the smoking behavior and attitudes of 262 self-identified Latinos attending community health fairs; 53 (20.2%) were current smokers and are the focus of this study.

Results: The majority of participants were uninsured (98.1%), male (54.7%), recent immigrants (96.2%) with limited English proficiency (60.4% spoke Spanish at home), had some high school education or less (67.9%), were employed (62.1%), and reported an estimated annual household income of less than or equal to $20,000 (47.2%). We identified that most participants were light smokers (86.3%), non-daily smokers (58.7%), and smoked their first cigarette after the first hour of waking (54%). Although most participants attempted to quit at least once in the past year and were ready to quit within 30 days, only 5.0% of current smokers had ever used cessation medication and 94.3% were unaware of telephone quitline services. Concerns for health and family were identified as leading reasons for quitting. The majority of participants (53.8%) were interested in participating in future cessation treatment.

Conclusion: Limited use of smoking cessation resources combined with the high interest in smoking cessation treatment among Latino immigrants emphasizes the need to develop culturally appropriate cessation treatments through community health fairs.

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POS5-33 REINFORCING EFFECTS OF SMOKING BY DEPRESSIVE STATUS AND MENSTRUAL PHASE: ARE DEPRESSIVE SYMPTOMS AN EFFECT MODIFIER?

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Both depressive symptoms and sex hormones play a role in minimizing smoking cessation efforts in women. However, little research has focused on the relationship between these two variables. The purpose of this study was to investigate differences by depressive status of reinforcing effects of smoking during different menstrual phases. Female subjects (n=39) who smoked at least 5 cigarettes per day, not on exogenous hormones, and had regular menstrual cycles were stratified into no depressive symptoms (NDS) or subclinical depressive symptoms (SDS) based on a structured interview. They were then randomized to complete testing in follicular (F-NDS n=7; F-SDS n=11) or luteal (L-NDS n=7; L-SDS n=14) phase. During ad libitum smoking conditions, subjects attended a clinic visit in their assigned phase and completed the modified Cigarette Evaluation Questionnaire (mCEQ). Subjects were 31.2±7.0 years old and approximately half were non-White (49%). They smoked 13.2±5.6 cigarettes per day, and their mean FTND score was 4.6±2.0. There were no significant differences in demographics or smoking behavior by stratification or randomization. In a two-way ANOVA model, there was a significant interaction between depressive status and menstrual phase for the mCEQ subscale of Smoking Satisfaction indicating that subjects in the NDS group had significantly greater variation in smoking satisfaction by menstrual phase; whereas minimal variation by menstrual phase differences were observed in the SDS group (F-NDS: 5.2±0.5; L-NDS: 3.4±0.5; F-SDS: 4.5±0.4; L-SDS: 4.8±0.3; p=0.016). A similar observation was made on the Enjoyment subscale, though it did not reach statistical significance (F-NDS: 4.4±0.6; L-NDS: 1.7±0.6; F-SDS: 3.6±0.5; L-SDS: 2.9±0.5; p=0.089). The remaining three subscales (Psychological Reward, Craving Reduction and Aversion) were not statistically different by depressive status or menstrual phase. These preliminary results indicate that depressive status may act as an effect modifier between menstrual phase and the reinforcing effects of smoking, such that women who experience depressive symptoms may experience less variation by menstrual phase.

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POS5-34 HOW TO DEFINE A "SMOKER": COLLEGE STUDENT ATTITUDES AND RELATED SMOKING CHARACTERISTICS

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Less than half of college students who have smoked in the past month identify themselves as smokers. Thus, the present study aimed to examine (1) how college students define the term "smoker"; and (2) how this definition is impacts motivation and confidence in quitting among college students. In 2009, we conducted 12 focus groups with a total of 73 college student smokers drawn from survey participants at two colleges in Minnesota (a two-year technical college and a four-year university). Each group was homogenous in terms of gender and school (two-year, four-year). The majority (56.2%) was female, 49.3% were from the two-year college, and 32.9% were regular smokers (smoked ≥25 of the last 30 days). Participants described a "smoker" in terms of (1) smoking frequency, ranging from smoking infrequently to smoking daily; (2) whether one purchases cigarettes, such that "smokers" buy cigarettes while nonsmokers borrow them; (3) contextual factors, such that smoking alone indicates being a smoker rather than smoking at parties; (4) addictive symptoms; (5) whether one can quit smoking if they want to; (6) whether smoking is habitual; and (7) time since smoking initiation. These beliefs had implications on intent and motivation to quit smoking and confidence in quitting. A large proportion of participants indicated a high confidence in being able to quit but reported that they did not believe that they were "smokers" and thus, did not need to quit. Several participants who did not believe they were smokers reported limiting their smoking as a relevant goal rather than smoking cessation. Alternatively, those who did consider themselves to be smokers noted a number of barriers to quitting, including drinking alcohol, having roommates or partners that smoked, and emotional triggers (e.g., stress, boredom). The vast majority of participants had not attempted to quit smoking, and thus, relied on secondhand information regarding the success or side effects of different resources to aid in cessation. These findings highlight the need to differentially address the patterns of smoking among college students and how different groups may perceive the need to "quit smoking."

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POS5-35 COLLEGE STUDENT ATTITUDES REGARDING SMOKE-FREE POLICIES IN PUBLIC, ON CAMPUS, AND IN PRIVATE SPACES

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Tobacco control policies have been increasingly implemented at various levels—in public places, on college campuses, and in private spaces. Thus, we examined college student smokers' attitudes regarding a recently implemented statewide smoke-free policy, campus smoking policies, and private smoking restrictions (in homes and cars) using a mixed methods approach (surveys and focus groups). In 2009, we conducted 12 focus groups with a total of 73 college student smokers drawn from survey participants at two colleges in Minnesota (a two-year technical college and a four-year university). Each group was homogenous in terms of gender and school (two-year, four-year). The majority (56.2%) was female, 49.3% attended the two-year college, and 32.9% were regular smokers (smoked ≥25 of the last 30 days). In regard to public policies, 79.5% approved of the ban in restaurants, whereas 58.9% approved of the ban in bars, with women being more likely to approve of the ban in bars (p=.04). Participants indicated the following benefits of the ban: demonstrates respect for the rights of others, prevents exposure to secondhand smoke, reduces smoking when drinking, and freedom from the smell of smoke. Concerns about the ban included infringing on smokers' rights and the rights of bar and restaurant owners and the economic impact of the ban on bars and restaurants. In regard to campus smoke-free policies, few people reported that a smoke-free policy would negatively impact student quality of life, learning, or enrollment (34.2%, 16.4%, and 20.5%, respectively). Participants noted concern about enforcement of campus smoke-free policies and the impact on smokers' rights. In regard to private smoke-free policies, 22.2% had complete car restrictions, and 47.2% had complete home bans, with women being more likely to have complete home bans (p=.01). Participants noted that the implementation of the statewide policy did not impact the implementation of private restrictions. Thus, even among college smokers, there is a high level of support for public and campus smoke-free policies. However, efforts should focus on promoting the implementation of private restrictions among this group.

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POS5-36 ESTABLISHING AND ENFORCING HOUSEHOLD SMOKING RESTRICTIONS IN CHINESE FAMILIES: A QUALITATIVE STUDY

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The enforcement and expansion of China's clean indoor air legislation due to the China's ratification of FCTC measures, homes are becoming a common place for smoking and a source for second hand smoke (SHS) exposure to children and other non-smokers in the households. However, very little is known about the household smoking practices in Chinese families. To better understand the issues around adopting household smoking restrictions, we conducted a qualitative research study, using both focus group discussions (FGD) and in-depth interviews (IDI), among Chinese households (n=17), including 5 smokers and 12 non-smokers, in urban Shanghai, China. All the FGDs/IDI was conducted in Mandarin Chinese using a discussion guide or a semi-structured interview guide. All FGDs/IDI were recorded using a voice-recording device and translated into English for analysis. Findings suggest that there are gaps in knowledge of the health consequences of smoking and SHS among the participants. Although there was lack of knowledge about the health risk of exposure to SHS, most (88%) were willing to protect the child from the SHS exposure. 71% (12/17) families had only partial smoking restrictions and 39% had no home smoking restrictions. Major reasons for smoking restrictions included concern about the harmful effects of smoking on child's health and adult health, establishing a good example in front of the child as a non-smoker, maintain a clean and odor free home, money savings from not or less smoking, and chance of accidents and fires at home. Many families do not openly discuss about smoking or smoking restrictions at home. Barriers to adopting a smoke free home included social gatherings at home which would need smoking (35%), authoritative attitudes of the husband or father-in-law (35%), difficulties with the visitors (29%), and the social acceptability of smoking (35%). 76% of the participants would accept a counseling intervention to reduce SHS exposure to children and suggested various measures to implement it. These findings have implications for designing intervention strategies to reduce SHS exposure reduction among children in China.

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POS5-37 HOUSEHOLD SMOKING RESTRICTIONS AND SHS EXPOSURE AMONG URBAN CHINESE FAMILIES WITH YOUNG CHILDREN: A PRELIMINARY ANALYSES

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The purpose of this study is to examine smoking habits, smoking attitudes, secondhand smoke knowledge, household smoking restrictions, and children's exposure to second hand smoke (SHS) in the households of the Xujiahui district in Shanghai, China. The study sample consisted of 139 households with at least one smoker and a child less than 5 years of age. Subjects were household members who self-reported smoking one or more cigarettes daily for the past 30 days, smoke at least 10 cigarettes per month at home in the presence of the child, live together with the child in the same household and during the entire period of the study. Overall reported levels of household smoking and children's exposure to SHS were low, with a significant amount of SHS exposure to children were taking place from smoking during the weekend and from the smoking of visitors. Although participants possessed appropriate knowledge of SHS and its health effects, the implementation of household smoking restrictions was not common (only 54.5% had some smoking restrictions at home). When smokers knew of the risks SHS had towards children, they were less likely to expose them to SHS. Not adopting household smoking restrictions was associated with duration of smoking, employment status, knowledge of SHS and its effects on the health of adults and children, and the perceived difficulty in quitting smoking. These findings have implications for designing intervention strategies to promote smoke-free homes in China.

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POS5-38 TRANSITIONS IN CIGARETTE SMOKING AMONG HEAVY DRINKING COLLEGE STUDENTS: A LONGITUDINAL STUDY

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This study examines smoking patterns and predictors of change in smoking among 895 students from five universities who participated in a randomized trial to reduce harms from high risk drinking and were followed for two years (91% follow-up rate). At baseline, 46% of the students were smokers, a quarter (25%) of whom smoked daily; two years later, 35% were smokers with 29% of them daily users. Over this period, 39% of the smokers quit, 18% increased the amount they smoked, 19% reduced their smoking and 24% remained at the same level; among non-smokers, 13% initiated tobacco use. Very few (9%) of those who quit were daily (>1cpd) smokers at baseline, compared with 38% of those who continued to smoke (p<.001). While average baseline drinking level was the same in both groups (76 drinks in past month), those who quit smoking had reduced their drinking by almost half (45%) after two years, compared with only a 25% reduction among continuing smokers (p<.001). In regression analyses, smokers who did not wake up wanting to smoke at baseline, increased weekly exercise, and decreased monthly alcohol intake were more likely to be quit at the two year mark (all p<.001). Predictors of smoking initiation among baseline non-smokers included class year (p<.03) and past month drinking level (p<.03). Gender, age, depression (as measured by BDI-PC), RAPI score and risky driving practices were not predictive of changes in smoking behavior. Additionally, whereas assignment to treatment group was associated with modest reductions in drinking, there was no treatment effect on smoking; instead there was a notable Hawthorne effect, with a large share of smokers reporting quitting in both the treatment and control groups. While the high quitting rates could be due to false reporting, it is also possible that monitoring smoking status among college students affects quitting behavior, especially among light smokers. These findings may point to a role for student health clinicians in screening for and monitoring tobacco use, as well as addressing tobacco use concurrently with other behavioral risk factors, such as drinking and fitness, in the context of acute and routine care.

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POS5-39 A DIRECT COMPARISON OF TWO TRANSDERMAL NICOTINE SYSTEMS: CLINICAL PHARMACOKINETIC PERFORMANCE

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Previous research has shown differences in the pharmacokinetic (PK) profiles of marketed nicotine transdermal systems likely due to the differences in patch design and control release mechanism; however, this work did not include the recently developed and marketed 25mg patch. Thus, a study was conducted to investigate the PK performance of 21mg NiQuitin/NicoDerm CQ (24 hour) patch and 25mg Nicorette (16 hour) Invisipatch. The study was a single-center, randomized, open label, single dose, two-way crossover study. Eligible subjects were domiciled for the entire study (two baseline and treatment sessions); no smoking was permitted during the baseline and treatment sessions. Blood samples were obtained immediately prior to dosing and at predetermined time points post dosing. The primary PK parameter was AUC0-inf, to compare the amount of nicotine delivered. Secondary PK parameters, including Cmax and tmax, as well as post hoc exploratory parameters AUC0-16 and AUC0-inf assuming a 16-hour application for the 21mg patch, were also explored. The difference in the AUC0-inf, Cmax, AUC0-16, and AUC0-inf assuming a 16 hour application for the 21mg patch was considered significant if the lower limit of the 90% Confidence Interval (CI) for the ratio of the geometric means (21mg:25mg) was greater than 100%. The primary PK result (AUC0-inf) demonstrated that the 21mg patch delivered 57% more nicotine than the 25mg patch [383 vs. 244 ng/ml*hr; ratio of geometric means (90% CI): 157% (148%, 166%)]. Additionally, the 21mg patch reached maximum concentration 6 hours earlier than the 25mg patch (6 vs. 12 hours, respectively, $p<0.0001$). The Cmax, AUC0-16, and AUC0-inf assuming a 16-hour application for the 21mg patch were also significantly higher for the 21mg vs. 25mg patch. These findings demonstrate that the 21mg patch delivers a higher dose of nicotine faster than the 25mg patch, when used as indicated. The post hoc analyses demonstrated that a 16-hour application of the 21mg patch would also deliver a higher dose than the 25mg patch. Both patches were well tolerated. This study provides further support that there are differences among marketed transdermal nicotine patches.

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POS5-40 ACUTE EFFECTS OF VARENICLINE ON SMOKING BEHAVIOR AND REWARD

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Varenicline, an α4β2 nicotinic acetylcholine receptor partial agonist, is known to be an effective smoking cessation medication, yet it is unclear through what mechanisms. This within-subjects study examined effects of varenicline versus placebo on smoking behavior and reward during a single acute smoking session. Adult cigarette smokers (n=110, 43.6% male) smoked and rated their own cigarette (blind) following a one-week run-up period with either placebo or varenicline (0.5 mg qd, then 0.5 mg b.i.d.), in counter-balanced order and separated by a week of ad lib smoking on no medication. Measures included smoking behavior via a CReSS Pocket topography device (i.e. number of puffs, total puff volume) and smokers' subjective ratings of their cigarettes (i.e. liking, how much nicotine, similar to own brand). Current interest in quitting (high or low) and sex were between-subjects factors, and medication condition (varenicline or placebo) was the within-subjects factor. A repeated measures ANOVA showed a main effect of varenicline on liking ($p <.001$), similar to own brand ($p <.001$), and how much nicotine ($p <.05$), but no effect of varenicline on smoking behavior. For both liking and puff number, main effects were significant for quit interest and for sex, as liking and puff number were lower in those with high versus low quit interest and in women versus men. These results show that varenicline lowers subjective reward ratings of cigarettes, but not actual smoking behavior in a single acute session under blind conditions. Thus, varenicline may acutely decrease enjoyment of smoking but not smoking reinforcement. Effects of varenicline over longer durations of opportunity to smoke should be examined in smokers attempting to quit permanently to determine whether these results generalize to smoking reward and reinforcement during the lead-in to a quit attempt while using varenicline.

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POS5-41 DIFFERENCES IN NEGATIVE MOOD-INDUCED SMOKING REINFORCEMENT AND REWARD DUE TO DISTRESS TOLERANCE, ANXIETY SENSITIVITY, AND DEPRESSION HISTORY

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Negative mood increases smoking reinforcement but may do so to differing degrees depending on various characteristics of smokers. Understanding the individual differences in negative mood-induced smoking reinforcement and reward could lead to identifying those at higher risk for relapse due to negative mood. The current study examined individual differences in acute smoking reinforcement and reward under negative mood induction. Smokers (n=71) were randomly assigned to one of two smoking groups (nicotine or denic cigarettes) and engaged in five different tasks across five different sessions. Four tasks were designed to increase negative affect (NA; computer memory recall, speech preparation, negative mood pictures, and smoking abstinence for 12 hours) and one task served as a neutral affect control. Smoking behavior (i.e. puff volume) was measured using a handheld smoking topography device, CReSS Pocket. Other dependent measures included self-reported affect, craving, withdrawal, and cigarette reward ratings (i.e. 'liking'). In each session, participants took four puffs from their respective cigarette, completed self-report measures, and then smoked ad lib during the final 10 minutes of mood induction during each session. The Distress Tolerance Scale (DTS), Anxiety Sensitivity Index (ASI), and the Inventory to Diagnose Depression-Lifetime (IDD; depression history) were the measures of individual differences. Those with a positive versus negative history of depression smoked significantly more across all sessions ($p < .001$), while those low in distress tolerance smoked more after overnight abstinence only ($p = .05$). Anxiety sensitivity was unrelated to smoking but increased liking during the speech preparation task ($p < .02$). There were no individual differences in affect, but a positive history of depression was related to greater craving ($p < .05$) and marginally greater withdrawal ($p < .10$). These results identify individual differences that may influence smoking behavior and reward, particularly in the context of negative mood.

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POS5-42 DISTRESS TOLERANCE AND ADOLESCENT SMOKING QUIT AND REDUCTION EFFORTS

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Aims: More than half of adolescent smokers report attempts to quit each year but only a small percentage actually succeeds. In efforts to understand the underlying reasons for failed cessation attempts, the current study investigated negative emotionality and resulting avoidant coping styles, specifically distress intolerance, as a contributing factor to relapse. Low psychological distress tolerance is defined as the inability to persist in goal-directed behavior in the face of affective distress and has predicted poor cessation outcomes among adult smokers.

Methods: The study is currently in the data collection process. The available sample consists of 22 adolescent daily smokers who reported a desire to quit smoking within 30 days upon enrollment (mean age =16.8, 57.1% male, 61.9% White, mean cigarettes per smoking day (CPSD) = 8.7). Outcome variables were assessed during baseline, quit date, and at 7-day intervals over the period of a month post-quit date. Psychological distress tolerance in the current study was measured using computer-based behavioral tasks, including the Mirror Tracing Persistence Task (MTPT) and the Paced Auditory Attention Serial Task (PASAT).

Results: To date, 82% of participants reported making a quit attempt (mean duration = 15.6 days) and 91% of participants indicated a reduction of CPSD. Lower distress tolerance was associated with younger age of smoking onset, higher baseline CPSD, and heaviest lifetime smoking. Prospective analyses indicated that lower distress tolerance predicted shorter quit attempt duration and smaller reductions in CPSD across the follow-up period, after accounting for baseline smoking.

Conclusions: Preliminary results of the current study elucidate processes that may predispose adolescents to fail in their smoking cessation attempts. Low psychological distress tolerance should be considered as a basic mechanism to target in smoking cessation treatments for adolescents.

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POS5-43 FACTORS AFFECTING EXPOSURE TO NICOTINE (NIC) AND CARBON MONOXIDE (CO) IN ADULT CIGARETTE SMOKERS

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Exposure to cigarette smoke among smokers is highly variable, some of which could be related to differences in smoking behavior as measured by smoking topography, as well as behavioral and subjective aspects of smoking. In a multi-center cross-sectional study of 3,585 adult smokers and 1,077 adult nonsmokers, biomarkers of exposure to nicotine and carbon monoxide were determined. Puffing parameters and responses to a 182-item adult smoker questionnaire (ASQ) were also determined. The relationship between exposure and demographic factors, Cambridge Filter Method (formerly known as FTC Method) tar yield and cigarette consumption, puffing parameters and selected questions from the ASQ (identified by a data reduction process) were examined. Number of cigarettes smoked per day was the most important factor in determining daily exposure. Other significant factors were number of years smoked, responses related to morning smoking, topography and Cambridge Filter Method tar yield categories. In conclusion, all these factors account for up to 40% of the variation in exposure to nicotine and carbon monoxide.

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POS5-44 ACTIVATION IN MESOLIMBIC CIRCUITS IN LIGHT ADOLESCENT SMOKERS: AN FMRI STUDY

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Background: As with other drugs of abuse, nicotine acts on the brain reward system. Developmental changes in these reward pathways occur during adolescence and thus nicotine exposure during this period may affect these reward pathways in such a way as to increase adolescents' susceptibility to addiction.

Objective: This study focused on light adolescent smokers to identify brain regions potentially important in early addiction. Using fMRI, we examined whether or not adolescents with low levels of nicotine exposure (light smokers) display neural activation in areas shown to be responsible for addiction in response to smoking-related stimuli in adults.

Methods: Twelve adolescent light smokers (aged 13 to17, smoked 1 to 5 cigarettes per day) and 12 non-smokers (ages 13 to 17, never smoked a cigarette) underwent fMRI scanning. During scanning they viewed blocks of photographic smoking and control cues. Smoking cues consisted of pictures of people smoking cigarettes and smoking-related objects such as lighters and ashtrays. Neutral cues consisted of everyday objects and people engaged in everyday activities.

Results: For smokers, smoking cues elicited greater activation than neutral cues in the mesolimbic reward circuit known to be activated by addictive drugs (left anterior cingulate ($T=7.88$, $p<.001$), right hippocampus ($T=6.62$, $p<.001$) and right parahippocampal gyrus ($T=4.70$, $p<.001$)). We also found significant activation from smoking cues versus neutral within both the left and right frontal medial orbital regions ($T=5.09$, $p<.001$ and $T=3.94$, $p=.001$ respectively which appears to be unique to adolescents. Non-smokers showed no significant relative activation between smoking-related cues and neutral cues.

Conclusions: Our finding that smoking cues produced activation in brain regions associated with nicotine craving and addiction in adolescent light smokers was striking and suggests that teen light smokers may already be developing signs of nicotine addiction. Furthermore, the finding of activation within the medial orbital frontal region may point to a novel brain locus associated with the development of nicotine addiction in early adolescent smokers.

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POS5-45 RELATIONSHIP BETWEEN SUBJECTIVE SOCIAL STATUS AND HEALTH BEHAVIORS AMONG AFRICAN AMERICAN SMOKERS

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Recent research suggests subjective social status is considered a strong predictor of social status because income, education, and occupation are not the only variables considered. The MacArthur Scale of Subjective Social Status is a tool used to identify perceived social status within society and local community. The MacArthur scale may elucidate other factors influencing the relationship between perceived social status and healthy behaviors. The present study assessed the association of subjective social status with nicotine dependence, smoking cessation, diet, and exercise among African Americans. Data was derived from a 2x2 clinical trial that tested the efficacy of nicotine gum (vs. placebo) and counseling (motivational interviewing vs. health education) among 755 African American light smokers (smoked ≤10 cpd). Data from the baseline survey provided information on the MacArthur Scale of Subjective Social Status (scale of 1-10), demographic, smoking, and other health information. Smoking cessation was confirmed at the end of 26 weeks using salivary cotinine (<20ng/ml). Analysis found the mean Community Ladder ranking associated with income (6.22 vs.6.59 for <$1,800 vs.≥$1,800/mnth;$p=.019$) but no significant relationship with education ($p=.943$). There were also marginally non-significant associations between Community Ladder ranking and walking for exercise (6.52 vs.6.22 for walking vs. not walking; $p=.108$); servings of vegetable consumption per day ($p=.081$); fat content in diet (6.66 vs.6.16 for low vs. high fat; $p=.074$); smoking within 30 minutes of awakening (6.27 vs. 6.54; $p=.108$); cotinine verified smoking cessation (6.74 vs.6.31 for abstinent vs. smoking; $p=.077$). Although the associations between Community Ladder and health behaviors were not statistically significant, there was a consistent trend suggesting that participants with higher perceived community status had a higher daily diet of vegetables and fruit; more likely to walk for exercise; had a low heart rate increase while walking; less nicotine dependent; and more likely to quit smoking. More research is needed to understand the association between community ladder and health behaviors.

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POS5-46 ACADEMIC ACHIEVEMENT AND SMOKING IN SECONDARY SCHOOL ADOLESCENTS: A GENERAL GROWTH MIXTURE MODEL

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Research suggests that academic achievement is associated with a decreased likelihood of adolescent smoking. However, no study to our knowledge has assessed the prospective relationship between developmental trajectories of academic achievement (Grade Point Average; GPA) and adolescent smoking, and what factors influence the relationship. Using general growth mixture modeling, we assessed if there are unobserved and relatively homogenous classes of GPA, the factors predicting class membership, and the effect of class membership on smoking (number of cigarettes smoked weekly; binary, 0 cigarettes versus else) at last follow-up. Participants were 741 non-smoking secondary school adolescents, age 12 (SD=.56) at 7th grade baseline, taking part in the four-year Montreal Adolescent Depression Development Project. GPA was assessed twice yearly (8 times) across the four years, from official school records. Results: The best model had three GPA trajectory classes: Elevated (n=267, 36%), Moderate (n=388, 52%), and Low (86, 12%), with the proportion smoking at last follow for the three classes being 7%, 15%, and 49%, respectively. Females were less likely have moderate than elevated GPAs. Participants repeating a grade were more likely to have moderate and low than elevated GPAs, and low than moderate GPAs. Parental support (e.g., bonding) and democratic control (e.g., strict but legitimate rules), and parental education decreased the likelihood of having moderate and low compared to elevated GPAs. Parental education also decreased the likelihood of having low compared to moderate GPAs. Conclusions: The results suggest that when adolescents do well in school, they are less likely to smoke. Further, as low parental education is a risk factor for poor educational outcomes and adolescent smoking, when adolescents do poorly in school, they may predispose their future children to poor developmental outcomes including smoking. However, as parental support and democratic control reduce the likelihood of poor academic performance, teaching parents essential parenting skills may be one way to reduce the intergenerational transmission of smoking.

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POS5-47 CIGARETTE BUTTS: TOXIC HAZARDOUS WASTE AND ENVIRONMENTAL POLICY

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Discarded cigarette butts are a form of non-biodegradable waste. Carried as runoff from streets to drains, to rivers, and ultimately to the ocean and its beaches, cigarette butts are the single most common littered item in the world (5.6 trillion cigarettes are sold worldwide each year). They are an environmental blight on streets, sidewalks, and other open areas. Rather than being a protective health device, cigarette filters are primarily a marketing tool to help sell 'safe' cigarettes. They are perceived by much of the public (especially current smokers) to reduce the health risks of smoking through technology, and they are non-biodegradable. Using standard acute fish bioassays, we determined the LC50 for leachate from smoked cigarette butts (with remnant tobacco) was about 1 cigarette butt/L for both fresh and salt-water species. For leachate from smoked cigarette filters (remnant tobacco removed), the LC50 was higher, at values of 3.3 and 5.5 cigarette butts/L, respectively. Several options are available to reduce the environmental impact of cigarette butt waste, including increasing fines and penalties for littering butts, litter fees or monetary deposits on filters, increasing availability of butt receptacles, expanding public education, and class action suits against the tobacco industry brought by communities that suffer from butt waste. Additional research is needed on the various policy options, including behavioral research on reframing the issue of butt waste as toxic hazardous material.

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POS5-48 EXAMINING THE ASSOCIATION OF VARENICLINE EFFECTS ON SHORT-TERM SMOKING REWARD AND BEHAVIOR WITH SUBSEQUENT ABSTINENCE

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Varenicline is a highly efficacious smoking cessation medication, but its mechanisms of action are not well understood. The present study explored the relationship between varenicline's effects on acute smoking reward and reinforcement and on subsequent short-term abstinence. Participants (n = 124) aged 18-65 (M = 32.1±1.0) who smoked ≥10 cigarettes per day (M = 16.3±0.5) completed a six week study consisting of two three-week phases: ad lib smoking (week 1), dose run-up with either varenicline or placebo while continuing to ad lib smoke (week 2), and then attempt to quit while on medication (week 3). Participants were either "high" or "low" in current quit interest based on intention to quit soon, and were administered medication double-blind in counter-balanced order. At the end of week 2 of each phase, near the end of dose run-up, participants recorded the number of cigarettes they smoked over the past 24 hours, provided a CO sample, and were asked to retrospectively rate the cigarettes they smoked that day for reward value (cigarette "liking"). Daily abstinence during week 3 of each phase was confirmed via CO <5 ppm. Varenicline significantly reduced cigarettes per day [$F(1,105) = 6.03$, $p < .05$] and CO [$F(1,105)=6.77$, $p<.05$], and marginally reduced liking [$F(1,107) = 2.92$, $p<.10$]. Liking was also influenced by quit interest [$F(1,107) = 15.75$, $p<.001$], as well as by interactions of varenicline x quit interest [$F(1,107) = 4.64$, $p<.05$] and varenicline x quit interest x sex [$F(1,107) = 7.41$, $p<.01$]. Varenicline decreased liking among men with high but not low quit interest, while no influence of quit interest was seen among women. However, varenicline effects on cigarettes per day and liking were not related to subsequent days of abstinence due to varenicline. Thus, although varenicline reduced short-term smoking behavior and reward, neither effect was associated with subsequent ability to quit due to varenicline in a brief simulated quit attempt. Longer-term assessments of these effects in smokers attempting to quit permanently could reveal a stronger relationship between these variables and abstinence.

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POS5-49 ASSOCIATION OF SELF-REPORTED CRAVING AND EXPECTANCY FOR NEGATIVE AFFECT RELIEF WITH ACUTE SMOKING BEHAVIOR DURING NEGATIVE MOOD

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Self-report measures of smoking urges and smoking expectancies have rarely been validated prospectively by comparison with actual smoking behavior in controlled laboratory tests. We examined the association of self-reported craving and expected negative affect relief with acute smoking behavior in different mood contexts. Dependent smokers (n=34) participated in 5 two-hour sessions, 4 with tasks intended to increase negative affect (NA) and one neutral control session. The four NA tasks included computer memory recall, negative mood slides, speech preparation, and overnight smoking abstinence. Following baseline and 20 min of mood induction, participants were permitted to smoke ad lib for 10 min. Smoking puff volume was recorded using the CReSS Pocket device. Craving was assessed via the QSU-brief, which includes Factors 1 (desire and intention to smoke) and 2 (anticipation of NA relief), as well as a global score. The Expected Negative Affect Relief (ENAR) scale of the Smoking Consequences Questionnaire (SCQ), administered during an introductory session, was the measure of ENAR. Results showed that the association of craving with subsequent smoking behavior depended on session context. Total puff volume during ad lib smoking was correlated with QSU Factor 1 ($r = .52$, $p < .01$), Factor 2, ($r = .47$, $p < .01$) and Global Craving ($r = .54$, $p < .01$) during neutral mood, and with Factor 2 ($r = .41$, $p < .05$) and Global Craving ($r = .39$, $p < .05$) during the abstinence day. Craving was unrelated to smoking behavior during negative mood induction via the other procedures. By contrast, there were no significant correlations between ENAR and puff volume for all sessions. Neither measure was correlated with the difference in smoking volume between any of the NA and neutral conditions. In sum, the QSU predicts subsequent acute smoking behavior during neutral mood and following smoking abstinence, but not under other negative mood conditions. The SCQ ENAR scale did not predict smoking during any session. These comparisons should be examined over longer periods of smoking opportunity to determine the reliability of our findings.

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POS5-50 THE ACCEPTABILITY AND FEASIBILITY OF A TEXT MESSAGING-BASED SMOKING CESSATION PROGRAM IN ANKARA, TURKEY

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We tested the acceptability and feasibility of a 6-week text messaging-based smoking cessation program among 75 current adult smokers living in Ankara, Turkey. Participants were required to have a cell phone, send and receive text messages, and be seriously thinking about quitting smoking in the next 30 days. By design, half (n=37) of participants were female. Age ranged from 19-62 years (M: 37.6, SD: 10.8 years). Indicators of program feasibility were positive. 182 people expressed interest in the research program during the four months of recruitment, 166 of them met initial eligibility criteria. Of those eligible, 46% (n=77) were enrolled. Two were censored prior to program initiation, resulting in a final sample of 75 participants. Participant retention was high: 1 participant dropped out of the intervention; 63 participants provided carbon monoxide data at 12-week post-quit date. Based upon an intent-to-treat analysis, 7.5% of participants (n=10) were quit at 12 weeks post-quit day (i.e., reported having 5 or fewer cigarettes since their quit date and had a CO reading of 8ppm or less). Among those who completed the 12-week follow up survey and had not quit smoking (n=46), the number of cigarettes smoked per day was reduced by an average of 5.1 cigarettes (SD: 6.8 cigarettes) since study enrollment. Program acceptability was high among the 38 participants who completed the likeability survey questions at 4 weeks: 78% said the program text messages talked about what their were experiencing and feeling; and 71% said they were somewhat or very likely to recommend the program to someone else. These data suggest that a text messaging-based program is feasible and acceptable to smokers in Ankara who are seriously thinking about quitting smoking.

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POS5-51 SENSATION SEEKING AND ADOLESCENT SMOKING: MEDIATION BY RISK EXPECTANCIES AND NEGATIVE AFFECT

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Previous research has shown that adolescents who are high in sensation seeking are at a higher risk for tobacco use. However, factors that explain this relationship are relatively unknown. Studies of adult smokers show that impulsive smokers may have disproportionately high expectancies about negative reinforcement from smoking, suggesting that negative affect may increase vulnerability to smoking; however, this is untested in adolescent samples. Additionally, impulsive adolescents may have lower expectations about the risks associated with cigarette smoking. The present study tested the effect of risk expectancies and negative affect on smoking initiation in adolescents. High school students (n=1688) participated in the study as a part of an annual survey. We found that students higher in sensation seeking reported greater lifetime and past 30-day cigarette use (ps < .05). Additionally, these relationships were partially mediated by both negative affect and risk expectancies. The findings suggest that individuals who are high in sensation seeking may be more likely to smoke because they have lower expectations about the risks associated with smoking and with the intention of alleviating negative affect.

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POS5-52 CIGARILLOS USE AND SMOKING CESSATION TREATMENT OUTCOME AMONG FEMALE INMATES

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Cigarillo and cigarette-like cigars sales have risen in recent years and the introduction of different flavors makes these products more attractive to females, youths, and minority users. Cigarillos and little cigars may be perceived as less harmful than other products due to a lack of both research and public health campaigns educating the public about the risks. To date, little research has been conducted on cigar/cigarillo use among females and no research has investigated the impact of their use on quitting cigarette smoking among female prisoners. 179 female inmates participated in a 10-session group plus nicotine replacement smoking cessation treatment, with additional follow-ups at 3, 6 and 12-months. White and African Americans female smokers were almost equally represented in the sample (45.3% and 46.5%, respectively). The majority were unmarried (48.6%), young (Mean = 33.13), with 2 children. The mean age women first tried smoking = 13.62 years; smoking about 16.6 cigarettes per day, and had made = 2.78 cessation attempts in the past. More than half (55.3%) endorsed using cigarillos currently with their other cigarettes smoking or in the past. One-way ANOVA revealed that cigarillo users, compared to cigarette-only smokers, were significantly more likely to be single (58.4%), younger (Mean = 30.97 years), and with a high school or GED education (69.6%). They had initiated cigarette smoking at an earlier age (Mean = 12.78 years), had fewer children (Mean = 1.98), and smoked less cigarettes per day (Mean = 16.10). The majority of cigarillo smokers were African American and other minorities (55.7%) compared to Caucasians. GEE analyses indicated that cigarillo smokers had significantly lower cessation rates overall compared to cigarette-only smokers. The results demonstrate that cigarillo smoking, particularly in conjunction with cigarette smoking, may negatively impact smoking cessation treatment outcomes. This is particularly relevant as cigarillo smoking increases among racial/ethnic minorities and women, groups that have the most difficulty with smoking cessation.

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POS5-53 AUTOMATED CIGARETTE SMOKE DELIVERY AND EXPOSURE MARKERS IN ANIMAL MODELS UNDER VARIOUS STANDARDIZED SMOKING CONDITIONS

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Cigarette smoke contains nicotine and a wide variety of chemical constituents of concern. As part of tiered product testing, different cigarette smoking regimens and systems are used for in vivo toxicology studies. However, some exposure systems do not provide consistent delivery of tobacco smoke and/or excessively alter its composition. In other systems the composition of the exposure atmosphere is inadequately characterized. A carefully controlled and well-characterized exposure atmosphere is essential to ensure reproducible biological outcomes in animal models and allow meaningful comparisons of target tissue dosimetry between animal models and human smokers. The Battelle Cigarette Smoke Exposure System generates mainstream (MS) and sidestream (SS) smoke and provides consistent delivery of smoke constituents to the test animal. MS and SS smoke is normally characterized in terms of wet total particulate matter, CO, particle size, nicotine, aldehydes, 1,3-butadiene, and temperature/RH under the ISO and the Canadian intense smoking regimen conditions. Monitoring and recording of environmental parameters and system flow rates is automatically controlled. Particular attention is paid to the design of the smoke dilution-delivery system to assure stability of the smoke chemical constituents under a wide range of concentrations for up to 4 hours. Animals (rats or mice) exposed to MS or SS smoke are normally sampled for their postexposure blood and urine followed by analysis for exposure markers commonly associated with smoke exposure: blood COHb (%), plasma nicotine/cotinine, and urinary nicotine metabolites.

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POS5-54 BIOPSYCHOSOCIAL DIFFERENCES BETWEEN NONDAILY AND DAILY SMOKERS IN A WEB-BASED COLLEGE SAMPLE

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Non-daily smokers, although growing in numbers, have been under-researched in psychology (Fagan, 2009). College students smoke in a non-daily pattern at higher rates than other groups and can be considered a special population of non-daily smokers (Whortley, 2003). This study compared daily and non-daily college smokers across variables related to process of change and the Transtheoretical Model of Intentional Behavior Change (TTM). An internet-based survey was completed by 162 college students between ages 18 and 25 from Maryland universities (84 non-daily and 78 daily smokers). Data were collected across TTM-related variables (decisional balance, temptation, self-efficacy, and processes of change), alcohol use, and other smoking-related variables. While the two groups did not differ on sex, number of parent smokers, age of first cigarette, alcohol use, or self control, t-tests revealed significant group differences on race, age, number of four closest friends who smoke, cigarettes smoked per day, cigarettes smoked while drinking alcohol, proportion of smoking days smoked while drinking, decisional pros and cons of smoking, temptation to smoke, confidence to abstain, and experiential processes of change (all p's < .01). Logistic regression revealed that number of cigarettes smoked per day, proportion of smoking days smoked while drinking, and confidence to abstain had significant unique effects in discriminating between the two groups. Specifically, for a one unit increase in cigarettes smoked per day, an individual was 1.5 times more likely to be a daily smoker; for a one unit increase in the proportion of smoking days while drinking alcohol, there was a 99% higher likelihood of being a non-daily smoker; and a one standard deviation increase in confidence was associated with a 73% higher likelihood of being a non-daily smoker (all p's < .01). Within a fairly homogeneous sample of college smokers, significant differences emerged between daily and non-daily smokers across a variety of biological, social, and psychological variables related to smoking, suggesting the need for continued research and intervention strategies that target these groups separately.

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POS5-55 CONTINUED SMOKING AMONG LUNG OR COLORECTAL CANCER PATIENTS: A POPULATION-BASED STUDY

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BACKGROUND: Cigarette smoking is the main risk factor for lung cancer (LC) and one of many risk factors for colorectal cancer (CRC). Continued smoking after diagnosis adversely affects treatment effectiveness, overall survival, and risks of subsequent cancers. There is variability in reported rates of smoking following a cancer diagnosis and little known about who continues to smoke post diagnosis. This study assessed smoking rates and predictors of smoking in a population-based cohort of LC and CRC patients, surveyed 4 mos following diagnosis.

METHOD: We analyzed 4 mos post-cancer diagnosis survey data from the Cancer Care Outcomes Research and Surveillance prospective cohort (a multi-site study; n=2455 LC patients, n=3047 CRC patients; median age=65; 69% Caucasian; 45% Stage I/II, 27% Stage III, and 19% Stage IV).

RESULTS: Reported rates of ever smoking were 90% for LC and 55% for CRC patients (population rate=42%; MMWR, 2004). 38% of LC patients and 14% of CRC patients were current smokers at diagnosis. 14% of LC patients and 9% of CRC patients were current smokers 4 mos post diagnosis; thus, 63% of LC patients and 35% of CRC patients quit after diagnosis. Of former smokers at 4 mos, 30% of LC patients and 14% of CRC patients quit within 2 years of diagnosis. CRC patients had lower smoking rates at both time points (all $p<.05$). LC and CRC ever smokers with lower self-ratings of health and higher rates of depression, pain, and lung disease were more likely to be current smokers at 4 mos post diagnosis. For LC ever smokers, higher fatalism and incidence of stroke were also associated with current smoking.

CONCLUSIONS: LC patients had higher current and ever smoking rates than CRC patients at both time points, but CRC patients had higher ever-smoking rates than the general population. Many LC patients quit smoking near the time of diagnosis; these relatively new quits are vulnerable to relapse and would benefit from a relapse prevention intervention. In both groups, a sizable minority of patients did not quit smoking despite a cancer diagnosis; targeted smoking cessation interventions are needed for both cancer patient populations.

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POS5-56 ACTIVE DRUG USE AND SMOKING CESSATION COUNSELING AMONG METHADONE MAINTAINED SMOKERS

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There is a disproportionately high prevalence of tobacco use and tobacco-related illness among methadone maintenance patients. Despite evidence that smoking cessation treatment does not adversely impact and may improve substance abuse outcomes, smoking cessation services in methadone programs are sparse. We sought to evaluate factors associated with smoking cessation counseling by substance abuse counselors. We conducted a cross-sectional study of current and former smokers receiving methadone maintenance treatment in seven clinics with on-site primary care in the Bronx, NY. Participants were recruited from clinic waiting rooms over a 6-week period in Summer 2007. Social and demographic characteristics; tobacco use behavior; receipt of smoking cessation advice or assistance from a methadone counselor; substance abuse treatment history; and self-reported illicit sedative, opiate and cocaine use were assessed. Our sample of current smokers (n=223) was 57% female, 64% Latino, 24% black with a mean age of 46 years. A minority (n=105, 44%) reported receipt of smoking cessation advice or assistance from a methadone clinic counselor. There was no significant difference in age, race/ethnicity, sex, methadone dose, cigarettes per day, Fagerström test for nicotine dependence score, or stage of change among patients who did or did not receive smoking cessation advice from methadone clinic counselors. Smokers reporting past 6 month illicit opiate (36% vs. 47%, p=0.18), sedative (33% vs. 46%, p=0.23) or cocaine use (35% vs. 47%, p=0.11) were less likely to report receipt of smoking cessation counseling, although these differences were not statistically significant. Significantly fewer patients with any past 6-month drug use (36 vs. 51%, p = 0.04) reported receiving smoking cessation counseling from a methadone clinic counselor. Results suggest that a minority of methadone maintained smokers receive smoking cessation counseling, and that active drug use is associated with fewer smoking cessation services. Research is needed to inform and expand the provision of smoking cessation services to this high-prevalence, high-risk population.

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POS5-57 IS THE PREVALENCE OF "HARD CORE" INCREASING AMONG SMOKERS WITH ANXIETY AND MOOD DISORDER?

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Background: Studies have shown that individuals diagnosed with anxiety and mood disorder (AMD) report higher smoking rates than non-AMD individuals. The "Hardening Hypothesis" suggests that there exists a subgroup of resistant or "hard core" smokers who are less prone to quitting and more likely to smoke more.

Purpose: To examine the relationship between AMD and "hard core" smoking status, in terms of smoking prevalence and cigarette consumption.

Methods: We conducted secondary data analyses on data from the 2001 to 2008 Centre for Addiction and Mental Health (CAMH) Monitor (a repeated cross-sectional RDD survey of Ontario residents aged 18+ with a region-stratified 2-stage (household, respondent) probability sample design; unweighted n=17,214). The 12-item General Health Questionnaire (GHQ-12) was used to identify AMD respondents and high heaviness of smoking index (HSI>4) was used to proxy "hard core" smokers. Descriptive and analytical statistics were produced, adjusting for complex survey design. Estimates were made representative for the Ontario population.

Results: Smoking prevalence was higher among AMD respondents than non-AMD respondents (33.2% vs. 20.9%, p<0.01), decreasing from 36.6% (95% C.I.=[28.9%-45.0%]) in 2001 to 31.7% (95% C.I.=[22.8%-42.2%]) in 2008 among AMD respondents, and from 23.0% (95% C.I.=[21.0%-25.1%]) to 18.7% (95% C.I.=[16.6%-21.1%]) over the same period among non-AMD respondents. Current smokers with AMD smoked more cigarettes daily than those without AMD (16.6 vs. 16.0 cigarettes, p<0.05). Although prevalence of "hard core" smokers was higher among AMD smokers than non-AMD smokers (16.2% vs. 11.9%, p<0.05), there was no evidence of increasing prevalence over time among either group.

Conclusions: These findings confirm higher smoking prevalence among AMD individuals. Prevalence of "hard core" is higher among AMD individuals, but "hard core" smokers account for only a small portion of smokers in both the AMD and non-AMD groups. We did not find evidence to suggest that the proportion of "hard core" smokers is increasing among AMD and non-AMD smokers.

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POS5-58 MENTHOL SMOKERS, SES and QUIT-SMOKING OUTCOME

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Some studies have found that menthol smokers exhibit greater nicotine dependence and have poorer success rates in smoking cessation. However, other studies have not found this association. Recently Gandhi et al. (2009) hypothesized that poorer outcomes in menthol smokers may be limited to smokers with lower socioeconomic status (SES). Furthermore, it was speculated that menthol smokers with low SES take in more nicotine from each cigarette, leading to greater dependence and greater difficulty when quitting smoking. To explore further the relationship between menthol cigarette use, dependence and quit-smoking outcome, we conducted a retrospective analysis of data from two randomized clinical trials conducted in our center from 2005-2008. The sample included 809 smokers (269 menthol, 540 non-menthol), who received NRT as part of their treatment. The primary measure of dependence was defined as the time to the first cigarette of the day. Abstinence outcomes included 4-week continuous abstinence at the end of treatment, and point (7-day) abstinence at 6 months. Menthol smokers showed greater dependence (p=.04) and a trend to have lower 4-week (p=.10) and 6-month (p=.09) abstinence rates (27.1% vs. 32.8% and 19.7% vs. 25.0%, respectively). Moreover, the association of menthol cigarette use and abstinence was significantly greater among smokers of brands with high FTC-rated nicotine yield (interaction of menthol X nicotine yield: p=.01 for 4-week abstinence; p=.005 for 6-month abstinence). In addition, the association of menthol cigarette use and dependence appeared to be mediated by cigarette nicotine yield (p=.0003). Interestingly, in menthol smokers, higher nicotine yield was strongly related to lower SES (household income, financial assets); p<.0001. In conclusion, the observed links between menthol smoking and dependence or cessation outcomes appeared to be mediated in part by higher cigarette nicotine yield among low SES smokers.

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POS5-59 DIFFERENTIAL EFFECTS OF NMDA AND MGLU5 RECEPTOR ANTAGONISTS INJECTED IN THE NUCLEUS ACCUMBENS SHELL OR THE VENTRAL TEGMENTAL AREA ON NICOTINE SELF-ADMINISTRATION IN RATS

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Tobacco smoking, a preventable cause of worldwide morbidity and mortality, is partly attributed to the reinforcing properties of nicotine contained in tobacco. We previously reported that systemic administration of the N-methyl-D-aspartate (NMDA) receptor antagonist LY235959 or the mGluR5 antagonist 2-methyl-6-(phenylethynyl)-pyridine (MPEP) attenuated intravenous nicotine self-administration in rats. Intravenous nicotine administration increases glutamate release in the ventral tegmental area (VTA) and the nucleus accumbens (NAcc). Based on these findings, we hypothesized that both compounds reduced the reinforcing effects of nicotine by acting on their respective receptors in the VTA and the NAcc shell. To test this hypothesis, we bilaterally microinjected LY235959 (0, 0.1, 1, 10 ng/0.5 μl/side) or MPEP (0, 10, 20, 40 μg/0.5 μl/side) directly into the NAcc shell or the VTA using a latin-square within-subjects design and assessed their effect on nicotine self-administration in rats. The results indicated that microinjection of MPEP in the NAcc shell or the VTA decreased nicotine self-administration in a dose-dependent manner (except 40 μg in the VTA that had no effect). LY235959 microinjection in the NAcc shell (10 ng/0.5 μl/side) increased nicotine self-administration, an effect rarely seen, while the same dose when injected into the VTA decreased nicotine self-administration. In conclusion, blockade of NMDA or mGlu5 receptors in the VTA decreased the reinforcing effects of nicotine indicating that activation of these receptors is critical in the reinforcing effects of nicotine. In contrast in the NAcc shell, blockade of NMDA and mGlu5 receptors had opposite effects on nicotine-self-administration. The increase in nicotine self-administration after microinjection of LY235959 in the NAcc shell is an interesting finding and suggests either of two alternative interpretations: (1) a decrease in the aversive effects of nicotine due to decreased activity of medium spiny neurons resulting from blockade of NMDA receptors; or (2) an increase in nicotine-seeking due to blockade of inhibitory inputs from the infralimbic cortex to the NAcc shell.

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POS5-60 META-ANALYSIS OF THE ACUTE EFFECTS OF NICOTINE ON HUMAN COGNITION

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The cognitive benefits of smoking motivate some smokers to continue using tobacco. The purpose of this meta-analytic review was to update the literature since our previous review (Heishman et al., 1994) and to specify aspects of human performance that are most sensitive to the effects of nicotine/smoking. Data sources published between 1994 and 2008 were located using searches of MEDLINE, EMBASE, and PsychINFO. Of 254 reports identified, 45 met criteria: (a) administration of nicotine (e.g., cigarette, patch, etc.) in laboratory sessions; (b) measurement of performance after nicotine administration; (c) participants (aged 18-59) were nondeprived or minimally-deprived smokers (< 2 hr), or nonsmokers; (d) use of a placebo control; (e) random assignment; and (f) reporting of data that allowed for effect size calculations. After data entry 39 studies (46 experiments) contributed effect size data to meta-analyses of the following nine domains (a minimum of five effects sizes were needed per outcome): fine motor, alerting attention [accuracy and reaction time (RT)], orienting attention (accuracy and RT), orienting attention (RT only), short-term episodic memory-accuracy, long-term episodic memory-accuracy, working memory (accuracy and RT). Analyses were conducted using Comprehensive Meta-Analysis 2.0 (CMA; Biostat, Inc.; www.MetaAnalysis.com) software. Overall, nicotine/smoking significantly ($p < 0.01$) improved performance on the following outcomes: fine motor, alerting attention (accuracy and RT), orienting (RT), short-term episodic memory accuracy, and working memory RT (Hedges's g effect size range: 0.34 to 0.86). Significant effect sizes were not observed for long term episodic memory, orienting accuracy, and working memory accuracy. These findings suggest that nicotine does facilitate some aspects of performance and often these benefits were observed for outcomes involving motor activity (e.g., reduced response time). Future research is needed on performance measures that yielded an insufficient number of effect sizes to be included in the present analysis (e.g., executive attention, semantic memory, and prospective memory).

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POS5-61 SLEEP DISTURBANCE PREDICTS FAILURE TO QUIT SMOKING IN TREATMENT-SEEKERS

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Sleep disturbance predicts increased difficulty quitting alcohol use and potentially quitting smoking. We investigated whether sleep disturbance predicts increased difficulty quitting cigarette use in a 6-week randomized controlled trial of nicotine patch and oral naltrexone hydrochloride (0, 25, 50, or 100 mg/d) (O'Malley et al., 2006). Smokers of at least 20 cigarettes daily (N=400) reported sleep disturbance via the Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989), cigarette use, carbon monoxide (CO) levels, and body weight at baseline and weekly for 6 weeks post-baseline. Self-reported smoking abstinence was verified by an exhaled CO level of <10 ppm. We report PSQI global scores (higher scores indicate more sleep disturbance) and used a global score of > 5 to classify individuals as "good" vs. "poor" sleepers. Mean PSQI global scores significantly changed from baseline to week 6 ($p<0.01$). The change in global sleep quality scores significantly differed by group, such that participants who received 25 mg/d naltrexone reported significantly more sleep disturbance at week 1 (i.e., post-cessation) than did those who received 100 mg/d (M=5.91 [SD=3.74] vs. M=4.98 [SD=2.82], $p<0.01$). Mean PSQI global scores differed by gender at all weeks, with women reporting more sleep disturbance than men ($p<0.04$). After controlling for group and gender, baseline PSQI scores significantly predicted smoking status at week 6 (OR=1.08 [95% CI=1.00, 1.15], $p<0.05$), such that more sleep disturbance predicted greater likelihood of smoking. Poor sleepers at baseline were less likely to achieve continuous 6-week abstinence than good sleepers ($\chi2=3.96$, $p<0.05$). Baseline PSQI scores significantly predicted weight change from baseline to week 1 (p=0.01), such that more sleep disturbance predicted more weight gain (B=0.12, p=0.02). We conclude that cigarette smokers who report sleep disturbance before initiating treatment are at increased risk for cessation failure and weight gain. Future studies might incorporate sleep management strategies into existing smoking cessation treatments.

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POS5-62 CHANGES IN METABOLIC SYNDROME COMPONENTS DURING AN EXERCISE AND SMOKING CESSATION INTERVENTION AMONG WOMEN

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Tobacco use and lack of physical activity (PA) are major contributors to metabolic syndrome (MetS). We examined how MetS components changed during a combined smoking cessation and exercise intervention. This was a secondary analysis of a randomized clinical trial including 130 initially sedentary female smokers aged 19-55 years, who participated in a smoking cessation and exercise intervention program with nicotine replacement and brief counseling for 15 weeks. We analyzed three MetS components applying the US Adult Treatment Panel III values for increased waist circumference (WC ≥88cm), the International Diabetes Federation criteria for raised triglycerides (>150mg/dL), and reduced HDL-cholesterol (<50mg/dL). For each component we investigated the incidence of abnormal values at follow-up among women with normal baseline values and the incidence of normal values at follow-up among those with abnormal baseline values. Changes of MetS components were analyzed by biochemically verified smoking abstinence and exercise adherence (PA Recall), adjusted for each other, as well as for age and body mass index change. Among 66 women with normal baseline WC, the abstainers had lower odds (OR= 0.08; 95%CI= 0.01-0.89) for increased WC, with no significant exercise effect. Regarding abnormal baseline WC (n = 54), no significant abstinence or exercise effect occurred. Among 86 women with normal baseline triglycerides, lower odds for elevated values were found for smoking abstinence (OR= 0.34; 95% CI= 0.10-1.16) and high exercise adherence (OR= 0.48; 95% CI= 0.14-1.62). Those with elevated baseline triglycerides (n= 30), abstinence (OR= 4.32; 95% CI= 0.69-26.9) and exercise (OR= 7.05; 95% CI= 0.86-57.6) led to higher odds for normal triglycerides. Among 78 women with normal baseline HDL, no effects of abstinence or exercise were shown. For the 38 women with abnormal baseline HDL, there was no significant abstinence effect but those regularly exercising had almost significantly higher odds of normalized HDL (OR= 4.60; 95% CI= 0.92-23.0). We cautiously suggest that a combined smoking cessation and exercise intervention may reduce MetS risk among initially sedentary women.

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POS5-63 SOCIOECONOMIC VARIATION IN RESPONSE TO DIFFERENT TYPES OF TELEVISED SMOKING CESSATION ADVERTISEMENTS

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There are large disparities in rates of cigarette smoking by socioeconomic status (SES; education and income) in many countries. Recent years have witnessed the implementation of large-scale media campaigns aimed at reducing smoking rates. These campaigns have not achieved unequivocal success in reducing SES disparities in smoking, leading to considerable interest in identifying messages that are most effective at increasing smoking cessation among low SES populations. This study extends this line of research by exploring SES variation in response to different types of cessation ads. We analyzed data from the New York Media Tracking Survey Online (MTSO), a web survey involving over 5,000 adult smokers in New York and New Jersey conducted between 2007 and 2009. Participants were shown clips from five categories of cessation ads: (1) why to quit – graphic images; (2) why to quit – testimonials; (3) how to quit; (4) anti-industry; and (5) secondhand smoke. After each ad, participants were asked about their level of previous exposure (aided recall) and the degree to which they found ads persuasive (perceived effectiveness). Regression models were used to examine whether aided recall and perceived effectiveness differed as a function of ad category, SES and their interactions. Analyses included a large set of controls to account for possible confounders. Ads focused on how to quit were recalled less often and perceived as less effective than ads focused on why to quit (via graphic images or testimonials; both $p<0.001$). These differences were particularly strong among smokers with less education (interaction $p<0.05$ for aided recall; $p<0.01$ for perceived effectiveness) and lower income (interaction $p<0.01$ for aided recall; $p<0.05$ for perceived effectiveness). We found little evidence that differences in quit intentions, past quit attempts and volume of cigarette consumption explained patterns of response by SES. Ads focused on why to quit, using either testimonial or graphic imagery, are more likely than ads focused on how to quit smoking to increase rates of cessation among lower SES populations. More work is needed to understand why these patterns occur.

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POS5-64 EFFECTS OF SOCIAL DESIRABILITY BIAS ON SELF-REPORT AND IMPLICIT ASSESSMENTS DURING SMOKING CESSATION

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Social desirability response bias (SDR) is the tendency of respondents to respond in a way that will be viewed favorably by others. SDR can influence responses on self-report measures and distort research findings. Concern about SDR has motivated the development of implicit assessments, e.g., the Implicit Association Test (IAT), which are purportedly less sensitive to SDR. However, little research has directly examined this claim or examined the effect of SDR in the context of smoking cessation. Adult smokers from the Houston metropolitan area (n = 146) were recruited for smoking cessation treatment. Participants were assessed at two pre-quit sessions (once when 12-hours abstinent (AB) and once when smoking normally (NON)) and on quit day (QD). At each session, participants completed self-reported smoking assessments, the Questionnaire for Smoking Urges (QSU), semantic differentiation scales (self-reported attitudes), and a smoking IAT (implicit attitudes). SDR was assessed using the Balanced Inventory of Desirable Responding (BIDR). BIDR scores were dichotomized by median split into LOW (0-12) and HIGH (13+). HIGH and LOW participants did not differ significantly in pre-quit salivary cotinine levels (342 vs. 383 ng/ml) or in pre-quit self-reported smoking rate (18.4 vs. 17.6 cigs/day). HIGH participants reported lower QSU ratings at the NON (3.37 vs. 4.34, $p = .06$) and QD sessions (2.35 vs. 3.55, $p < .01$). HIGH participants reported significantly more negative attitudes to smoking at the NON (-2.15 vs. -1.56 on 7-pt scale from -3 to +3, $p < .01$) and QD sessions (-2.68 vs. -2.39, $p = .06$). However, HIGH and LOW participants did not exhibit different smoking IAT effects (ps > .2). Averaged over test sessions, the correlation between self-reported and implicit attitudes was significant in LOW ($r = .29$, $p < .05$), but not HIGH participants ($r = .02$, ns). In sum, participants with high SDR scores appeared to under-report their craving and over-report their negative attitudes to smoking, but they did not exhibit different implicit attitudes. Future research can investigate the implications of SDR in smoking cessation research.

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POS5-65 EFFECTS OF ACUTE SMOKING ABSTINENCE ON RESPONSES TO SOCIAL STRESS

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Acute abstinence from drugs, including nicotine, may induce stress or enhance reactions to external stressors, either of which may increase risk for relapse (VanderKaay & Patterson, 2006). However, there is evidence that responses to external stressors may actually be dampened, rather than enhanced, during nicotine withdrawal (Caggiula et al., 2002; Kotlyar et al., 2006). In a recent unpublished study, Munafò et al. found that responses to a physiological stressor (inhalation of CO2) were dampened during smoking withdrawal. In this preliminary study (n = 28) we extend this finding to another form of stress, a public speaking task. Smokers were randomly assigned to one of three groups: (1) normal smoking (NS), (2) overnight abstinent with placebo patch (PP), and (3) overnight abstinent with nicotine patch (NP). On the day after overnight abstinence subjects participated in the Trier Social Stress Test, and both subjective (self-report) and psychophysiological (heart rate and blood pressure) responses were assessed. Although acute nicotine withdrawal did not influence subjective stress response, it did affect heart rate (HR). Planned contrasts showed that NS and NP subjects exhibited the expected increase in HR after stress, whereas the PP group did not. This indicates nicotine withdrawal may dampen physiological responses to stress, consistent with the findings of Munafò et al. The psychological significance of these HR findings remains to be determined, as no differences in subjective stress response were seen. HR increases may indicate either anxiety, or an adaptive response to challenge (Tomaka et al., 1993). Future directions include exploring the effects of nicotine withdrawal on cardiac measures more specific to adaptive coping with challenge and examining the impact of these physiological changes on actual task performance and task perceptions. For example, heart rate variability may provide a better index of the individual's capacity to cope with challenge during withdrawal than simple HR. Alternatively, measures of task performance or perception of performance would elucidate the functional consequences of the altered stress response during withdrawal.

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POS5-66 MOTIVATION TO ENGAGE IN ADJUNCTIVE EXERCISE OR RELAXATION IN A SMOKING CESSATION PROGRAM

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Recent research indicates that exercise may be an acceptable and effective adjunctive intervention for smoking cessation. Less is known about relaxation both in terms of acceptability and effectiveness. The aim of this study is to investigate the motivation of postmenopausal smokers to participate in these adjunctive interventions to assist with smoking cessation. Postmenopausal women (N=90) at least 45 years of age were recruited to participate in an ongoing, multi-site study testing the effectiveness of exercise or relaxation as an adjunct to smoking treatment (counseling and varenicline). Women interested in participating in this study completed an initial eligibility interview over the phone, during which they were asked to rate their motivation to use exercise or relaxation using a 10-point Likert-type scale. Descriptive statistics were computed to describe the study sample and mean motivation scores for the exercise and relaxation interventions were calculated. Determinants of motivation were examined in terms of self-reported demographics, smoking behavior, and medical history. Participants were 54.9 years of age (SD=5.4), 66% White, and 18% African American. Participants reported smoking an average of 17.5 cigarettes per day (SD=8.9), and had been smoking an average of 32 years (SD=10.6). Participants rated their motivation to use relaxation and exercise as an adjunct to smoking cessation at a high level, although relaxation rated higher (mean 9.2; SD=1.3 v. mean 8.4; SD=1.8; two-tailed $t(88) = 4.29$; $p < .01$). The only significant determinants of motivation were a positive correlation between motivation to engage in exercise and motivation to quit smoking ($r=.29$; $p < .01$) and an inverse correlation between motivation for using relaxation and education level ($r=-.21$; $p < .05$). The present study indicates that postmenopausal women are motivated to participate in both of these adjunctive interventions for smoking treatment. Motivation to pursue either of these strategies was independent of most other factors. The results indicate that exercise or relaxation are acceptable strategies to add to main line smoking cessation treatments in postmenopausal women.

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POS5-67 CHROMOSOME 20 SHOWS LINKAGE TO NICOTINE DEPENDENCE IN FINNISH ADULTS

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Chromosome 20q and CHRNA4 gene have been previously associated with nicotine dependence, maximum cigarettes smoked during a 24-h period and smoking cessation success. Our aim was to replicate and extend these findings of the linkage signal between chromosome 20 microsatellite markers and nicotine dependence. A total of 1295 subjects belonging to 357 Finnish families were genotyped with microsatellite markers residing on chromosome 20. The sample was drawn from the Adult Twin Cohort Study comprising of Finnish twins born between 1938-57. Based on earlier health questionnaires, the twin pairs concordant for smoking were identified and recruited along with their family members for the Nicotine Addiction Genetics (NAG) study, which is an international consortium among Finland, Australia and USA. Nicotine dependence diagnosed by DSM-IV criteria was used as a phenotype in the non-parametric linkage analysis using MERLIN program. Among the genotyped sample, altogether 548 individuals (313 males and 235 females) fulfilled the criterion for DSM-IV nicotine dependence. The linkage analyses for the whole sample provided suggestive evidence for linkage peaking at markers D20S112 at 44.35 cM (single-point LOD=1.7). However, the separate analyses for males and females revealed that this signal was driven by females; the maximum LOD score being 1.3 in males (singlepoint, marker D20S899 at 66.42 cM) versus 3.3 in females (singlepoint, marker D20S884 at 58.4 cM). Our results provide further evidence that chromosome 20 harbors a genetic element influencing nicotine dependence.

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POS5-68 FEASIBILITY OF A SMOKING PREVENTION WEB SITE IN AMERICAN INDIAN YOUTH

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Introduction: The rate of smoking commercial tobacco products among American Indian youth is nearly triple the rate for Caucasian youth. Interventions are needed to reduce this disparity.

Methods: We tested the feasibility of a web-based intervention to influence attitudes towards and intentions about smoking cigarettes among American Indian youth who attended a Native summer camp in the Northern Plains. The study website, Smoking Zine, was originally developed and tested in Canadian youth, then adapted to be appropriate for American Indian youth. We conducted a randomized, controlled trial to test the influence of exposure to the adapted Smoking Zine website on smoking attitudes and behaviors among American Indian youth 12-18 years of age. Participants assigned to the intervention group were given access to the website for one hour per day during their camp experience and asked to sign in to the site and use it. Control group participants were not given access to the site.

Results: Compared to the control group, youth in the intervention group were less likely to report intentions to smoke, more likely to help others quit, and had less positive attitudes about smoking.

Discussion: These data indicate that Smoking Zine deserves more rigorous investigation as a way to keep American Indian youth from becoming regular smokers. Because the intervention group could use computers only one hour per day, increasing access might result in more visits and a greater effect of the website on smoking behaviors.

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POS5-69 MANIPULATING A SACRED TRADITION: FINDINGS OF COMMERCIAL TOBACCO MARKETING AND SALES STRATEGIES ON AMERICAN INDIAN COMMUNITIES

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OBJECTIVE: To describe the tobacco companies' strategies for targeting American Indian communities and reservations as revealed in tobacco industry documents.

METHODS: The authors searched industry documents to determine tobacco companies' strategies from 1970s to 1990s.

RESULTS: Major findings include commercial tobacco companies' rationale, strategies, and marketing tactics for using tribal casinos as a means to target American Indians and gaming patrons; tobacco company pricing strategies intended to increase business at tribal tobacco outlets; and tobacco company marketing that abuses American Indian imagery and concepts and misleads consumers into thinking that their commercial products are "natural" and perhaps safer to smoke.

CONCLUSIONS: Sovereign tribal governments must recognize the tobacco industry strategies and be amenable to the development of culturally tailored interventions to reduce high rates of commercial tobacco use.

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POS5-70 FAX TO QUIT: LINKING SMOKERS VISITING CLINICS TO STATE QUITLINES

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Background: Telephone quitlines are effective treatments for tobacco dependence; however, population penetrence remains low. Fax to Quit – a strategy to link state quitlines to the 70% of smokers who visit a primary care physician each year - has been identified as a means of increasing quitline reach at potentially lower cost than traditional quitline promotional strategies. A number of states have implemented some form of Fax to Quit, yet this approach has not been adequately evaluated.

Objective: This study systematically evaluates two strategies for Fax to Quit implementation: Fax to Quit implemented with no in-person support (F2Q) and Fax to Quit implemented with Enhanced Academic Detailing (F2Q + EAD), comprising ongoing training/technical assistance and performance feedback (the implementation method used in most states).

Methods: Fifty clinics were randomized to the two conditions. Clinic referral rates, quitline-patient contacts, and "quality contacts" (referrals that resulted in enrolled smokers) are being measured over 12 months. In addition, a qualitative research component and economic analysis will evaluate key aspects of the two Fax to Quit interventions.

Results: Over six months, the number of fax-referrals (measured as both per clinic and per clinician) to the Wisconsin Tobacco Quit Line steadily increased in both groups; however, referrals from the F2Q + EAD group occurred at almost 7 times the rate of the F2Q group.

Conclusions: Fax to Quit is an innovative, effective strategy to link tobacco users to quitlines. By providing enhanced academic detailing to F2Q, clinic referrals to the quitline can be dramatically increased when compared to F2Q alone.

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POS5-71 EFFECTS OF NICOTINIZED AND DENICOTINIZED CIGARETTE SMOKING ON RESPONSE TO 7.5% CARBON DIOXIDE ANXIETY CHALLENGE

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Cigarette smokers frequently report that smoking is anxiolytic, and that exposure to stress increases the likelihood of relapse. Cigarette smoking and affective disorders are also highly co-morbid. We have explored this relationship using a carbon dioxide (CO2) challenge, which acts as a robust anxiogenic stimulus, and previously reported reduced increased in anxiety following this challenge in abstinent compared to non-abstinent smokers. Here we extend this work to investigate the effects of smoking a nicotinized or denicotinized cigarette on response to CO2 challenge among acutely abstinent regular smokers. Cigarette smokers (N = 23) who reported smoking within 60 minutes of waking abstained from smoking for 12 hours, and were randomized to smoke either a nicotinized or denicotinized cigarette on the test day. They then underwent a 20-minute inhalation of 7.5% CO2-enriched air. Measures of anxiety, affect, heart rate and blood pressure were taken before and after inhalation. There were significant gas × cigarette interactions for ratings of anxiety ($F [1, 21] = 4.40$, $p = 0.048$) and positive affect ($F [1, 21] = 10.78$, $p = 0.004$), reflecting a greater increase in anxiety, and a lesser reduction in positive affect, among those who smoked a nicotinized cigarette compared to those who smoked a denicotinized cigarette. These data extend our previous findings, and suggest that the acute administration of nicotine via smoking may reduce response to physiological anxiety challenges. These findings are apparently at odds with our previous data suggesting greater anxiety reactivity in non-abstinent compared with abstinent smokers. One possibility is that nicotine administration via smoking after a period of acute abstinence may reduce responding to such challenges in the short-term, but that over longer periods the presence of nicotine potentiates anxiety reactivity. Another possibility is that relative reductions in self-reported anxiety may reflect associative learning processes governed by the amelioration of withdrawal symptoms following cigarette smoking. The relationship between abstinence, smoking and anxiety is complex and requires further research.

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POS5-72 CATEGORIZATION OF SMOKING CUES FROM PHOTOGRAPHS TAKEN BY CUE-EXPOSURE PATIENTS

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Leading models of tobacco dependence and relapse emphasize the role of reactivity to stimuli that had previously been repeatedly paired with smoking. These models have led to numerous laboratory-based cue-reactivity studies, as well as a handful of extinction-based cue-exposure intervention studies. As noted previously (Conklin et al., 2008), the cues used in these studies have tended to be stimuli that are proximally related to smoking, such as smoking-related paraphernalia (cigarette, ashtray, lighter) or someone smoking. However, reactivity can also be triggered by more distal cues, such as general smoking contexts, alcohol, and mood states. The nature of such cues has been examined via retrospective self-reports of relapse situations, and more recently with ecological momentary assessment of smoking and relapse situations. The present study used data from a clinical cue-exposure treatment study to characterize cues important to smokers attempting to quit. Participants (N=107) were loaned digital cameras to take pictures of their own key "triggers" of craving in their natural environment. They were then asked to select the four photos that captured their most important cues to smoke. These pictures were then incorporated into an automated stimulus program that was used during extinction trials. For the present analysis, the individualized photos taken and selected by participants were analyzed across a range of content dimensions. One key finding was that only 6% of the photos represented purely proximal cues (e.g., a cigarette). In contrast, the majority of the photos (60%) represented purely distal cues (e.g., a kitchen, alcohol), and another 33% showed both distal and proximal cues (e.g., a kitchen with an ashtray on the counter). These findings reinforce the importance of distal cues generally, and smoking context in particular, in motivating smoking, with implications for both laboratory studies and interventions. In addition to these findings, further breakdowns of the photo content will be presented, as well as associations between the type of stimuli photographed by participants and individual difference variables (demographic and smoking-related).

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POS5-74 EFFECT OF SMOKING CUES ON CRAVING AND OPERANT RESPONDING FOR CIGARETTE PUFFS

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Cue-reactivity paradigms have shown that smoking-related stimuli (e.g., pictures, imagery, in vivo cues) reliably increase ratings of tobacco craving and certain autonomic measures. Few studies, however, have investigated the effect of smoking cues on behavioral measures of nicotine reinforcement. We examined cue-elicited changes in motivation to self-administer cigarette puffs as well as traditional measures of cue-elicited craving. In two counterbalanced sessions, 15 adult daily smokers (13 male) were exposed to either smoking (lit and held a cigarette) or nonsmoking (sharpened and held a pencil) cues. During each session, we first measured craving, mood, and physiological responses to cues. After a 15-min break, cues were re-introduced and participants responded for up to 3 hr on a Lindsley lever for cigarette puffs under a progressive ratio (PR) schedule of reinforcement (FR160 to FR8400). Completion of each ratio was reinforced with two cigarette puffs. Compared with the nonsmoking cue, exposure to the smoking cue significantly increased self-reported tobacco craving as assessed by visual analog scales and the Tobacco Craving Questionnaire-Short Form, but had no effect on mood ratings. Exposure to the smoking cue also significantly increased PR breakpoint (final ratio completed) compared with the nonsmoking cue condition. These results indicate that smoking cues can influence a behavioral measure of nicotine reinforcement as well as traditional subjective responses. Such behavioral outcomes might improve the validity of the cue-reactivity paradigm as a laboratory model of tobacco dependence that can be used to test the efficacy of potential treatment medications for tobacco dependence.

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POS5-75 EFFECT OF AN INTENSIVE, DEPRESSION-FOCUSED SMOKING CESSATION INTERVENTION ON NICOTINE WITHDRAWAL IN WOMEN WITH AND WITHOUT CURRENT MAJOR DEPRESSION

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Compared to smokers with a negative history of major depressive disorder (MDD), smokers with a history of MDD enter treatment with higher levels of depression and are more likely to experience increases in depressive symptoms that are associated with relapse. Among smokers with current MDD, little is known about withdrawal or the impact of treatment on withdrawal processes. In the current study, we examined the effect of an intensive, depression-focused smoking cessation counseling intervention on withdrawal symptoms, and whether the presence of a current major depressive episode (MDE) moderated the treatment effect. Participants were 257 pregnant smokers, 37% of whom entered the trial in a current MDE. Women were randomly assigned to a 10-week depression focused intervention based on cognitive behavioral analysis system of psychotherapy (CBASP) or a time and contact intervention focused on health and wellness (HW). Both treatments included equivalent amounts of smoking cessation counseling. Women were allowed to set their quit dates at any point between weeks 2 and 8. Withdrawal symptoms were measured throughout the 10-week treatment period and at 3- and 6-months postpartum using the Wisconsin Smoking Withdrawal Scale, the Positive and Negative Affect Scale, and the Center for Epidemiological Studies Depression scale. Results showed that, compared to women with current MDD who received HW, women with current MDD who received CBASP experienced greater improvement from week 1 to 6-months postpartum in affective symptoms of withdrawal, including anger, anxiety, sadness, positive and negative affect, and depression; among women without MDD, changes in these symptoms did not vary by treatment group. In addition, women who received CBASP had greater improvement in sleep across time. Changes in craving, concentration, and hunger did not vary by treatment group. Results suggest that depression-focused smoking cessation interventions may contribute to the alleviation of affective distress in smokers with current MDD during smoking cessation attempts, and may be associated with continued affective improvement beyond end of treatment.

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POS5-76 PUFFING BEHAVIOR ACROSS A SINGLE CIGARETTE FOR LIGHT ADOLESCENT SMOKERS IS INFLUENCED BY NICOTINE DEPENDENCE, DEPRESSION AND ANXIETY

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The purpose of the current study was to examine smoking topography over the course of a single cigarette in young, light adolescent smokers. Previous research has demonstrated that nicotine dependent adult and adolescent smokers tend to self-regulate nicotine intake by taking longer and larger puffs at the start of the cigarette, with decreasing volume and duration observed over the course of the cigarette. Whether this behavior is present in light smokers remains to be seen, and may provide valuable information regarding the learning of self-regulatory nicotine intake behaviors. In the current study, we analyzed puffing behavior over a single cigarette in a sample of 79 light (mean modified Fagerström Tolerance Questionnaire 2.67) adolescent smokers (mean age 15.71, 48% female). Moreover, we examined whether puffing behaviors time were influenced by smoking dependence level and indices of anxiety and depressive symptoms. In a laboratory session, participants smoked a single cigarette ad libitum through a hand-held Cress smoking topography device. Data were analyzed using HLM6, where the Level 1 model looked at smoking topography indices (puff volume, puff duration, puff velocity and interpuff interval) over time, and the Level 2 model investigated the role of nicotine dependence, anxiety (Beck Anxiety Inventory) and depression (Beck Anxiety Inventory) in predicting the intercepts and slopes of the Level 1 topography trajectories. Results revealed that over the course of a single cigarette, puff volume and puff duration decreased, whereas velocity and interpuff interval increased over time. Although nicotine dependence, anxiety and depression influenced neither the intercepts nor slopes for average flow and interpuff interval, they did predict puff volume and puff duration. Specifically, initial puff volume was higher for people with higher dependence scores. Also, the traditional decline in puff volume and duration over time was stronger for people with higher dependence, higher depression, and lower anxiety scores. Results are discussed in terms of shedding light on the motivational processes governing smoking in this vulnerable population.

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POS5-77 DO WEIGHT CONCERNS PREDICT SMOKING CESSATION PROGRAM OUTCOME IN WOMEN ENGAGED IN AN EXERCISE PROGRAM?

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Despite robust evidence of the adverse effects of tobacco use, the prevalence of smoking in adolescent girls and young women has increased in the last few decades. Previous research indicates that women have more difficulty quitting smoking than do men. One explanation for this divergence is that women use cigarettes as a weight-control tool and concerns over post-cessation weight gain interfere with successful quitting. However, the relationship between weight concerns and smoking cessation outcomes has not been observed consistently. The first aim examined whether the magnitude of weight concerns predicts smoking cessation outcome and abstinence (abs) (pretreatment attrition, immediate (0 days abs), early (1-7 days abs), intermediate (8-90 days abs), and late relapse or abstinence (abs over 90 days). The second aim compared the characteristics of women with varying degrees of weight concerns (low, moderate and high levels of concern). A total of 300 women ages 18-55 provided demographic information, depression scores, tobacco intake and dependence, and quitting motivation, and were enrolled in a 15-week aid-to-cessation program combining an exercise regimen and NRT. Fitness level, weight, and a 6-item survey addressing weight concerns were also assessed at baseline. Biochemically verified abstinence and exercise frequency were assessed for a year. We found that neither univariate nor survival analyses indicated weight concerns to be predictive of smoking cessation outcome. Confounders such as depression, fitness level, body mass index (BMI), or exercise frequency did not alter this finding. Women who had lower levels of depression, better baseline fitness level, and lower BMI reported the lowest levels of weight concerns (ps<.05), while women who smoked the greatest number of cigarettes per day had the highest concern levels(p=.05). While our data does not support the assertion that weight concerns impede smoking cessation, it elucidates the existence of a subgroup of women with a cluster of prospective risk factors (weight concerns, depression, poor fitness level, and high tobacco intake) for a failed quit attempt and tobacco-related morbidity.

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POS5-78 DISSOCIATION OF THE REWARDING AND LOCOMOTOR STIMULANT PROPERTIES OF NICOTINE IN AN ANIMAL MODEL OF SCHIZOPHRENIA

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Schizophrenic patients smoke significantly more than any other psychiatric or non-psychiatric group. The underlying reasons are not known. One neurobiological correlate of schizophrenia is thought to involve enhanced dopaminergic neurotransmission along the mesolimbic pathway. Animal studies suggest that this pathway is involved in the locomotor stimulant as well as the rewarding properties of abused drugs, including nicotine (NIC). One can hypothesize, then, that the high incidence of smoking in schizophrenia stems from enhanced NIC reward in hyperdopaminergic states. We tested this hypothesis by measuring the rewarding effect of NIC in an animal model of schizophrenia known to cause hyperdopaminergia. 7-day-old male rat pups received excitotoxic (ibotenic acid: 3ug/0.3ul/side) or sham lesions of the ventral hippocampus. When rats attained adulthood, we tested the locomotor stimulant effect of acute and repeated NIC. Lesioned and sham rats received a single dose of NIC (0, 0.1, 0.2 or 0.4 mg/kg, sc) and were immediately tested for 1h in automated activity chambers. Acutely, the stimulant effect of NIC was comparable across rats. These rats then received 5 daily injections of NIC (0.4 mg/kg, sc) and were then challenged with the original dose on day 6. Repeated exposure to NIC resulted in a dose-wise increase in locomotion, with lesioned rats showing the greatest increase. In a separate group of rats, we employed the same drug schedule and intracranial self-stimulation to measure the rewarding effectiveness of NIC. In contrast to our locomotion findings, we did not observe any difference in NIC reward between lesioned and sham rats, following either acute or repeated exposure, at any dose tested. We observed similar results with the psychostimulant amphetamine, that is, significantly greater locomotion in lesioned rats, but absolutely no difference in amphetamine reward. These findings suggest that central neurobiological alterations resulting from neonatal lesions of the ventral hippocampus do not modify reward circuitry, and suggest that alternative processes, perhaps abnormally enhanced motivation, may more accurately reflect smoking rates in schizophrenia.

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POS5-79 SMOKING CESSATION AMONG CHINESE HOPITAL STAFF: AN OPEN LABEL STUDY WITH NICORETTE® GUM AND PATCH

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There are 350 million smokers in China (57% of men; 3% of women). Chinese government has started to implement policies to reduce smoking, but knowledge about the health consequences of smoking needs further improvement. Many physicians in China (23 % overall; 41% men, 1% women) smoke. Nicotine replacement therapy (NRT) is recently introduced and not well known. Study objectives were to evaluate the acceptability, safety, smoking cessation and smoking reduction rates following NRT treatment in 300 Chinese physicians and other health care professionals from six general hospitals, ready to quit smoking. Subjects chose between Nicorette® Mint Gum, 4 mg and 2 mg, or Nicorette® Patch, 15, 10 and 5mg/16h. Treatment period was 12 weeks followed by a 12-week off-treatment period. Limited behavioral support was given at visits, through phone calls and a Short Message Service system. Seventeen percent of subjects (n=51) were continuously, CO-verified smoking abstinent from Week 2 until and including the 24-week visit. CO-verified point prevalence smoking abstinence since last visit, at 6, 12, and 24 weeks, were 30.7, 36.7, and 35 %, respectively. In total 53.0% (n=159) managed to reduce their smoking to at least 75% and 68.3% (n=205) of subjects had reduced to at least 50% at week 24. Similar results were found in patch and gum groups. Treatments were well tolerated and acceptable. No serious adverse events were reported. There is a need for continued active work through the medical community in China in order to decrease the current smoking prevalence and ideas for how to succeed will be discussed.

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POS5-81 BOOST YOUR HIGH: CIGARETTE SMOKING TO ENHANCE ALCOHOL AND DRUG EFFECTS AMONG SOUTHEAST ASAIN AMERICAN YOUTH

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Increased interest in the joint use of cigarettes and other drugs has included reports of cigarette smoking to increase the high from marijuana consumed in "blunts," or hollowed-out small cigars, in New York City. We present data on this practice from an ethnographic study of substance use among Southeast Asian American youth and young adults in Northern California. In qualitative interviews with 153 youth and young adults selected for recent use of illicit drugs, respondents referred to the practice as "boosting" their high. From this sample, 89 persons (35 females) were re-recruited for a second wave of interviews, including a brief survey with standard measures of alcohol, cigarettes and other drug use, and items to measure lifetime prevalence and frequency of boosting for alcohol or drug high and frequency and quantity of use of blunts separate from other forms of marijuana. Of these respondents, 73% smoked cigarettes in the past 30 days and 72% reported any lifetime boosting. Of those who reported boosting, the majority (81%) smoked cigarettes to enhance both alcohol and drug highs. No significant relationship was found with gender. Controlling for gender, results of linear regression analyses show a significant positive relationship between frequency of boosting to enhance alcohol high and number of drinks per occasion. A significant positive relationship was found between frequency of boosting to enhance drug high and past-30-day use of blunts but not with marijuana in other forms. A positive relationship was also found with the number of blunts on a typical day. The findings indicate that boosting may be common among drug-using Southeast Asian youths. The prevalence of the practice among a small West Coast population combined with reports from the East Coast further indicate that the practice may be implicated in a larger subcultural youth movement in the U.S. oriented to blunts use. Subcultural practices associated with blunt smoking may promote and encourage cigarette smoking for the purpose of boosting the high of other substances. Boosting may also be associated with heavier drinking and blunt smoking.

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POS5-82 EFFECTIVENESS OF VARENICLINE AS AN AID TO SMOKING CESSATION: RESULTS OF AN INTER-EUROPEAN OBSERVATIONAL STUDY

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Aims: The efficacy of varenicline as an aid for smoking cessation has been demonstrated in several placebo-controlled clinical trials with well-defined inclusion/exclusion criteria and standardized behavioral support and follow-up. This study aimed to determine the effectiveness and safety of varenicline for smoking cessation in a "real-world" environment of smokers who were prescribed varenicline and managed by their healthcare professional in routine clinical practice.

Methods: This 12-week, prospective, observational, non-comparative study was conducted in four European countries (Belgium, Greece, Hungary, Slovenia). Subjects were adult smokers who were motivated to quit. Patients were included who had been prescribed varenicline in accordance with the European product license. Continuous abstinence was determined based on verbal reporting in the 7-day period between Week 11 and 12 of treatment. Safety parameters were also evaluated.

Results: Of 567 screened smokers, 551 received varenicline (Belgium, n = 226; Greece, n = 196; Hungary, n = 107; Slovenia, n = 22). The mean age for the overall population was 45.5 years, 53.5% were men and 97.1% were white. Mean smoking history was 27.0 years; with an average number of cigarettes of 25.3 per day; and a mean score on the Fagerström Test for Nicotine Dependence of 6.1. The most common past or present comorbidities relevant to smoking were elevated cholesterol (20.7%), hypertension (20.0%) and chronic obstructive pulmonary disease (18.2%). Furthermore, 9.4% reported past or present depression. A third of subjects (33.5%) participated in an intensive smoking cessation behavioral support program during the entire study. By the end of the treatment, 64.6% of subjects had quit smoking. The most frequent adverse events (AEs) were nausea (8.9%), insomnia (2.9%) and sleep disorder (2.2%). Seven patients had serious AEs and one patient died (unrelated to study drug). Nineteen (3.4%) subjects discontinued due to treatment-related AEs.

Conclusions: Varenicline is an effective smoking cessation aid, with an acceptable safety profile, in smokers treated in a "real world" setting as part of routine clinical practice.

The study was funded by Pfizer Ltd UK.

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POS5-83 THE ADVERSE EFFECTS OF NICOTINE ON CHEMOTHERAPY AND/OR RADIOTHERAPY IN CANCER TREATMENT

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Background: Though nicotine replacement is the standard of care for smoking cessation in cancer patients, nicotine administration is associated with modulating a broad spectrum of proteins associated with tumor promotion, progression, and therapeutic resistance.

Methods: Analysis of the literature (PubMed) was used to develop a construct delineating the effects of nicotine on signal transduction pathways (STP) to identify common pathways of activation. Human cancer cells (FaDu, A549, or H460) were treated with chemotherapy (CT) and/or radiotherapy (RT) in the presence or absence of nicotine and STP inhibitors in vitro. Nude mice inoculated with H460 lung cancer xenografts were treated with fractionated RT or chemoradiotherapy (CRT) in the presence or absence of nicotine. Statistical comparisons were made between non-nicotine and nicotine treated groups. Animal procedures were performed with the approval of the Institutional Animal Care and Use Committee of the University of Kentucky.

Results: Analysis of over 1,500 publications resulted in the construction of a complex parallel STP scheme used to identify the alpha-3 nicotinic acetylcholine receptor (a3-nAChR), a7-nAChR, PI3K, and MEK as common parallel mediators of the effects of nicotine in cancer cells. Nicotine administration in vitro significantly reduced the efficacy of CT (dose escalated cisplatin), dose escalated RT (0, 2, 4, 6 Gy), and CRT. Whereas inhibition of the a3-nAChR and MEK appeared to only prevent the effects of nicotine on RT, inhibition of the a7-nAChR or PI3K prevented nicotine-mediated protection against both CT and RT. In vivo, systemic periodic nicotine administration in H460 lung cancer xenografts increased tumor regrowth following treatment with RT or CRT.

Conclusions: Data demonstrate that nicotine significantly reduces the effectiveness of CT and RT both in vitro and in vivo. These data suggest that non-nicotinic alternatives to tobacco cessation may be necessary in patients during cancer treatment. These data further suggest specific targets of therapy to overcome the effects of nicotine-mediated decreases in therapeutic response.

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POS5-84 PREMIUM, DISCOUNT AND CONTRABAND CIGARETTE SMOKERS: HOW DO THEY DIFFER FROM EACH OTHER?

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Background: Higher cigarette price is associated with reduced consumption, however, little is known about the characteristics of those smoking discounted cigarettes. We describe the characteristics of these smokers.

Methods: Baseline data were compiled from the Ontario Tobacco Survey (OTS), a population-based study of smokers conducted between 2005 and 2009 in Ontario, Canada. Respondents providing a usual brand of cigarettes (n=3740) were classified as users of premium, discount or contraband. Chi-square tests were used to examine differences in the prevalence of discounted cigarette use. Multivariable logistic regression modelled demographics and smoking behaviours on brand classification. Analyses were corrected for the complex sampling of the OTS.

Results: The prevalence of premium, discount and contraband as usual brand was 60%, 29% and 10%, respectively. Compared to premium cigarette users, discount users were more likely to be older, female, daily smokers, and to have made more lifetime quit attempts and to smoke more cigarettes per day ($p<0.01$). Education and six-month quit intention were not associated with smoking discount cigarettes. Similar results were identified for contraband use but contraband users were less likely to intend to quit than those smoking premium cigarettes ($p=0.018$). Smokers with less than high school education were more likely to smoke contraband cigarettes than those who have completed high school or have some college education ($p=0.01$). Age was not associated with contraband use.

Conclusions: Discount and contraband cigarette smokers have different demographic characteristics and smoking behaviours than those who smoke premium cigarettes. Future research will determine how discounted cigarette use impacts cessation behaviours.

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POS5-85 THE EFFECTIVENESS OF A NURSE-MANAGED SMOKING CESSATION PROGRAM ON THE BIRTH AND OTHER PERINATAL OUTCOMES OF A PREGNANT RURAL POPULATION

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The purpose of our previous study was to examine the effectiveness of a nurse-managed program based on the 5 A's and integrated into the "real world" of routine perinatal care on the smoking cessation of a rural population. Data were collected from a convenience sample of 194 pregnant women who stated that they were smokers at the onset of their pregnancies. Results published elsewhere showed that there were no significant differences in validated cessation rates during pregnancy at three prevalence points between the control and intervention groups among all subjects. At the postpartum visit women in the intervention group who had quit smoking by the first prenatal visit had higher validated (cotinine ≤ 200ng/ml) cessation rates than those in the control group. We now report the analysis of birth data and other perinatal outcomes of 160 enrollees in the original study (average age, 23.7; gravidity, 2.4; Medicaid insured, 56%) with viable pregnancies. There were no differences in birth weight, maternal weight gain, length of gestation, number of prenatal visits, perinatal complications, and maternal co-morbidities by groups or by cotinine at the first prenatal visit. Infants of those women with positive cotinine at the first prenatal visit in the experimental group had higher one minute Apgar scores than those of women with negative cotinine ($p<.039$), but not in the control group. Overall, infants of women with positive cotinines at the first prenatal visit had higher 5 minute Apgar scores ($p<.001$). Also of note, validated smokers at the first prenatal visit had significantly more male infants (64.0% vs. 56.0%), while validated non- smokers had more female babies (58.3% to 41.7%) ($p<.014$). Further research regarding the associations among these variables is needed. While this study adds to the database on pregnant smokers in rural areas, its results underscore the lack of intervention effect of programs integrated into routine prenatal care, thereby possibly decreasing the motivation to quit among whole communities.

Quest Diagnostics, & The Southern Tier Tobacco Awareness Coalition.

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POS5-86 ANALYSIS OF SMOKING PATTERNS AND CONTEXTS AMONG COLLEGE STUDENT SMOKERS

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College smoking remains a significant public health concern. Limited information exists regarding patterns of smoking in this population. We examined smoking patterns in three cohorts of college students enrolled in a clinical trial in three successive fall academic semesters. Only participants assigned to the control condition, which received motivational interviewing targeting fruit and vegetable consumption were included in these analyses. The Timeline Follow-Back (TLFB) assessment of past 30-day smoking at up to 5 assessment points covering a total period of 96 days was completed by 207 smokers in each of three cohorts ($N1 = 80$; $N2 = 61$; $N3 = 66$). In the combined sample, smoking rates were higher during weekends relative to weekdays with average number of cigarettes smoked on Fridays (63.8) and Saturdays (144.6) two to three times the average number smoked on Sundays (30.5), Mondays (33.5), and Tuesdays (34.3). Smokers were divided into three categories based on number of smoking days in the past 30 days reported at baseline: infrequent (0-5 days), moderate (6-29 days) and daily (30 days) smokers. Compared to infrequent and moderate smokers, daily smokers showed substantial variation in daily smoking rates. Daily smoking rates for moderate smokers exhibited a stronger downward trend compared to infrequent and daily smokers. For all three groups, spectral analysis revealed a cyclic pattern repeating every seven days (high smoking in weekends and low smoking in the beginning of the week). Qualitative analyses of anchoring events entered by participants in the first cohort at the baseline administration of the TLFB revealed the most frequent event category was Party (e.g. "party," "went out") and represented 31.8% of all records. Other categories included Work, Vacation, and Sorority/Fraternity Event. These findings indicate that college students smoke at higher rates on weekends and report partying and socializing frequently in the context of smoking assessments. These results also provide new insight into the events students perceive as relevant to their smoking behavior and the consistency of temporal trends in college student smoking behavior.

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POS5-87 ROLE OF a5* AND a3b4* NICOTINIC RECEPTOR SUBTYPES IN THE REWARDING PROPERTIES OF NICOTINE USING THE CONDITIONED PLACE PREFERENCE TEST IN MICE

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Rationale: Nicotinic acetylcholine receptors bind to nicotine and initiate the physiological and pharmacological responses to tobacco smoking. Identifying these specific subtypes is essential to finding effective treatments for smoking cessation. Recent genetic human studies suggested nicotinic acetylcholine receptor (nAChRs) gene cluster (CHRNA5-CHRNA3-CHRNB4) play a significant role in both nicotine dependence. a5* nAChRs are found in the midbrain and the dorsal diencephalic system such as the habenula (Hb) and interpeduncular nucleus (IPN), brain regions involved in drug reward mechanisms. In addition, Hb and IPN areas express the highest level of a3b4* nAChRs subtypes in the brain.

Objectives: To determine the role of a5* and a3b4* nAChRs subtypes in nicotine reward using an unbiased conditioned place preference (CPP) paradigm in mice.

Methods: Adult male wildtype (WT) mice and a5 nAChR knock-out (KO) mice were used to study the role of a5* receptors. On day 1, pre-conditioning scores were recorded as mice roamed all compartments for 15 min. On days 2-4 mice underwent conditioning, where each was randomly assigned either black or white compartment paired with nicotine 0.5 mg/kg s.c. injections. Day 5 was a nicotine-free test day where mice once again moved freely through all compartments. The involvement of a3b4* receptors was determine by using the selective antagonist, Conotoxin AuIB, which was given centrally before post-conditioning scores were obtained. Results: a3b4* antagonist Conotoxin AuIB dose-dependently blocked nicotine rewarding effects. In contrast, CPP results for the a5 receptor KO mice showed an increase of nicotine preference at high doses of nicotine (2 and 3 mg/kg) that did not result in nicotine preference in WT counterparts.

Conclusions: Results suggest an important but apparently opposing roles for a5* and a3b4* nAChRs subtypes in nicotine reward. Decrease in nicotine aversive effects and/or involvement of a negative reward system are possible mechanisms that may explain the results of a5* subtypes.

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POS5-88 SMOKING CESSATION SUCCESS GENETICS: GENE ONTOLOGY AND BAYESIAN NETWORK ANALYSES OF GENOME WIDE ASSOCIATION RESULTS

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Individual differences in abilities to quit smoking receive contributions from genetic and environmental sources. No data supports large effects of any common variant. On the other hand, genome wide association (GWA) and candidate gene studies support largely polygenic genetic architecture. While no variant provides the ca 10-8 p values in individual or metaanalyzed smoking cessation samples, we have identified evidence for contributions from a number of allelic variants to individual differences in seven studies of smoking cessation success. Searches for genomic regions tagged by several SNPs with nominally significant association with quit success in multiple independent samples identify dozens of SNPs, candidate genes and loci. BioBase™ gene ontology analyses allow us to assess functional enrichment of gene classes for these “quit success” gene candidates. There is significant overrepresentation of genes encoding molecules involved in synaptic transmission cell adhesion and significant underrepresentation of molecules involved in regulation of biosynthetic processes. Bayesian networks (BN) provide probabilistic models that help visualize influences of a set of SNPs and the conditional independencies of their effects on smoking cessation. BNs can thus help to classify individuals based on genotypes and other relevant phenotypic variables. We have constructed BN models for predicting success in smoking cessation. Bayesian models support the idea that additive genetic influences are likely to drive substantial portions of the genetic contributions to smoking cessation. Each of these models is internally consistent and provides a basis for development of clinically relevant probabilistic decision-making.

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POS5-89 MONAMINE OXIDE INHIBITION INTENSIFIES SOMATICALLY-EXPRESSED WITHDRAWAL SYNDROME IN THE RAT

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There have been several reports that non-nicotine ingredients in tobacco smoke markedly inhibit the activity of the A and B isoforms of monamine oxide (MAO) in the brain. In smokers, MAO inhibition continues for a number of days following smoking cessation. This raises the question: might continuing MAO inhibition affect the intensity of the withdrawal syndrome occurring around this same period? In the present study, fourteen Sprague-Dawley rats were rendered nicotine-dependent by seven days of 9 mg per kg subcutaneous nicotine bitartrate infusion via Alzet osmotic minipump. Nineteen hours after pump removal, seven rats received intraperitoneal injections of saline, while seven received 4 mg per kg each of the primarily MAO A inhibitor clorgyline and the primarily MAO B inhibitor selegiline. MAO inhibitors in this general dose range have altered various other nicotine actions in the rat. At 22 hours post-withdrawal (the peak time-point for nicotine withdrawal syndrome in our laboratory), each rat was observed under “blind” conditions for somatically expressed nicotine abstinence signs, utilizing a standard, previously validated checklist. Signs recorded during 20-minute observations included writhes, gasps, shakes, tremors, vacuous chewing, teeth chattering and ptosis. Saline-injected rats averaged 27.7 signs with a standard error of 3.0 signs, while rats treated with MAO inhibitors averaged 64.7 signs with a standard error of 11.3 signs. This difference was significant, p equal to 0.008. To test whether MAO inhibition by itself might account for the extreme number of withdrawal signs, a similar experiment was performed in nicotine-naïve rats infused for seven days with saline alone. Saline-injected nicotine-naïve rats averaged 14.2 signs with a standard error of 4.3 signs, while nicotine-naïve rats treated with MAO inhibitors averaged 19.5 signs with a standard error of 6.2 signs, a non-significant difference. The results raise the possibility that MAO inhibition continuing into smoking cessation may modulate the intensity of certain withdrawal phenomena.

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POS5-90 ATTRIBUTES OF WEB-ASSISTED TOBACCO INTERVENTIONS (WATIS): EMERGING BEST PRACTICES FOR ENGAGING QUITTERS

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Background: Smoking is a leading cause of death in North America, yet 18% of Canadians and 21% of Americans smoke. Web-Assisted Tobacco Interventions (WATIs) can offer tailored treatment and facilitate anonymous peer support. As WATIs are accessible 24 hours a day, they can potentially promote cessation for current and social smokers, and assist with relapse prevention in recent quitters. Objectives: Despite the promise of WATIs, there is limited evidence supporting their effectiveness, best practices for their design and delivery, and if they are equally effective for a variety of populations. In order to aid in the development of best practices a literature review was conducted to help establish which tools and features are most appealing to current smokers, recent quitters and social smokers. Methods The sheer speed at which WATIs have evolved and become popular limits the number of Randomized Controlled Trials (RTC’s) that would typically be relied upon as the “gold standard” of evidence. However, a fair number of well designed Observational Studies (OSs) constitute the literature base. Common themes emerged in both the RCTs and OSs that were associated with higher degrees of success. Results: Attributes of online features that quitters found appealing were: engagement, reach and availability and anonymity. Tools and features that have shown promising effectiveness are social / peer support, expert counseling, tailored and targeted support, and text messaging. In both RCTs and OSs there were no results targeting different quitter types. There is also limited data on the effectiveness of targeting by age group (i.e. young adult versus adult). Discussion: Sufficient evidence demonstrates that dynamic content, tailoring and interactive exercises enhance engagement. Since the existing evidence is inconclusive on specific tactics, it is recommended that particular attention be paid to tone, messaging and creative to appeal to as general of an audience as possible.

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POS5-91 EFFECT OF NICOTINE ON ATTENTION IN SMOKERS AND NONSMOKERS

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Recent research has demonstrated that smoking and nicotine can improve aspects of attention and memory in nondeprived and minimally deprived smokers. The effects of nicotine on attention in nonsmokers are not as clear. We examined the effect of nicotine on attention in 30 daily smokers (15 women) and 30 nonsmokers (15 women). At each of three experimental sessions on separate days, participants received a single dose of 0, 0.5, or 1.5 mg nicotine nasal spray. They completed subjective ratings and two cognitive tasks before and after nicotine administration. Nicotine significantly increased ratings of stimulated, dizzy, and drug strength. Cognitive measures were an Attentional Blink (AB) task assessing rapid visual attention and a Continuous Performance Test (CPT) assessing sustained attention. 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. Each AB trial consisted of 16 individually presented words with T1 and T2 in red and the 14 distracter words 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 T1 and T2. Smokers' recall of T1 and T2 was enhanced by active doses of nicotine compared with placebo. Nonsmokers' recall of T1 and T2 was not significantly affected by nicotine. On the 30% degraded CPT, participants monitored letters displayed individually in rapid succession and responded when they saw the letter X. Male nonsmokers made significantly more hits and fewer false alarms, and female nonsmokers had significantly less response time variability after 1.5 mg nicotine. Smokers made significantly fewer false alarms after the 1.5 mg dose. These results indicate that both smokers and nonsmokers derive subtle benefit from nicotine on sustained attention, but only smokers showed improvement in rapid visual attention processing. Such attentional benefits might serve to maintain tobacco dependence in smokers and increase the risk of smoking initiation in nonsmokers.

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POS5-92 AFFECT ASSOCIATED WITH CIGARETTES SMOKED DURING A SCHEDULED REDUCED SMOKING CESSATION INTERVENTION IN TOBACCO-DEPENDENT CANCER PATIENTS FACING SURGICAL TREATMENT

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In the context of cancer diagnosis and medical advice to quit smoking prior to surgery, continued smoking and pressure to quit engender strong affective responses in patients. Research using ecological momentary assessment (EMA) has shown complex relationships between negative affect and smoking lapses in non-medically ill smokers. We examined affect and smoking behavior among smokers participating in a cessation trial of scheduled reduced smoking for recently diagnosed tobacco dependent cancer patients facing surgical treatment. We used EMA data from 76 patients randomly assigned to a tapering regimen to reduce daily smoking prior to quitting before hospitalization. None were using cessation medications before quitting. Smoking was guided by a handheld computer that prompted smoking on a schedule at increasing time intervals over 7-21 days up to a pre-specified quit date. Using PANAS items, positive (PA) and negative affect (NA) were assessed "right now" at 50% of scheduled cigarettes, at 100% of off-schedule cigarettes, and at all post-quit lapses. Random assessment of affect thrice daily captured affect unrelated to smoking behaviors. Growth curve modeling with individual quadratic trajectories was fitted to relate affect with smoking. Averaged over 21 days, affect levels were low (PA=2.67, between "2=a little" and "3=moderately"; NA=1.83). Affect associated with smoking scheduled cigarettes was stable (PA, p=0.72; NA, p=0.36). Cigarettes smoked off-schedule were associated with lower PA and higher NA (both p's<0.0001). Smoking lapses were associated with lower PA (p=0.02) and higher NA (p<0.0001). For lapses, PA declined (p=0.003) and NA increased marginally over time (p=0.11); whereas for scheduled cigarettes, neither PA nor NA differed from reference affect state. Beyond day 14, lapse-related NA showed upward acceleration closer to "moderate" NA (p=0.05). Affect assessed at scheduled cigarettes did not differ from affect measured randomly, suggesting that the behavioral intervention (scheduling, smoking reduction) did not engender increased NA. However, off-schedule cigarettes and post-quit lapses were associated with reduced PA and increased NA.

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POS5-93 ROLE OF REGRET WITHIN THE THEORY OF PLANNED BEHAVIOR FOR PREDICTING QUIT INTENTIONS AND QUIT ATTEMPTS: FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL (ITC) FOUR COUNTRY SURVEYS

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The Theory of Planned Behavior (TPB) can explain many health-related intentions and behaviors, including why some people start and stop the harmful behavior of smoking. According to TPB, the likelihood of an individual performing a behavior is predicted by their attitudes toward the behavior, perceived norms, and self-efficacy for performing it. A growing number of studies have identified additional variables, such as affective processes, that determine intentions and behavior after the TPB variables have been accounted for. One such variable is the emotion of regret, a near-universal experience among smokers in developed countries (Fong et al., 2004). Anticipated regret has been shown to predict intentions to start smoking within the TPB (Conner et al., 2006), but no studies have used the TPB model to examine experienced regret as a predictor of quitting smoking. We analyzed data from the International Tobacco Control (ITC) 4-Country survey, a prospective cohort telephone survey of adult smokers in four countries (Canada, US, Australia, and UK). Data is from 6424 smokers who completed Wave 1 (October to December 2002) and Wave 2 (May to August 2003). Cross-sectional analyses supported the Theory of Planned Behavior as a predictor of intentions to quit at Wave 1: negative attitudes and perceived social norms toward smoking, along with self-efficacy for quitting all significantly predicted quit intentions. In addition, those who felt more regret for smoking were more likely to intend to quit after controlling for the TPB variables (OR=1.42, p<.001). Longitudinal analyses found that intentions to quit strongly predicted actual quit attempts by Wave 2 (OR=4.13, p<.001), and controlling for intentions, the TPB variables also significantly predicted quit attempts. Though regret alone predicted quit attempts (OR=1.25, p<.001), it did not account for any additional variance in quit attempts when added to the TPB model. This study supports the TPB as a model to explain both quit intentions and behavior, and suggests that regret is an important variable to add to the TPB to predict whether smokers will intend to quit, which in turn leads to actual future quit attempts.

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POS5-94 USING SOCIAL COGNITIVE CONCEPTS TO PREDICT ADOLESCENT SMOKING CESSATION

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Several studies have used social-cognitive concepts and measures to examine adolescent smoking cessation. Self-efficacy, use of cognitive coping strategies, and reasons for quitting are related to initial cessation or probability of relapse. In this study, we examined the relationship between these variables and initial lapses to smoking. Because initial lapses almost uniformly lead to relapse, it is important to understand factors that may underlie progression to this milestone. Adolescents (N=58) volunteered to quit without treatment and completed the Adolescent Reasons for Quitting Smoking Questionnaire (ARFQ) and the Smoking Temptation Coping Questionnaire (STCQ) during a baseline assessment one week before a targeted quit date. The STCQ is comprised of one six-item score measuring cognitive temptation-coping strategies and four temptation-coping variables that assess level of temptation, self-efficacy, difficulty in abstaining, and importance of abstaining all in a given social smoking situation. The ARFQ is comprised of 16 items that describe different reasons for quitting smoking and responses fall on a scale from 0 (not important) to 4 (extremely important). Occurrence and timing of a first lapse was assessed using palm-top computers. Participants indicated the start of a quit attempt and the occurrence of first lapse by making entries on the computer. Cox Regression Survival Analysis was used to assess the relationship between reasons for quitting, cognitive coping strategies, cognitive evaluation of a tempting social situation (including self-efficacy) and probability of lapsing. Number of cigarettes smoked on average at baseline was used as a covariate for each analysis. 93% of participants had a first lapse, and average time to first lapse was 0.89 days. There was a significant relationship between self-efficacy and first lapse (odds ratio= .748, p<.05), but other variables did not predict lapsing. This study suggests that, as with adults, self-efficacy may be an important factor underlying smoking cessation and may be an important target in interventions for adolescent smokers.

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POS5-95 HOW DO CHINESE SMOKERS RESPOND TO CHANGES IN CIGARETTE PRICES?

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The Government of China has been reluctant to regulate tobacco use, including via the taxation of cigarettes. Tobacco taxation is believed to be an effective strategy at curbing tobacco use. As the burden of tobacco-related illness mounts, cigarette taxes may become increasingly important to tobacco control efforts in China over the coming decade. As such, it is important to understand the effect of tobacco prices on Chinese smokers in the recent past. This study uses 13 years of longitudinal microdata, from 1993 to 2006, to determine how Chinese smokers have responded to changes in cigarette prices. The panels, collected as part of the China Health and Nutrition Survey, cover a longer time period than any data currently available in the literature. The analytic sample includes more than 60,000 person-year observations representative of 9 eastern Chinese provinces. The sample was restricted to adult men age 18 years or older, because adolescents and women often underreport their tobacco use and may comprise nonrepresentative samples. A two-part model of smoking participation and smoking intensity is used to estimate the price elasticity of demand for cigarettes. We test several specifications, including models with community fixed effects and models with province by urbanicity fixed effects, both of which control for time-invariant characteristics that are related to smoking behavior. We find that smokers are relatively insensitive to price changes, with a best estimate of the total elasticity below -0.10, on par with previous estimates in China. The analysis also examines the price elasticity by year, income group, urbanicity, and province. Two possible reasons for the low elasticity estimates relative to other countries, in which -0.4 is a common value, are the large price spread of cigarettes in China and the rise in household incomes outpacing the change in cigarette prices.

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POS5-96 STROOP EFFECT PREDICTS ADOLESCENT SMOKING CESSATION OUTCOME

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PURPOSE: Abstinence from smoking can decrease attention and impair concentration among adolescents; this may be a key factor in understanding relapse among this population. In this study, the relationship between ability to focus attention on relevant stimuli, while suppressing prepotent responses, and cessation outcome was examined. This ability may be critically important when adolescents encounter cues for smoking or experience urges to smoke during a quit attempt.

METHODS: This study included 103 adolescent smokers, 14 to 18 years old, who expressed interest in quitting smoking. The color-word Stroop task was administered before the quit attempt began and on the quit day. While recording their smoking on a palm-top computer, 97 participants attempted to quit; at the time of the post-quit Stroop, 55 were abstinent and were included in analysis of this measure. Relapse was defined as smoking greater than or equal to 50% of baseline smoking rate for 3 or more consecutive days. Cox regression, using standardized Stroop scores, was used to predict first lapse and relapse.

RESULTS: A first lapse was experienced by 85% of participants; average latency to first lapse was 1.06 days. Relapse occurred in 17% of participants; average latency to relapse was 3.94 days. The Stroop effect on the quit day significantly predicted first lapse (odds ratio = 1.34, 95% CI = 1.04 – 1.72, $p < .05$) and relapse (odds ratio = 1.47, 95% CI = 1.73 – 2.01, $p < .05$). This suggests that greater inability to inhibit responses is associated with an increased likelihood of cessation failure. Neither the pre-quit Stroop nor the difference between pre- and post-quit Stroop scores predicted outcome.

CONCLUSIONS: The factors underlying smoking cessation among adolescents are not well defined. This study suggests that ability to inhibit prepotent responses may play a role in the relapse process among this population. However, only Stroop scores following several hours of initial abstinence predicted cessation outcome. Cognitive vulnerabilities that are relevant for cessation may only emerge after the quit attempt has started.

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POS5-97 PRELIMINARY OUTCOMES OF "PHARMACOTHERAPY GUIDANCE" TO INCREASE QUIT SMOKING MEDICATION UTILIZATION

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Objective: The purpose of this paper is to describe the process and preliminary outcomes of a "pharmacotherapy guidance" procedure for helping clients select and obtain quit smoking medications. This guidance is provided to all participants in a randomized controlled trial of telemedicine for smoking cessation, Connect2Quit.

Methods: At baseline, staff collected potential medical contraindications, insurance information, and current prescription drug use, which were sent to a pharmacist to screen for medical eligibility and insurance coverage. Based on the collected information, counselors invite participants to prioritize medication options based on personal preferences, resources and medical eligibility. For income-eligible patients with no insurance, counselors complete and submit applications to pharmaceutical drug assistance programs. At 3 months post randomization, patients are surveyed on study outcomes, including pharmacotherapy use. We analyzed data from all participants who had completed 3-month follow-up surveys as of January 1, 2010.

Results: Of 40 participants to date, 31 (78%) had some type of prescription insurance with 9 (23%), 18 (45%), and 18 (45%) eligible to receive prescription assistance with NRT, bupropion, and varenicline, respectively; 13 (33%) were eligible for free medications through manufacturer-sponsored pharmacy assistance programs, with 6 (15%) receiving assistance. Of the participants, 29 (73%) had taken some form of quit smoking medication and 9 (23%) had taken more than one form of quit smoking medication. Of those that used medication, medication was used for an average of 5.2 +/- 5.07 weeks and the average spent was $60 +/- 73 per patient.

Conclusion: Medication use rates when using "pharmacotherapy guidance" were much higher than the general population. The utilization rates from these preliminary outcomes approximate utilization rates of a study that gave participants free quit smoking medication (73% vs. 61%). An autonomy-supportive mechanism for facilitating pharmacotherapy use consisting of assessment, feedback, and assistance in obtaining medications may increase smoker utilization of medications.

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POS5-98 PREDICTORS OF SMOKING INITIATION IN AN URBAN SAMPLE OF AFRICAN AMERICAN ADOLESCENTS

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Several studies have explored potential demographic and psychosocial variables that may help predict the likelihood adolescents will initiate smoking. However, the majority has focused on predominately Caucasian samples. Thus, it is unclear whether such findings hold true with minority subgroups (e.g., African Americans), as certain variables (demographics, social/peer influences) may differentially influence smoking in African American adolescents. In addition, adolescents may be reluctant to report smoking behaviors to adults, thus computer-based screening and assessment may be a practical alternative. The present study (N=150) employed a computer-directed assessment to examine smoking in an urban sample of African American adolescents recruited through their primary care provider. The assessment included demographic and psychosocial variables previously found to predict the likelihood of an adolescent trying a cigarette in Caucasian adolescent samples (e.g., peer smoking, adult smoking in the home, self-esteem, and self-efficacy). Compared to nonsmokers (never smokers), findings indicated that African American adolescent smokers (ever smokers) were more likely to have friends who have tried smoking, were more likely to have adult smokers in the home, and obtained lower smoking avoidance self-efficacy scores. Additionally, adolescent satisfaction ratings of the computerized assessment were generally favorable. Study findings suggest that computer-based screening and assessment strategies may be an effective tool when developing culturally and developmentally tailored prevention and cessation campaigns for urban minority youth.

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POS5-99 RELIABILITY OF EARLY SMOKING EXPERIENCE: CORRELATIONS AND AN AUTOREGRESSIVE MODEL

Róbert Urbán*

BACKGROUND: Higher initial sensitivity to nicotine predicts the development of nicotine dependence. The most frequently used measure of initial experience is the early smoking experience scale. However it is not clear to what extent memory bias distorts self-reported early smoking experience.

AIMS: The goal of the current report is to examine the five-month test-retest reliability of the early smoking experience scale and its constituent items.

PARTICIPANTS: 9th grade students (N=1203) who reported that they had tried a cigarette (by the first wave of the study and answered the Hungarian version of the early smoking experience scale during the first and the second waves of the Budapest Adolescent Smoking Study.

MEASURES: Self-reported smoking behaviors, Hungarian version of early smoking experience scale, short version of sensation seeking scale and CES-D.

RESULTS: Test-retest correlation of items and factors of early smoking experience scales are .28 (pleasant), .21 (unpleasant), .21 (nausea), .20 (relaxation), .31 (dizziness), .17 (rush or buzz), .33 (coughing), .31 (difficulty inhaling), .38 (unpleasant experience factor), .30 (pleasant experience factor). Test-retest correlations are higher among experimental smokers (.43 for unpleasant experience factor, and .34 for pleasant experience factor) and intermittent smokers (.41 and .18 respectively) than regular smokers (.12 ns. and .18 respectively); therefore, heavier smoking experience might alter the memory of the first experience. Although the test-retest reliability of early smoking experience scale is moderate, the fit of the autoregressive model is satisfactory (CFI=.968 TLI=.952 RMSEA=.036 pclose=1.00). The pleasant experience factor changes significantly (t(1180)=3.03 p<.002) with time, while the unpleasant experience did not change (t(1174)=1.85 p<.07) with time.

CONCLUSION: Self-reported early smoking experience scale seems to be moderately reliable; therefore it should be used cautiously. The fact that smoking status moderates the reliability coefficients requires further examination.

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POS5-100 FEW SALIENT CHARACTERISTICS PREDICT QUIT ATTEMPTS AMONG FEMALE PRISONERS

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Several demographic and smoking characteristics have been found to predict a smoking cessation attempt including younger age, higher education, lower nicotine dependence, and fewer years of smoking. However, in clinical trial studies, other barriers such as transportation, childcare, work responsibilities and other lifestyle problems may interfere with an individual's ability to attend treatment and make a subsequent cessation attempt, thus skewing these predictors. We were interested in examining predictors of women who made a major quit attempt, defined as verified 7-day sustained abstinence, who were incarcerated and participating in a smoking cessation trial. No previous studies have examined the characteristics of female prisoners who make a quit attempt where lifestyle issues such as transportation or childcare are not relevant. 250 women started a 10-week group psychotherapy intervention and received nicotine patches. We examined baseline demographic, smoking history, FTND, mental health and substance abuse variables using univariate analyses to determine predictors of quit attempts. Average age was 33.8+9.0 years, 44% were Caucasian, 72.8% had at least a high school diploma or GED, and 47% had never been married. 123 (49.2%) of women made at least one quit attempt during the trial. Out of all the predictor variables examined, only two variables, age of first becoming a daily smoker and total years of smoking were predictive of making a quit attempt, with participants who were older when they began smoking (16.8 v. 15.6; p<.05) and who smoked for fewer years (18.2 v. 22.0; p<.004) more likely to make a quit attempt. These results suggest that when smoking cessation treatment is offered to participants where lifestyle issues and other non-treatment factors are not relevant, few smoking or demographic characteristic are predictive of who makes a sustained quit attempt. Treatment programs should make an effort to reduce these lifestyle barriers (e.g., providing childcare, help with transportation) to ensure that all participants are given the opportunity to attempt to quit smoking.

Department of Health and Human Services.

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POS5-101 LOOK AT THAT! BRAIN REACTIVITY TO EMOTIONAL, NEUTRAL, AND CIGARETTE-RELATED STIMULI IN SMOKERS

Francesco Versace*, Jennifer A. Minnix, Jason D. Robinson, Cho Y. Lam, Victoria L. Brown, and Paul M. Cinciripini

It has been argued that drug-associated cues can "hijack" neural mechanisms that, under normal circumstances, serve to shape survival behaviors related to the pursuit of reward. Event-related potentials (ERPs), given their sensitivity to affective neural responses, represent an excellent tool to non-invasively test this hypothesis in humans and investigate both temporal and spatial commonalities in the processing of intrinsically emotional and drug-related stimuli. Before beginning a smoking cessation program, 116 smokers (33% female) participated in a laboratory session in which 96 pictures were presented and dense array ERPs (129 sensors) were recorded. The pictures were drawn from categories representing mutilation, sad, neutral, romantic, erotic, and cigarette content. The amplitude of the late positive potential (LPP; 400-600 ms after picture onset) was computed for each condition at each sensor. A randomization procedure was used to compare the voltage topographies associated to each condition. As hypothesized, both emotional (pleasant and unpleasant) and cigarette-related pictures prompted significantly larger positivity than neutral pictures over central, parietal, and frontal sites. High arousing images (i.e., erotica and mutilations) prompted the highest cortical positivity relative to any other category. No difference in the amplitude of the late positive potential was observed between romance and cigarette-related pictures, and sad pictures evoked the smallest LPP among emotional categories. These results support the hypothesis that for smokers, cigarette-related cues are motivationally relevant stimuli that engage brain circuits normally involved in the processing of intrinsically motivating stimuli.

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POS5-102 PARTICIPANT BELIEF ABOUT DRUG ASSIGNMENT: PREDICTORS AND CESSATION OUTCOMES IN A CLINICAL TRIAL OF BUPROPION FOR SMOKING CESSATION

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Results from randomized double-blind placebo-controlled trials of smoking cessation medications have suggested that participant guess about treatment assignment can be influenced by drug expectancies and smoking status. However, less is known about predictors of drug guess among people who have successfully quit smoking. The current project sought to determine: (1) how quit day drug guess was related to quit day smoking outcomes and (2) how mood and smoking-related variables influenced drug guess on quit day among a subsample of people who were nicotine abstinent on quit-day. A total of 524 smokers (45.5% female, mean age=44.7years) participated in a 12-week randomized, double-blind, placebo controlled 2x2 clinical trial comparing: (a) standard smoking cessation treatment (ST) plus bupropion SR (BUP); (b) ST plus placebo; (c) ST plus CBT for depression plus BUP; (d) ST plus CBT for depression plus placebo. On quit day, 75% of individuals who correctly identified bupropion treatment assignment and 48% correctly guessing placebo assignment had biochemically confirmed smoking abstinence. Quit date smoking cessation rates for incorrect guesses were 59% among individuals incorrectly guessing bupropion treatment and 48% incorrectly guessing placebo treatment. In a subsample of quit day abstainers (N=392; 49% female), participants self-reporting lower levels of urges to smoke on quit day were more likely to guess that they had been assigned to bupropion treatment ($p < 0.001$). Quit day abstainers reporting a higher level of side effects 1-week after drug initiation were also significantly more likely to guess that they had been assigned to bupropion treatment ($p = .001$). Level of nicotine dependence and quit day levels of positive affect, negative affect, and withdrawal symptoms were not related to drug guess (all ps > 0.05). Therefore, among smoking abstainers, integrity of the blind was influenced not only by medication side effect profile, but also by decreased urges to smoke on quit day.

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POS5-103 NICOTINE DEPENDENCE AND SMOKING CHARACTERISTICS AMONG CAUCASIAN AND AFRICAN AMERICAN FEMALE PRISONERS

Galen J. Hale, Gabriella Villalobos, Adam Perkins*, and Karen L. Cropsey

Previous research indicates that 70-80% of correctional populations are current smokers, a rate that is 3-4 times higher than the general population. Differences between Black and White smokers have been consistently documented in the literature. Blacks are at an increased risk for smoking related diseases and death and are less likely to quit smoking than White smokers, whereas White smokers tend to smoke more cigarettes per day and begin smoking at earlier ages. Nicotine dependence has also been studied among the female prisoner population; one study found that almost half of participants were classified as having high dependence. Individuals with high dependence differed significantly from those with low dependence on most smoking characteristics. The current study sought to further explore the relationship between race and nicotine dependence among a large sample of female prisoners. Participants were 655 women recruited from a medium-high security prison. Their mean age was 34.2 and 45.3% were White. Dependence was assessed using the Fagerström Test for Nicotine Dependence (FTND) and participants were divided into four groups: White Not Dependent (WND), Black Not Dependent (BND), White Dependent (WD), and Black Dependent (BD). Individuals in the WD group were the most likely to have been treated for both mental illness and substance abuse. WDs also had the most negative smoking characteristics as compared to the other groups, such as having medical problems due to smoking and having the most difficult past quit attempts. However, BDs were the most likely to have increased their daily smoking since coming to prison and were less likely to report having using successful smoking cessation methods in the past (e.g., the patch or medication). Interestingly, BNDs were the most likely to report that they would continue to smoke outside of prison. Given significant differences between racial groups and levels of dependence, smoking cessation interventions should be tailored to address the different potential barriers to quitting among groups.

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POS5-104 SMOKING STATUS IS PREDICTIVE OF HAZARDOUS DRINKING AND ALCOHOL USE DISORDERS IN YOUNG ADULTS: EPIDEMIOLOGICAL DATA

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Young adults often pair cigarette smoking and alcohol use. Prior epidemiological evidence has indicated that young adult smokers drink alcohol more frequently and have greater rates of hazardous drinking and alcohol use disorders, compared to their peers who do not smoke. We have recently shown that young adults who smoke on a non-daily basis are particularly vulnerable to developing hazardous drinking patterns. The purpose of this investigation was to explore the temporal relationship between smoking and drinking in young adults, as it is unknown whether smoking status can be predictive of future alcohol use behavior. The relationship between college student status and drinking was a secondary aim. We used Waves 1 and 2 of the National Epidemiological Survey on Alcohol and Related Conditions (NESARC) to examine the predictive relationship of smoking status and college student status at Wave 1 on alcohol drinking, hazardous drinking, and alcohol use disorders at Wave 2, in young adults aged 18-25 at Wave 1. Differential effects of daily and non-daily smoking were investigated. Young adults who were either daily or non-daily smokers at Wave 1, compared to nonsmokers, were at a greater risk for hazardous drinking and alcohol use disorders at Wave 2. A similar relationship was found for young adults who were college students at either both Waves or at Wave 1 only, compared to those who were not students. Together these findings indicate that daily and non-daily cigarette smoking is associated with problematic alcohol use among young adults. Non-daily smokers continue to represent an important population. Future research should be conducted to continue the development of targeted interventions for college students, given that students, compared to non-students, were more likely to engage in hazardous drinking and were at greater risk of meeting criteria for alcohol diagnoses.

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POS5-105 ELEVATED CARBON MONOXIDE LEVELS OF YOUNG ADULTS EXITING HOOKAH CAFES

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Hookah (also known as shisha and waterpipe) cafes are opening at surprising rates in the United States, with many found in college towns and bigger cities. As the popularity of this perceived less harmful use of tobacco spreads, it is necessary to understand this new and potentially deadly behavior. Very little is known regarding the biological mechanisms and toxins associated with hookah use. Carbon monoxide (CO) will result and be absorbed by the user from the tobacco and the charcoal used to warm the tobacco with this form of use. Data were collected in nighttime field studies in Gainesville, Florida. Research teams recruited outside of known hookah bars (N=173) and also traditional bars (N=198) that allowed cigarette smoking (comparison group). After providing verbal consent for anonymous data to be collected, participants answered a brief questionnaire with demographic information, tobacco use patterns, and attitudes and knowledge of tobacco harm. Upon completion of the instrument, participants provided a breath carbon monoxide level, which was then recorded on their survey. Results indicate that patrons of hookah bars had significantly higher CO levels (mean = 30.7) compared to patrons of traditional bars (mean = 8.9). Accounting for cigarette smoking, respondents who indicate no cigarette use in the past month but had visited a hookah café still demonstrated significantly higher CO values (mean = 28.1) compared to those exiting traditional bars (mean = 7.1). Even participants who indicate not smoking cigarettes or hookah, but still were in the hookah café for a period of time have elevated CO levels (mean = 7.5) comparable to a daily cigarette user (evidence for second-hand smoke exposure). Current cigarette smokers also produced significantly more CO if exiting a hookah bar (mean = 34.7) compared to a traditional bar (mean = 13.3). Clearly CO levels are higher for patrons of hookah cafes, for both current and non-cigarette smokers. While users report less harm with hookah, CO tests do not support such a claim. Education needs to be extended to alert adolescents and young adults of the harm in hookah smoking, even for those who do not use daily.

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POS5-106 AN ELECTRONIC DECISION SUPPORT SYSTEM INCREASES MOTIVATION FOR SMOKING CESSATION TREATMENT AMONG PERSONS WITH SERIOUS MENTAL ILLNESS

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Americans with serious mental illnesses (SMI) such as schizophrenia and mood disorders are four to five times as likely to smoke cigarettes than those without mental illness. While wishing to quit, this group lacks interest in and underutilizes evidence based smoking cessation treatment. Two studies suggest that motivational interviewing and education increase motivation to seek treatment for smoking cessation. Electronic decision support systems (EDSS) provide a way to educate and motivate a large number of individuals with minimal professional assistance. We tested the ability of a tailored EDSS for smoking cessation to increase motivation for smoking cessation treatments among people with SMI. Forty-two patients with SMI were interviewed at baseline and two month follow-up for smoking characteristics and clinician-verified motivation-demonstrating behaviors: (1) meeting with a smoking cessation counselor, (2) meeting with a doctor to discuss smoking cessation, (3) initiating a smoking cessation medication, (4) attending group treatment for smoking cessation, and (5) patient-initiated quit attempt. The main outcome was the sum of these motivation behaviors. Negative binomial regressions, controlling for baseline differences in diagnosis and attitude subscale scores, was used to evaluate the impact of the EDSS. Of the study participants, 29 (69.0%) were diagnosed with schizophrenia and 31 (73.8%) were diagnosed with a lifetime substance use disorder. The group smoked 15.9 +/- 10.1 cigarettes per day. At the two-month follow-up, and after controlling for baseline differences in mental illness diagnosis and substance abuse, significantly more individuals who used the EDSS (14/22 or 70.0%) demonstrated smoking cessation motivation behaviors than those who did not use the EDSS (7/22 or 35.0%; Chi2=4.21, p=0.04). Similarly, those who used the EDSS were more likely to have contact with a professional (Chi2=3.78, p=0.05). This study suggests that computer programs, such as this EDSS, can provide education and motivational exercises that increase motivation for smoking cessation, and may be a cost effective way to engage this high risk population into treatment.

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POS5-107 CIGARETTE AND HOOKAH TOBACCO USE IN THE CONTEXT OF SOCIAL NETWORKS DURING THE FIRST YEAR OF COLLEGE

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Introduction: Recent innovations in the modeling of social networks have yielded new insights into the development of leading causes of mortality, such as tobacco use and obesity. This methodology has the potential to address important questions regarding the development of social networks, and the propagation of behaviors within social networks, during one crucial transitional stage: the first year of college. Our study focuses on behavior and attitudes regarding tobacco smoking with cigarettes and waterpipes (hookahs) in the context of social networks.

Methods: All students aged 18-23 living in 10 pre-specified freshman dormitory floors at the University of Pittsburgh were eligible. During August and September 2009, participants signed informed consent and completed surveys during events held in dormitory lounges, with support from residence hall staff. Questionnaire items regarded their (1) patterns of tobacco use; (2) predictors of tobacco use such as attitudes, normative beliefs, and intention to smoke; and (3) essential sociodemographic covariate data; (4) up to 10 named close associates; and (5) perceived tobacco use and attitudes of each social contact.

Results: Data were collected for 245 respondents (72% of eligible) and 1081 contacts. 39% reported having ever smoked a cigarette; 37% reported ever having smoked tobacco from a waterpipe. 62% reported that among their peers, smoking tobacco from a waterpipe is at least moderately socially acceptable. Popularity (frequency of being named as friends by other study participants) was not associated with cigarette or hookah smoking. Network centrality was significantly associated with cigarette but not hookah smoking. In this presentation, we will also display the distribution of tobacco behaviors with social network graphs (with nodes for all participants and their named contacts connected by lines to indicate ties between people).

Conclusion: The examination of tobacco use as it relates to individuals' roles within their social networks yields new insights and may inform future interventions. This study also assesses a form of smoking that is rapidly becoming common among young people, the waterpipe.

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POS5-108 COMPARISON OF PHYSICIAN FAX-REFERRED AND SELF-REFERRED TOBACCO QUITLINE USERS

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Physician fax referrals to tobacco quitlines may enhance population reach and brief practice interventions. Willett et al., 2009 found that fax-referred enrollees had somewhat different demographic characteristics than other enrollees. We repeated and extended this analysis, comparing Maine Tobacco HelpLine (MTH) caller characteristics and services utilized between fax- and non-fax-referred tobacco users. From January 2007-December 2008, physicians faxed 1,824 referrals and 13,167 tobacco users initiated calls to the MTH. MTH registered 749 of fax-referred tobacco users (41.1%). We compared characteristics of three groups, excluding those with prior MTH enrollment: 696 fax-referred (FR), 2,225 self-callers who heard about MTH from a health care provider (HCP), and all other self-callers (SC)(N=6,722). FR and HCP participants were more likely to be age 35+ yrs (80% FR, 73% HCP, 59% SC), female (61% FR, 58% HCP, 51% SC), have a high school degree or less (66% FR, 65% HCP, 59% SC), have Medicaid (41% FR, 32% HCP, 26% SC) and be in action/maintenance stage at registration (12% FR, 12% HCP, 7% SC). Significantly more in the FR group had 1+ chronic illness (51% FR, 42% HCP, 28% SC). There were no differences in time to first cigarette after waking. Fewer FR completed at least one counseling call of 10+ minutes (62% FR, 84% HCP and SC), but among those counseled, more FR and HCP completed 4 or more calls (31% for FR and HCP vs. 26% SC). Notably, among those counseled and eligible for free NRT, fewer FR received any (45% vs. 73% and 76% in HCP and SC groups). Similar to Willett et al., we found fax referred tobacco users to be more likely female, older, less educated and to have more chronic illness. Fewer fax-referred enrollees completed a single counseling call, but of those counseled, a greater proportion used 4 or more calls. The lower rate of MTH authorized NRT use by fax-referred participants is not explained by program eligibility or medical contraindications; perhaps alternate medications are prescribed at higher rates in this group prior to or simultaneously with quitline referral. Population reach and quit rate comparisons are planned for a future study.

Partnership for a Tobacco-Free Maine, Maine Department of Health and Human Services, Maine Centers for Disease Control and Prevention.

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POS5-109 PRECLINICAL EVALUATION OF N-ACETYL-CYSTEINE IN RODENT MODELS OF NICOTINE DEPENDENCE

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The cysteine pro-drug, N-acetylcysteine (NAc) has been shown to reduce the number of cigarettes smoked (Knackstedt et al., (2009) Biol Psychiatry 15:841-5). This effect has been attributed to the facilitation of the cysteine/glutamate exchanger by NAc, which restores glutamate levels to physiological levels. The behavioural studies presented herein aim to clarify the nature of interaction by NAc to reduce cigarette smoking. In the first experiment, male hooded Lister rats (n=6-8) were repeatedly exposed to nicotine (0.4 mg/kg SC) before tested on locomotor activity. Tolerance developed to the depressant effects of nicotine by the tenth injection of nicotine and a stimulant effect emerged thereafter. Another group was also exposed to the same dose of nicotine but after each locomotor test and the third group received saline injections before and after each locomotor test. Pretreatment with NAC (5, 20, 50 or 100 mg/kg i.p.) dose dependently abolished hyperactivity observed in the absence of nicotine, while the same doses had little effect against the sensitised loocomotor response to nicotine and in saline-treated controls. Thus, NAc specifically reduced conditioned hyperactivity in a dose-dependent manner without modifying the expression of sensitised responses to nicotine. This inability of NAc to diminish nicotine-induced responses was also evident against the subjective states produced by nicotine. In a two-lever operant nicotine discrimination task, similar doses of NAc (50, 100 & 150 mg/kg) were ineffective in attenuating the stimulus effect of nicotine; rather NAc enhanced the stimulus effects produced by submaximal doses of nicotine. Across all doses, NAc did not generalise to nicotine. These results suggest that NAc may reduce cigarette smoking by exerting effects on conditioned responses rather than directly modifying the subjective states produced by nicotine. It is likely that NAc may reduce cigarette smoking via a novel mechanism that involves a glutamatergic component, which targets conditioned responses relevant in craving and relapse.

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POS5-110 REASONS FOR INELIGIBILITY IN A SMOKING CESSATION TRIAL FOR HOMELESS INDIVIDUALS

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Due to the alarmingly high prevalence of smoking (~70%) and tobacco-related morbidity in homeless populations there is a need for effective cessation intervention programs for this medically underserved population. Identifying clinical trial ineligibility criteria can be important for designing culturally relevant studies for homeless smokers. The current study examines reasons for which homeless individuals were not eligible for an ongoing Randomized Clinical Trial (RCT) assessing the efficacy of Motivational Interviewing (MI) counseling for smoking cessation. To date, 354 people have been screened, of which 234 (66.1%) were eligible and 120 (33.9%) were ineligible to participate. Of those eligible, 73.9% (173/234) have been randomized and 47 people did not keep their randomization appointment. Compared to those who were randomized, the ineligible individuals were younger (42.8 yrs v. 46.3 yrs; p=0.01) and more likely female (females= 27.6% v. 23.9%; p=0.33), but similar in the number of cigarettes smoked per day (22.3 v. 21.4; p=0.66). The most common reason for ineligibility was the use of another cessation aid in the previous 30 days (n=30). The next most frequent reasons for ineligibility included having an expired carbon monoxide level that was less than or equal to 5 ppm (n=28), not being homeless (n=25), residing in the Twin Cities area for less than 6 months (n=19), and having suicidal ideations in the last two weeks (n=11). The least common reasons for ineligibility included pregnancy, unwillingness to use birth control, and history of stroke or heart attack within the previous 30 days. In all, 26.7% of those who were found ineligible had more than one reason for ineligibility. Despite the high enrollment rate for the clinical trial, a substantial proportion of homeless smokers were not eligible to participate in the RCT. Researchers should strive to minimize reasons for which homeless smokers are excluded from clinical research in order to enhance the participation of homeless individuals in clinical research.

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POS5-111 SMOKING REDUCTION AMONG PEOPLE LIVING WITH HIV/AIDS: ARE THERE ASSOCIATIONS WITH SHORT-TERM HEALTH OUTCOMES?

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People living with HIV/AIDS have been found to smoke at higher rates and be more nicotine dependent than demographically similar, non-HIV-infected smokers. Little is known regarding the extent to which changes in smoking behaviors are associated with HIV disease progression or health outcomes in this medically vulnerable population. Drawing from 444 HIV+ smokers who were enrolled in a larger cessation trial in 8 clinics in southern New England (mean age=42 years; 63% male; 52% European-American, 19% African-American, 16% Hispanic-American; 78% unemployed), a random sub-sample (N=84) of patient medical records were reviewed to obtain T-cell, CD4-count laboratory values, and systolic and diastolic blood pressure closest to dates of participant study baseline and 6-month follow-up (6 MFU) sessions. Demographic comparisons with the 357 participants without chart review data indicated the presence of significant differences (p=0.03), with more females among those with chart reviews (47.12%) than those without (34.17%). Participants with chart review data did not differ from those without with respect to current substance use, FTND score, number of household smokers, or several other psychosocial variables. Thus, despite an oversampling of females, this subsample fairly represents participants in the larger trial. In order to examine whether reductions in cigarette consumption led to improvements in T-cell counts, viral load and blood pressure, we fit normal regression models in which change in these variables from baseline to 6 MFU was regressed upon a) baseline variables themselves, b) baseline daily cigarette consumption, and c) change in daily cigarette consumption from baseline to 6 MFU. Baseline values of the outcome were predictive of change at 6 MFU for viral load, and both systolic and diastolic blood pressure (p-values <0.001), but not for T-cell counts (p=0.15). However, neither baseline smoking nor change in smoking rates was significantly related to t-cell counts, viral load, or blood pressure. Future research needs to examine if associations with these health outcomes are different for those who are able to achieve and maintain long-term abstinence.

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POS5-112 DIGITAL STORYTELLING AS AN INTERVENTION FOR REDUCING TOBACCO USE AMONG LATINOS IN COLORADO

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In the 2000s, health researchers and community advocates used digital storytelling to increase voices of community members in social development initiatives and promote healthy behavior among Latinos and other economically disenfranchised groups. Digital stories are autobiographical videos about three minutes long with photographs and background music. This presentation analyzes ethnographic and visual data on digital storytelling as an intervention for reducing tobacco use among Latinos in Colorado and examines the emerging institutionalization of digital storytelling as a tool for building research partnerships with Latino health and immigrant rights advocacy groups in the University of Colorado. In 2008, the author received funding from the University of Colorado Denver Clinical and Translational Sciences Institute to conduct digital storytelling workshops with health advocates and practitioners engaged in tobacco control and health disparities among Latinos in Colorado. The author collaborated with a professional writer and a professional videographer to administer the workshops with nine participants in June 2009 and eight participants in October 2009 in Denver, Colorado. In the workshops, participants created digital stories with themes of tobacco use, cancer disparities, substance abuse, mental health, and limited access to health care. One digital story from each workshop was selected for inclusion in a web survey to obtain views of digital stories as health promotion tools from members of the general public in Colorado (n=399) and health professionals in the United States (n=130). Criteria for selection of digital stories were quality and relevance to project themes such as tobacco use and health disparities among Latinos in Colorado. The presentation systematically analyzes the digital storytelling approach and practice, and assesses findings from an online survey using two digital stories produced in the workshops. Opportunities and limitations of digital storytelling as a method for building research partnerships between university professors and community leaders are also discussed.

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POS5-113 EFFECTS OF A TOTAL DISPLAY BAN ON TOBACCO PURCHASES

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Introduction: While several jurisdictions have introduced total display bans on tobacco products, little research on the effects of this innovative policy has been published. We studied the impacts of Ontario's total display ban on impulse tobacco purchases among smokers attempting to quit and among recent quitters.

Method: Data were compiled from five questions added to existing evaluation surveys for three cessation interventions: 'Driven to Quit' contest, STOP study and Smoker's Helpline. A total of 5,765 participants responded to these questions, which focused on items and situations encountered while standing in a line at a convenience store in the past 6 months. Data from the three sources were combined and stratified by each cessation intervention. Using design based descriptive analyses, we estimated impulse and relapse purchases. Logistic regression was used to determine risk factors contributing to impulse and relapse purchases.

Results: About 80% of respondents noticed covering over cigarette display shelving; 78% saw a person in line buying cigarettes; 50% saw a clerk retrieve cigarettes from the covered display shelving. About one quarter of respondents experienced an urge to purchase cigarettes. Almost half (48%) of smokers who were attempting to quit acted on their urge and purchased cigarettes; while 8% of recent quitters purchased cigarettes. Smokers attempting to quit smoking who noticed covering over cigarette display shelving were significantly less likely to purchase cigarettes (OR= 0.59; p <.05). Smokers attempting to quit smoking who saw a clerk retrieve cigarettes from behind the covered display shelving were significantly more likely to purchase cigarettes (OR= 1.45; p <.05). Recent quitters who encountered a clerk verbally promoting cigarettes were significantly more likely to purchase cigarettes (OR= 3.95; p <.05).

Conclusions: Covered tobacco displays appear to have a protective effect for impulse and relapse cigarette purchases. However, seeing tobacco products being sold to other customers and hearing store clerks verbally promote tobacco products continue to pose obstacles for smokers trying to quit or stay quit.

Ontario Ministry of Health Promotion.

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POS5-114 INTERACTION OF GENDER, MENTHOLATED CIGARETTES AND RACE ON NICOTINE DEPENDENCE AND EXPOSURE BIOMARKERS

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Relationships of gender, mentholated cigarettes, and race with variables of interest are complex. The specific aim was to examine main and interaction effects of gender, mentholated and regular cigarettes, and race on nicotine dependence (time to first cigarette [TTF], FTND, and Etter Cigarette Dependence Scale [CDS]), and cigarette exposures of cotinine, nicotine and CO boost, tobacco specific nitrosamines, and polycyclic aromatic hydrocarbons (PAH). Smoking topography was assessed. The 36 hr inpatient human laboratory investigation was conducted at The Ohio State University Clinical Research Center. Stratified recruitment of the sample of 135 current smokers yielded similar numbers of menthol and nonmenthol smokers within African American (AA) and European American (EA) groups, and gender was balanced within each quadrant. Persons smoked their usual brand of cigarettes throughout the inpatient protocol and a 24-hour urine sample was collected to assay NNAL, NNAL glucuronide, PAH metabolites, and menthol glucuronide. The sample was 29.7 years of age (SD 9.1), averaged 15.7 (SD 6.4) cigarettes per day and an average cotinine of 226 ng/ml. Average TTF was 20.7 (SD 20.7), a CDS average of 43.2 (SD 8.5), and FTND 4.4 (SD 1.9). GLM multivariate analyses were conducted and univariate examination as warranted. To illustrate, TTF was significantly higher in EA (26.7 min) compared to 12.6 min among AA. Exposures included significantly higher NNAL and cotinine in AA participants, and lower NNAL glucuronide:NNAL ratio in women. There was a significant race by menthol interaction on nicotine boost of the first cigarette of the day with AA menthol smokers having the lowest increase (9.3 ng/ml) and AA regular smokers having the highest increase (18.1 ng/ml). Nicotine boost for EA regular smokers was 10.9 ng/ml and for mentholated cigarette smokers it was 12.1 ng/ml. Average CO boost of the first cigarette of the day was significantly higher among AA participants. A balanced 3-factor design facilitated distinguishing unique inter-relationships to further understanding of dependence and exposure.

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POS5-115 SOURCES OF SECONDHAND SMOKE EXPOSURE AND EXPOSURE REDUCTION MESSAGES FOR CHILDREN AND PARENTS ATTENDING COMMERCIAL CHILDCARE CENTERS

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Secondhand smoke (SHS) exposure in children is a major public health problem, disproportionately affecting those in lower income households. Childcare centers, with frequent parental contact, are an underutilized venue for child health promotion and could have a significant influence on parental smoking behavior. The Parents' Awareness Reducing Exposure to Nicotine and Tobacco (PARENT) project is a randomized, controlled, pilot feasibility study testing the effectiveness of a childcare center system intervention, including tobacco cessation brief intervention training for child care center workers, to reduce children's exposure to SHS. This presentation reports baseline findings of household smoking and child SHS exposure. A General Health Survey (GHS) querying household tobacco use and SHS exposure was administered to parents of children enrolled in 8 commercial childcare centers serving predominantly low-income families (50-95% receive childcare subsidies) in Tucson, AZ. Of households reporting (n=320), 21.9% (n=315) of mothers and 21.1% of fathers currently smoking (2008 AZ adult prevalence was 15.7%), although far fewer report smoking in the house (3.8% and 2.4%, respectively). In addition, 13.9% of respondents reported that their children are exposed to cigarette smoke on a regular basis by someone other than a parent. Of the adults spending the most time with the child(ren) 23.7% are tobacco users, although 91.4% (n=315) of the respondents report that smoking is not allowed in their house. Respondents reported seeing or hearing messages about reducing children's SHS exposure from numerous sources: TV (80.6%), doctor (66.3%), family member (32.8%), friend (24.1%), billboard (40.6%), and clinic (28.8%). Childcare centers were less Infrequently cited sources where messages were seen (17.5%) or heard (7.5%). Only 5.3% of respondents had not seen or heard any messages about SHS. Although parents are receiving messages to reduce children's SHS exposure, and report wide use of home smoking bans, they are not receiving exposure reduction messages from childcare centers, and non-parental adults area also a significant source of potential SHS exposure.

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POS5-116 GENETIC VULNERABILITY FOR NICOTINE DEPENDENCE: LINKAGE AND ASSOCIATION ANALYSES SUGGEST ST8SIA4 INVOLVEMENT

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The Nicotine Addiction Genetics Project (NAG) is an international collaborative study between investigators from Australia, Finland and the USA to identify factors that affect risk for tobacco use and dependence. Here we report on genetic linkage and association findings for a quantitative measure of nicotine dependence (ND). Because our previous multivariate genetic factor analyses of Australian twin data suggest that a single genetic factor accounts for most genetic variation associated with items of nicotine dependence as measured using Fagerström and DSM-IV criterion, for purposes of this study we generated a factor score (NDFS) using items from both measures, assessed in regular smokers for heaviest period of cigarette consumption. Linkage findings were obtained from the analysis of 10cM microsatellite marker genome scan data on DNA obtained from over 1300 Australian and 540 Finnish subjects, over 280 and 160 families respectively, ascertained for heavy lifetime cigarette use. Results indicate linkage signals for NDFS on chromosomes 5 (LOD=3.9) and 22 (LOD=2.4) among Australian smokers. Differences in findings across sample for the NDFS may be due in part to elevated ND severity in the Australian sample. Family-based association analyses of the Australian NAG data, conducted using SNP data limited to the region under this chromosome 5 linkage peak, suggest a relationship between ND and the gene ST8SIA4 (p-value: 1.10E-5), a polysialyltransferase which is involved in the polysialylation of the neural cell adhesion NCAM molecule, the expression of which has been reported in findings from animal research to be affected by the presence of nicotine.

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POS5-117 SAFETY AND EFFICACY OF VARENICLINE IN SCHIZOPHRENIA: PRELIMINARY DATA FROM 12-WEEK TRIAL

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INTRODUCTION: Varenicline was approved in 2006; in 2009 the FDA issued a warning for adverse behavioral and psychiatric effects of varenicline including depressed mood, suicidal ideation and attempts, agitation and behavioral dyscontrol. Smokers with schizophrenia may be at high risk for these effects due to underlying psychiatric vulnerability.

OBJECTIVE: This analysis was undertaken to evaluate effects of varenicline on psychiatric symptoms and cognitive performance in stable outpatient smokers with schizophrenia attempting to quit smoking.

METHODS: A 12-week, open label, smoking cessation trial with varenicline at standard titration was conducted in adults with schizophrenia who were on stable antipsychotic medications, smoked ≥10 cigarettes/day, and had no hospitalization for suicidal ideation in the prior 12 months. Participants who quit smoking in the open phase entered a 40-week, double-blind, placebo-controlled relapse prevention phase. Data from the open phase were analyzed.

RESULTS: Ninety-eight participants were enrolled from May 2008 to December 2009. Forty-two (43%) achieved ≥2 weeks biochemically verified continuous tobacco abstinence at the end of 12 weeks open varenicline treatment. No worsening in structured clinical ratings of psychiatric symptoms or cognitive performance has been observed in the group as a whole or when analyzed by abstinence status or expired air CO. For the group as a whole, mean ratings on standard psychiatric rating scales at baseline and week 12 or end of treatment, were as follows: Brief Psychiatric Rating Scale (BPRS) (53.8 (15); 52.8 (14.6), p= 0.49), Scale for Assessment of Negative Symptoms (44 (16.4); 46 (16.4), p=0.25). Calgary Depression Rating Scale (4.2 (3.3); 4.0 (4.2), p=0.63). BPRS Psychosis sub-scale improved (10.4 (5.6), 9.6 (5.0), p< 0.04). Data on improved cognitive performance will be presented. Ten participants discontinued treatment: nausea (5); depressed mood (2); dysphoria (1); substance use/increased psychotic symptoms (1); anxiety (1).

CONCLUSION: This trial suggests that varenicline is not associated with worsening in symptoms of depression, psychosis or cognitive performance in patients with schizophrenia.

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POS5-118 ASYMPTOTICALLY PRACTICED NONSMOKERS AND LIGHT SMOKERS BENEFIT FROM NICOTINE AFTER 20 MINUTES OF 60 MINUTE RAPID PROCESSING AND VIGILANCE TASKS

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Inconsistent reports on the effects of nicotine on cognitive performance in nonsmokers without a history of psychiatric disorder (HPD) prompted the current study. After several extended practice sessions to assure asymptotic performance, 5 nonsmokers and 3 light smokers without a HPD each received a nicotine patch (NP) on one day and a placebo patch (PP) on another. The 60-minute rapid visual information processing (RVIP) task included targets that were the 3rd consecutive even or odd digit in a row in a series of randomly presented digits presented at a rate of 100/minute. The 60-minute MacWorth Clock (MWC) task assessed sustained vigilance and presented 75 targets during which the "second hand" of a computer clock paused for 1,650 ms instead of 1,000 ms as it moved from second to second. The results from both tasks were analyzed in 20-minute thirds to account for the effects of nicotine on performance decrements across time. NP, relative to PP, significantly improved overall accuracy for both the RVIP (p=.008) and MWC (p=.042) in both groups. NP also tended to have greater benefits during the final 40 minutes of both tasks (RVIP p=.103, and MWC p=.157). The greatest benefits of NP tended to occur in the final 20 minutes for light smokers and in the middle 20 minutes for nonsmokers (Patch type x Group x Time p=.096). For both groups, RIP Errors of commission (EOC) were significantly reduced in the final 40 minutes on NP relative to PP (Patch type x Time p=.037), but not for the task overall (p=.161). This analysis revealed that the first 20 minutes were insufficient to detect a significant effect of nicotine. Overall, the results from both tasks suggest that nonsmokers and light smokers without HPD benefit from nicotine, primarily after 20 minutes of sustained task performance.

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POS5-119 ARE SMOKERS WITH HIV USING INFORMATION AND COMMUNICATION TECHNOLOGY? IMPLICATIONS FOR BEHAVIORAL INTERVENTIONS

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People living with HIV/AIDS have been reported to smoke at three times the national rate of the general adult population. Smoking creates well-known risks for conditions such as cancer, heart disease, and obstructive lung disease. PLWHA appear to be at an even greater risk for smoking related conditions including non-HIV associated malignancies and cardiovascular disease. Exploring acceptable and feasible modes of delivery of smoking cessation interventions within the HIV clinic setting are essential. We conducted a cross-sectional survey of 507 individuals attending the Johns Hopkins HIV Clinic in 2009. Individuals were referred by care providers if they were interested in answering brief questions to characterize: (1) smoking behaviors; and (2) cell phone and internet use to determine feasibility of using these modalities for cessation interventions. The median age of this sample was 49 years (IQR:44-54), 83% were African American, 51% female, and 39% with less than a high school education. Overall, 64% of those surveyed were current smokers, with 40% smoking their first cigarette within 5 minutes of waking, and 76% smoking their first cigarette within 30 minutes of waking. 90% smoked less than 1 pack per day. Cell phone use was nearly ubiquitous, with 76% of the sample using their own cell phone, and an additional 9% using one belonging to a friend or family member. Internet and text messaging use, however, were low with over 47% never using the internet and 56% never text messaging. When asked preferred methods to receive health messages responses varied, with 45% endorsing telephone counseling (either cell phone or landline) and only 15% endorsing internet use. Future interventions with this underserved patient population may better reach this population if delivered via phone or advances in technology bring internet access to this population for various forms of web-based support.

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POS5-120 MEDICATION ADHERENCE QUESTIONNAIRE AND MOTIVATION TO ADHERE TO A NICOTINE PATCH AMONG HOMELESS SMOKERS

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Approximately 2-3 million people experience homelessness every year in the United States and 7% of the US population will experience homelessness at some point in their lifetime. Despite a very high (~70%) smoking prevalence, homeless populations have been perceived as difficult to reach and therefore have not been included in cessation studies. Despite the proven efficacy of the nicotine patch, adherence rates to the patch use have generally been poor, even in the general population. Homeless individuals also face multiple social and health-related challenges that can affect both their smoking and adherence to smoking cessation medication and counseling. The purpose of this study was to assess the relationship between the 4-item medication adherence questionnaire (MAQ) and motivation and confidence to adhere to a nicotine patch schedule as measured using a 5-item 10-point scale among a homeless population in a Midwestern city. Data were obtained from a baseline survey conducted as part of an ongoing randomized smoking cessation clinical trial in four homeless shelters. Of the 126 smokers randomized to date, the majority were African American or Black (64.2%) and male (75.2%). At baseline, 73.5 % of the sample reported low to moderate (0-3) scores on the MAQ, meanwhile 26.5 % reported high medication adherence (scores of ≥4). MAQ scores were not associated with motivation to adhere to a nicotine patch (p=0.13). MAQ scores were marginally related to nicotine dependence with those who smoke within 30 minutes of awakening having lower score (p=.055). Results suggest low to medium medication adherence in the majority of this high-risk population as well as no main association between MAQ and motivation to adhere to a cessation treatment. Further studies are warranted on adherence to nicotine replacement treatment schedule among homeless smokers in order to enhance smoking cessation among this under-served population.

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POS5-121 EXPOSURE TO SECONDHAND SMOKE, HOME SMOKING POLICIES, AND SUPPORT FOR SMOKE-FREE POLICY OVER TIME

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Introduction: The purpose was to determine whether home smoking policies, exposure to secondhand smoke (SHS), and support for smoke-free policy changed over a 5-year time period, and to assess the impact of municipal smoke-free laws on these outcomes.

Methods: An internet-based survey was administered to Kentucky residents from 2005-2009. The sample was drawn from the e-Rewards Consumer™ Panel (N = 14,000 Kentuckians). Participants were 25-75 years of age and the primary or joint decision maker regarding health care decisions for their families. Sample sizes ranged from 593 in 2005 to 477 in 2009. Among the 2,032 participants, most were female (67%), between the ages of 35 and 54 (57%), had at least some college education (80%), were married (67%), were non-smoking (75%), and did not have minor children in their household (55%). Forty-two percent lived in a county with a local smoke-free law.

Results: Controlling for personal factors (i.e., education, smoking status, and children in the home), there was a significant decline in smoking in the home from 2005 to 2009 (34% to 22%). The existence of a smoke-free ordinance did not predict home smoking; nor did it predict support for smoke-free laws. Exposure to SHS at work did not change significantly over time, but those living in a county with a smoke-free law were 0.6 times as likely to be exposed at work. Controlling for demographics and compared with 2005, the rate of SHS exposure was significantly lower in 2008 (odds ratio = 0.6) and 09 (OR = 0.5). Those living in a county with a smoke-free law were 0.7 times as likely to report SHS exposure. Controlling for personal factors, support for smoke-free policy increased between 2005 and 06; rates were 65%, 80%, 77% and 78% for the four-year study period.

Discussion: There was a decline in home smoking and an increase in support for smoke-free laws over time, which may reflect the changing pro-health norms related to smoke-free policies. Smoke-free laws provide protection from SHS exposure, not only at work but also in all public venues. Having a smoke-free law did not predict home smoking policy or support for smoke-free policy.

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POS5-122 USING QUITLINE SERVICES AND NRT TO HELP HOSPITALIZED SMOKERS STAY QUIT: A PILOT RANDOMIZED TRIAL

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Hospitalization creates a "teachable moment" for smoking cessation. Regulatory agency guidelines (JCAHO) currently only require that hospitals offer smoking cessation assistance for patients with conditions such heart, stroke, or pneumonia. Even with these smokers, most of them receive only brief bedside counseling. Most smokers go back to smoking after discharge from the hospital. This study compares an enhanced proactive intervention against the assistance that smokers usually receive when hospitalized. A two-arm randomized controlled study was conducted as a collaboration between the California Smokers' Helpline (the state-sponsored quitline in California) and a private hospital in San Diego, CA. In the usual care condition smokers received bedside counseling from respiratory therapists; the enhanced condition included proactive telephone counseling from the Helpline (up to two months post-discharge), plus 8-weeks of nicotine patches. Hospitalized smokers of all diagnoses were included except those hospitalized for psychiatric reasons. A total of 126 smokers were recruited into the study. Two months after randomization, the evaluation team reached 97 of 126 smokers for a 78.0% contact rate (79.7% in the enhanced condition and 74.2% in usual care). Of those reached, 33.3% vs. 4.1% quit smoking for at least 1 month ($\chi 2=7.2$, $p<0.01$). In the enhanced condition, 76.6% of the participants received at least one counseling session: the median number of follow up sessions was 3. Also, 66.7% of them used the nicotine patches given to them by the project. In contrast, 21.8% of participants in the usual care condition used NRT, obtained from various other sources. Using quitline counseling in combination with NRT can significantly increase the quitting success of hospitalized smokers. A larger randomized trial, which can tease apart of the effects of quitline counseling and NRT, is merited. Given that quitlines are now in operation in all U.S. states, a more definitive study can facilitate dissemination of this model to state quitlines.

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POS5-123 YOUNG SMOKERS' INTEREST IN SMOKING CESSATION INTERVENTIONS

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The National Youth Smoking Cessation Survey is a two-year longitudinal household telephone survey administered to a nationally representative sample of U.S. smokers to learn about their smoking behaviors and cessation experiences. Respondents aged 16 to 24 years were interviewed at baseline in 2003 (N=2582, RR =62.6%) and re-interviewed at 24-month follow-up in 2005 (n=1,431, RR=56.4%). This study investigated the correlates and predictors of interest in various smoking cessation services including telephone quitlines, free nicotine replacement, talking with a health care provider, web-based programs, and attending a quit smoking support group. Multivariate models were used to assess the association between each method and demographics, addiction/smoking intensity, prior use of methods, motivation to quit, quitting confidence, whether respondent considers himself a smoker, home smoking bans, and family member's illness from smoking related diseases. Eighty percent of respondents were interested in a chance to win $1000 for quitting or staying quit. Among evidence-based methods, respondents were most interested in receiving free nicotine patches or gum (48%) followed by talking with their doctor or dentist about how to quit (37%). Among all methods, respondents were least interested in having a person call on a regular basis to help them quit or stay quit (14%) and attending a quit smoking support group (14%).

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POS5-124 NICOTINE REDUCES IMPULSIVITY AND DIFFERENTIALLY INFLUENCES POST-ERROR SLOWING IN SMOKERS AND NONSMOKERS WITH ADHD

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Little is known about the effects of nicotine on impulsivity and post-error slowing (PES) in smokers or adults with attention deficit hyperactivity disorder (ADHD). Increasing RTs after an error (PES) is adaptive because it allows more time for processing before responding and thereby helps avoid future errors. Thus, we assessed the effects of nicotine patch (NP) vs. placebo patch (PP) on errors in response inhibition (impulsivity) and PES in 12 ADHD nonsmokers and 11 overnight-deprived smokers with ADHD. A Go-NoGo task required a response when the preceding letter was different (Go trial), but not when it was identical (NoGo, 10% random frequency). Stimuli were X's and Y's presented for 900 ms with a 200 ms ISI. A minimum of 6 Go trials separated NoGos, so Go RTs were assessed separately for this "early post-error go-only safe-period" versus the subsequent risky period (post-error stimuli 7-9) during which a NoGo could occur. PES was defined as the difference between the incorrect NoGo RT and the RT for each of the subsequent consecutive Go trials (1-9). For safe-period GoRTs (1-6 post-error), NP, relative to PP, increased slowing for both groups ($p=.050$). However, for risky Go RTs (7-9 post-errors during which a NoGo could have occurred), relative to PP, NP significantly increased PES for smokers and significantly decreased PES for nonsmokers (Patch type x Group $p=.025$). NP, relative to PP, also significantly increased NoGo accuracy (successful response inhibition, $p=.032$) across both groups and there was no significant Patch type x Group interaction. These findings support the view that individuals with ADHD may self-medicate with nicotine to reduce impulsivity. The differences between smokers and nonsmokers in risky period PES may be due to withdrawal-alleviation, differences in reward and punishment sensitivity, and/or other factors. Studies of the relationship between PES, group difference variables, and post-error ERPs are needed in this population to further investigate the phenomenon of pressing before processing.

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POS5-125 BEHAVIORAL COUNSELING WITH MATERNAL SMOKERS IN UNDERSERVED COMMUNITIES IS EFFECTIVE IN REDUCING YOUNG CHILDREN'S TOBACCO EXPOSURE

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Secondhand smoke exposure (SHSe) affects approximately 19 million US children daily. Younger children are more susceptible to SHSe consequences, which are magnified in underserved communities. This clinical trial, Philadelphia FRESH (Family Rules for Establishing Smoke-free Homes), employed intensive, individualized behavioral counseling over 16 weeks, targeting a medically-underserved group with high tobacco morbidity/mortality risk (low income, AA maternal smokers with newborns through 4 year old children) – one that typically experiences greater difficulty modifying smoking behavior than the general population. The primary aim of FRESH was to test the hypothesis that children of mothers randomized to behavioral counseling would have lower reported SHSe (cigarettes/day) and urine cotinine levels than participants receiving advice plus a self-help manual. Participants (n=229) were recruited through community WIC and pediatric clinics. Double-blind randomization occurred after consent and baseline (BSL) assessments. Mothers did not receive NRT or medication. End of treatment (EOT) assessments were obtained at 16 weeks. Nineteen missing cotinine values (collection or assay complications) were imputed using overall mean. Mean maternal age was 29.82 years old (sd= 7.98) child age was 19.57 months old (sd= 14.54). Among mothers, 81% were single, 59% had a <HS education, and 71.2% had income <$15,000. Only 1 (0.4%) reported NRT use and 2 (0.9%) reported medication use during treatment. The entire sample reported exposing their children to 5 cigs/day (sd = 4.05) at BSL vs. 2 (sd= 2.4) at EOT. ANCOVAs controlling for BSL exposure showed significantly lower reported SHSe ($F= 17.28$, $p<.01$) and baby urine cotinine ($F= 4.54$, $p=.03$) in the counseling vs. control group. Mothers receiving counseling also reported lower SHSe from all sources compared to the control group ($t= -2.9$; $p<.01$). This trial demonstrates that intensive, individualized behavioral counseling to reduce child SHSe is feasible and effective through 16 weeks of intervention in an underserved population. Such reductions could impact children's SHSe-related risks.

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POS5-126 NEURAL CORRELATES OF RESPONSE INHIBITION AND CIGARETTE DEPENDENCE IN ADOLESCENT SMOKERS

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Despite well-established and heavily advertised health risks, teen smoking continues to be a significant problem in the U.S. As eighty percent of adult smokers become nicotine- dependent by age 18 (American Health Association), knowledge about neurobiological development in adolescent smokers is critical. Compared to their nonsmoking peers, adolescent smokers exhibit poor inhibitory control in self-report and laboratory tests (Dinn et al., 2004; Burt et al., 2000). No previous reports have examined the neural correlates of this behavioral phenotype in adolescents. We used fMRI in conjunction with the Stop-Signal Task, which measures motor response inhibition, to examine the neural substrates in late adolescent smokers (n=25) and nonsmokers (n=25). On the SST, a "staircase" procedure was used to determine the magnitude of the delay between a primary visual stimulus and the stop-signal, when each individual successfully inhibited responding on 50% of stop trials. The stop-signal reaction time (SSRT), the time needed by a participant to inhibit his or her response, was inferred from the SSRT according to the race model of Logan and Cowan (1984). During successful inhibition on the Stop-Signal Task, both groups (smokers and nonsmokers) recruited left inferior frontal gyrus, insula and cingulate cortices; however, the groups differed significantly in the relationship between successful response inhibition and neural activation. In nonsmokers, faster response inhibition was associated with right insula and parietal activation. Smokers recruited a much broader network to obtain fast response inhibition, such that those with faster response inhibition recruited striatal, frontal, thalamic and parietal regions. Further, cigarette use and dependence were associated with poorer recruitment of prefrontal regions previously shown to be critical for efficient response inhibition. These results suggest that smokers exhibit underlying deficits in neural recruitment associated with response inhibition relative to nonsmokers.

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POS5-127 DUAL USE OF TOBACCO PRODUCTS AMONG CESSATION TREATMENT SEEKERS

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INTRODUCTION: Dual use of oral tobacco and cigarettes has been of great interest since tobacco companies have been marketing smokeless tobacco products to smokers. To date little information is available on dual users. This study's goal was to examine the characteristics of dual users vs. sole users of tobacco products in a population seeking treatment for cessation.

METHODS: Smokeless tobacco (SLT) users and cigarette smokers were recruited for four tobacco reduction and cessation studies between 2002 and 2008. Interested subjects called our research center and were asked screening questions on demographics, health and alcohol use, tobacco use history and current dual use of other tobacco products.

RESULTS: Of the 1004 cigarette smokers who called to participate in an intervention study, 1.8% reported using SLT (n=18); 22% used SLT daily and 78% used intermittently for an average of 1.3 (SD=1.1) times a week. The average age of dual users was 29.6 (SD=9.0), while the average age of smokers who did not use SLT was 40.2 (SD= 12.4; $p<0.001$). SLT users drank an average of 6.2 (SD=3.9) alcoholic drinks per occasion vs. non-users who averaged 3.7 (SD=8.7) drinks per occasion ($p=.036$). Of 814 SLT users who called to participate in a smokeless reduction study, 15.7% reported smoking cigarettes. 20% were daily smokers and 80% were intermittent smokers averaging 8 cigarettes (SD=7) per month. Significant differences were observed between cigarette smokers and non-smokers on age and alcohol use. Dual users average age was 29.5 (SD=6.4) while non-smokers were 34.5 (SD=8.2) years old ($p< 0.001$). Smokers drank an average of 8.5 (SD=5.6) drinks per occasion, while non-smokers drank an average of 6.1 (SD=4.5) drinks per occasion ($p< 0.001$).

CONCLUSIONS: SLT treatment seekers were more likely to be dual users than smoking treatment seekers were. Dual users were more likely to be younger and drink more alcohol. The observation that dual users drink more alcohol may be related to the younger age of dual users. Dual users tended to regularly use their primary form of tobacco and use the second intermittently. One limitation of this data is that it is based on self-report.

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POS5-128 PSYCHOMETRIC PROPERTIES OF THE FAGERSTROM TEST OF NICOTINE DEPENDENCE – SMOKELESS TOBACCO (FTND-ST)

Joni Jensen, M.P.H.*, Marc Mooney, Ph.D., Andrew Oliver, B.A., Amanda Anderson, B.A., and Dorothy Hatsukami, Ph.D., University of Minnesota

OVERVIEW: Ebbert and colleagues [2006, Addictive Behaviors, 31(9), 1716-1721] introduced the Fagerström Test of Nicotine Dependence – Smokeless Tobacco (FTND-ST). However, psychometric properties of the FTND-ST have not been replicated and the factor structure for FTND-ST has not been explored.

OBJECTIVE: This presentation has two goals concerning the FTND-ST: (1) to replicate psychometric properties from Ebbert et al., 2006 (internal consistency reliability, convergent validity); and (2) to explore the factor structure for unidimensionality.

METHODS: We used baseline data from 4 studies of ST users seeking treatment (N = 470). As part of a larger ST nicotine dependence (ND) assessment, we asked the 6 items in the FTND-ST. Time to first dip was assessed dichotomously (i.e., 1, 0-30 min; 0, >30 min), range of scores, 0-8. Urine cotinine values were available for 102 subjects.

RESULTS: Sample demographics were: 100% male; Age (M = 34.5, SD = 8.2); 97.4% White. ST history characteristics were: Age of Daily Use (M = 19.7, SD = 5.9); Dips/Day (M = 9.7, SD = 5.3); Tins/Week (M = 4.2, SD = 1.9); first dip <30 minutes (67.3%). The two most commonly used ST brands were Copenhagen and Kodiak (both 29.2%). Standardized Cronbach's Coefficient Alpha was equal to 0.41, indicating unacceptable internal consistency reliability. The FTND-ST correlated significantly with total urine cotinine, r = 0.45. Models including 1, 2, and 3 factors were fitted and clarified with oblique (PROMAX) rotations, revealing that a one factor model was most parsimonious.

CONCLUSIONS: The FTND-ST appears to perform as well as some other ND indexes for smokers, replicating Ebbert et al., 2006. However, formal measurement development for ST ND, such as done for the Wisconsin Inventory of Smoking Dependence Motives (WISDM), should be undertaken to produce a comprehensive and theoretically grounded instrument.

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POS5-129 USE OF SMOKELESS TOBACCO WHILE SLEEPING: FREQUENCY AND PREDICTORS

Marc Mooney, Ph.D.*, Andrew Oliver, B.A., Amanda Anderson, B.A., Joni Jensen, M.P.H., and Dorothy Hatsukami, Ph.D., University of Minnesota

Overview: The phenomenon of waking at night to smoke cigarettes has drawn recent interest. However, little attention has been paid to sleep in smokeless tobacco users (SLT) or "sleep chewing."

Objective: This presentation has two goals: (1) to describe the frequency of nocturnal SLT use; (2) to identify predictors of nocturnal SLT use.

Methods: We used baseline data from 4 studies of SLT users (N = 470). We assessed use of SLT while sleeping with the question "Do you use smokeless tobacco during the night (i.e., while sleeping)?" We also assessed SLT use history and used a modified version of the Fagerström Test of Nicotine Dependence – Smokeless Tobacco (FTND-ST). A multivariate logistic regression model was evaluated, regressing nocturnal SLT use on demographic and SLT-use history and dependence variables.

Results: Sample demographics were: 100% male; Age (M = 34.5, SD = 8.2); 97.4% White. SLT history characteristics were: Age of Daily Use (M = 19.7, SD = 5.9); Dips/Day (M = 9.7, SD = 5.3); Tins/Week (M = 4.2, SD = 1.9); first dip <30 minutes (67.3%). The 2 most commonly used SLT brands were Copenhagen and Kodiak (both 29.2%). Nocturnal SLT use was relatively uncommon (5.1%). Bivariate analyses revealed few correlates at $p<.05$: dips/day, $r = 0.16$; average dip duration, $r = 0.26$. Nocturnal SLT use was not associated FTND-ST score. Backward, stepwise logistic regression analysis retained only one covariate at $p<.05$: dips/day, OR = 1.093, 95% CI (1.1, 1.2).

Conclusions: Nocturnal SLT use appears to be uncommon. In future research, rising at night to use SLT should be assessed to allow direct comparisons to tobacco smokers.

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POS5-130 EXTINCTION OF NICOTINE CUES USING D-CYCLOSERINE IN COCAINE-DEPENDENT CIGARETTE SMOKERS

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Drug-related cue exposure can lead to reinitiation of drug-seeking. D-cycloserine is an NMDA glycine site partial agonist that enhances extinction learning. The current study is set forth to examine the effects of D-cyloserine on cigarette craving as elicited by exposure to virtual reality (VR) cues. Additionally, the effects of D-cycloserine plus cognitive behavioral therapy (CBT) on cigarette smoking are examined. Cocaine-dependent cigarette smokers seeking treatment for their cigarette use are three times a week for 1 month. Cocaine users are a population of interest as they exhibit smoking rates 3- to 4-fold greater than the general population. Participants are randomized to receive either D-cycloserine or placebo. At each visit, participants (1) provide biochemical verification of smoking status and illicit drug use, (2) are exposed to neutral- and nicotine-related VR cues, and (3) receive CBT for cigarette smoking. Currently, 14 participants have completed the study and we project reaching our target (N=40) by June 2010. To date, 90.5% of sessions were attended. Baseline CO levels were 30±19 (Mean±SD) ppm and CO levels during treatment were 10±10 ppm. During treatment, 64.5% (98/152) of provided CO samples were <10 ppm (the smoking abstinence criterion). Relative differences in "craving a cigarette" scores were significantly greater following nicotine-cue sessions relative to neutral-cue sessions ($p = .003$), indicating that the VR session is effective in eliciting nicotine craving. By study day 9, relative differences in craving were not significant, indicative of extinction. The preliminary results are promising and suggest that our treatment is both readily tolerated by the target population and effective at reducing cigarette smoking among cocaine-dependent cigarette smokers. Based on these initial findings, we predict that we will subsequently be able to ascertain the effects of D-cycloserine on VR-elicited nicotine craving and cigarette smoking following VR exposure and CBT.

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POS5-131 IMPACT OF HEALTH WARNING MESSAGES ON APPEAL AND YOUNG ADULT SMOKERS' INTEREST IN TRYING SMOKELESS TOBACCO

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Although the health risk posed by smokeless tobacco (ST) appears to be much less than conventional cigarettes, the extent to which ST may reduce harm is highly contentious. Furthermore, although ST products are legal and widely available, it remains unclear whether conventional cigarette smokers will use ST products as a substitute for cigarettes or as a cessation aid, if at all. And despite the strong evidence for the effectiveness of cigarette health warning labels (HWL), there is little research on ST HWL. The current study investigated perceptions of ST products with and without HWL and relative health risk (RR) messages. The study consisted of a full-factorial, 'between-subjects' experiment in which four ST packages, four HWL and a RR message were systematically varied. 611 young adult Canadian smokers aged 18-30 completed an online survey where they viewed a series of standard ST packages that had been photographed and digitally altered according to six randomly assigned conditions: (1) no HWL, (2) RR message, (3) text HWL, (4) text HWL and RR message, (5) picture HWL, and (6) picture HWL and RR message. The findings indicate that many smokers are unaware that ST is less harmful to health compared to smoking. Despite this, approximately half of the smokers indicated that they were willing to try ST as a substitute for smoking and to help quit smoking. Picture HWL increased misperceptions about the health risk of ST and decreased smokers' willingness to try ST, whereas text warnings did not. Similarly, adding a RR message to the HWL that communicates the lower risk of ST compared to cigarettes increased willingness to try ST when added to text HWL, and decreased willingness to try ST even further when added to picture HWL. This study is among the first to examine ST HWL, and is the first to examine the impact of picture HWL on ST. Overall, the findings indicate relatively high levels of appeal for ST among young adult cigarette smokers in Canada. However, false beliefs about the RR of ST products were high, and picture HWL on ST products may make it more difficult to communicate the differences in health risk between ST and cigarettes.

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POS5-132 EVIDENCE THAT THE "CAMEL NO. 9" CIGARETTE MARKETING CAMPAIGN TARGETED YOUNG TEENAGE GIRLS

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In 1998, the Master Settlement Agreement (MSA) restricted tobacco industry advertising practices that had encouraged underage teens to smoke. We aimed to assess whether a recent tobacco industry cigarette advertising campaign, conducted after the MSA, influenced smoking uptake among adolescents in the United States. We analyzed data from a national longitudinal cohort of 1036 adolescents who were enrolled in a parenting study at ages 10-13; five sequential telephone interviews were conducted between 2003 and 2008. The fifth interview was conducted after the start of RJ Reynolds' innovative "Camel No. 9" advertising campaign that targeted young women. The primary study outcome measures were self-report of teen smoking by the fifth interview and report of a "favorite" cigarette advertisement by brand at each interview. The response rate for completion of all five surveys was 71.8%. Teens who reported any favorite cigarette ad at baseline (average age 11.7 years) were 50% more likely to have smoked by the fifth interview (adjusted OR: 1.5 [95% CI:1.0-2.3]). For boys, the proportion reporting a favorite ad was stable across all five surveys, as it was for girls across the first four surveys. However, after the start of the Camel No. 9 advertising campaign the proportion of girls who reported a favorite ad increased by 10 percentage points, to 44%. Camel brand accounted almost entirely for this increase, while the proportion of both boys and girls nominating Marlboro brand remained relatively stable. This study demonstrates that adolescents continue to be responsive to cigarette advertising a full decade after the MSA. Those who are responsive are more likely to start smoking. Furthermore, recent RJ Reynolds' cigarette advertising may have effectively targeted adolescent girls.

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POS5-133 CHILD HEALTH PROVIDER COMMUNICATION AND PARENTAL SECONDHAND SMOKE EXPOSURE WITHIN LOWER INCOME AFRICAN AMERICAN HOMES

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Background: The American Academy of Pediatrics recommends that pediatricians inform parents of the health hazards of SHS exposure in efforts to reduce children's SHS exposure. This study reports associations between child's health provider communication about SHS exposure and parental belief of the harms of SHS smoke, the implementation of home smoking restrictions, and SHS exposure in young children attending a inner-city childcare center.

Methods/Analysis: Data were obtained from a survey of 63 African American parents of infants and children up to 5 years old at the daycare. Forty-three of these children had salivary cotinine levels assessed. Salimetrics LLC provided cotinine test data. Descriptive statistics summarized participant demographic and tobacco-related characteristics. Correlation analyses tested for significant differences between participant demographics, children's cotinine levels, and other relevant variables.

Results: Parents below the poverty line report their children were regularly exposed to SHS by family/friends (p=.014). Parents who were employed fulltime were less likely to be asked about SHS exposure (p=.009). Younger parents and those that reported being current smokers were more likely to be asked about SHS exposure by their child's doctor (p=.034). The harmfulness of SHS had a significant association with child health provider advising smoke-free environment (p=.012). Sixty-three percent of participants reported complete home smoking restrictions, which was significantly correlated with child's health provider advice to have a smoke-free environment (p=.001). Of the 43 children whose cotinine levels were assessed, 39.5% had high SHS exposure (> .64 ng/ml). Lower cotinine levels were significantly correlated with health provider advice to have a smoke-free environment (p=.039).

Conclusions: Health provider interventions to reduce SHS must enhance communication and outreach to older parents, those employed fulltime and who are non-smokers in reducing SHS exposure as well as support to quit smoking efforts.

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POS5-134 A BLIND RETROSPECTIVE STUDY ON THE CONSUMPTION OF THERAPEUTIC PSYCHOTROPIC DRUGS OF THE PATIENTS TREATED IN OUR SMOKINS CESSATION UNIT

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INTRODUCTION: Psychiatric pathology is more prevalent in those who smoke. The level of consumption of drugs used to treat psychiatric symptoms may indirectly detect its presence. Most of the population of our region, Cantabria, is covered by public health insurance. Drugs prescribed for most diseases or symptoms (but not for smoking cessation) are financed ¬– either partially (60%) or totally by this insurance. A centralized record of prescriptions is kept by the regional Government.

AIM AND METHODS: Our aim was to analyze the prescription of therapeutic psychotropic drugs (anxiolytics, antidepressants and neuroleptics) of those people treated in of those attended in our Smoking Cessation Unit. All patients attended during the first half of 2008 and who started pharmacological treatment (n:159) were included in the study. After obtaining a written permission from the ethical committee of the region (CEIC), during 2009 a blind observer looked for which drugs – and how much of each- had been prescribed to all our patients. The prescription period analyzed was the year before initiating treatment and the following-up period (six months). Prescription results were crossed with the drug employed for smoking cessation (either NRT, bupropion or varenicline) and abstinence rates (measured at six months with a CO monitor).

RESULTS: 52 patients (32´7% of the population) had consumed any psychotropic drug in the previous year to smoking treatment initiation. Their cessation rate 10 of these patients decreased their consumption of therapeutic psychotropic drugs after smoking cessation. 8 of them remained abstinent. This decrease was associated with a higher abstinence rates at 6 months (OR:6,50; p:0,0313). Those who received varenicline (n=11) had more chances of reducing their use of therapeutic psychotropic drug than those who received NRT ot bupropión (n=41): 45´4% vs. 12´2%; p=0´0251, OR:6´00. Their abstinence rates at six months were also higher: 9/11 vs. 15/41); p:0´0147, OR:7´80.

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POS5-135 HEALTH ECONOMIC DISCRETE EVENT SIMULATION (DES) CORE MODEL OF THE VARENICLINE PIVOTAL TRIAL DATA

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BACKGROUND: Smoking is the leading cause of preventable death in the US. While 1 in 5 individuals smokes and 70% indicate a desire to quit, less than 4% of unaided quit attempts are successful. Cessation aids can double, even triple the probability of a successful quit attempt.

AIM: To develop an economic model of smoking cessation behavior that replicates pooled varenicline clinical trial results, wherein varenicline was compared to bupropion (both in addition to counseling) and to counseling alone.

METHODS: A DES model was developed to predict the course of a quit attempt over a one-year time horizon at the individual patient level. A logistic regression was used to predict the probability of response (CO-confirmed abstinence between weeks 9-12) in the model. Relapse (failure to maintain CO-confirmed abstinence from week 9 onwards) was simulated by applying a Cox proportional hazards model to a flexible survival model with multiple breakpoints. Probability of relapse within the following 40-week period of the model was assigned to all patients who achieved abstinence at week 12. Unresponsive subjects, or those who experienced relapse, were assumed to remain smokers for the balance of the model time horizon.

RESULTS: The model predicted response rates of 44.2%, 30.5% and 18.6% for the varenicline, bupropion, and counseling cohorts respectively, compared to observed rates of 44.0%, 29.7%, and 17.7% respectively. Predicted continuous abstinence rates over weeks 9-52 were 22.8%, 16.6% and 9.5% compared to the observed rates of 22.4%, 15.4%, and 9.3%. Total mean abstinence time accrued was 2.6, 1.9, and 1.1 months respectively, and total direct medical costs were $307, $487, and $46.

CONCLUSIONS: The model accurately replicates the clinical trial data. Using cost per abstinent month achieved as a measure of cost-effectiveness, varenicline dominates bupropion and yields an incremental cost-effectiveness ratio of $172 when compared to counseling alone. This simulation incorporates powerful individual predictions of response and relapse, and provides a framework for adaptation to a long-term model that accommodates multiple quit attempts over time in diverse populations.

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POS5-136 DEVELOPMENT OF WIRELESS NEURAL PROBING SYSTEM FOR SIMULTANEOUS SENSING OF DOPAMINE AND NEURAL IMPULSE IN ADDICTIVE BEHAVIORS

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Many studies have examined that the neurotransmission of mesolimbic dopamine connected to ventral tegmental area and the basal forebrain system (nucleus accumbens, olfactory tubercle, frontal cortex and amygdale) plays critical roles in addictive behaviors caused from stimulants such as nicotine, cocaine and amphetamine. Current analysis of neural circuitry involved in behavioral studies is generally limited to either measuring the level of neural transmitters or monitoring neural impulses in the brain. Multifunctional neural sensing devices allow simultaneous monitoring of neural activities from the neural network. Development of a wireless neural probing system with neural recording electrodes and neurotransmitter sensors will be beneficiary to the systematic analysis of neural networks involved in addictive behaviors. For this purpose, metallic needle sensors are proposed for monitoring neural impulse and localized extracellular dopamine concentration at the same time. Preliminary results from electrochemical dopamine sensing in-vitro and neural impulse recording in-vivo will be presented. In this study, wireless communication systems have been developed for behavioral study in free moving animals. Measurement results of wireless data and power transmission through the skin will be discussed. Multi-shank probing system with the sensing devices integrated with wireless network may capture the full spectrum of behavioral, neurochemical and electrophysiological changes in real time and elucidate the associative nature in complex addiction behavior.

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