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SYM1

ALPHA 7 NICOTINIC ACETYLCHOLINE RECEPTOR REGULATION OF ADDICTION AND DISEASE

Chair: Darlene Brunzell, Ph.D.*[1]
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Discussant: Sue Wonnacott, Ph.D.*[6]
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Nicotine in tobacco has many functional consequences that vary according to the nicotinic acetylcholine receptor (nAChR) target. This symposium will highlight the contributions of the homomeric alpha 7 nAChRs to phenotypic responses that support tobacco dependence and disease. The alpha 7 expression patterns in the brain and periphery are distinct from the higher affinity nicotinic receptors. Inflammatory responses that result from infection can lead to secondary insults that promote mental illness and cognitive insult. Alpha 7 nAChRs are upregulated following brain injury. Evidence will be presented to show that alpha 7 nAChRs modulate cytokines and regulate inflammatory responses. Blockade of these receptors can promote neuroprotection in rodent models of peripheral and brain injury as well as protect against the development of plaques and cognitive decline in mice carrying a human gene that promotes Alzheimer's disease. There is an exceptionally high concordance for tobacco use with schizophrenia, a population that shows a decrement in alpha 7 receptor expression. We will show that these receptors are highly relevant for sensory gating in this population and identify multiple genetic variants of alpha 7 that are associated with diagnosis for schizophrenia. This receptor subtype has received less attention than the high affinity heteromeric nAChRs in tobacco dependence. Selective antagonism of alpha 7 nAChRs in brain areas that support addiction appears to promote nicotine use in laboratory animals; this preclinical model suggests a potential mechanism for exacerbated tobacco use in individuals with schizophrenia. Together these data suggest that alpha 7 nAChRs may contribute to comorbid dependence of tobacco use with disease and identify the alpha 7 nAChR subtype as a potential therapeutic target.

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SYM1A

PERIPHERAL EXPRESSION OF NACHR ALPHA7 MODULATES INFLAMMATORY RESPONSES

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The ionotropic nicotinic receptors, particularly the distinct subtype alpha7 (α7), in non-neuronal peripheral systems contribute to pro-inflammatory responses. Not unlike α7 in the nervous system, the effects of α7 peripherally can vary greatly depending upon where it is expressed and in which cell type. We have demonstrated that α7 expression in peripheral tissues, independent of vagal innervation, modulates the local production of cytokines as well as chemokines responsible for recruiting cells to sites of inflammation. For example, a robust contribution by α7 towards modulating inflammatory cytokine production in the skin is revealed, in part, by comparing inflammation in α7 wild-type (WT) and α7 knock-out (KO) mice. Results demonstrate that not only are inflammatory cytokines elevated in a7KO mice but skin associated chemokines are similarly affected, resulting in altered recruitment of neutrophils to sites of inflammation. To confirm the identity of cells expressing α7 we have generated mice that are di-cistronic for α7 and co-GFP expression. Results have shown that specific peripheral cell types are positive for α7/GFP expression and suggest that the modulatory effects of α7 on the inflammatory response are mediated through these cells. The implications of regulated peripheral inflammation through α7 expression toward the generation of central inflammatory responses observed in processes of disease will be discussed.

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SYM1B

MODULATION OF ALPHA7 NEURONAL NICOTINIC RECEPTORS FOR NEUROPROTECTION AND ENHANCEMENT OF COGNITIVE RECOVERY IN RODENT MODELS OF EXPERIMENTAL BRAIN INJURY

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Modulation of the brain cholinergic system for neuroprotection and/or enhancement of functional recovery following brain injury has not received a great deal of attention, in spite of clear involvement of the cholinergic system in the response to trauma. Previous studies from our lab have used the cortical contusion injury (CCI) model of experimental brain injury to document widespread and significant deficits in α7 nicotinic cholinergic (nAChR) expression in brain regions impacted directly and indirectly by the injury. We hypothesize that early antagonism of α7 nAChRs may be neuroprotective, and long-term enhancement of cholinergic function by α7 agonists could promote some aspects of functional recovery including enhanced learning and memory. Rats were treated with various doses of the α7 nAChR antagonist methyllycaconitine (MLA) for 2 days following a 1.5 mm CCI to the somatosensory cortex. MLA administration was associated with significant neuroprotection as assessed by increased cortical tissue sparing, and reduced neuroinflammation measured by [3H]-PK11195 autoradiography. However spatial memory was not significantly improved by MLA administration, and a persistent down-regulation of hippocampal alpha7 nAChRs was seen following MLA administration. Choline is an integral component of cellular membranes, a precursor for ACh synthesis, and an agonist of α7 nAChRs. Dietary supplementation with 2% choline before and after a 1.5 mm CCI attenuated cognitive deficits in the Morris Water Maze, significantly spared cortical tissue, and reduced brain neuroinflammation. Choline exposure also caused significant up-regulation of α7 nAChRs, but did not reverse the TBI-induced deficit of the ipsilateral side of the brain. Dietary choline supplementation also improves outcomes in the midline fluid percussion model of diffuse brain injury. These studies provide some promising evidence for alpha7 nAChRs serving as targets of improving outcomes after focal and diffuse brain injury. However more work must be performed to establish the best compounds, drug dosing regimens and therapeutic windows for optimization of behavioral and cellular outcomes.

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SYM1C

NEW APPROACHES TO UNDERSTANDING ALZHEIMER'S DISEASE AND THE ROLE OF THE ALPHA7 NICOTINIC RECEPTOR

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Synaptic dysfunction has been shown to be one of the earliest correlates of disease progression in animal models of Alzheimer's disease. Beta amyloid protein (Abeta) is thought to play an important role in synaptic dysfunction, however, the mechanism by which Abeta leads to synaptic dysfunction is not understood. It has been shown that the Alzheimer's disease (AD) pathogenic peptide amyloid-b1-42 (Ab1-42) binds to the alpha7 nicotinic acetylcholine receptor (alpha7nAChR) with high affinity and the alpha7 nicotinic receptor and Ab1-42 are both found co-localized in neuritic plaques in human brains from AD patients. Moreover, the intra-neuronal accumulation of Ab1-42 has been shown to be facilitated by its high-affinity binding to the alpha7nAChR. In addition alpha7nACh receptor activation mediates Abeta-induced phosphorylation of the tau protein. We will present the results of experiments utilizing genetic engineering of mice coupled to mouse behavioral experiments that test the involvement of the alpha7 nicotinic acetylcholine receptor (alpha7nAChR) in the mouse model of Alzheimer's disease. Our results demonstrate that deleting the alpha7 nicotinic acetylcholine receptor (alpha7nAChR) gene improves the performance of wild-type mice carrying the deletion as well as mice over-expressing human mutant APP protein known to cause Alzheimer's disease in humans. Possible mechanisms that underlie the improved performance of mice that carry a deletion mutation of the alpha7 nicotinic acetylcholine receptor gene will be discussed. These genetic experiments suggest that therapeutic drugs that target the alpha7 nicotinic acetylcholine receptor (alpha7nAChR) may be beneficial for the treatment of Alzheimer's disease.

This work was supported by the Salk Institute.

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SYM1D

STRUCTURE AND FUNCTION OF THE PARTIAL DUPLICATION OF CHRNA7, CHRFAM7A

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The α7 nicotinic receptor gene, CHRNA7, is a replicated candidate gene for schizophrenia. Expression of CHRNA7, as measured by [125I]-α-bungarotoxin binding is decreased in postmortem hippocampus, cortex, and the reticular nucleus of the thalamus, the regions that have been thus far examined in schizophrenic subjects, compared to controls. Schizophrenic patients are generally heavy smokers, yet do not up regulate their receptor levels. Examination of mRNA and protein from the CHRNA7 gene show that levels are low in schizophrenic non-smokers, but normal in schizophrenic smokers. Thus, the low bungarotoxin binding is not explained. The CHRNA7 gene is partially duplicated in humans. Exons 5-10 were duplicated centromeric to CHRNA7 by 1.6 Mb, interrupting a partial duplication of a gene on chromosome 3, ULK4. The chimeric gene containing an exon (D) of unknown provenance, exons A-C from ULK4 and exons 5-10 of CHRNA7, is expressed in brain and more abundantly in the periphery. The chromosomal duplication resulting in CHRFAM7A is not present in either rodents or primates. The CHRFAM7A gene is decreased in expression following viral infection of lymphocytes. A 2bp deletion in exon 6 of CHRFAM7A is associated with schizophrenia. Co expression of CHRFAM7A with the full-length gene, CHRNA7 in oocytes suggests that the gene duplication functions as a potent dominant negative regulator of α7* receptor function. The 2bp deletion, CHRFAM7Aα2bp, further decreases function, consistent with low levels of α7* binding and function in schizophrenic subjects.

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SYM1E

ALPHA7 NICOTINIC RECEPTORS REGULATE SELF ADMINISTRATION OF NICOTINE IN RATS

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Previous studies have shown that activation of ß2 subunit containing nicotinic acetylcholine receptors (ß2*nAChRs) is critical for expression of i.v. nicotine self administration, an animal model with good face validity for human tobacco use. Less is known regarding the contributions of the homomeric α7 nAChRs to nicotine self administration. These studies utilized a highly selective α7 nAChR antagonist to assess the role of α7 nAChRs to nicotine use during a progressive ratio (PR) schedule of reinforcement. Rats were implanted with bi-lateral cannulae that targeted the anterior cingulate cortex, an area of the brain that regulates impulsivity and that is compromised in the brains of schizophrenics. Rats were then trained under a fixed ratio 1 schedule of reinforcement; responding on an active lever resulted in i.v. delivery of 0.03 mg/kg nicotine plus light/tone cues (NIC) and inactive lever presses had no consequence. A separate group of rats received no nicotine (CUEonly). Animals that reached criteria of 70% active lever response accuracy and at least ten infusions/session for 3 consecutive sessions were advanced to PR where rats were required to give an increasing number of active responses for each NIC or CUEonly delivery. The highest active lever press:infusion ratio was defined the break point. Immediately prior to each PR session, rats received anterior cingulate microinfusions of 0.5-1 uL of 0, 10, 20, or 40 pmols/side of α-conotoxin ArIB[V11L,V16D] followed by a 2-min wait period. Antagonism of α7 nAChRs in the anterior cingulate cortex resulted in a dose-dependent increase in break point and number of NIC infusions without affecting response accuracy or responding in CUEonly rats. These data suggest that decrements in anterior cingulate cortex α7 nAChR activity increases motivation to self administer nicotine. This is in contrast to ß2*nAChRs where antagonism in limbic projection areas decreases nicotine self-administration. Together with post mortem studies showing that α7 nAChR levels are decreased in brains of those with schizophrenia, these studies implicate α7 nAChRs in the exaggerated tobacco use observed in this population of smokers.

This work was supported by Virginia Commonwealth University start-up funds to DHB and NIH grant MH53631 to JMM.

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SYM2

TOBACCO PACKAGING POLICY: INTERNATIONAL EVIDENCE ON HEALTH WARNINGS AND PLAIN PACKAGING

Chair: David Hammond, Ph.D.*[1]
Presenters: Jessica Reid, M.Sc.[1], Samantha Daniel, B.A.[1], James Thrasher, Ph.D.[2], Edna Arillo-Santillán, Ph.D.[3], Marta Caballero, Ph.D.[4], Melanie Wakefield, Ph.D.[5], Daniella Germain, Ph.D.[5], Sarah Durkin, Ph.D.[5], Ron Borland, Ph.D.[5], and Marvin Goldberg, Ph.D.[6]
Discussant: Geoffrey Fong, Ph.D.*[1]
[1]University of Waterloo, Canada; [2]University of South Carolina, USA; [3]National Institute of Public Health, Mexico; [4]National Autonomous University of Morelos, Mexico; [5]Cancer Council Victoria, Australia; [6]Pennsylvania State University, USA

Tobacco packaging policies have emerged as an important and rapidly evolving area of tobacco control. To date, pictorial health warnings have been implemented in more than 30 countries, while Australia recently became the first country to announce plain packaging regulations. This symposium will present new research findings on best practices in health warning design, the interaction between health warnings and pack branding, as well as the potential impact of "plain" or "standardized" packaging. First, Dr. David Hammond will present findings examining perceptions of industry pack design and plain packaging among youth in the United Kingdom. Dr. Melanie Wakefield will report findings from Australia on the extent to which colour and branding of cigarette packs influence positive brand perceptions even in the presence of full front-of-pack health warnings, and compare this with the impact of plain packaging. Dr. David Hammond will then report on a study that examined the potential effectiveness of pictorial health warnings in the United States, including a test of the pictorial warnings that have been proposed by the US FDA, as well as how these warnings compare to alternatives form other jurisdictions. Dr. James Thrasher will present research findings on pictorial health warnings in Mexico. The study will examine effective design principles for health warnings, including the use of testimonials, graphic depictions of health effects and symbolic imagery. Dr. Geoffrey Fong will serve as the symposium discussant and will address implications for international regulatory developments, including future rounds of pictorial warnings in Mexico, new FDA regulations in the United States mandating picture health warnings, as well as prohibitions of misleading packaging information, as well as plain packaging regulations to be implanted in Australia in 2012.

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SYM2A

PLAIN PACKAGING AND SMOKING SUSCEPTIBILITY AMONG UK YOUTH

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Tobacco companies have identified "plain packaging"—standardizing the appearance of cigarette packs by prohibiting brand imagery and colours—among the leading threats to the industry. The United Kingdom (UK) recently considered plain packaging in its consultation on future tobacco control initiatives, while Australia recently became the first country to announce plain packaging regulations to be implemented in 2012. The current study sought to examine the potential impact of plain packaging on brand perceptions and susceptibility to smoking among youth in the UK. Females aged 16-19 (n=947) in the UK were recruited from a consumer panel to complete an online survey. Participants were randomly assigned to view 10 female-oriented cigarette packs according to one of 3 experimental conditions: (1) fully-branded, "normal" packs; (2) the same branded packs without descriptors (e.g., "slims"); and (3) the same packs without brand imagery or descriptors ("plain" packs). Participants rated each pack on several attributes and completed a behavioral task in which they could select to receive one of 4 packs displayed on the screen or indicate that they did not wish to be sent a pack of cigarettes. (Note: no packs were actually sent.) The results indicated that participants in the fully branded pack condition were significantly more likely to rate brands as appealing, better tasting, lower tar, and lower harm than participants in the "plain" pack condition. Branded packs were also associated with more positive smoker characteristics, including being slim, glamorous, sophisticated, and cool. Participants offered fully branded packages were significantly more likely to accept the offer of a pack of cigarettes compared to participants offered "plain" packs. Overall, the findings indicate that cigarettes in plain packages are significantly less appealing to young females in the UK and are associated with fewer positive attributes. Most importantly, plain packaging reduced the likelihood of accepting an offer of cigarettes, a key behavioural outcome. The findings have implications for plain packaging regulations in Australia, as well as an ongoing consultation process in the UK.

ASH UK, U.S. National Cancer Institute (P50 CA111236), Canadian Institutes for Health Research New Investigator Award (Hammond), the Propel Centre for Population Health Impact.

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SYM2B

EFFECTS ON BRAND PERCEPTIONS OF PLAIN PACKAGING AND SIZE OF GRAPHIC HEALTH WARNINGS AMONG ADULT SMOKERS AND ADOLESCENTS IN AUSTRALIA

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Plain packaging of cigarettes has been shown to reduce positive brand perceptions, but few studies to date have examined the effects on brand perceptions of size of health warnings on plain versus branded packs. This study aims to shed light on the extent to which colour and branding around the sides of the pack might preserve positive brand perceptions even in the presence of full front-of-pack health warnings, and compare this with the impact of plain packaging. A 30% front-of-pack warning is the current size in Australia, but both plain packaging and larger health warnings have been mooted for implementation in mid-2012. We conducted a two (plain vs. branded pack) by three (30% vs. 70% vs. 100% front-of-pack health warning) between-subjects experimental study where 1,000 adults who smoked at least weekly were randomised to view and complete ratings of six brands exemplifying one of the six packaging conditions. Smokers who were members of an online panel were sent an invitation email with a link to the internet-administered study. Participants first completed demographic and smoking characteristics questions and then viewed and made ratings of six consecutive packs presented in random order. All packs were prepared by a graphic designer and were shown online next to the rating questions. Each image clearly displayed the front, top and one side of the pack. After the final pack was rated, participants answered post-exposure questions on smoking intentions and attitudes. We repeated the study with 1,000 adolescents aged 14-17 years, using the same pack conditions, brands and health warnings, but with more youth-appropriate measures. We used analysis of variance with robust standard errors adjusting for individual-level clustering to analyse the results of both studies. We discuss implications for policies pertaining to cigarette packaging.

Australian National Health and Medical Research Council.

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SYM2C

PICTORIAL HEALTH WARNINGS IN THE UNITED SATES: WHAT TYPES OF WARNINGS WILL BE MOST EFFECTIVE?

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Health warnings on cigarette packages provide governments with a direct and cost-effective means of communicating with smokers. However, the impact of the health warnings depends upon their design and content. New pictorial health warnings will be implemented on cigarette packages in the United States in 2012. The US Food and Drug Administration has until June 2011 to issue final regulations on the specific images and text, and recently released a set of proposed warnings for public comment. The primary objective of the current studies was to evaluate the potential effectiveness of health warning labels for 15 different health effects and to test the effectiveness of different themes or executional styles (text only, graphic pictorial, testimonial, etc.). Two online studies were conducted in the US: Study 1 was conducted in December 2010 with 772 adult smokers (19 years and older) and 677 youth aged 16-18 as part of an international study of health warnings. Participants rated 2 sets of 5-7 warning labels, with each set corresponding to one of 15 health effects. Study 2 was conducted to specifically test the proposed FDA warnings compared to alternatives tested in Study 1. Study 2 was conducted with 783 adult smokers and 510 youth, and tested 9 sets of health warnings, one for each of the nine statements required under the Tobacco Control Act. Results indicated that warnings with graphic depictions of health effects, elements of human suffering, and "testimonial" components were rated as more effective. With respect to the proposed FDA warnings, those with graphic content were rated as most effective and sets of warnings that included little graphic content were rated as less effective than alternatives tested in the international study. In addition, adding a tollfree "quitline" to a cessation message significantly increased the perceived effectiveness. Similar patterns were observed among adults and youth. Overall, the findings highlight important principles for designing effective health warnings. International comparisons and specific implications for the selection of health warnings in the US will be discussed.

U.S. National Institutes of Health (grant number 1 P01 CA138-389-01: "Effectiveness of Tobacco Control Policies in High vs. Low Income Countries").

SYM2D

DETERMINING EFFECTIVE MESSAGE CONTENT FOR PICTORIAL WARNING LABELS ON CIGARETTE PACKAGES: RESULTS FROM A FIELD EXPERIMENT IN MEXICO

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Little research exists to help countries select the most effective content for pictorial warning labels on cigarette packages. Experimental research in Mexico has indicated which images were most effective, including the added impact of testimonials. The objective of this study was to determine which testimonial content is the most effective complement to pictorial imagery. Testimonials from people with different smoking-related diseases were collected and analyzed to determine: (1) metaphors for expressing the impact of smoking and toxic components on their health; (2) impact of the disease on individual daily living; (3) impact on family life; and (4) calls to action for quitting. For each picture selected to illustrate a particular health impact, four testimonials were selected, one from each of these domains. Mock cigarette packs were constructed to integrate pictorial and testimonial elements into health warning labels. Field experiments are currently being conducted with 500 adult smokers (25 and older) and 500 young adults (18 to 24 year old smokers and nonsmokers) recruited from public venues in Mexico City (i.e., parks and supermarkets). One of four possible packs is selected randomly for each health outcome, and participants rate the pack in terms of message impact (i.e., attention, credibility, relevance, emotional arousal, preventing uptake, promoting quitting). For each health outcome, means on indicators will be compared to determine if one testimonial type works best for that particular outcome. Indicators across health outcomes will also be examined to determine whether one testimonial style works best across images or for some types of images vs. others (i.e., grotesque vs. human suffering; social identity or face present vs. absent) or whether population characteristics (i.e., sex, age, sensation seeking) moderate impact.

NCI, U.S. National Cancer Institute (PO1 CA138389), and Bloomberg Global Initiative, Union Against Tuberculosis and Lung Disease (Mexico 7-01).

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SYM3

CUE REACTIVITY: FROM BASIC SCIENCE TO SMOKING CESSATION

Chair: Saul Shiffman, Ph.D.*[1]
Presenters: Mohammed Shoaib, Ph.D.[4], Jane Powell, Ph.D.[5], and Paul M. Cinciripini, Ph.D.[6]
Discussants: Kenneth Perkins, Ph.D.*[2], Stephen Tiffany, Ph.D.*[3]
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Smoking is more likely to occur in the presence of certain stimuli or cues, and relapse is often triggered by similar cues. Cue reactivity research studies these stimulus associations in the laboratory, to understand what cues trigger craving and smoking; how response to cues is mediated by learning processes, neurobiological substrates, and regional brain activity; whether and how individuals differ in their responses to cues; and how such reactions bear on an individual smoker's ability to quit smoking. Even as the area has grown, the relevance of cue reactivity to smoking and dependence is being debated. This symposium presents a broad range of recent research on cue reactivity, ranging from laboratory studies of rodents to prediction of clinical outcomes, addressing the role of the cue reactivity paradigm in understanding tobacco use. Mohammed Shoaib reviews studies showing that, in rodents trained to self-administer nicotine, exposure to a cue or context previously associated with use can reinstate self-administration after extinction, providing an animal model of the role of cues in relapse. Paul Cincripini uses fMRI brain imaging to compare smokers' brain activation in response to smoking cues versus other emotion-laden or appetitive cues, concluding that the left insula responds uniquely to smoking cues. Importantly, injury to the insula has been associated with spontaneous loss of interest in smoking. Saul Shiffman presents a study demonstrating the effect of a diverse panel of cues on craving and the strong link between craving and smoking, but challenging the direct link between cues and smoking. Finally, Jane Powell presents data showing that smokers who show greater cue reactivity are less likely to succeed in quitting smoking. Our discussants are two senior scientists who have both written influentially – but divergently – about cue reactivity. Stephen Tiffany is a leading cue reactivity researcher, and written about the value of this research paradigm. Kenneth Perkins is a leading critic of cue reactivity research, questioning its relevance to smoking and dependence. We allow time for audience discussion, which we expect to be lively.

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SYM3A

CRAVING AND SMOKING IN RESPONSE TO DIVERSE CUES

Saul Shiffman, Ph.D.*[1], Michael Dunbar, B.S.[1], Xiaoxue Li, B.S.[1], Stewart Anderson, Ph.D.[1], Hilary Tindle, M.D., M.P.H.[1], Sarah Scholl, M.P.H.[1], Thomas Kirchner, Ph.D.[2], and Stuart Ferguson, Ph.D.[3], [1]University of Pittsburgh; [2]Schroeder Institute for Tobacco Research, American Legacy Foundation; [3]University of Tasmania

Certain cues are associated with smoking in real-world settings, and also trigger relapse. Such cues include proximal cues of smoking (e.g., a lit cigarette) and distal cues like negative affect and alcohol consumption. Cue reactivity methods assess reaction to cues (usually proximal cues), and have been criticized for assessing only craving and not smoking. We present a study of reactivity to a range of cues, assessing smoking as well as craving responses. We also examine gender differences, as it has been suggested that women's smoking is more related to cues. In separate sessions, 207 smokers were exposed to visual images relevant to 6 sets of cues (total 1225 sessions): smoking, negative affect, positive affect, alcohol, non-smoking (e.g., no-smoking signs), and neutral cues. Craving (QSU) was assessed pre- and post- exposure. Subjects were then permitted to smoke, while cue exposure continued, and smoking topography was assessed. Compared to neutral cues, exposure to smoking cues increased craving, and positive affect decreased craving. Alcohol cues increased craving only among drinkers. Negative affect and non-smoking cues had no effect. Post-cue craving was a strong predictor of smoking, predicting whether a subject smoked, latency to smoking, number of puffs, puff duration, and carbon monoxide boost. Moreover, the increase in craving pre- to post-cue exposure significantly predicted subsequent smoking, over and above pre-cue craving. These effects were strong: e.g., for every 1-point increase on a 49-point craving scale, the "risk" of smoking over time (survival analysis) increased 12%. However, there were no differences across cues in subsequent smoking behavior, suggesting that idiosyncratic craving responses, rather than specific cue effects, drove smoking. The findings confirm the importance of cues in craving, and of craving in smoking, but suggest that cues may not drive smoking in laboratory settings. There were no gender differences on any outcome, contradicting the hypothesized role of cues in women's smoking.

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SYM3B

ANIMAL MODELS OF NICOTINE CUE REACTIVITY

Mohammed Shoaib, Ph.D.

Discrete cues, such as drug-associated paraphernalia, play an important role in tobacco smoking and relapse. While an extensive human clinical literature exists, the research is limited in its ability to study mechanisms and underlying neuropharmacology. Fortunately, such effects can be modeled in the nicotine-seeking behaviour of laboratory animals. These animal models of cue reactivity show that both discrete cues and larger environmental contexts associated with previous self-administration can trigger reinstatement after extinction, which has been taken as a model for human relapse. However, these paradigms are imperfect as models of human relapse, both structurally (e.g., the contingencies for self-administration) and in terms of findings. In particular, while some compounds that are clinically effective for smoking cessation can attenuate reinstatement of nicotine-seeking behaviour (e.g., rimonabant & varenicline), the mechanisms behind these actions are still unknown, and the parallels to human cue reactivity have not been fully understood. There is also a need for better measures of cue reactivity that incorporate physiological endpoints that may predict cue reactivity and relapse. Nevertheless, these animal models of relapse have the potential for identifying and screening smoking cessation medications.

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SYM3C

RELAPSE TO SMOKING DURING UNAIDED CESSATION: CLINICAL, COGNITIVE, AND MOTIVATIONAL PREDICTORS

Jane Powell, Ph.D.*, Lynne Dawkins, Ph.D., Robert West, Ph.D., John Powell, Ph.D., and Alan Pickering, Ph.D., Goldsmiths College, University of London

Neurobiological models of addiction suggest that abnormalities of brain reward circuitry distort salience attribution and inhibitory control processes, which in turn contribute to high relapse rates. The present study aimed to determine whether impairments of salience attribution and inhibitory control predict relapse in a pharmacologically unaided attempt at smoking cessation. 141 smokers were assessed on indices of nicotine consumption / dependence (e.g. the FTND, cigarettes per day, salivary cotinine), and three trait impulsivity measures. After overnight abstinence they completed experimental tests of cue reactivity, response to financial reward, motor impulsiveness, and response inhibition (antisaccades). They then started a quit attempt with follow-up after 7 days, 1 month, and 3 months; abstinence was verified ia salivary cotinine levels ≤ 20ng/ml. Relapse rates at each point were 52.5%, 64% and 76.3%. The strongest predictor was pre-cessation salivary cotinine; other smoking / dependence indices did not explain additional outcome variance and neither did trait impulsivity. All experimental indices except responsivity to financial reward significantly predicted one-week outcome. Salivary cotinine, attentional bias to smoking cues and antisaccade errors explained unique as well as shared variance. At one and three months, salivary cotinine, motor impulsiveness and cue reactivity were all individually predictive; the effects of salivary cotinine and motor impulsiveness were additive. These data provide some support for the involvement of abnormal cognitive and motivational processes in sustaining smoking dependence and suggest that they might be a focus of interventions, especially in the early stages of cessation.

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SYM3D

DO CIGARETTE CUES DIFFER FROM EMOTIONAL IMAGES? AN FMRI STUDY IN SMOKERS

Francesco Versace, Ph.D.[1], Victoria Brown, Ph.D.[1], Jason D. Robinson, Ph.D.[1], Cho Y. Lam, Ph.D.[1], Jennifer Minnix, Ph.D.[1], Paul Cinciripini, Ph.D.[1], Edward F. Jackson, Ph.D.[2], and Vincent D. Costa, Ph.D.[3], [1]Department of Behavioral Science, The University of Texas MD Anderson Cancer Center; [2]Department of Imaging Physics, The University of Texas MD Anderson Cancer Center; [3]NIMH Center for the Study of Emotion and Attention, University of Florida

To test the hypothesis that, in smokers, exposure to cigarette-related cues activates brain processes similar to those induced by intrinsically emotional stimuli, we obtained whole brain BOLD fMRI data from 35 smokers during the presentation of pleasant (erotica and romance), unpleasant (mutilations and sad contents), neutral, and cigarette-related images. Individual time series were pre-processed and transformed into Talairach coordinate space. Random effects analyses were conducted to identify clusters (>125 ml) of voxels showing greater BOLD signal increase during presentation of cigarette-related images relative to neutral ones and during presentation of emotional images (pleasant and unpleasant) relative to neutral ones. The clusters identified by the cigarette vs. neutral contrast were located within the secondary visual areas, the limbic system, and the left insula. Except for the insula, these clusters overlapped with those identified by the emotional vs. neutral contrast. Subsequent pairwise comparisons among categories showed that: (a) pleasant, unpleasant, and cigarette-related images significantly increased BOLD response relative to neutral in the secondary visual and limbic areas, (b) within these areas erotic stimuli prompted the largest BOLD responses, and (c) only cigarette-related images significantly increased activation of the left insula. The insula activation might contribute to the cue-induced cravings in smokers attempting to quit. Results will be discussed in light of current findings for cue activation in this region as well as recent reports of neural damage in this area being associated with spontaneous smoking cessation.

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SYM4

UNASSISTED QUITTING VS. CESSATION INTERVENTIONS IN THE ERA OF TOBACCO REGULATION AND HEALTH CARE REFORM

Chairs: Louise Wideroff[1] and Wilson Compton[1]
Presenters: Scott Leischow[2], Gary Giovino[3], Laura Bierut[4], Glen Morgan[5], Wilson Compton[1], and Louise Wideroff[1]
[1]National Institute on Drug Abuse; [2]University of Arizona and Arizona Cancer Center; [3]University of Buffalo School of Public Health and Health Professions; [4]Washington University School of Medicine; [5]National Cancer Institute

In smoking research, unassisted quitting is defined as gradual or abrupt cessation without medical or behavioral interventions. The American Cancer Society has noted that in the two decades following the first Surgeon General's report, over 90% of 37 million former smokers quit unassisted. In absolute terms, this is the most common way people achieve abstinence; yet overall relapse rates remain high for quit attempts. In relative terms, clinical and community trials consistently report greater efficacy for methods employing medical, behavioral, and combination therapies. Furthermore, certain subgroups may be unmotivated to quit or may experience significantly higher relapse possibly due to behavioral phenotype, genotype, and/or environmental conditions. This symposium will examine the evidence regarding unassisted quitting and the added value of assisted methods. Findings will be discussed in light of two major legislative changes: the 2009 Family Smoking Prevention and Tobacco Control Act, one goal of which is to increase cessation at the population level through regulation of nicotine levels in tobacco products, and the 2010 Affordable Care Act, which may widely increase coverage of assisted cessation to achieve long-term reduction in health care costs for tobacco-related disease. Dr. Scott Leischow will discuss the data and meta-data from studies employing medication, experimental vaccine, quittlines, and behavioral therapies. Dr. Gary Giovino will characterize the trends and factors associated with unassisted quitting. Dr. Laura Bierut will address current thinking on 'refractory' smokers, reflecting findings in genomic/pharmacogenomic, psychiatric, and epidemiologic research. Dr. Glen Morgan will serve as discussant.

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SYM5

THE ROLE OF CHRNA5/A3/B4 IN MEDIATING RESPONSES TO NICOTINE: HUMAN, MOUSE AND MOLECULAR STUDIES

Chairs: Marissa A. Ehringer and Paul D. Gardner
Presenters: Nancy L. Saccone, Amber V. Flora, Mariella De Biasi, and Paul D. Gardner
Discussant: Michael J. Marks*

Neuronal nicotinic acetylcholine receptors (nAChRs) have been extensively studied in order to elucidate their roles in nicotine-mediated behaviors. In the past several years, the gene cluster encoding the human alpha3, alpha5 and beta4 nAChR subunits (CHRNA5/A3/B4) has become the focus of intensive investigation after a succession of candidate-gene analyses and large-scale genome-wide association studies identified multiple single nucleotide polymorphisms across the CHRNA5/A3/B4 locus that are associated with nicotine-related behaviors (age of initiation, cigarettes per day, nicotine dependence, lung cancer). This symposium will bring together investigators studying these genes, their regulation and effects on behavior using human, mouse and molecular approaches. Dr. Nancy Saccone will describe a recent meta-analysis including over 30,000 subjects that has confirmed the presence of multiple distinct loci in the human chromosome 15 region harboring the genes. Dr. Amber Flora will present work providing evidence that the intergenic region between CHRNA3 and CHRNB4 is likely to be important in mediating complex regulation of gene expression. Dr. Mariella De Biasi will present recent data supporting the hypothesis that the medial habenula-interpeduncular axis and the nAChRs therein play a critical role in the mechanisms underlying nicotine addiction with a particular emphasis on the role of nAChRs containing either the wild type alpha5 subunit or the rs16969968 alpha5 variant. Finally, Dr. Paul D. Gardner will discuss work implicating alpha3/beta4-containing nAChRs in the pathogenesis of small cell lung carcinoma. Taken together, these studies highlight the complexity of the CHRNA5/A3/B4 region at the molecular genetic and behavioral levels. Although significant progress has been made toward understanding the underlying biological mechanisms, continued interaction and collaboration across areas of expertise has the potential to yield even more exciting results which should ultimately improve our ability to prevent and treat nicotine addiction.

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SYM5A

THE CHRNA5-CHRNA3-CHRNB4 GENE CLUSTER AND SMOKING BEHAVIOR: META-ANALYSIS AND NEW DEVELOPMENTS IN HUMAN GENETIC STUDIES

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Genetic association studies in human population samples first identified associations between single nucleotide polymorphisms (SNPs) in the CHRNA5-CHRNA3-CHRNB4 nicotinic receptor subunit genes and nicotine dependence. In particular, the non-synonymous CHRNA5 SNP rs16969968 is consistently associated with smoking behavior in many independent datasets. Complementary investigations of this gene cluster (e.g., in vitro and animal studies) have led to new insights into biological function and behavioral implications. Human genetic studies continue to add to our understanding of the role of these genes. Through meta-analysis, large collaborative consortia can combine results from multiple datasets to greatly increase power. We performed a meta-analysis across 34 datasets with 38,617 European-ancestry smokers. The analysis focused on selected loci in the CHRNA5-CHRNA3-CHRNB4 region, including SNPs such as rs588765 that have previously been associated with mRNA levels of CHRNA5 in brain and lung tissue. Our meta-analysis showed for the first time that rs588765 and correlates are associated with smoking behavior (heavy versus light smoking) with genome-wide significance ($p < 10\text{-}8$), when analyzed jointly with rs16969968. This finding provides strong evidence that multiple statistically distinct loci in this region affect smoking behavior. It also highlights the importance of two different biological effects on CHRNA5: altered amino acid sequence and altered mRNA levels. These results represent just the beginning of what we can expect from the collaborative power of meta-analysis. Questions and hypothesis tests for which a single dataset would be underpowered are now tractable through collaboration. Gene-environment interactions, early smoking behavior, diverse populations, and multi-locus effects are among the new areas that are being investigated, following the collaborative model that facilitated the above study. This paradigm involves novel, coordinated analyses of existing datasets, rather than retrospective compilation of published results. This approach is proving effective for exciting discoveries about the genetics of smoking behavior.

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SYM5B

FUNCTIONAL ANALYSIS OF SNPS IN THE INTERGENIC REGION BETWEEN CHRNA3 AND CHRNB4

A.V. Flora*, C. Zambrano, E.M. Funk, J. Miyamoto, J.A. Stitzel, M.A. Ehringer, University of Colorado, Institute for Behavioral Genetics, Boulder, CO

The cluster of nicotinic acetylcholine receptor (nAChR) genes for the alpha5/alpha3/beta4 subunits has emerged as an important region associated with nicotine dependence and lung cancer. Our study of young adults found an association with single-nucleotide polymorphisms (SNPs) rs8023462 and rs1948 and age of initiation for tobacco and alcohol use in two separate samples. We are investigating whether these SNPs, which are located intergenic between CHRNA3 and CHRNB4, influence transcription levels using a luciferase-based gene expression assay. Each allele for each SNP has been cloned into a plasmid containing the luciferase gene (pGL3 promoter vector). Expression is studied by transfecting cell lines known to express nicotinic receptor gene subunits (HEK293T, SH-SY5Y, PC12) as well as lung cancer cell lines and evaluating relative chemiluminescence signals. Transcription levels are expressed as a ratio between the luciferase intensity and a co-transfected control (renilla). To further investigate transcription levels in response to nicotine, a physiologically relevant dose of nicotine is added to some cells. For both rs8023462 and rs1948 the rare allele showed reduced transcription compared to the more common allele in several cell lines. In some cases, addition of nicotine enhanced transcription levels for the rare allele. In summary, this work provides promising data about the potential for differential allelic expression of the CHRN genes that may be functionally relevant to human nicotine behaviors. This work may lead to improved understanding of the molecular mechanisms underlying genetic associations of CHRN genes and therefore facilitate better prevention approaches based on genetic risk and to development of improved pharmacogenomic-based treatments for nicotine dependence.

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SYM5C

FUNCTIONAL CHARACTERIZATION OF NICOTINIC RECEPTORS IN THE MEDIAL HABENULA AND INTERPEDUNCULAR NUCLEUS

Mariella De Biasi*, Michael Paolini, Erika Perez, Dang Dao, and Aaron Lauver. Department of Neuroscience, Baylor College of Medicine, Houston, TX

Cigarette smoking is the single most important environmental cause of lung cancer but it is evident that genetic factors can also affect the risk of developing the disease. Several laboratories have pinpointed a cluster of single nucleotide polymorphisms (SNPs) that is strongly linked to the risk of developing lung cancer. The SNPs are located in a 160 kilobase region on chromosome 15 (Chr. 15 q24-25.1). SNPs in the same region also show strong association with smoking intensity and age of smoking initiation. The Chr. 15 q24-25.1 region contains multiple genes, including CHRNA3, CHRNA5, and CHRNB4. Those three genes encode nicotinic acetylcholine receptor (nAChR) subunits that form functional receptors expressed in the autonomic nervous system and selected areas of the CNS. The medial habenula (MHb) and the interpeduncular nucleus (IPN) are two CNS areas that express nAChRs comprising beta4 and alpha5 subunits. Data from the lab support the notion that the MHb-IPN axis and the nAChRs therein have a crucial role in the mechanisms underlying nicotine addiction. The presentation will cover recent experiments in which the role of nAChRs containing wild-type alpha5 or the rs16969968 alpha5 variant has been examined in cultured cells and brain slices, as well as behavioral paradigms in vivo.

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SYM5D

REGULATION AND FUNCTION OF ALPHA5/ALPHA3/BETA4-CONTAINING NICOTINIC RECEPTORS IN LUNG CANCER

Paul D. Gardner, M.A.*, Reina D. Improgo, Nicolette A. Schlichting, Rubing Zhao-Shea, Scott W. Rogers, J. Michael McIntosh, and Andrew R. Tapper, The Brudnick Neuropsychiatric Research Institute, Department of Psychiatry, University of Massachusetts Medical School, Worcester, MA; Departments of Neurobiology and Anatomy, Psychiatry and Biology, University of Utah, Salt Lake City, UT

A plethora of human genetic studies have implicated the clustered neuronal nicotinic acetylcholine receptor CHRNA5/A3/B4 subunit genes in several pathological states including nicotine, alcohol, and cocaine dependence as well as lung cancer. To elucidate the role that these genes play in lung cancer, we examined the expression of these genes in a panel of lung cancer cell lines and tumor samples. We found the CHRNA5/A3/B4 genes to be over-expressed in small cell lung carcinoma (SCLC), the most aggressive type of lung cancer and the form of lung cancer most highly associated with cigarette smoking. This over-expression is regulated by achaete-scute complex homolog-1 (ASCL1), a basic helix-loop-helix transcription factor important in lung cancer etiology. Knockdown of ASCL1 led to a corresponding decrease both in CHRNA5/A3/B4 mRNA expression and in radioligand binding sites. ASCL1 knockdown also decreased CHRNA3 promoter activity whereas ASCL1 over-expression increased CHRNA3 promoter activity. In addition, knocking down the CHRNA5/A3/B4 genes decreased SCLC cell viability. Consistently, pharmacological blockade of α3ß4-containing receptors using α-conotoxin Au|B decreased SCLC cell viability. Taken together, our results suggest a mechanism by which ASCL1-mediated up-regulation of the CHRNA5/A3/B4 genes potentiates the proliferative and pro-survival effects of nicotine and its carcinogenic derivatives.

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SYM6

CONTRABAND TOBACCO AND SMOKING BEHAVIOR

Richard J. O'Connor[1], Frank J. Chaloupka[1,2], Andrea S. Licht[1], Rahmat Awang[3], Brian V. Fix[1], and K. Michael Cummings[1], [1]Roswell Park Cancer Institute; [2]University of Illinois, Chicago; [3]National Poison Centre, Universiti Sains Malaysia

Contraband tobacco can be defined as those products purchased outside regulated retail channels in a number of possible ways, and can include counterfeit products. Much contraband tobacco use comes in the form of individual tax avoidance and organized tax evasion. The Framework Convention on Tobacco Control includes provisions for addressing contraband, the specifics of which are currently being negotiated, while individual nations also must address local contraband issues. This session aims to explore measurement and policy issues related to the availability of contraband tobacco products. Dr. Chaloupka will open the session by outlining findings from the International Agency for Research on Cancer's upcoming Handbook for addressing tobacco tax avoidance and evasion. Ms. Licht will present findings from the International Tobacco Control (ITC) 4-Country survey on purchase of low/untaxed cigarettes in relation to demographics, SES, and quitting behaviors. Dr. Awang will present findings from The ITC Malaysia survey, where packs were collected from participants to uncover evidence

of contraband product use and its demographic and behavioral correlates in a middle-income country. Mr. Fix will conclude the session by presenting findings from the ITC US survey, where packs were collected from participants to assess prevalence of contraband tobacco use following the 2009 Federal Excise Tax increase. Dr. Cummings will serve as discussant and place the research findings in the broader context of tobacco product regulation, product availability, and smoking behavior.

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SYM6A

TAX AVOIDANCE, TAX EVASION, AND TOBACCO USE: FINDINGS FROM IARC HANDBOOK 14

Frank J. Chaloupka, University of Illinois-Chicago, on behalf of the Handbook 14 Working Group

Tax avoidance and tax evasion can decrease economic welfare by making tobacco products more affordable and available, thus exacerbating the negative health consequences resulting from tobacco use. Furthermore, tax avoidance and tax evasion can undermine the impact of tobacco control measures, primarily tobacco tax policies. The existence of illicit tobacco trade has been used to increase political pressure on governments and discourage them from adopting and implementing effective tobacco tax strategy. Moreover, illicit tobacco trade can channel sales proceeds to organized crime and lead to a loss in government tobacco tax revenues. This presentation reviews and summarizes the research evidence related to tobacco tax avoidance and tobacco tax evasion from the published literature and empirical evidence, as assessed by the Working Group for the International Agency for Research on Cancer's Handbook on the Effectiveness of Tax and Price Policies for Tobacco Control (Handbook 14 in IARC's Handbooks in Cancer Control series, to be published in summer 2011). First, the differences between tax avoidance and tax evasion are described and the activities that fall into each category defined, with a brief review of the methods used in measuring the extent of each. This is followed by a discussion of the motivations for and determinants of tax avoidance and tax evasion. A review of recent estimates of the extent of tax evasion globally, regionally and in selected countries is then provided and the impact of tax avoidance and tax evasion on smoking prevalence, smoking intensity and disparities in tobacco use is discussed. The presentation closes with a review of the impact of policies aimed at curbing illicit tobacco trade, a summary of the lessons learn from the implementation of those policies in selected countries, and the Working Group's assessment of the evidence on tax avoidance, tax evasion, and tobacco control.

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SYM6B

USE OF PRICE AND TAX AVOIDANCE BEHAVIORS AS PREDICTORS OF CESSATION MEASURES AMONG SMOKERS WITH VARYING SOCIO-ECONOMIC STATUSES IN THE INTERNATIONAL TOBACCO CONTROL POLICY EVALUATION PROJECT – 4 COUNTRY SURVEY

Andrea S. Licht, Andrew Hyland, Richard J. O'Connor, Geoffrey T. Fong, Frank J. Chaloupka, and K. Michael Cummings

Higher cigarette prices may result in increased quit attempts and smoking cessation. However, smokers faced with higher prices may also engage in behaviors aimed at decreasing the cost burden to maintain usual smoking behaviors. This study examines correlates of use of these behaviors and their relationship with cessation across SES strata. Data come from the ITC 4-Country Survey (CA, US, UK, AU). In the 2006 ITC survey, 7030 smokers were interviewed by telephone. Logistic regression analyses were used to determine cross-sectional correlates of using: low/untaxed sources (n=6543), discount brands (n=5594), and any price/tax avoidance (n=6435). A total of 4961 (70.6%) smokers were re-interviewed in 2007. Logistic regression assessed whether use of these behaviors in 2006 were predictive of: cessation, making a quit attempt, and making a successful quit attempt in 2007. Statistical tests for interaction with SES were performed for each set of analyses. High levels of price/tax avoidance were present; 52% of respondents reported "any use" at last purchase. Participants with low SES were 73% more likely to use any cheaper tobacco products (low/untaxed, discount or RYO) at last purchase compared to respondents with high SES (OR=1.73, 95% CI: 1.47-2.02). Participants who engaged in at least one price avoidance behavior were 19% less likely to report cessation (OR=0.81 [0.66-0.99]); those using multiple behaviors simultaneously were 44% less likely to quit (OR=0.56 [0.33-0.95]) at follow-up. No statistically meaningful interactions with SES were observed on cessation outcomes. The role of cheaper cigarettes is potentially two-fold, as they both encourage smoking and also reduces cessation among those using them. Use of cheaper products is associated with lower indicators of cessation overall, but no interaction between use of price/tax avoidance behaviors and SES were observed on cessation outcomes. However, since respondents with low SES were more likely to engage in these behaviors, policies aimed at eliminating cheaper alternatives may help reduce social inequalities that exist due to higher smoking prevalence among low SES subgroups.

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SYM6C

MALAYSIAN PACK COLLECTION AND PREVALENCE OF CONTRABAND CIGARETTES

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Since 2003, the Confederation of Malaysian Tobacco Manufacturers (CMTM) has lobbied the Malaysian not to increase tobacco tax or extend regulations for fear of increases in contraband smuggling. A recent study by CMTM showed increasing trend on smuggling rates from 20% in 2003 to 37.5% in 2009. There is a need for an independent body to provide research data to the Malaysian government on smuggling rates to verify data from the industry. This research paper is to evaluate the current situation of contraband cigarette trade in Malaysia based on the International Tobacco Control (ITC) survey. We used cross-sectional wave 4 data from the ITC longitudinal cohort study, conducted between July 2009 and December 2009. Total of 1744 adult smokers of factory made cigarettes from seven states of Malaysia were recruited for the survey using multi-stage clustering sample technique, and invited to submit a package of their cigarettes for analysis, of whom 692 agreed. Cigarette packs were verified by the Malaysian Customs Department using standardized observational tools. Criteria of genuine packs were based on the Food Act 2008, which was derived from The Framework Convention on Tobacco Control (FCTC). Absences in any of cigarette pack specifications were considered as evidence of contraband. Descriptive analysis plus chi square test and binary logistic regression analysis were conducted. No significant differences between those who sent the packages and those who did not with respect to their rural/urban, level of education, employment status and annual household income. Twenty percent of the received packages were contraband. Likelihood of returning contraband packages was highly significantly related to socio-economic status and demographic characteristics ($p<0.001$). Sabah and Selangor were among the highest in contraband cigarette compared to the other 5 states. Gudang Garam (34%), Premium (14%), Winston (13%) and Marlboro (8.5%) were most associated with contraband. The observed percentage of contraband cigarettes was not as high as the tobacco industry claimed. This data supports Malaysian government efforts to further increase tobacco taxes.

ITC Malaysia wave 4 was funded by the Canadian Institutes for Health Research, the US National Cancer Institute, ad the Ontario Institute for Cancer Research.

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SYM6D

ITC UNITED STATES SUPPLEMENTAL CIGARETTE PACK COLLECTION: EVALUATING BEHAVIORAL RESPONSES TO THE 2009 SCHIP FEDERAL EXCISE TAX INCREASE

Brian V. Fix[1], Andrew Hyland[1], Richard J. O'Connor[1], K. Michael Cummings[1], and Geoffrey T. Fong[2], [1]Roswell Park Cancer Institute; [2]University of Waterloo

On April 1, 2009, the federal cigarette excise tax in the United States increased from $0.39 to $1.10 per pack. This tax increase presented a unique opportunity to evaluate whether smokers would respond with compensatory behaviors that might diminish or negate the desired impact of this tax increase. A supplementary study among International Tobacco Control (ITC) Survey participants residing in the US was conducted to examine whether smokers changed their smoking and/or purchasing

behavior in response to the tax increase. Between November 2009 and January 2010, a brief telephone survey was conducted among a subsample of ITC survey participants -- 678 of the 912 eligible participants completed a survey. In addition to data collected during the survey, eligible participants were invited to mail an unopened pack of their cigarettes to us. These packs were examined in detail for indicators of counterfeit and/or contraband as another means of assessing tax avoidance behavior. No significant differences were observed in terms of self-reported smoking and cigarette purchasing behavior between the 2008 and 2009 surveys. We received packs from 320 (80%) of the 401 participants who agreed to provide one. Of packs returned 11% showed evidence of being contraband, most commonly due to lacking a state tax stamp on the outside of the cigarette packaging. Although 98% of participants reported that the pack sent for analysis was purchased at their usual source of cigarettes, 39% reported making a special effort to purchase cigarettes at a less expensive source within the 12 months prior to survey administration. Although a relatively substantial proportion of the cigarette packs were classified as contraband, little difference was observed in terms of smoking behavior or purchasing behavior following the federal cigarette excise tax increase. This type of data collection is feasible for assessing contraband prevalence. Additionally, the development of methods used to classify and detect contraband or counterfeit cigarettes is critical given the presence of contraband and counterfeit cigarettes in the world tobacco market.

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SYM7

NEW INSIGHTS ON MECHANISMS AND PROCESSES IN SMOKING LAPSE AND RELAPSE

Christopher W. Kahler, Ph.D.*[1], Sherry A. McKee, Ph.D.*[2], Maggie M. Sweitzer, M.S.[3], Chad J. Gwaltney, Ph.D.[1], and Thomas H. Brandon, Ph.D.*[4], [1]Brown University; [2]Yale University; [3]University of Pittsburgh; [4]University of South Florida and H. Lee Moffitt Cancer Center & Research Institute

Ultimately, all failed attempts to quit smoking involve an initial lapse to smoking and subsequent progression from that lapse to full-blown relapse. Deeper understanding of the mechanisms that contribute to smoking lapses and the process of smoking relapse itself is needed in order to develop and tailor interventions that foster sustained smoking cessation in a wide range of smokers. This symposium presents research that uses laboratory models, naturalistic ecological assessment approaches, and clinical research to provide new insights into who is at risk for smoking relapse and the processes and mechanisms that might increase or decrease smoking lapse risk. Ms. Sweitzer will present data on predictors of abstinence during a brief incentive based model of relapse. Results support the validity of the model as a useful framework for investigating mechanisms underlying vulnerability to relapse. Preliminary neuroimaging findings addressing potential neural mechanisms also will be discussed. Dr. Kahler will present on a laboratory model of smoking relapse in which the effects of alcohol use are investigated using a balanced-placebo alcohol administration design. Results indicate that women's decisions to initiate smoking may be more strongly influenced than men's by the learned associations between alcohol and cigarette use. Dr. Gwaltney will present data from an ecological assessment study of adolescents making an unaided cessation attempt, examining the emotional contexts associated with first lapses. Results indicate that the amount of time since the launch of a quit attempt predicts the nature of high-risk cues for smoking. Dr. McKee will present data from a novel human laboratory paradigm demonstrating that guanfacine decreased the likelihood of smoking lapse following stress and that outcomes in the laboratory were consistent with clinical outcomes during a subsequent smoking cessation attempt. Potential mechanisms identified in the laboratory and during the quit attempt will be presented. Finally, Dr. Brandon will provide a discussion of the overall symposium.

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SYM7A

PREDICTORS OF ABSTINENCE IN A LABORATORY INCENTIVE BASED MODEL OF RELAPSE

Maggie M. Sweitzer, M.S.*, Rachel L. Denlinger, B.S., Gina M. Sparacino, B.S., Charles F. Geier, Ph.D., and Eric C. Donny, Ph.D., Department of Psychology, University of Pittsburgh and Center for Neural Basis of Cognition

Understanding the mechanisms which render some individuals more vulnerable to smoking relapse during a quit attempt is critical to tailoring treatment efforts. The development of laboratory models of relapse can provide a framework for identifying underlying mechanisms, which may contribute to vulnerability. Here, we examined the validity of an incentive based model of relapse. Fifty-three non-treatment seeking daily smokers completed a battery of nicotine use and dependence measures prior to participating in a one-week abstinence incentive procedure. During the abstinence procedure, subjects earned monetary reinforcement for each biochemically verified day of abstinence according to a descending schedule of reinforcement (e.g., $75 the first day, $55 the second day, and so on). Subjects also completed self-report measures of mood, craving, and withdrawal on each day during the abstinence procedure, and functional neuroimaging data in response to monetary rewards were acquired for a subset of participants (n=27). Subjects achieved a mean of 4.5 days of abstinence, with 72% lapsing at some point during the procedure. Scores on the Fagerstrom Test of Nicotine Dependence (FTND), number cigarettes smoked per day (CPD), and self-reported craving on the first day of abstinence significantly predicted days of abstinence ($p<.05$). The single item of time to first cigarette smoked in the morning on the FTND significantly predicted days of abstinence ($p<.001$), even when controlling for CPD and other FTND items. In addition, the tolerance subscale of the Wisconsin Inventory of Smoking Dependence Motives (WISDM), previously shown to predict long term abstinence in smoking cessation trials, predicted days of abstinence ($p<.01$). These findings replicate those of previous full-scale clinical trials and support the validity of an incentive-based model of relapse. The time-limited and laboratory based nature of this model has the potential to further investigations of underlying mechanisms contributing to relapse. Preliminary neuroimaging findings addressing potential neural mechanisms will also be discussed.

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SYM7B

SEX DIFFERENCES IN STIMULUS EXPECTANCY AND PHARMACOLOGICAL EFFECTS OF ALCOHOL ON SMOKING LAPSE RISK IN A LABORATORY ANALOGUE STUDY

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Alcohol use frequently co-occurs with smoking and often is implicated in initial lapses to smoking during quit smoking attempts. It is unknown the extent to which alcohol use increases smoking lapse risk due to (a) learned associations between drinking and smoking or (b) its direct pharmacological effects. In a 2 (instruction condition: told alcohol vs. told placebo) X 2 (beverage condition: 0.4g/kg vs. 0.0 g/kg ethanol) between-subjects balanced-placebo design for alcohol administration, we examined whether instruction condition and beverage condition would have unique effects on smokers' ability to resist initiating smoking when smoking abstinence was monetarily incentivized in a laboratory paradigm. Participants were 96 heavy alcohol drinkers who smoked 10-30 cigarettes per day. After 15 hours of smoking abstinence, participants consumed their assigned beverage and completed measures of potential mediating mechanisms, and then completed a smoking lapse analogue task in which they were paid $1 for each 5 minutes they remained abstinent during a 50-minute test period. Survival analyses indicated that although the told alcohol and received alcohol conditions were associated with shorter time to initiating smoking, these effects did not reach significance. However, there was a significant interaction between instruction condition and sex. Among women, being told alcohol, compared to being told placebo, was associated with significantly shorter time to initiating smoking (hazard ratio [HR] = 3.03, 95% CI = 1.28 – 7.16, p = .011); this effect was not seen among men (HR = 0.70, 95% CI = 0.35 – 1.39, p = .31). The told alcohol condition also had a relatively greater effect among women compared to men on increasing urge to smoke and expectations of satisfaction from smoking. However, these sex differences did not account for the observed sex X instruction condition interaction effect on time to initiating smoking. Sex differences on implicit measures of cigarette craving were not found. Results indicate that during acute smoking abstinence, moderate alcohol use may increase women's risk of initiating smoking due to learned associations between drinking and smoking.

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SYM7C

RELATIONSHIP BETWEEN AFFECT STATE AND FIRST LAPSES AMONG ADOLESCENT SMOKERS

Chad J. Gwaltney, Ph.D.*, Suzanne M. Colby, Ph.D., and Christopher W. Kahler, Ph.D., Brown University Center for Alcohol and Addiction Studies, Providence, RI, USA

Affect states and cigarette craving are robust predictors of initial lapses in adult smokers. However, the relationship between these variables and lapsing among adolescents is not as well understood. As different biological, psychological, and social processes may underlie adolescent smoking, it is possible that findings with adult smokers may not apply to adolescents. In this study, 124 adolescents used palm-top computers to monitor their emotional state, craving, and smoking behavior for 2 weeks during an attempt to quit smoking. Participants made an entry on the computer when they decided to launch their quit attempt and subsequently answered questions about their emotional state and craving immediately before they smoked a cigarette and at random, non-smoking times. First smoking episodes were compared to selected, preceding non-smoking assessments to identify proximal cues for smoking using generalized estimating equations. The average age of the sample was 16.7 (range 14-18) and the average number of cigarettes smoked per day at baseline was 10.0. The median latency between initiation of the quit attempt and the first smoking episode was approximately 9 hours. When all first smoking episodes were considered, increased craving and stress and decreased relaxation and calmness were associated with smoking (all $p < .05$). However, the latency between the quit attempt and first smoking significantly moderated this association. When lapses occurred within 9 hours, only increased craving was significantly associated with smoking. In contrast, lapses occurring after 9 hours were associated with increased craving, stress, restlessness, and frustration/anger, and decreased relaxation, boredom, and calmness (all $p < .05$). These findings may provide targets for adolescent smoking interventions and may demonstrate how time since the launch of a quit attempt predicts the nature of high-risk cues for smoking.

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SYM7D

GUANFACINE ATTENUATES THE EFFECT OF STRESS ON SMOKING LAPSE BEHAVIOR AND IMPROVES SMOKING CESSATION OUTCOMES

Sherry McKee, Ph.D.*, Rajita Sinha, Ph.D., Amy Arnsten, Ph.D., Mehmet Sofouglu, M.D., Marina Picciotto, Ph.D., Andrea Weinberger, Ph.D., and Meaghan Lavery, B.A., Yale University School of Medicine

Preclinical findings support the hypothesis that noradrenergic pathways are involved in stress-induced relapse and that their manipulation may be of potential benefit in the prevention of stress-related drug relapse. Guanfacine is an alpha-2 adrenergic receptor agonist known to attenuate stress-induced reinstatement to drugs of abuse and to improve stress-induced decrements in prefrontal functioning. Thus, the primary aim of this double-blind placebo-controlled study was to examine whether guanfacine (0mg vs. 3mg/day) attenuated the effect of stress on precipitating smoking lapse behavior in the laboratory, and to determine whether guanfacine improved clinical outcomes during a brief treatment period. Following titration to steady state levels of guanfacine daily smokers completed two laboratory sessions where we modeled the effect of stress on smoking lapse behavior. Our lapse paradigm is focused on two primary aspects of early lapse behavior: (1) ability to resist the first cigarette and (2) subsequent smoking. Following the laboratory component, subjects set a quit day and then engaged in a brief 4-week treatment phase. Medication was continued during this period and basic behavioral support was provided on a weekly basis. During the laboratory component, results to date have demonstrated that guanfacine significantly improved the ability to resist smoking following stress and decreased ad-libitum smoking. During the treatment component, guanfacine significantly decreased tobacco craving, withdrawal symptoms, and cigarette use. Measures of stress reactivity collected during the laboratory component (i.e., craving, mood, HPA-axis levels, catecholamines) will be discussed as potential mechanisms for the treatment outcome findings. Using our novel human laboratory paradigm, we are the first to show that guanfacine attenuated the effect of stress on smoking lapse behavior and improved clinical outcomes in daily smokers. Results such as these provide important evidence that targeting stress-related relapse is a viable medications development strategy for nicotine dependence, and support the testing of noradrenergic agents in clinical trials of nicotine dependence.

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SYM8

LIGHT SMOKERS: A MULTIDISCIPLINARY PERSPECTIVE AND FUTURE DIRECTIONS

Chair: Kolawole S. Okuyemi, M.D., M.P.H.[1]
Presenters: Neal Benowitz, M.D.[2], Geri Dino, Ph.D.[3], Won Choi, Ph.D., M.P.H.[4], and Lisa Cox, Ph.D.[4],
Discussant: Jasjit S. Ahluwalia, M.D., M.P.H.[1]
[1]University of Minnesota; [2]University of California San Francisco; [3]West Virginia University; [4]University of Kansas

The pattern of cigarette smoking in the US is rapidly changing and a substantial proportion of smokers now smoke ≤10 CPD (light smokers). The proportion of light smokers among racial/ethnic minorities, adolescents, and college students is particularly high. While the rate of decline in smoking prevalence has plateaued, there are indications that the combination of increased awareness of health concerns, increased environmental restrictions on smoking at public places, and increased cost of cigarettes may all have influenced the prevalence of light smoking. Since light smokers have been excluded from most tobacco control research, there is limited evidence about how best to intervene with light smokers. Furthermore, tobacco control researchers perceive light smoking to be "safe," that light smokers are not nicotine dependent, and that quitting smoking may be easier for this group. To examine these issues, the SRNT Tobacco-Related Health Disparities Network and the SRNT Treatment Network are collaborating on this symposium, which will present new research across multiple disciplines (basic science, epidemiology, and treatment) and populations (African Americans, American Indians, Whites, and Adolescents) focused on relevant issues about light smoking. Dr. Benowitz will begin by presenting research on disparities in the relationship between cigarettes per day and biomarkers of carcinogen exposures between African American and White smokers. Dr. Dino will present data from a teen intervention study, which compared the baseline characteristics and cessation outcomes among light, moderate, and heavy teen smokers. Dr. Choi will then present data of a recent study of 1,000 American Indian smokers that includes new evidence about light and heavy smokers in this population including nicotine dependence and the use of ceremonial tobacco. Next, Dr. Cox will present data from a recent NIH-funded randomized clinical trial of bupropion among African American smokers. Finally, Dr. Ahluwalia, a leading expert in smoking cessation among minority populations, will discuss the relationship between these findings and their implications for future research addressing light smoking.

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SYM8A

NONLINEAR DOSE-RESPONSE BETWEEN CIGARETTES PER DAY AND NICOTINE AND CARCINOGEN EXPOSURE

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African American(AA) smokers smoke fewer cigarettes per day (cpd) but are reported to have higher lung cancer rates and greater tobacco dependence compared to non-Hispanic white (W) smokers. We studied the relationship between cpd and biomarkers of nicotine (Nic) and carcinogen (CA) exposure in 128 AA and W smokers. We measured plasma Nic and its main proximate metabolite, cotinine (Cot), urine Nic equivalents (NE), 4-(methylnitrosamino)-1-(3)pyridyl-1-butanol (NNAL) and polycyclic aromatic hydrocarbon (PAH) metabolites. The dose-response between cpd and NE, NNAL and PAH was flat for AA but positive for W (race x cpd interactions, all $p < .05$). In contrast there was a strong correlation between NE and NNAL and PAH independent of race. Nic and CA exposure per cigarette was inversely related to cpd. This inverse correlation was stronger in AA compared to W smokers. Our data indicate that AA on average smoke cigarettes differently than W smokers such that cpd predicts smoke intake more poorly in AA than W smokers. Furthermore light smokers are exposed to more Nic and CA per cigarette than heavier smokers, and that this phenomenon is stronger in AA than W smokers.

DA02277 and CA78603.

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SYM8B

CHARACTERISTICS OF TEENS WHO ARE LIGHT SMOKERS AND WHO ATTEMPT CESSATION

Geri Dino, Ph.D.*[1], N. Noerachmanto, Ph.D.[1], Traci Jarrett, M.P.H.[1], Steven Branstetter, Ph.D.[2], Jianjun Zhang, M.S.[1], and Kimberly Horn, Ed.D.[1], [1]West Virginia University; [2]The Pennsylvania State University

Adolescent cigarette smoking is a serious public health issues in the US. Each day, nearly 4,000 US teens tries smoking for the first time and 1,000 become regular smokers. Currently, little is known about the characteristics of teens who are light smokers. This study compares the baseline characteristics and cessation outcomes among light, moderate, and heavy teen smokers. Participants were recruited as a part of an evidence-based teen smoking cessation intervention, Not-On-Tobacco (N-O-T). Inclusion criteria included being 14-19 years old, participation in the N-O-T program in Florida, New Jersey, North Carolina, West Virginia, or Wisconsin between 1998 and 2009, and having smoked at least one cigarette in the past 30 days, but smoked less than 80 cigarettes per day. Cessation outcomes were measured by asking, "Do you currently smoke tobacco?" with an intent-to-treat sample at 3 months post baseline. There were 7,130 teens in the analytic sample. Consistent with previous literature, light smokers were classified as teens who reported smoking <5 cigarettes per day (cpd) (n=1,073). Moderate smokers smoked 5-15 cpd (n=3,616), and heavy smokers smoked >15 cpd (n=2,441). Analysis of participants' baseline characteristics revealed statistically significant differences by gender, age, grade in school, race, age of initiation, lifetime quit attempt, and having a parent, sibling or friend who also smokes. There were also significant differences between light and moderate/heavy smokers in motivation to quit, confidence in quitting, and attitudes towards changing smoking. However, there were no significant differences between moderate and heavy smokers in motivation and attitudes towards changing smoking. Light smokers were significantly more likely to report smoking cessation at follow-up than were heavy smokers (χ^2=192.09, p<.000). In summary, light smokers who enroll in a teen smoking cessation program have significantly different baseline characteristics and cessation outcomes than did their moderate and heavy smoking peers. These findings will have implications for teen smoking cessation intervention recruitment, program content, and marketing.

Centers for Disease Control and Prevention: U48-DP-001921, Dino-PI.

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SYM8C

LIGHT VERSUS HEAVY SMOKING AMONG AMERICAN INDIAN SMOKERS

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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. Little is known about the smoking characteristics of American Indian smokers. The present study compared the demographic and smoking characteristics of light (<= 10 cigarettes per day; n=197) and moderate to heavy (11+ cigarettes per day; n=86) American Indian smokers participating in a cross-sectional survey of smoking and health. American Indian light smokers were younger (31 years vs. 40 years) and less likely to be married or living with a partner compared to moderate/heavy smokers. American Indian light smokers are less dependent on smoking (18.2% smoked within first 30 minutes compared to 74.4% of moderate/heavy smokers; p<0.001), and are more likely to have home smoking restrictions compared to moderate/heavy smokers (62.4% vs. 37.6%; p<0.001). There were no differences with respect to number of quit attempts in the past year or the average length of their most recent quit attempt by light vs. moderate/heavy smoking. In addition, a similar proportion of light and heavy smokers reported using tobacco for traditional purposes such as ceremonial, spiritual and prayer. These findings highlight important differences between American Indian light and heavier smokers. Differences related to smoking characteristics such as level of dependence and home smoking restrictions have important implications for the treatment of American Indian smokers.

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SYM8D

BUPROPION FOR TREATMENT OF AFRICAN AMERICAN LIGHT SMOKERS

Lisa Sanderson Cox, Ph.D.*[1], Nicole L. Nollen, Ph.D.[1], Matthew S. Mayo, Ph.D.[1], Won S. Choi, Ph.D.[1], Babalola Faseru, M.D, M.P.H.[1], Tricia S. Snow[1], Carrie A. Bronars[1], Rachel Tyndale, Ph.D.[2], Neal Benowitz, M.D.[3], Kolawole S. Okuyemi, M.D., M.P.H.[4], and Jasjit S. Ahluwalia, M.D., M.P.H.[4], [1]University of Kansas School of Medicine; [2]University of Toronto; 3University of California San Francisco; [4]University of Minnesota

More than half of African American smokers are light smokers (use 10 or fewer cigarettes per day), yet African Americans experience significant tobacco-related health disparities. Kick It at Swope III (KIS-III) was a randomized, double-blind, placebo-controlled study of bupropion and health education for 540 African American light smokers.

METHODS: African American light smokers (< 10 cpd) were randomly assigned to receive 150mg bid bupropion SR (n=270) or placebo (n=270) for 7 weeks. Health education counseling, including setting a quit date, managing cues and withdrawal, and preventing relapse, was provided to all participants at Weeks 0, 1, 3, 5, 7, and 16. The main outcome was cotinine-verified 7-day point prevalence abstinence at Week 26; secondary outcome was abstinence at end of drug treatment, Week 7.

RESULTS: Participants were predominantly female (66.1%), with a mean (SD) age of 46.5 (11.3) years, low income (60.7% had monthly income <$1,800), but with at least a high school education (84.2%). At enrollment, participants smoked an average of 7.9 cpd and had a mean serum cotinine of 275.8ng/mL; most used menthol cigarettes (83.7%) and smoked within 30 minutes of waking (72.2%). Imputing lost to follow-up as smokers, verified abstinence rates at Week 26 follow-up were 13.3% in the bupropion group and 10.0% in the placebo group (p = 0.23). However, verified abstinence rates at the end of 7 weeks of treatment were 23.7% in the bupropion group and 9.6% in the placebo group (p < 0.0001).

CONCLUSIONS: Bupropion SR was effective in promoting short-term abstinence among African American light smokers, but effects were not sustained following discontinuation of the drug. Future analysis of biopsychosocial determinants of abstinence will contribute to understanding these findings. Additional research is needed to identify mechanisms for achieving higher rates of abstinence among African American light smokers and strategies for sustaining abstinence among this high risk group. Advancing treatment will further the goal of decreasing tobacco-related health disparities.

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SYM9

ATTENTIONAL CAPTURE BY NICOTINE RELATED CUES: BASIC NEUROPSYCHOLOGICAL MECHANISMS AND CLINICAL RELEVANCE

Chair: Lee Hogarth[1]
Presenters: Marcus Munafò*[2] and Amy C. Janes[3]
[1]University of Nottingham; [2]University of Bristol; [3]Brain Imaging Center, McLean Hospital, University of Harvard

The publication of Robinson and Berridge's (1993) incentive-sensitization theory sparked a generation of research exploring the claim that attentional capture by drug associated stimuli plays a causal role in mediating drug seeking and taking behavior. The aspirational notion embedded in this claim was that by modifying the attentional bias for drug cues either behaviorally or neuropharmacologically, new and more effective treatments for addictive behavior might be created. This symposium will examine the role played by the attentional bias for smoking related cues in tobacco dependence, bringing together data from a breadth of approaches. The talk by Hogarth will address the basic mechanisms of the attentional bias using human associative learning procedures translated from animal behavioural neuroscience. This work suggests that attention is a hybrid system serving competing demands, only one of which is value related attentional capture. The talk by Munafò will address the reliability of two standard assays of attentional bias, the Stroop task and the dot probe task, and will point the way towards building methods that achieve greater sensitivity. The talk by Janes will report recent data on the measurement of attentional bias using fMRI techniques, and the relationship of this measure to relapse. Together, the talks will address the neuropsychological basis of the attentional bias, its clinical significance, and the implications for the treatment of tobacco dependence.

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SYM9A

DISSOCIATING ATTENTIONAL BIAS FROM BEHAVIOURAL CONTROL: IMPLICATIONS FOR THE TREATMENT OF ADDICTION

Lee Hogarth, University of Nottingham

Numerous studies have now been published which indicate that there is a more complex relationship between the capacity of drug cues to capture attention and prime drug-seeking behavior than simple one-to-one determinism. Rather, attentional capture and behavioral control by drug stimuli have been dissociated by brain lesions, neuropharmacological treatments and behavioral manipulations, suggesting that stimulus control of attention and behavior are subserved by unique neuropsychological processes. This talk will focus on recent studies from our lab which have dissociated attentional capture (measured by eye-tracking) from stimulus control of drug-seeking in human Pavlovian to instrumental transfer and outcome devaluation procedures. These studies suggest that attention serves at least three diverse functions. Simple detection of drug stimuli retrieves a representation of the perceptual features of the drug outcome, which primes drug-seeking automatically. By contrast, the maintenance of attention to drug stimuli is determined by the current incentive value of the drug (conditioned reinforcement), but is dissociated from automatic stimulus control over drug-seeking (i.e., this form of attentional capture plays no causal role in behavioral control). In addition, the maintenance of attention to stimuli is also determined by the predictive uncertainty associated with the stimulus, which may play a role in contingency learning rather than performance. These data substantiate the claim that stimulus control of selective attention and drug-seeking behavior are mediated by multiple dissociable neuropsychological processes. New and sophisticated experimental protocols will therefore be required to isolate the specific attentional component that plays a causal role in enabling drug stimuli to bring about drug-seeking behavior. Only then might this causal attentional component be challenged for the purpose of treating addiction.

MRC.

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SYM9B

RELIABILITY OF MODIFIED STROOP AND VISUAL PROBE TASKS TO ASSESS COGNITIVE BIASES FOR SMOKING-RELATED CUES

Marcus R. Munafò, Ph.D.*, Sally Adams, M.Sc., Alia Ataya, M.Sc., and Emma Mullings, M.Sc., University of Bristol

There is considerable current interest in the use of computer-based tasks to assess cognitive biases for smoking-related cues. Typically either the modified Stroop or visual probe tasks are used. However, a recent meta-analysis indicated the cognitive bias measured on these tasks correlates weakly with self-reported subjective craving, casting doubt on the validity of these measures. One possible explanation for these findings is that the tasks themselves have poor reliability. We therefore calculated the internal reliability of the modified Stroop and visual probe tasks, using Cronbach's alpha. Data were taken from a number of experiments, which used various versions of the modified Stroop and visual probe tasks. These included tasks, which employed lexical and pictorial stimuli, and experiments, which compared cognitive biases across different drug user groups (e.g., non-smokers versus smokers), or across different drug challenge conditions (e.g., placebo versus nicotine). The internal reliability of the visual probe task was consistently low, irrespective of whether lexical or pictorial stimuli were used (coefficient alphas < 0.5). The internal reliability of the modified Stroop task was generally better, and highest when pictorial stimuli were employed. These findings are consistent with similar analyses in other fields (e.g., attentional bias to threat in anxiety). These findings indicate that many widely used measures of cognitive bias may have unacceptably low internal consistency, reflected in very low coefficient alphas, suggesting that these tasks may not in fact accurately measure the underlying constructs they are intended to measure. Greater consideration of the psychometric properties of these tasks is therefore required, and the development of novel tasks should be a priority if the underlying constructs, which these tasks are widely assumed to measure, are to be accurately assayed.

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SYM9C

ATTENTIONAL BIAS AND BRAIN REACTIVITY TO SMOKING CUES PRIOR TO SMOKING CESSATION PREDICTS RELAPSE VULNERABILITY

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Developing methods to identify relapse-vulnerable smokers before a smoking cessation attempt may allow personalized treatment. Previously, a smoking emotional Stroop (SES) task revealed that increased attentional bias (AB) toward smoking words predicted relapse vulnerability in recently abstinent smokers. We tested whether enhanced AB and functional MRI (fMRI) measures of cue reactivity obtained prior to a quit attempt aided by nicotine replacement therapy (NRT) could predict outcomes. Twenty-one nicotine-dependent women underwent fMRI during presentation of smoking and neutral images. Smoking-related word AB also was measured with the SES task. Smokers then quit using NRT and a behavioral intervention for at least 24 hours and relapse vulnerability was identified based on short-term (8-week) outcomes (abstinence vs. slip: smoking ≥1 cigarette after attaining abstinence). Pre-quit fMRI and SES assessments in these groups were compared to define phenotypes associated with relapse vulnerability. While no demographic differences were found between groups, fMRI reactivity was greater in slip than abstinent subjects in anterior insula, anterior cingulate cortex (ACC), amygdala, and prefrontal cortex. SES AB to smoking words was greater in slip (N=8) versus abstinent subjects (N=11). In a discriminant analysis, SES accuracy, RT, and anterior insula and ACC fMRI reactivities predicted cessation outcome (79% accuracy; $p<0.05$). Furthermore, relapse vulnerable smokers had reduced functional connectivity between an insula-containing network and cognitive control-related brain regions including the dorsal ACC and dorsal lateral prefrontal cortex, suggesting decreased top-down control of cue-induced emotional and interoceptive reactivity. We conclude that smokers with enhanced fMRI reactivity and AB to smoking-related stimuli may be especially relapse-vulnerable, that fMRI and AB measures may be good outcome predictors and thus useful for individualizing smoking cessation treatment, and that top-down control of cue-reactivity may be disrupted in relapse vulnerable smokers.

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SYM10

SMOKING CESSATION IN HIV-POSITIVE POPULATIONS: FINDINGS FROM THE FIRST GENERATION OF RANDOMIZED TRIALS

Ellen R. Gritz, Ph.D.*[1], Damon J. Vidrine, Dr.PH.[1], Gary L. Humfleet, Ph.D.[2], Raymond Niaura, Ph.D.[3], and David B. Abrams, Ph.D.*[3], [1]The University of Texas MD Anderson Cancer Center; [2]University of California San Francisco; [3]The Schroeder Institute for Tobacco Research and Policy Studies, Legacy Foundation

The current era of antiretroviral therapy has brought about significant changes in the HIV/AIDS epidemic. Life expectancy has been extended, but mortality due to non-AIDS defining illnesses has increased, including smoking-related diseases (CVD, various cancers, and pulmonary disease). Smoking prevalence is significantly elevated among PLWHA, up to 3 times population prevalence, and significant barriers to cessation exist. Few smoking cessation trials targeting PLWHA have been published, to date. This symposium will provide an overview of the problem from clinical, public health and behavioral viewpoints (D. Vidrine), and findings from three ongoing or newly completed randomized trials, each using novel interventions. R. Niaura will present findings on the influence of socialization on the response to motivational enhancement, in a trial comparing a motivationally enhanced behavioral treatment to standard care. The analysis examined whether degree of socialization differentially influenced response to treatment. The study population consisted of 444 participants; results will be presented through 6-month follow-up. G. Humfleet will report findings from a randomized trial of 207 participants, evaluating 3 smoking cessation treatments provided in HIV clinical care settings: individual counseling; computer/internet based treatment; and minimal contact control. The 2 active treatment groups were hypothesized to have superior cessation outcomes (at 12 months) over the minimal treatment control; high rates of psychosocial variables negatively related to treatment success were present. E. Gritz will describe a randomized trial of 474 participants, which compared usual care to a cell-phone delivered intervention designed to reduce barriers while providing an intensive cessation intervention. High rates of barriers to cessation also exist in this sample.

Data will be presented from baseline through 3-month outcome, as follow-up (to 12 months) is still in progress. D. Abrams will serve as Discussant, providing comments on this high-risk population, approaches to cessation to date, current findings, and the challenges and opportunities for future research.

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SYM10A

A RANDOMIZED TRIAL OF AN INNOVATIVE CELL PHONE INTERVENTION FOR SMOKERS LIVING WITH HIV/AIDS

Ellen R. Gritz, Ph.D.*[1], Damon J. Vidrine, Dr.P.H.[1], Rachel M. Marks[1], and Roberto C. Arduino, M.D.[2], [1]The University of Texas MD Anderson Cancer; [2]The University of Texas Health Science Center at Houston Medical School

Cigarette smoking, a highly prevalent behavior among people living with HIV/AIDS (PLWHA), is associated with increased risk of multiple AIDS- and non-AIDS-related diseases, including cancer, cardiovascular, pulmonary and other conditions. Smoking cessation confers medical and behavioral benefits to PLWHA, a diverse and underserved population. Our research has targeted HIV+ smokers from an indigent, largely minority, inner-city patient population. After a series of feasibility and pilot studies, we conducted an NCI-supported R01 randomized clinical trial, which compared a usual-care smoking cessation intervention (UC) with a cell-phone delivered intervention (CPI) designed to reduce barriers in access to care while providing an intensive cessation intervention. We enrolled 474 participants in the trial (236 in CPI and 238 in UC), who are being followed for 12 months. This presentation will feature data from baseline through 3-month follow-up. Baseline demographics of enrolled participants (n=474) are: mean (SD) age=44.8 (8.1) years; 70% male; 17.7% married/living with partner; mean (SD) years of formal education=10.9 (2.6); 12.5% white; 76.6% Black/African American; 9.1% Hispanic/Latino; and 1.9% other. Means of HIV transmission (self-reported): men who have sex with men=25.2%; heterosexual contact=45.6%; injection drug use=17.2%; other=12.1%. Participants smoked an average (SD) of 19.2 (11.5) cigarettes/day. No significant differences in baseline smoking history, behavioral, or psychosocial variables were observed between the two treatment groups. Smoking outcomes at 3-month follow-up showed statistically significant differences in favor of the CPI, compared to the UC. Using intent to treat analysis on 474 participants, biochemically confirmed, Risk Ratios (95% CI) were 3.6 (1.8-6.25) for 24 hr abstinence; 3.5 (1.6-7.6) for 7-day; 3.03 (1.3-7.0) for 30-day and 4.24 (1.6-11.0) for continuous abstinence, all p value's <0.01. The longest period of abstinence also differed significantly between treatment conditions (UC vs. CPI): 6.6 vs. 14.7 days. These strongly positive findings are highly encouraging as longer-term outcomes are expected by the end of 2010.

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SYM10B

TOBACCO CESSATION AND THE MEDICAL MANAGEMENT OF HIV/AIDS

Damon J. Vidrine, Dr.P.H.*[1], Ellen R. Gritz, Ph.D.[1], and Roberto C. Arduino, M.D.[2], [1]The University of Texas MD Anderson Cancer Center; [2]The University of Texas Health Science Center at Houston Medical School

The HIV/AIDS epidemic has been dramatically changed by the introduction and widespread availability of effective antiretroviral therapy. Life expectancy has been markedly extended, and the number of people living with HIV/AIDS has significantly increased. Patterns in causes of death have also changed significantly during this treatment era. Mortality attributable to AIDS-related causes has decreased, while the proportion of deaths attributable to non-AIDS defining illnesses has increased. Several of the most frequently reported non-AIDS causes of death include cardiovascular disease, pulmonary disease, and various malignancies. Therefore, the medical management of HIV/AIDS demands a broadening of scope to include the prevention of a variety of chronic medical conditions, and efforts to improve long-term health outcomes among people living with HIV/AIDS represent a vital public health priority. One approach to decrease the risk of many of the most common diseases impacting people living with HIV/AIDS is to target established health-risk behaviors, such as tobacco use. Several factors indicate that smoking is particularly detrimental in the HIV-positive population. These factors include the significantly elevated prevalence of smoking, the association of smoking with numerous HIV-related complications (e.g., cancer, cardiovascular disease, oral complications, and various pulmonary diseases), and the adverse impact of smoking on antiretroviral treatment response. Previous research efforts have demonstrated that persons living with HIV/AIDS are confronted with numerous barriers to tobacco cessation treatment, and novel intervention modalities may be more efficacious than usual care approaches. Despite the need, very few smoking cessation trials targeting people living with HIV/AIDS have been published. Integrating careful tobacco use screening and treatment into routine clinical practice has the potential to significantly improve a variety of health outcomes, ranging from perceived symptom burden to reduced risk of mortality. Such an approach also offers the very real potential of significantly improving the survivorship experience of this growing population.

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SYM10C

SOCIALIZATION INFLUENCES RESPONSE TO MOTIVATIONAL ENHANCEMENT FOR SMOKING CESSATION AMONG HIV+ SMOKERS

Raymond Niaura, Ph.D.*[1], Cassandra Stanton, Ph.D.[2], Marcel DeDios, Ph.D.[2], Karen Tashima, M.D.[2], [1]The Schroeder Institute for Tobacco Research and Policy Studies, Legacy Foundation; [2]Alpert Medical School of Brown University

Antisocial characteristics have been associated with an increased propensity for substance use and dependence, as well as poorer treatment outcomes. Little is known about how such characteristics might influence smoking cessation. In a previous study among smokers living with HIV/AIDS (SLWHA), we found that motivationally enhanced (ME) behavioral treatment was not superior to standard care (SC). We sought to examine whether degree of socialization differentially influenced response to treatment. SLWHA were referred by their physicians for participation in a randomized controlled smoking cessation trial. Participants smoked 5 or more cigarettes per day and could not have contraindications to using the nicotine patch. Participants were randomized to receive either a brief two-session intervention modeled on PHS guidelines, or a more intensive four-session motivational counseling intervention. Participants in both conditions were provided 8 weeks of nicotine patches. Socialization was measured at baseline via the California Psychological Inventory Socialization (CPI-So) scale. 599 participants were screened, 444 randomized: 212 to the ME group and 232 to the SC group. 72% completed the 6-month follow-up visit. 63% were male, 52% white, 16% Hispanic, 18% black. Six-month quit rate by ITT analysis was 9% overall (9% ME, 10% SC, p=0.76). Across groups, CPI-So was associated with increased likelihood of quitting (p<.01). The CPI-So score was associated with increased probability of quitting in the ME group [odds ratio (OR) for quit vs. smoking = 1.09; 95% confidence limits (CL) = 1.03-1.16, p=.002, per unit CPI-So increase], but not in the SC condition [OR = 1.02; CL = .96-1.08, ns]. The CPI-So effect in the ME condition remained significant after adjusting for the effects of gender, age, and nicotine dependence. SLWHA who were more socialized, as reflected in higher CPI-So scores, were more apt to respond to a motivational intervention. Clinicians should consider individual patient differences when selecting behavioral treatment approaches for smoking cessation.

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SYM10D

SMOKING CESSATION IN HIV+ CLINICAL CARE SETTINGS

Gary L. Humfleet, Ph.D.*, James Dilley, M.D., Sharon Hall, Ph.D., and Kevin Delucchi, Ph.D., University of California San Francisco

HIV-positive (HIV+) populations have higher rates of smoking than the general population and smoking puts HIV+ individuals at higher risk for HIV-related health problems. The present study reports findings from a clinical trial evaluating smoking treatment provided in HIV clinical care settings. Participants were randomly assigned to one of three treatments; (a) a six session individual counseling treatment, (b) a computer/internet based treatment, and (c) a minimal contact control condition. All participants had access to 10-weeks of nicotine replacement treatment. Treatment duration was 12 weeks. Follow-up assessments were conducted at Weeks 12, 24, 36, and 52. Individuals were coded as abstinent if they report no cigarettes within the last 7 days and have a CO reading of less than 10 ppm. We hypothesized that both the individual counseling and computer-based intervention would result in higher abstinence rates than the self-help control condition at all assessment points. 207 HIV-positive cigarette smokers with a mean age of 45 years were enrolled in the study. The sample was 82% male with 53% identifying as Caucasian, 27% as African-American and 13% as Hispanic/Latino. 62% of the sample identified as gay/lesbian/bisexual. 59% of the sample had a high school education or less with almost half reporting an income of < $10,000. 17% were employed and 41% were in temporary living situations or homeless. Mean daily cigarettes = 19.8. Mean FTND score = 5.0. 41% met criteria for a history of major depression and 22% met criteria for bipolar disorder. Overall, abstinence rates were 26% at Week 12, 19% at

Week 24, 20% at Week 36, and 21% at Week 52). Although the abstinence rates for the computer-based intervention were initially higher than the other conditions, differences were not significant over time. Conclusions: Psychosocial variables negatively related to smoking treatment success (low SES, unstable housing, mental health issues) occur at high levels in this sample. However, these data indicate that smoking treatment can be effective with this underserved group of smokers.

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SYM11

HARDCORE SMOKERS FROM A MULTI-PILLAR PERSPECTIVE

Joanna Cohen, Ph.D.*[1], Robert Schwartz, Ph.D.[1], Jolene Dubray, M.Sc.[1], Bernard Le Foll, Ph.D.[2], Peter Selby, M.B.B.S., C.C.F.P.[2], Laurie Zawertailo, Ph.D.[2], and Susan Bondy, Ph.D.[3], [1]Ontario Tobacco Research Unit; [2]Centre for Addiction and Mental Health; [3]University of Toronto

The "hardening hypothesis" posits that as smoking prevalence declines as a result of population-level tobacco control interventions, less dependent smokers will quit, leaving behind a growing and irreducible proportion of highly dependent, "hardcore" smokers. The implication is that new, more targeted approaches – particularly pharmacotherapy – may be the only effective approach to reduce smoking prevalence in the future. Despite a large amount of discussion about hardcore smokers in the tobacco control research community, there has been little empirical literature contributing to the debate. This symposium will take a multi-pillar approach to the topic of hardcore smokers. We will begin with a presentation of preclinical data that examine the relationships between nicotine intake, extinction, and relapse. This will be followed by a presentation on better practices for treating hardcore smokers. The third presentation will explore the attributes of an ideal definition of hardcore. The fourth presentation will focus on the co-occurrence of hardcore status with other disease risk factors at the population level. The discussant will compare and contrast the key findings from the four presentations and will highlight the implications for policy, practice and research.

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SYM11A

CAN PRECLINICAL RESEARCH INFORM US ON 'HARDCORE SMOKERS'?

Bernard Le Foll, M.D., Ph.D., Translational Addiction Research Laboratory, Centre for Addiction and Mental Health

Preclinical research has informed us about the neurobiological substrates and the neurotransmitters mediating nicotine-taking and nicotine-seeking. Most of the preclinical work identifies subjects (i.e. mice, rats or non human primates) as an homogeneous group against which intervention can be evaluated or hypothesis can be tested. In contrast, clinical practice reveals marked inter-individual differences in vulnerability to nicotine dependence and/or in ability to quit smoking. Here, we will explore the potential of using preclinical approaches to explore the 'hardcore smokers' concept. This hardcore smokers concept suggests that there are marked inter-individual differences in motivation to take nicotine or in nicotine-seeking. First, evidence will be provided that marked inter-individual differences in expression of midbrain alpha4beta2* subtype of nicotinic acetylcholine receptors (nAChRs) can be measured using 2-[(18)F]fluoro-A-85380 (2-FA) and positron emission tomography (PET) in squirrel monkeys. Then evidence that levels of alpha4beta2* nAChRs influence motivation to self-administer nicotine (as measured using a progressive-ratio (PR) schedule of reinforcement will be given. Secondarily, the intravenous nicotine self-administration behavior of Long Evans rats will be evaluated in condition with access or without access for nicotine (i.e. extinction responding). The high intake group rats were more likely to show a burst in responding in the first 5min of extinction (85%) compared with the low intake group (51%), while in the extinction condition. The high intake group also showed greater overall extinction responding for the first and second extinction sessions ($p<0.0001$ and $p<0.05$, respectively). Taken together, those findings indicate that rodent and non-human primates can be used to study inter-individual differences and can provide insights on neurobiological substrates or pattern of responding that can inform the factors that underlie 'hardcore smokers' group. In addition, the current preclinical research in this area will be summarized and future possible direction of research will be presented.

Research supported by the Centre for Addiction and Mental Health.

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SYM11B

CLINICAL MANAGEMENT OF THE HARDCORE SMOKER – BEHAVIOURAL AND PHARMACOTHERAPEUTIC STRATEGIES

Peter Selby, M.B.B.S., C.C.F.P., M.H.Sc., FASAM*[1,2], and Laurie Zawertailo, Ph.D.[1], [1]Centre for Addiction and Mental Health; [2]University of Toronto, Faculty of Medicine, Ontario Tobacco Research Unit

This session will describe the clinical strategies used in the Nicotine Dependence Clinic to assist hard-core smokers when standard treatment has failed. Heavily dependent smokers often have comorbid mental health and addictive disorders. There is emerging evidence that they might require higher doses of NRT and a greater number of behavioural sessions to quit and maintain abstinence. The pharmacotherapeutic strategies we use involve titrating NRT to clinical effect (i.e., high dose NRT), combination therapy (NRT and bupropion, nicotine patch plus ad lib gum or inhaler or lozenge). Varenicline appears to be effective across the amount smoked and is effective in heavily dependent smokers. Other medications or drug use such as alcohol, opioids, marijuana, and neuroleptics may make tobacco more reinforcing thus requiring accommodations to the treatment plan. Hard core smokers also benefit from Motivational interviewing and we use a modification of the 5Rs (relevance, rewards, risks, reflection, roadblocks) to enhance motivation to change. The combination of group and individual sessions help the smoker recognize the importance of quitting as well as increase their confidence to quit smoking.

The Nicotine Dependence Clinic is funded by the Centre for Addiction and Mental Health.

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SYM11C

THE IDEAL HARD CORE DEFINITION

Susan J. Bondy, Ph.D., Ontario Tobacco Research Unit and Dalla Lana School of Public Health, University of Toronto

Drawing on the methodology literature from a broad range of social science and medical fields, this presentation will consider what criteria against which we should judge indicators of being a hard core smoker. Arguably, the ideal indicator will be theoretically valid and constructed to reflect lasting somatic or attitudinal characteristics that make of the individual distinctive. Some debate and discussion can be expected regarding the degree to which we see 'hard core' status as a lasting trait. Obviously, this is a measure, and as such it must have low potential for random and systematic misclassification error and high reproducibility. To be informative for public health surveillance, the measure must also correctly identify individuals at greater than average risk of experiencing important health consequences or of experiencing a qualitatively greater burden for poor health (predictive validity). Where this is true and we capitalize on this knowledge, the precision of our forecasting could be greatly improved and we would have more information to evaluate the strength of our existing surveillance methods against criteria such as coverage and representiveness. In order to also be of relevance to clinical and policy intervention, the measure also should indicate a substantively different group who might respond differently to specific interventions or for whom novel strategies are required. This is a challenging criterion as the history of substance abuse treatment and research is littered with suggested and abandoned means to customize intervention and match intervention to client characteristics.

No funding.

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SYM11D

CO-OCCURRENCE OF HARDCORE SMOKING WITH OTHER CHRONIC DISEASE RISK FACTORS

Robert M. Schwartz, Ph.D.*, and Jolene M. Dubray, M.Sc., Ontario Tobacco Research Unit, University of Toronto

Using a definition of hardcore smokers that predicts no quit attempts upon follow-up, this presentation will present findings from analyses of the co-occurrence of hardcore smoking with other chronic disease risk factors. Co-occurrence of hardcore smoking with other chronic disease risk factors has important implications for both public health policy and clinical practice. In our analysis, hardcore smokers are defined as those who have no lifetime quit attempts and no 6-month quit intentions. We examine co-occurrence of hardcore smoking with 7 other chronic disease risk factors: problem drinking, illicit drug use, problem gambling, physical inactivity, unhealthy eating, obesity, and diagnosis

of a mood disorder. Data are drawn from the 2007-2008 Canadian Community Health Survey, a national survey with 131,959 respondents aged 12 years or more. Analyses will be conducted in two stages. First, bivariate descriptive statistics will be conducted for each of the 7 chronic-disease risk factors by hardcore smokers to measure co-occurrence with hardcore smoking alone. Second, a cluster analysis will be conducted to determine co-occurrence amongst all chronic-disease risk factors. Results from both analyses will be presented, followed by a discussion about the implications these results will have for public health policy and clinical practice.

The Ontario Tobacco Research Unit receives funding from the Ontario Ministry of Health Promotion and Sport.

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SYM12

INNOVATIVE INTERVENTIONS FOR SMOKELESS TOBACCO CESSATION

Chair: Herb H. Severson, Ph.D.*[1],
Presenters: Dorothy Hatsukami, Ph.D.[2], Brian Danaher, Ph.D.[1]
Discussant: Judith Gordon, Ph.D.*[3]
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Smokeless Tobacco (ST) use is increasing in prevalence in the United States and there is growing interest in innovative interventions to assist ST users to quit using technology or novel approaches. However, the relative paucity of cessation outcome studies as well as some unique aspects of ST use (e.g., being able to use ST where smoking is prohibited, the lack of efficacy for NRT in cessation treatments, predominately male users, and high dual use of ST with smoking) makes ST cessation uniquely challenging. In this presentation we review the content and outcome of three RCTs that test innovative ST cessation approaches. In the first study, we describe MyLastDip, a Web-based cessation program targeted to ST users between 15 and 26 years of age. Results from 1500 participants at 3 and 6-month follow-up support the efficacy of a Web-based cessation program for young users. We discuss participant demographics and other baseline variables as they relate to abstinence. The second presentation describes an RCT that evaluated methods to encourage cessation among ST users who were not considering quitting in the next 90 days. This study compared gradual reduction to immediate cessation for 332 ST users randomized to condition. Although, both conditions had equal appeal for the users, participants assigned to the immediate cessation condition had higher cessation rates. Our third presentation describes the ongoing ChewFree II RCT that uses a 2 x 2 design to evaluate the relative efficacy of a Web-based intervention, telephone counseling, and combinations of both for cessation of ST with adult users. Outcome results for the first 600 participants in the RCT will be presented. We will conclude the presentation by discussing how these RCTs highlight important new directions in ST cessation research and program design. Funded by the National Cancer Institute, grant #CA 118575

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SYM12A

IMMEDIATE VS. GRADUAL REDUCTION TOWARD CESSATION IN SMOKELESS TOBACCO USERS

Dorothy Hatsukami, Amanda Anderson, and Joni Jensen, University of Minnesota, Minneapolis, MN

The goal of this innovative study was to examine methods to encourage cessation among Smokeless (ST) users who were not considering quitting in the next 90 days. Specifically, the study compared ST cessation among chewers randomly assigned at the time of the phone screening to one of two conditions: (a) an immediate cessation condition (n= 165) in which subjects were told to set a quit date and were given 21 mg nicotine patch for 2 weeks for relief of withdrawal symptoms; or (b) a gradual reduction condition (n= 167) in which subjects were given the choice to use nicotine lozenge or brand-switching with the goal of reducing use or nicotine exposure by 50% during the first two week, 75% the subsequent 4 weeks and then cessation at the end of this 6 week gradual reduction period. Of those individuals randomized, an equal number of subjects in each group attended the first orientation meeting (n=103 in each group). Some of these individuals were found ineligible so the remaining sample size was 99 in the immediate cessation and 100 in the gradual reduction group. All subjects were seen for counseling at weeks 2, 4, 6 (phone counseling) with follow-up at weeks 8, 12, 26 and 32 (only gradual reduction group). The percent who dropped at the end of treatment (6 weeks) was 36% for immediate cessation and 44% for gradual reduction. The rate of biochemically verified abstinence at 12 weeks post-treatment initiation and at 6 months post-quit was higher for the immediate cessation condition compared to gradual reduction condition (25% vs. 11% and 18% vs. 7%, respectively). These results show equal interest in these two treatment approaches to ST users who were not considered quitting in the immediate future. However, subjects assigned to the immediate cessation condition had higher ST abstinence rates compared to subjects assigned to a gradual reduction group.

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SYM12B

EVALUATION OF A WEB BASED CESSATION PROGRAM FOR YOUNG SMOKELESS TOBACCO USERS: OUTCOMES FROM MYLASTDIP.COM

Herbert H. Severson* Brian G. Danaher, Milagra S. Tyler, Judy Andrews, and Edward Lichtenstein

The MyLastDip project is a NCI-funded randomized control trial that compared two Web-based interventions targeted to smokeless tobacco (ST) users ages 14 -25. The two Web conditions were: (a) a highly interactive targeted and tailored website that provided cessation materials, advice and support to teen ST users (Enhanced Condition), and (b) a more static information website that presented generic (non-tailored) cessation materials (Basic Condition). Assessments occurred at baseline and at both 3- and 6-months following enrollment. Our prior ChewFree.com research that used a largely parallel design but with adult ST users found that the Enhanced Condition was more efficacious than the Basic Condition. We use a CONSORT diagram to describe flow in the program for 1500 youthful ST users who participated in the MyLastDip program. We describe our national recruitment process and participant baseline characteristics. We then present outcome results in terms of ST abstinence and all-tobacco abstinence at the 3- and 6-month assessments. Data will be analyzed as complete cases as well as using an intent-to-treat imputation. While the Enhanced program appears significantly more effective at 3 months this difference dissipates at the 6-month follow up. However, the absolute level of self-reported ST abstinence was encouraging. Possible interpretations of these findings will be described. Strengths and limitations of the study will be noted and implications of these results for enhancing the design of Web-based tobacco cessation interventions targeting youthful ST users will be highlighted.

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SYM12C

EVALUATING THE RELATIVE EFFICACY OF WEB-BASED INTERVENTION AND HELPLINE IN SMOKELESS TOBACCO CESSATION: THE CHEWFREE II RCT

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This presentation describes preliminary outcomes for the NCI-funded ChewFree II randomized controlled trial (RCT) that studies two smokeless tobacco cessation interventions that are growing in use but still need more systematic evaluation. While counseling delivered via tobacco cessation help lines and Web-based tobacco cessation interventions have been extensively evaluated with smokers, there are few studies of their efficacy for smokeless tobacco users. Specifically, the ChewFree II RCT for smokeless tobacco chewers uses a 2x2 design to evaluate the relative efficacy of a Web-based intervention, telephone counseling from the California Tobacco Chewers' Helpline, and the combination of both. We describe our recruitment process, our use of online screening, and the baseline characteristics of our study participants. We use a CONSORT diagram to describe participant flow for 600+ smokeless tobacco users who participated in the RCT. We then present outcome results in terms of smokeless tobacco abstinence and all-tobacco abstinence at the 3- and 6-month follow-up assessments. Data analyses use both complete case and an intent-to-treat imputation. Strengths and limitations of the study will be noted and implications of these results for enhancing the design of Web-based tobacco cessation interventions will be highlighted.

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PAPER SESSION 1: TREATMENT AND MECHANISMS: WHAT DO SMOKING CESSATION TREATMENTS DO?

PA1-1

THE IMPACT OF VARENICLINE ON CUE-SPECIFIC CRAVING ASSESSED IN THE NATURAL ENVIRONMENT OF CIGARETTE SMOKERS

Julie C. Gass*[1], Jennifer M. Wray[1], Larry W. Hawk, Ph.D.[1], Martin C. Mahoney, M.D., Ph.D.[1,2], and Stephen T. Tiffany, Ph.D.[1], [1]University at Buffalo, SUNY; [2]Roswell Park Cancer Institute

Among cigarette smokers, the presentation of smoking cues increases craving relative to the presentation of neutral cues. Cue-reactivity has been observed in numerous laboratory-based studies, but only limited research has been conducted on cue-reactivity in the natural environment. We studied cue-reactivity among smokers treated with varenicline using ecological momentary assessment procedures that allow cues to be presented to smokers outside of the laboratory. The study used handheld personal digital assistants (PDAs) to collect cue-reactivity ecological momentary assessment (CREMA) data for five weeks among 59 adult smokers who were preparing to quit smoking. One week of baseline data was collected, followed by three weeks during which participants were randomly assigned to receive either varenicline or placebo, and one final week when all participants received varenicline. Cue reactivity sessions were delivered via PDA two times randomly each day with trials of smoking or neutral cues presented through photographs or in vivo modes (i.e., holding a cigarette or a neutral object). Each CREMA session consisted of pre-cue data collection followed by two consecutive trials of the same cue type and mode of presentation. Craving, the principal outcome measure, was assessed with 4-item scale. Assessments of craving before cue presentations indicated that varenicline did not significantly influence general levels of craving (p=0.98). Across all phases of the study, there were robust cue-specific craving effects with smoking cues eliciting higher craving than neutral cues (p< .0001), with no differences across the two modes of cue presentation. Cue-specific craving declined across successive weeks of the study. There was no evidence that varenicline affected cue-specific craving (p=.58). The current findings suggest that varenicline has little or no impact on craving, cue-specific or general, among smokers who have not yet quit smoking. Implications of the results for understanding the processes underlying varenicline's clinical efficacy and the use of assessments of cue reactivity in the natural environment will be discussed.

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PA1-2

USING DISCRETE EVENT SIMULATION (DES) TO EVALUATE THE LONG-TERM IMPACT OF SMOKING CESSATION INTERVENTIONS

James Xenakis, Jeno P. Marton, Nikhil Revankar, Denis Getsios*, Richard J. Willke, Qian Li, K. Jack Ishak, J. Jaime Caro, and Kelly H. Zou

Objective: Previous models of smoking cessation therapies have had a number of limitations. Markov models, including HECOS and BENESCO, have required simplifications such as restricting disease combinations and limiting evaluations to a single quit attempt. We developed a DES, which overcomes some of these and evaluated its effect on predictions.

Methods: The DES incorporates data from clinical trials, a survey and the literature to simulate individuals' smoking cessation behavior over their lifetimes, allowing for analyses with single and multiple quit attempts. The simulation assigns and reassigns the success of quit attempts, time between attempts, type of interventions, and relapse to individuals. Based on individuals' smoking or abstinence patterns, diseases and corresponding changes to mortality and quality of life are assigned. Analyses compare initial treatment with varenicline, nicotine replacement therapy (NRT) and unassisted quit attempts (UQA). Results are compared to BENESCO.

Results: When analyses are restricted to a single quit attempt, both models predict that varenicline leads to better outcomes compared to NRT and UQA. Lifetime quality adjusted life years (QALYs) gained in BENESCO range from 0.03-0.08/patient. The DES predicts larger gains; QALYs increase by 0.07-0.25, largely as a result of removing restrictions on allowable disease combinations. When multiple quit attempts are modeled, QALY gains decrease, ranging from 0.03-0.14. The decrease is a result of repeated interventions and allowing switching to more effective treatments. For example, QALYs in the UQA arm increase from 13.3 to 14.0/patient with multiple quit attempts. If future attempts are restricted to less effective treatments, results for varenicline improve, with QALY gains between 0.17-0.67 versus NRT and UQA, respectively.

Conclusion: While both models predict gains with varenicline, alternative approaches lead to significant differences. The reality and impact of multiple quit attempts and importance of choice of interventions over the course of individuals' lives highlight the need for more sophisticated modeling to inform clinical and public health decision making.

All are employees of UBC and this research was conducted with a grant from Pfizer.

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PA1-3

LONGER TERM OUTCOMES FROM A DROP-IN ROLLING GROUP SMOKING CESSATION PROGRAMME

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Objectives: Smoking cessation programmes delivered in a group format are effective but can be less popular with smokers than individual counselling. In the UK's national network of stop smoking services, just 6% of service clients choose treatment in closed groups while 78% choose individual counselling. A number of stop smoking services have implemented a more flexible group intervention to appeal to smokers that involves drop in group sessions that clients can attend at any point in their quit attempt. We aimed to explore the longer-term cessation rates of smokers receiving this drop in rolling group intervention in two areas in northwest England.

Methods: The study employed an observational design that involved the analysis of data collected from 2,614 service clients between January and April 2009. CO validated continuous abstinence was measured at 4 and 52 weeks and multivariate analysis was conducted to explore the relationship between client and service characteristics and outcomes.

Results: At four weeks after their quit date, 31% of clients had quit smoking. One year after their quit dates, 6% of clients reported continuous abstinence that was confirmed by CO validation. The client characteristics that were found to be significantly related to longer-term cessation were age, determination to quit, level of addiction (heaviness of smoking index) and socio-economic status.

Conclusions: A drop in rolling group cessation programme is effective in supporting smokers to quit in the short and longer term although effectiveness is attenuated by a range of client characteristics. Comparisons with several studies conducted by the same team employing an identical study design suggest that this format of smoking cessation programme is likely to be less effective than structured group support or intensive one to one support in primary care, but may be more effective than one to one interventions in a pharmacy setting.

Roy Castle Lung Cancer Foundation, UK.

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PA1-4

VARENICLINE EFFECTS ON CUE REACTIVITY AND SMOKING REWARD/ REINFORCEMENT

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Although the clinical efficacy of varenicline has been established via multiple randomized controlled trials, the bio-behavioral mechanisms underlying its clinical efficacy remain unclear. As a nicotinic agonist-antagonist, its use could lead to the extinction of conditioned responses to smoking cues and to attenuated reinforcement from smoking itself. The current study examined these hypothesized effects of varenicline. One hundred nicotine dependent smokers completed a randomized double-blind study comparing varenicline to placebo. Participants completed 3 laboratory assessments: pre-medication, mid-titration, and at full therapeutic dose. All laboratory assessments were conducted following overnight (12 hr.) abstinence. In addition to tonic (i.e., non-cue-provoked) cravings, as indexed by the Questionnaire of Smoking Urges, cue-provoked cravings were assessed by subjective ratings using an established picture-viewing paradigm. Smoking reward/reinforcement was assessed by self-report on the Modified Cigarette Evaluation Questionnaire and the cigarette choice procedure (CCP). Results indicated that treatment condition produced differential changes over time for all of the outcomes, with both post-dosing assessments differing from pre-medication baseline. Specifically, participants who received varenicline reported lower tonic and cue-provoked cravings than those who received placebo. Those who received varenicline also reported less satisfaction, psychological reward, craving reduction, and respiratory sensations from smoking ad libitum than did placebo-receiving participants.

Finally, those in the varenicline condition indicated that a hypothetical cigarette was less valuable to them (i.e., that they would accept a lesser amount of money in lieu of smoking) on the CCP compared to those in the placebo condition. Findings are consistent with the theoretical mechanisms of action for varenicline. Effects were evident at mid-titration levels, indicating that varenicline influenced these outcomes prior to reaching full therapeutic blood levels. Future studies should evaluate the extent to which these effects predict cessation outcomes.

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PA1-5

MEDIATION OF THE MODERATING EFFECTS OF AGGREGATE GENETIC RISK ON BUPROPION EFFICACY FOR SMOKING CESSATION BY SMOKING URGES IN A RANDOMIZED, PLACEBO-CONTROLLED TRIAL

Sean P. David[1,2,3#], David Strong[3], Adam M. Leventhal[4], John E. McGeary[3], Marcus R. Munafò[5], Andrew W. Bergen[2], and Raymond Niaura[3,6], [1]Stanford University; [2]SRI International; [3]Brown University; [4]University of Southern California; [5]University of Bristol; [6]American Legacy Foundation; [#]Adjunct appointment

Smokers (≥10 cigarettes per day, N = 356) of European ancestry taking part in a double-blind placebo-controlled randomized trial (RCT) of 12 weeks of treatment with bupropion for smoking cessation were genotyped for a variable number of tandem repeats polymorphisms (VNTR) in exon III of the dopamine D4 (DRD4) gene and the 3' untranslated region of the dopamine transporter gene (DAT1), respectively, and rs4680 and rs1800497 ('DRD2 Taq1A') single nucleotide polymorphisms (SNPs) in the catechol-O-methyl transferase (COMT) gene and ankyrin repeat domain containing 1 (ANKK1) gene. An additive, continuous genetic risk (GRS) score was calculated for each locus (range 0-2) based on the number of putative 'efficacy' alleles for bupropion smoking cessation efficacy. Cox survival analyses were conducted adjusting for age, nicotine dependence, and sex. Drug condition (bupropion, placebo) (p = <0.001) and DRD4 score (p = 0.005) were associated with time to relapse during treatment. However, there were no main effects of COMT, DAT1 or DRD2 scores. There was a significant DAT1 x DRD4 interaction (p = 0.008) and a significant DAT1 x drug (p = 0.020) and DRD4 x drug (p = 0.005) interactions with time to relapse. Moreover, there was an association between aggregate genetic risk score quotient [AGRS Quotient = interaction term of number of efficacy alleles for each locus (range 0-8) x drug condition] and time to relapse [hazard ratio (HR) of upper 75%tile vs. lower 25%tile AGRS = 0.34; 95% CI 0.04, 0.64; p = 0.022]. The AGRS quotient was significantly associated with change in smoking urges such that the upper 75 percentile scores were associated with greater reduction in smoking urge, but neither positive nor negative affect from before to after initiation of treatment. The degree to which apparent AGRS moderation of smoking cessation and mediation of cessation efficacy vis-à-vis urge reduction was driven by DRD4 genotype alone or additive effects of each variant is speculative in this discovery sample and will be further evaluated through analyses of a replication sample from a bupropion RCT of similar design.

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PAPER SESSION 2: TECHNOLOGY AND CESSATION: QUIT LINE AND INTERNET INTERVENTIONS FOR SPECIFIC GROUPS OF SMOKERS

PA2-1

RANDOMIZED CLINICAL TRIAL TO EVALUATE QUITLINE CESSATION COUNSELING FOR 18 TO 24 YEAR-OLD SMOKERS

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Objective: Tobacco quitlines provide accessible, evidence-based interventions for smokers seeking cessation assistance but few quitline cessation studies have focused on young adult smokers. The current study is a randomized clinical trial that tested the effectiveness of telephone quitline smoking cessation counseling in comparison to mailed self-help materials in young adult quitline callers.

Methods: A total of 410 smokers age 18 to 24 years who called the Wisconsin Tobacco Quit Line (WTQL) were randomized to two treatment groups: a Self-Help (SH) group that received only a mailed self-help cessation booklet, and a Counseling Intervention (CI) group that received up to four proactive cessation counseling calls over 4-6 weeks via the WTQL in addition to a mailed self-help booklet. Eligible callers must have smoked at least one cigarette within the past 30 days and have an interest in quitting. Participants were not required to set a quit date at the time of study enrollment; CI participants were encouraged to set a quit date during each counseling call. Follow-up data collection occurred at one, three, and six months post-enrollment. Primary study outcomes included self-reported intention to quit, quit attempts, and 7-day point-prevalence abstinence.

Results: The overall sample was predominantly White (78%), female (58%), and high school graduates (67%). Mean age was 21.3 years with 50.7% 18 to 21, and 49.3% 22 to 24 years old. At the one-month follow-up, 59.8% of the CI participants set a quit date compared to 43.3% of the SH participants (p<.01). There was no group difference in actual quit attempts (CI:39.7%; SH:38.8%) or in overall abstinence (CI:10.3%; SH:8.8%). Among participants who reported making an actual quit attempt, 25.3% of CI participants (N=83) reported abstinence compared with 14.1% of SH participants (N=78) but the difference was only marginally significant (p=.08).

Conclusion: Quitline-based cessation counseling for young adult smokers provides modest benefit as compared to minimal intervention consisting only of mailed self-help materials.

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PA2-2

EFFICACY OF AN EXPERIENTIAL, WEB-BASED SMOKING INTERVENTION FOR COLLEGE SMOKERS

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The college years represent a window of opportunity to intervene before college student smokers' progress to long-term nicotine dependence. Research on the development of interventions specifically for college student smokers has been limited. Using cognitive dissonance theory as our model, we previously developed and tested a brief experiential group-based intervention that demonstrated changes in intentions to quit smoking (Simmons & Brandon, 2007). The goals of the current study were to adapt this intervention into a novel, web-delivered intervention to increase its reach and to test the efficacy of this intervention for increasing motivation to quit smoking and reducing smoking. Specifically, we tested the efficacy of a web-based experiential smoking intervention by comparing it to an in-person, group based, experiential smoking intervention (akin to our previous study) and two web-based control groups (traditional didactic smoking intervention and an experiential nutrition intervention), in a four-arm randomized study. We expected to find the greatest changes in cessation motivation and behavior from the experiential smoking interventions as compared to both control groups. Primary dependent variables included intentions to quit smoking and smoking behavior at one and six-months following the intervention. To date, 318 participants have been randomized. At baseline, participants (55% male) had a mean age of 20.6 and smoked an average of 46.0 cigs/week. Retention rates for 1 and 6-month follow-up are 98% and 96%. At post-intervention, results indicate that the web-based experiential smoking intervention led to higher increases in readiness to quit compared to the group and both web-based control conditions, $F(3, 314) = 14.24$, $p < .001$. As hypothesized, participants who received the experiential group or web-based smoking intervention were more likely to have quit smoking one-month following the intervention, $\chi 2$ (1, N = 306) = 9.15, p =.002). Preliminary analyses suggest a similar pattern at the six-month follow-up, p =.09. Final sample and analysis of mediators and moderators of intervention outcomes will be presented.

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PA2-3

PROJECT SUCCESS: STUDENTS USING COMPUTERIZED COACHING TO END SMOKING SUCCESSFULLY

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Objectives: Project SUCCESS was designed to test an innovative smoking cessation program among university students that combined state-of-the-art intervention approaches and computer technology.

Methods: The study was a randomized smoking cessation trial with two treatment conditions and repeated measures. Five hundred and nine smokers from University of Houston were randomly assigned to two treatment conditions: [1] individual motivational counseling/respiratory health feedback plus an Internet-based program (MFI), or [2] self-help manual (SC).

Results: The mean age of students was 24 ± 4.0 years; 53% were male; 50% reported CES-D scores of 16 or higher and 89% reported moderate to heavy drinking. Abstinence at 12 Months. 236 students completed the final assessment. We used intent to treat analysis to compare abstinence rates between groups. In the MFI group 55(20%) of students were quitters compared to 24(10%) in SC, (p<.01). When adjusted for important covariates the MFI group showed significantly higher abstinence compared to SC (adjusted OR = 2.3, 95%CI = (1.3, 3.9), p<.01). Respiratory Health Feedback. Individualized respiratory health feedback may be beneficial for young smokers. We investigated changes in the following respiratory symptoms: wheezing, cough, shortness of breath and chest pain. The baseline respiratory symptom score did not differ between quitters and smokers. At 12-month follow-up quitters showed significantly greater improvement in symptoms than continued smokers (-1.1 vs.-0.5, p<.01).

Conclusions and Future Directions: Our study showed a promising impact of the smoking cessation program. The improvements in respiratory health after quitting may cause substantial psychological effect by demonstrating rapid health benefits that prevent relapse. However, considerable challenges were revealed in dealing with college smokers. SUCCESS II, designed to enhance our cessation program and with a prevention module, will be tailored to the needs of culturally diverse urban and rural campuses. This study will establish the feasibility of two new modules addressing alcohol use and depression, major challenges revealed by our research.

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PA2-4

EVALUATION OF TWO MULTI-COMPONENT INTERVENTIONS FOR INTEGRATING SMOKING CESSATION TREATMENTS INTO ROUTINE PRIMARY CARE PRACTICE: A CLUSTER-RANDOMIZED TRIAL

S. Papadakis*, A. Pipe, P. McDonald, R. Reid, and S. Brown

Multi-component intervention that combine practice, provider, and patient-level supports have been shown to increase the rates at which primary care providers deliver smoking cessation treatments and increase patient smoking abstinence. The incremental value of telephone-based smoking cessation counseling when delivered as part of a multi-component intervention has not been examined.

Aim: The primary objective of this study was to determine whether adjunct telephone-based smoking cessation follow-up counseling (FC), when delivered as part of a multi-component intervention program within primary care clinics is associated with increases in (a) the delivery of evidence-based smoking cessation treatments, (b) patient quit attempts, and (c) patient smoking abstinence when compared to the provision of practice and provider supports (PS) alone.

Methods: A two-group, pre-post cluster randomized controlled trial was conducted. Both intervention groups were supported with implementing a multi-component intervention program that involved outreach facilitation visits, provider training, real time provider prompts and patient tools, and performance feedback. Clinics assigned to the FC group were also able to refer patients who smoke to a telephone-based follow-up support program. An exit survey was completed with a cross-sectional sample of patients at each study clinic and all patients completed a 4-month follow-up interview.

Results: Seven family medicine clinics and a total of 835 eligible patients participated in the study. Significantly higher rates of provider 5As delivery and patient quit attempts were documented compared to baseline, with no differences between groups. A statistically significant increase in 7-day point prevalence abstinence was observed in the PS group compared to the FC group (OR 6.8, 95% CI 2.1-21.7; p=<0.01).

Conclusion: The introduction of a multi-component intervention program in primary care settings was associated with significant improvements in the delivery of evidence-based cessation treatments and patient quit attempts. The added value of adjunct telephone counseling was not evident at the 4-month follow-up.

This study was supported by the Canadian Tobacco Control Research Initiative (Idea Grant #19826 and Student Research Grant #19813), the Ontario Tobacco Research Unit, and the Ontario Ministry of Health and Long-Term Care. Sophia Papadakis was supported with doctoral fellowships from the Canadian Institute for Health Research Strategic Training Program in Tobacco Research (2005-2009) and the Canadian Institute for Health Research Training Program in Population Intervention in Chronic Disease Prevention (2009-2010).

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PA2-5

AUTOMATED TELEPHONE MONITORING FOR RELAPSE RISK AMONG RECENT QUITTERS ENROLLED IN QUITLINE SERVICES

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This study is part of a randomized controlled trial to test the efficacy of interactive voice response (IVR) technology for enhancing existing quitline services (Free & Clear's Quit for Life® program) to prevent smoking relapse and achieve abstinence. The IVR system screens for six indicators of risk for relapse including smoking lapse, physical withdrawal symptoms, depressive symptoms, perceived stress, decreased self-efficacy for quitting, and decreased motivation to quit. Participants can screen positive on any one or more risks, resulting in a rollover call to a telephone counselor. There are two intervention arms that differ in timing and frequency of IVR screening. In the Technology Enhanced Quitline arm (TEQ-10), 10 automated calls are placed at decreasing frequency for 8 weeks post-quit (twice a week for the first two weeks, then weekly). The High Intensity Technology-Enhanced Quitline arm (TEQ-20) includes 20 IVR calls (daily for the first 2 weeks, then weekly). This preliminary analysis includes IVR data collected on calls from 4/12/2010 to 10/31/2010. 2620 calls were made to 98 participants in the two intervention arms, TEQ-10 (n=44) and TEQ-20 (n=54). The two arms did not differ significantly on demographics or comorbid conditions. Three outcomes were analyzed: completed screening assessments, positive screen for relapse risk, and smoking lapse (i.e., smoking even a puff since the last call). 136 of the 736 (18.5%) completed assessments were positive for relapse risk: 66 for smoking lapse (49%), 42 craving (31%), 32 depressive symptoms (24%), 27 lack of confidence (20%), 8 stress (6%), and 8 lack of motivation (6%). Logistic regression models (adjusted for age and gender), with GEE estimation to account for within-person correlation, showed that compared to the TEQ-10 study group, participants in the TEQ-20 study group were more likely to complete assessments (OR=1.7; 95% CI=1.2-2.4), less likely to screen positive for relapse risk (OR=.3; 95% CI=.2-.6), and less likely to have smoked (OR=.2; 95% CI=.09-.4). These results indicate that frequent IVR monitoring during the immediate post-quit period may have a positive effect on relapse risk.

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PAPER SESSION 3: THE GENETICS OF NICOTINE RECEPTORS AND METABOLISM: BETA WHO? AND METABO-TOO

PA3-1

PERSISTENT BETA2*-NACHR DYSFUNCTION IN MAJOR DEPRESSIVE DISORDER

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A wealth of preclinical, molecular and clinical evidence suggests that modulating the function of nicotinic acetylcholine receptors (nAChRs) may be a useful strategy in the treatment of patients with major depressive disorder (MDD). Using [123I] 5-I-A-85380 single photon emission computed tomography (SPECT), we studied beta2*-nAChR availability in patients with MDD to determine if there was a core dysfunction in beta2*-nAChRs in MDD. We also studied beta2*-nAChR binding in post mortem samples of human brains of subjects with MDD. A total of 23 medication-free, early-onset subjects with familial MDD (8 acutely depressed (aMDD) and 15 fully recovered (rMDD) and

23 age and gender matched controls had one SPECT scan and MRI scan in addition to clinical, demographic and personality measures. beta2*-nAChR availability was quantified as VT/fP. Post mortem samples were analyzed for beta2*-nAChR binding in MDD and age-matched controls. Post-mortem and preclinical tissue were analyzed with [125I] 5-I-A-85380 to determine beta2*-nAChR binding. beta2*-nAChR availability in aMDD and rMDD subjects was significantly lower across all brain regions assessed as compared with their respective controls. Further, beta2*-nAChR availability was lower in aMDD subjects compared with rMDD subjects. There were no differences in beta2*-nAChR binding between populations in the human post mortem study. In the MDD cohort, there were statistically significant correlations between beta2*-nAChR availability and lifetime number of depressive episodes, as well as trauma and anxiety scores. There is a persistent enduring dysfunction in beta2*-nAChR availability in patients with MDD that cannot be explained by acute illness or treatment. Results from post mortem studies suggest that this may not result from a decrease in receptor number but may reflect lower receptor availability as a result of increased endogenous acetylcholine. Association of beta2*-nAChR availability with clinical and personality variables and the widespread lower receptor availability observed suggest that the nAChR system plays a critical role in the pathophysiology of MDD and may be a viable target for drug development.

NARSAD, CDA-1, KO2 DA21863, KO1 DA20651, RO1DA015577 and T32 DA07238-16.

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PA3-2

GENETIC REGULATION OF BETA2-NICOTINIC ACETYLCHOLINE RECEPTOR AVAILABILITY IN NONSMOKERS: INFLUENCE OF ANKK1 AND CHRNA4

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Background: Genetic differences influence susceptibility to nicotine dependence and may impact treatment response. The most prevalent nicotinic acetylcholine receptors (nAChRs) in the brain contain alpha4 and beta2 subunits and demonstrate high affinity for nicotine as well as the nicotinic agonist radiotracer [123I]5-IA-85380 (5IA). In this study, we evaluated the relationship between single nucleotide polymorphisms (SNPs) at two genes that have been associated with nicotine dependence (CHRNA4 and ANKK1) with beta2-nAChR availability in nonsmokers. Methods: To date, 40 healthy European-American nonsmokers (aged 32+13, 21 women, 19 men) have been imaged with 5IA SPECT and genotyped. 5IA was administered as a bolus plus constant infusion and subjects were scanned at equilibrium (6-8 hrs post-injection). An MRI was obtained to guide the placement of the regions of interest: thalamus, striatum, cerebellum and cortical regions. SNPs were genotyped via Taqman. ANOVAs were conducted with Bonferroni as the post-hoc. Results: In preliminary analyses, for the CHRNA4 SNPs (rs2273502, rs2273504, rs2236196), there were no significant differences across genotypes on beta2-nAChR availability. For the ANKK1 SNP (rs4938013), there were significant differences in beta2-nAChR availability ranging from 23-46% in the thalamus, striatum and cortex ($p<0.05$) Discussion: Our preliminary results suggest SNPs at the ANKK1 gene locus may modulate beta2-nAChR availability in nonsmokers, providing a straightforward biological rationale to previously reported statistical associations. The ANKK1 gene encodes a tyrosine kinase, and thus may phosphorylate the nAChR in a manner that alters nicotinic agonist binding.

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PA3-3

VARIATION IN NICOTINE METABOLIC AND NICOTINE RECEPTOR GENES INFLUENCES SMOKING AND LUNG CANCER RISK

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We investigated the combined impact of variation in the nicotine metabolism gene, CYP2A6, and in the nicotine receptor gene cluster, CHRNA5-CHRNA3-CHRNB4, on smoking behaviors and lung cancer risk as these genes have kinetic and dynamic roles in both nicotine and nitrosamine pharmacology. Caucasians (860) were selected from a lung cancer case-control study and were grouped by CYP2A6 genotype into normal or reduced activity metabolizers. Genetic variation in the CHRNA5-CHRNA3-CHRNB4 cluster was represented by the tag SNP rs1051730 G/A. As the AA genotype has been associated with smoking intensity and lung cancer risk, we grouped together GG and GA subjects. CYP2A6 alone was significantly associated with smoking behaviors: CYP2A6 normal vs. reduced metabolizers smoked more cigarettes per day (CPD: 25.9±11.7 vs. 20.2±16.1, $p<0.001$) and had higher nicotine dependence scores (FTND: 5.1±2.5 vs. 4.2±2.3, $p=0.036$). Alone, rs1051730 was not significantly associated with smoking behaviors, but the combined CYP2A6 and rs1051730 genotypes were. Cigarettes per day ($p<0.001$, linear trend $p=0.042$) were lowest for the combined genotype group CYP2A6 reduced and rs1051730 GG/GA (20.8±16.8), intermediate in CYP2A6 normal and rs1051730 GG/GA (25.6±11.7) and greatest in CYP2A6 normal and rs1051730 AA (27.9±11.0). FTND scores ($p=0.036$, linear trend $p=0.013$) were lowest in the combined genotype group CYP2A6 reduced and rs1051730 GG/GA (4.3±2.3), intermediate in CYP2A6 normal and rs1051730 GG/GA (5.0±2.5) and greatest in CYP2A6 normal and rs1051730 AA (5.9±2.1). CYP2A6 normal metabolizers trended towards increased lung cancer risk (OR 1.27; 95% CI 0.92-1.78), whereas rs1051730 AA alone showed a significant association (OR 1.57; 95% CI 1.07-2.31). The combined group, CYP2A6 normal and rs1051730 AA, was associated with the greatest overall risk of lung cancer (OR 2.02; 95% CI 1.22-3.36), particularly among lighter (≤20 CPD) smokers (OR 2.88; 95% CI 1.32-6.30); this remained similar after adjusting for age, sex, and cigarette pack years. Thus, variation in both nicotine metabolic and in nicotine receptor genes combines to increase cigarette consumption, dependence, and lung cancer risk.

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PA3-4

PREDICTING NICOTINE METABOLISM BY CYP2A6 GENOTYPE

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The cytochrome P450 2A6 (CYP2A6) enzyme is the largest contributor to in vivo nicotine metabolism and encoded within a locus that achieved genome-wide significance in a recent association study of cigarette consumption. The conversion of deuterated nicotine to cotinine was directly measured in 189 subjects of European ancestry to determine the contribution of current smoking, gender, and CYP2A6 genotype to variability in hepatic nicotine metabolism. The majority of phenotypic variability was accounted for by only seven common polymorphisms in this gene ($R2=0.72$). Estimates of the relative activity of different CYP2A6 haplotypes demonstrate that the CYP2A6/CYP2A7 gene conversion, CYP2A6*12, is a severe loss-of-function allele statistically indistinguishable from the deletion and known loss-of-function alleles CYP2A6*4 and *2(rs1801272 L160H). The metabolic activities of the *1B, *1D, *1H, and *14 alleles are equivalent to one another, demonstrating that the *1B 3' UTR conversion has a negligible effect on in vivo CYP2A6 activity. Furthermore, in normal metabolizers, CYP2A6 is responsible for an average 72% of hepatic metabolism of nicotine to cotinine, with all other combined enzymatic activities contributing ~27%.

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PA3-5

NICOTINE DEPENDENCE AND COMORBID PSYCHIATRIC DISORDERS: EXAMINATION OF SPECIFIC GENETIC VARIANTS IN THE CHRNA5-A3-B4 NICOTINIC RECEPTOR GENES

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Background: The associations between nicotine dependence and specific variants in the nicotinic receptor CHRNA5-A3-B4 subunit genes are irrefutable with replications in many studies. The relationship between the newly identified genetic risk variants

for nicotine dependence and comorbid psychiatric disorders is unclear. We examined whether these genetic variants were associated with comorbid disorders and whether comorbid psychiatric disorders modified the genetic risk of nicotine dependence.

Methods: In a case control study of nicotine dependence with 2032 subjects of European descent, we used logistic regression models to examine the risk moderation and pleiotropy. Comorbid disorders examined were alcohol dependence, cannabis dependence, major depressive disorder, panic attack, social phobia, posttraumatic stress disorder (PTSD), attention deficit hyperactivity disorder (ADHD), conduct disorder, and antisocial personality disorder (ASPD).

Results: Nicotine dependence was associated with every examined comorbid psychiatric disorders, with odds ratio varying from 1.93 to 3.72. No evidence supported the associations between the genetic variants and the comorbid disorders (pleiotropy). No evidence suggested that the risks for nicotine dependence associated with the genetic variants vary with comorbid psychiatric disorders in general, but the power was limited in detecting interactions.

Conclusions: The genetic risks of nicotine dependence associated with the CHRNA5-A3-B4 subunit genes were specific, and not shared among commonly comorbid psychiatric disorders. The risks for nicotine dependence associated with these genetic variants are not modified by comorbid psychiatric disorders such as major depressive disorder or alcohol dependence. However, the power is an important limitation in studying the interplay of comorbidity and genetic variants

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PAPER SESSION 4: MARKETING OF TOBACCO: WHAT ARE THE MAD MEN UP TO NOW?

PA4-1

PORTRAYAL OF SMOKELESS TOBACCO IN YOUTUBE VIDEOS

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Objective: Videos of smokeless tobacco (ST) on YouTube are abundant and easily accessible, yet no studies have examined the content of ST videos. This study will assess how ST is being portrayed on YouTube.

Methods: In August 2010, researchers identified the top 20 search results on YouTube by "relevance" and "view count" for the following search terms: "smokeless tobacco," "chewing tobacco," "snus," and "Skoal." After eliminating videos that were not about ST (n=26), non-English (n=14), or duplicate (n=42), a final sample of 78 unique videos was coded for overall portrayal, genre, and various content measures.

Results: Among the 78 unique videos, 15.4% portrayed ST in a negative manner, while 74.4% portrayed ST positively. Researchers were unable to determine the portrayal of ST in the remaining 10.2% of videos because they involved excessive or "sensationalized" use of the ST, which could be interpreted either positively or negatively, depending on the viewer. The total number of views of positive ST videos far exceeds the total views of "sensationalized" or negative ST videos: 3,000,797 views of positive videos; 599,179 views of "sensationalized;" and 386,499 of negative videos. The most common ST genre was positive video diaries (or "vlogs"), which made up almost one third of the videos (29.5%), followed by ST promotional ads (16.7%), and anti-ST Public Service Announcements (12.8%). While YouTube is intended for user-generated content, 21.8% of the videos were created by professional organizations. Almost one third (30.8%) of all videos had at least one mention of a negative health effect from ST (75% among negative videos; 20.7% among positive videos). Among positive videos, 15.5% downplayed the negative health effects of ST or promoted the use of ST as a smoking cessation method.

Conclusion: These results demonstrate that ST videos on YouTube are overwhelmingly positive in nature. More research is needed to determine who is viewing these ST YouTube videos and how they may affect people's knowledge, attitudes, and behaviors regarding ST use.

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PA4-2

SMOKELESS TOBACCO ADVERTISING IN POPULAR MAGAZINES

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Although the prevalence and message focus of tobacco industry advertising has been extensively studied, there has been little corresponding analysis of smokeless tobacco (ST) advertising. Moreover, the ST market is in the midst of a profound shift, with the two largest U.S. cigarette companies, Philip Morris and R.J. Reynolds, entering the ST market in the last year. The overarching objectives of this study were to determine if the rate and content of ST ads are changing over time. The seven most popular adult magazines in the Appalachian region of Ohio were the focus of this study. All magazines had a readership of over 11% and did not have a tobacco-advertising ban. Six magazines per year from the years 2003-2008 were randomly selected and reviewed in their entirety for tobacco ads (ST and cigarettes) by two reviewers. Characteristics of the ads, such as the size, presence of a logo, and message content, were coded by two reviewers. The message content was categorized the following way: 1) ST use for harm reduction; 2) ST use because of a smoking ban; 3) ST use because of cost; and 4) other (new product, taste, flavor of product, etc.). The ST ad per magazine rate did not vary much over time: each year the rate was 0.23 to 0.27 ads per magazine. During the same period, however, the cigarette ad rate decreased substantially, from 1.47 ads per magazine in 2003 to 0.23 ads per magazine in 2008. The majority of ST ads were for Copenhagen (39%) or Skoal (49%). The analysis of the characteristics of the ads and the content of the message is ongoing. Results will be available at the time of the SRNT meeting. The results suggest that while the rate of cigarette ads per issue decreased over time, there was no corresponding change in the ST ad per issue rate. The analysis of ad characteristics and message content will allow us to determine if messages related to harm reduction and ST use due to a smoking ban are increasing over time.

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PA4-3

SMOKERS' PERCEPTIONS OF ELECTRONIC CIGARETTE MARKETING

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BACKGROUND: Hundreds of manufacturers around the world are marketing electronic cigarettes (e-cigs) with claims that these products are safe and effective nicotine delivery devices. Despite their wide availability, limited scientific research has been conducted on smokers' perceptions of e-cig marketing and concerns have been expressed over the lack regulation of messages used in marketing.

METHODS: 180 adult cigarette smokers completed a web-based survey on knowledge, attitudes and perceptions of e-cig messaging. After viewing product images and a video advertisement from a major e-cig manufacturer (NJOY), participants were asked about (1) perception of product descriptors (e.g., appeal, interest); (2) expectations (sensory and nicotine effects); (3) beliefs (perceptions of risk, dependence, ease of quitting); and (4) future use intentions.

RESULTS: Only 31% of respondents reported an interest in trying e-cigs. Most respondents believed that e-cigs were less addictive (57%) and had lower health risks (66%), compared to their usual cigarette brand. However, only 38% of subjects reported that e-cigs would be as satisfying as their usual brand. Most subjects believed that e-cigarettes could be used in the home (77%), in a car (72%), in social situations (64%), and in bars/restaurants (58%), while a minority of respondents supported using the devices around children (44%). Less than a quarter of respondents (24%) felt that they could replace their usual brand with e-cigs, while 21% reported that they would use e-cigs concurrently with their usual brand. Only 14% believed that e-cigarettes could function as a cessation device.

CONCLUSIONS: Smokers report low risk perceptions of e-cigs. Marketing strategies have also been successful in promoting e-cigarette appeal among smokers, while

influencing a sizeable minority of smokers to report future use intensions. Regulation of e-cigarette marketing is needed to oversee health claims and limit promotion of dual use with cigarettes.

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PA4-4

STRATEGIES USED BY MULTINATIONAL TOBACCO COMPANIES IN EMERGING MARKETS: A CASE STUDY OF TARGETED MARKETING AND LEGISLATION INFLUENCE IN SPAIN

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Although the prevalence of smoking in Spain has decreased in recent years due to tobacco control efforts, it still remains high (35.3% for men and 24% for women). Multinational tobacco companies entered the Spanish market during the 1970s and 1980s, when Spain was particularly vulnerable, as it emerged from decades of fascism. A deeper investigation into the industry's approach to influence advertising regulations and target women and youth in Spain can provide useful lessons for other countries with emerging tobacco markets currently pursuing tobacco control. A keyword search of the University of California San Francisco's Legacy Tobacco Document's Library was conducted, followed by complementary searches on PubMed, newspaper, and other relevant websites. During the 1970s, multinational tobacco companies developed agricultural assistance and research programs to modify the characteristics of tobacco grown in Spain to help farmers shift to growing U.S. type blond tobacco. To inform marketing strategies, the industry closely monitored changing social movements, the status of tobacco control regulations, and smoker's attitudes. Tobacco companies identified Spain as having a tolerant society with a weak regulatory system. Industry surveys found that "light" cigarettes and American-type tobacco (perceived to be milder) were preferred by women and youth over the dark, Spanish type, and marketed these brands heavily to both groups. At the same time, through the establishment of voluntary self-regulation agreements and the creation of the AET (Asociación Española de Tabaco), the tobacco industry was successful in halting more stringent legislation in Spain for well over two decades. As stronger regulations succeeded during the 1990s, with pressures from the European Union, tobacco companies developed more innovative marketing techniques, such as expansion of sponsorship of sporting events and promoting an ineffective juvenile smoking prevention campaign. Spain can serve as a useful case study for tobacco control policy efforts in other countries currently experiencing similar economic and social development situations as those in Spain during the 1980s and 1990s.

National Cancer Institute.

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PA4-5

EFFECTS OF SECONDHAND SMOKE, ADVERTISING AND MARKET DOMINANCE ON TEENAGE SMOKING IN LOW- AND MIDDLE-INCOME COUNTRIES: MULTILEVEL ANALYSIS OF CROSS-SECTIONAL DATA

G. Emmanuel Guindon, University of Illinois at Chicago

Objective: To determine the relation between teenage smoking and exposure to and knowledge of secondhand smoke, exposure to advertising (tobacco billboard advertising and anti-smoking media advertising) and market dominance by international tobacco companies.

Methods: Pooled cross-sectional data from the Global Youth Tobacco Survey conducted in 86 low- and middle-income countries are used to conduct multilevel analyses that account for the nesting of students in schools and schools in countries. The outcome variables are smoking susceptibility, defined as the absence of a firm decision not to smoke, current smoking defined as 30-day smoking prevalence and a five-point scale of smoking uptake.

Results: Teens who are exposed to secondhand smoke at home and in places other than home and who are exposed to billboard tobacco advertising have higher odds of being susceptible to smoking, of being currently smoking and of being in a later stage of smoking uptake. Teens who have better knowledge of the harmful effects of secondhand smoke and who are exposed to anti smoking media advertising have lower odds of being susceptible to smoking, of being currently smoking and of being in a later stage of smoking uptake. Teens from countries where government-owned companies own their preferred brands have higher odds of being in a later stage of smoking uptake.

Conclusions: These findings suggest that restrictions on smoking at home, bans on smoking in public places and on tobacco advertising, anti-smoking media campaigns and incorporating information about secondhand smoke to information provision efforts such as media campaigns and health warnings may reduce teenage smoking.

Social Sciences and Humanities Research Council of Canada; Centre for Health Economics and Policy Analysis; Ontario Tobacco Research Unit.

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PAPER SESSION 5: MULTINATIONAL VIEWS OF TOBACCO TRENDS: DOES TOBACCO MAKE THE WORLD GO AROUND?

PA5-1

BEDOUIN SMOKING RATES AND RELATED HEALTH SERVICES UTILIZATION

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Background: The Bedouin, the southern part of Israel, consists of 180,000 residents, half of whom live in six townships. This is a population in urban transition. There are difficulties in pointing out trends in tobacco dependency and control in this population.

Objectives: To evaluate the prevalence of cigarette smoking and second hand smoking exposure among the Bedouin population of the Negev. To characterize smoking and non-smoking populations and to compare their health services utilization.

Methods: Parents visiting primary pediatric centers for a regular follow up visit, during the years 2000-2007, were interviewed using a structured questionnaire. Information about utilization of medical services of all family members living together was collected from the HMO database for the period of one year previous to the survey entrance interview.

Results: Reported smoking prevalence reached 52.5% (1133) of the Bedouins who participated in our survey. Of them, 94% (1065) were males and 48.5% (550) smoke more than 20 cigarettes per day. The average heavy smoker (at least 2 packs a day) have more children ($P<0.001$) and live in larger houses ($P<0.002$). No differences were found in other socioeconomic variables. Among smoking fathers, a trend of over utilization of medical diagnostic and intervention procedures, emergency-room referrals and hospitalizations was found as compared to non-smokers, though not statistically significant. Health utilization among the family members showed similar trends were noted though the differences were less pronounced.

Conclusion: Our results may indicate a unique national health concern whereby Israeli Bedouins is 2.5 times higher than the Israeli reported prevalence. It seems that smokers live in better socioeconomic conditions and many Bedouin children and mothers are exposed to second-hand smoke. Active and passive Bedouin smokers utilize more medical services. An efficient intervention is mandatory in this community.

No funding.

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PA5-2

UNASSISTED SMOKING CESSATION IN THE ONTARIO TOBACCO SURVEY

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Background/Objective: Population studies demonstrate that the majority of ex-smokers quit without any form of assistance. However, few studies have examined the characteristics of smokers who are able to quit unaided. The objective of this study was to compare the baseline characteristics of adult smokers in Ontario who quit with or without assistance.

Methods: Data on 235 smokers who had quit for at least 1 month with and without assistance were obtained from the baseline and six month follow-up of the Ontario Tobacco Survey (OTS). The OTS is a population-based representative sample of adult smokers (aged 18 years and older) recruited between July 2005 and June 2008 and followed up biannually for at least two years. Weighted frequencies were calculated

for baseline characteristics including: smoking behavior and history, attitudes and beliefs about smoking, number of prior quit attempts, quit intentions, and demographic characteristics. Differences were assessed using overall Chi-square tests for categorical variables and t-tests for continuous variables.

Results: At the first follow-up interview, 153 (64.1%) smokers had quit without assistance (unassisted quitters) and 82 (34.9%) smokers had quit with at least one pharmaceutical or non-pharmaceutical quit aid (assisted quitters) for at least 1 month. Unassisted quitters were significantly more likely to have been daily smokers ($p < 0.0001$), set a firm quit date ($p = 0.03$), believe it would be easy to quit ($p = 0.001$), feel they would benefit more from quitting ($p = 0.03$) and perceive themselves as less addicted ($p = 0.01$) and in better health ($p = 0.04$) at their baseline interview when compared with assisted quitters. In addition, unassisted quitters smoked significantly fewer cigarettes per day in the last 30 days compared to assisted quitters ($p < 0.0001$).

Conclusions: There were significant differences between smokers quitting with and without assistance in terms of smoking behavior as well as attitudes and beliefs about smoking. Studying smokers who are able to successfully quit unaided could reveal novel strategies to encourage unaided quit attempts.

The data used in this study is from the Ontario Tobacco Survey, an initiative of the Ontario Tobacco Research Unit, which receives funding from the Ontario Ministry of Health Promotion. Mrs. Edwards' work is also funded by the CIHR Training Grant in Population Intervention for Chronic Disease Prevention: A Pan-Canadian Program (Grant #: 53893).

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PA5-3

TRENDS IN SMOKING IN INDIA: NATIONALLY REPRESENTATIVE CROSS SECTIONAL SURVEYS FROM 1997-2006

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Smoking in India is estimated to be responsible for one million adult deaths in 2010; with a majority of these deaths occurring in men aged 30-69. Currently only about a third of Indian men, and few women smoke, but little is know if rates of smoking are increasing. We evaluate the temporal trend in male Indian smoking by age group, region, and rural/urban residence. We examine if there is a trend of switching from bidi to cigarette smoking, especially within the urban population. Respondent data from the 1999 and 2006 National Family Health Surveys were used to determine trends in smoking prevalence. Over the seven year period of the study, though smoking prevalence was found to be greater in rural India across all the age groups surveyed, it increases sharply from 13 to 25% among the young urban males, while for young rural males the increase was less evident. Data from the Global Youth Tobacco Survey (2003 and 2006) provide further evidence to the hypothesis with a higher prevalence of cigarette use as compared to bidis among school going youth in India. This paper also reveals a slight decrease in smoking prevalence among men aged 34 and above, indicating possible low cessation levels. The data will be compared with the forthcoming Global Adult Tobacco Survey results. The trends of higher uptake of smoking among youth (and possible shift to cigarettes) and minimal cessation among older men may well suggest that smoking deaths in India will increase in the future above the already high number of 1 million deaths.

Gates Foundation –India.

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PA5-4

YOUTH TOBACCO USE IN INDIA: INFLUENCE OF PRICES AND PEERS

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The tobacco epidemic has been rapidly spreading in many of the poorer nations of the world, including India. Though studies on youth smoking in countries like the U.S. are abundant, comparable research on Indian youth has been largely ignored due to lack of data at the national level. My work aims to bridge this disparity in tobacco research. For this study, I make use of a national survey among 73,356 youth aged 13-15 years in India to examine the price elasticity of demand among youth for three tobacco products, cigarettes, beedi, and gutka. The results from the models reaffirm that that higher prices can be an effective deterrent to youth tobacco use, irrespective of the form of tobacco. Among the products considered, beedis have the highest participation price elasticities (-2.70), followed by gutka (-0.58) and finally cigarettes (-0.40), which are the least price elastic. In line with emerging literature that includes several social interaction variables to explain youth smoking, I introduce peer effects into tobacco use decision-making among Indian youth. I find that both in the simple model, where peer effects are assumed to be exogenous, and the corrected model, these peer effects persist, mostly for beedis and gutka. My results suggest that, for beedis, moving a student from a school where no youth smoke beedis to one where half of the kids smoke could increase the probability that he/she smokes by 11.5 percentage points, while for gutka use the increase in probability is 6.5 percentage points. In my gender analysis I observe higher participation price elasticities for females for all products when compared to males. After incorporating the effect of peers, I see that for beedis and gutka, peer effects seem to be stronger (both in magnitude and statistical significance) for males as compared to females for beedis and gutka.

No Funding.

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PA5-5

TOBACCO USE IN CANADA: A REPORT ON PATTERNS AND TRENDS FROM 1999-2009 AND IMPLICATIONS FOR THE FUTURE

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After a decade of policy change and industry innovation, the tobacco control landscape in Canada has shifted. Understanding changes in the prevalence and patterns of tobacco use among Canadians over this period is critical to planning the next generation of tobacco control policies. This presentation will review key patterns and trends of tobacco use among Canadians from 1999-2009, highlighting implications for policy. Data were drawn from national population-level tobacco surveys, including 11 annual waves of the Canadian Tobacco Use Monitoring Survey, and 5 waves of the Youth Smoking Survey. Demographic patterns and time trends were examined for a number of measures of tobacco use and cessation, including prevalence, consumption, sources of tobacco, and quitting-related behaviours. Full results are available in an accompanying report. Among adults, although smoking prevalence declined substantially over the past decade (from over 25% in 1999 to just over 17% in 2009), this decline appears to have slowed in recent years. A number of socio-demographic and geographic patterns were observed. For example, male smoking rates continue to be higher than females, but the gender gap has narrowed over time. Canadians of lower socioeconomic status (SES) are far more likely to smoke; although tobacco use has declined at similar rates among all SES groups, these disparities have not been reduced over the past decade. In contrast to speculation about a "hardening" of smokers, daily consumption has actually fallen, while intentions to quit and quit attempts have increased. Trends in quitting and related behaviors and use of cessation assistance will also be reviewed. Among youth, 3.5% of students (grades 6-9) were current smokers in 2008-09, up slightly from 2006-07. Smoking rates varied substantially by province, age and sex. Ten percent of students had ever tried cigarillos. Only one in five youth smokers obtained cigarettes from a retail outlet, indicating the importance of alternative sources. Implications of these and other findings for current policy and practice will be discussed, including contraband, government legislation, and comprehensive cessation strategies.

Support for this presentation and accompanying report was provided by the Propel Centre for Population Health Impact at the University of Waterloo, and a CIHR New Investigator Award. The report uses public-use datasets collected and made available by Health Canada and Statistics Canada.

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PAPER SESSION 6: PROVIDER TRAINING AND PUBLIC HEALTH: HOW TO CHANGE BEHAVIOR

PA6-1

PREPARING NURSES TO INTERVENE IN THE TOBACCO EPIDEMIC: DEVELOPING A MODEL FOR LEADERSHIP AND CURRICULUM REDESIGN

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Introduction: A 2001 National survey of U.S. baccalaureate and graduate nursing programs revealed an absence of curricular content in tobacco-dependence treatment and prevention. Nurse educators' knowledge, beliefs, practices and perceptions about

teaching tobacco-dependence content and clinical skills are still unclear.

Methods: In 2007, the Loma Linda University School of Nursing participated in a University-wide initiative to enhance tobacco-dependence curricula. Concurrently, the faculty formed a task force to address student and community needs related to tobacco dependence. A 16-item survey revealed faculty (n=39) practices and perceptions about teaching tobacco-dependence curricula.

Results: With a 95% response rate, a majority (82%) indicated a need for faculty development in tobacco education. Findings provided data on the current curriculum, faculty practices, and gave direction for the task force to address faculty and curriculum development. The task force proceeded to: (1) Collaborate with other schools on campus, (2) Attend national tobacco-related meetings (SRNT), (3) Coordinate three tobacco-related workshops & one motivational interviewing seminar, (4) Share tobacco-related resources, (5) Meet with individual course coordinators, and 6) Provide frequent feedback to the faculty. The following curricular changes ensued (2008-2010): (1) New tobacco competencies and educational goals for the undergraduate program, (2) Recommendation for progression of tobacco-related content, (3) Curriculum review to identify gaps in tobacco-related content, (4) Increased didactic hours dedicated to tobacco (undergraduate=1 to 3) and (graduate=0 to 4), (5) Integration of tobacco-related content into specialty courses, and (6) Increased clinical skills training from 0 to 4 hours for undergraduate and nurse practitioner programs.

Conclusions: Successful implementation of evidence-based guidelines into nursing curricula requires empowerment of key faculty members. A model of system redesign principles to prepare nurses to be effective counselors for tobacco-users emerged. We shall re-administer the survey in 2011 to measure faculty practice and perception changes.

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PA6-2

EFFECTIVENESS OF THE WEB-BASED RESPIRATORY EDUCATION ABOUT TOBACCO AND HEALTH (WEBREATHE) PROGRAM

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Introduction: Childhood exposure to Environmental Tobacco Smoke (ETS) can result in an increased incidence of respiratory diseases, respiratory irritation, ear infections, and symptoms of asthma, and reduced lung function. Children's hospitals are a major source of outpatient care. Given the high correlation between ETS exposure and respiratory illnesses, hospital-based respiratory therapists (RTs) and nurses (RNs) are in a position to motivate and assist smokers to quit, and the hospital visit provides a unique opportunity to bring up the issue of tobacco and its detrimental effect on the smoker's child.

Objectives: The purpose of this study was to develop and evaluate a web-based tobacco cessation-training program (Web-Based Respiratory Education About Tobacco and Health: WeBREATHe) for pediatric RTs and RNs.

Methods: The WeBREATHe program was developed to include didactic information, streaming video role models, interactive activities, practitioner and patient resources, and an exam for obtaining continuing education units. 217 RTs and RNs from two large children's hospitals were randomly assigned to either the training (TC) or wait-list control (WC) condition. TC participants completed the 3-hour, online WeBREATHe program over the course of 1 week. Participants' tobacco cessation behaviors, attitudes and perceived barriers were assessed at baseline, 1-week and 3-months post-training. Consumer satisfaction was also assessed for TC participants at 1-week follow-up.

Results: TC participants reported significantly higher cessation-related behaviors, more positive attitudes and lower perceived barriers towards providing cessation assistance than their WC counterparts at both 1-week and 3-months post-enrollment. Engagement with the program was positively associated with these changes. In addition, TC participants rated the program highly on all measures of consumer satisfaction.

Conclusions: The WeBREATHe program was well received and effective at teaching pediatric RTs and RNs to help their patients' parents to quit smoking.

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PA6-3

NATIONAL TRAINING FOR A NATIONAL STOP SMOKING SERVICE: AN ENGLISH CASE STUDY

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England has a national smoking cessation service, which is in reality a collection of local stop smoking services. There is an absence of minimum standards for entry training for the 5,000 plus stop smoking practitioners. This, and the differing levels of financial support given locally to stop smoking services, means that the quality of behavioural support offered to smokers, and thus quit rates, is varied. The NHS Centre for Smoking Cessation and Training (NCSCT) is a consortium led by University College London, which is funded by the Department of Health until March 2012. The purpose of the NCSCT is to help NHS (National Health Service) Stop Smoking Services in England to deliver high quality behavioural support by providing assessment, certification, training and continuing professional development for stop smoking practitioners. The training and assessments developed by the NCSCT are based on research into what competences (skills and knowledge) are required by stop smoking practitioners. This research has identified a set of 'behaviour change techniques' (BCTs) that are used when providing behavioural support and has established which of these has the strongest evidence. This has been supplemented by a systematic analysis of guidance documents on competences required for the role of stop smoking practitioners. This presentation will outline the methodology used for identifying the evidence-based behaviour change techniques for individual smoking cessation interventions. This presentation will also discuss evaluations of the effectiveness of the NCSCT online knowledge-based training and assessment programme, face-to-face skills-based training courses and online skills assessment based around these core competences.

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PA6-4

THE EFFECTIVENESS OF THE CALIFORNIA TOBACCO CONTROL PROGRAM: MAJOR REDUCTIONS IN SMOKING BEHAVIORS AND LUNG CANCER RATES OVER THE PAST 40 YEARS

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Background: Declining lung cancer rates in California have been attributed to the California Tobacco Control Program, but may reflect earlier declines in smoking.

Methods: Using state-taxed sales and 3 survey series, we assessed trends in smoking behavior for California and the rest of the nation from 1960-2008 and compared these with lung cancer mortality rates. We tested the validity of recent trends in state-taxed sales by projecting results from a model of the 1960-2002 data.

Results: From 1960 to 2002, the state-taxed sales and survey data are consistent. Californians initially smoked more than the rest of the nation, but cigarette consumption declined earlier, dropping lower in 1971 with an ever-widening gap over time. Lung cancer mortality follows a similar pattern, after a lag of 16 years. Introduction of the California Tobacco Control Program doubled the rate of decline in cigarette consumption. From 2002-2008, differences in enforcement and tax evasion may compromise the validity of the taxed sales data. In 2010, smoking prevalence is estimated to be 9.3% in California and 17.8% in the rest of the nation. However, in 2008, for the first time, both cigarette price and tobacco control expenditures were lower in California than the rest of the nation, suggesting that the gap in smoking behavior will start to narrow. Using a birth cohort analysis, we demonstrate that the California effect was achieved by changes in all three of the smoking behaviors: smoking initiation, smoking cessation and consumption level among continuing smokers.

Conclusion: The California Tobacco Control Program was effective in changing all levels of smoking behavior so that both prevalence and consumption are now half the level of the rest of the country. Given the correlation between these difference in smoking behavior and lung cancer rates over the past 20 years, we predict that California will have much faster declines in lung cancer than the rest of the nation for the next 16 years, but possibly not beyond.

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PA6-5

CAN-ADAPTT: A CANADIAN SMOKING CESSATION GUIDELINE

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Project overview: Despite the existence of international clinical practice guidelines for smoking cessation, there remain barriers to implementation of these guidelines in practice across Canada. CAN-ADAPTT aims to overcome these barriers with a unique approach to guideline development. CAN-ADAPTT's guideline is based on a compilation of existing, high quality guidelines, adapted to the Canadian context through feedback from practitioners and input from a practice-based research network (PBRN). Strategies used to engage practitioners, researchers and policy makers in this process involved collaboration through workshops, stakeholder meetings, an online discussion board and an interactive wiki platform. The guideline brings together both clinical and population level approaches to smoking cessation in Canada.

Discussion: Summary statements and clinical considerations will be reviewed and discussed. The opportunities and challenges encountered throughout this unique process will be explored.

Funding for CAN-ADAPTT has been made possible through a financial contribution from the Drugs and Tobacco Initiatives Programs, Health Canada.

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PAPER SESSION 7: TAXES AND SMOKE-FREE POLICY: HOW RULES CAN CHANGE THE WORLD

PA7-1

CIGARETTE EXCISE TAX INFLUENCES SMOKING BEHAVIOR: A CROSS-SECTIONAL ANALYSIS

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Taxation is a regulatory environmental change that has been shown to decrease tobacco use. Excise state tax revenues collected from cigarette packs widely varies nationally. We examined the effect of excise tax revenues (as a percent of retail price) on cigarette consumption behavior in 50 states and D.C. Data from 2005-2009 were obtained from the STATE System to describe the average federal and state tax for cigarette packages (percent of the retail price: <25; 25-35; >35), smoking behavior (prevalence of current smoking), and quit attempts (abstinence from smoking > 6 months). Multivariate regression analyses were conducted to analyze the relationship between the tax rate and these smoking behaviors. The results show that the average price per pack increased from $4.04 in 2005 to $4.55 in 2008, and jumped to $5.53 in 2009. Quit attempts increased gradually from 49% in 2005 to 57% in 2009, while smoking prevalence decreased from 21% to 18%. Excise tax revenues fluctuated between 30% and 33% during 2005 to 2008, and to 40% in 2009. States that were most active in collecting higher excise tax (>35%) had higher quit attempts and lower smoking prevalence than states with lower excise tax rates. We found that a 10% increase in tax rate lead to 1.85% ($p<0.01$) increase in quit attempts and 3.36% decrease in smoking prevalence. This study provides rationale for continued support for excise taxes revenues and demonstrates that increasing the price of cigarettes through excise tax is an effective means for tobacco control.

Work was supported by the internal funds of the U.S. Centers for Disease Control and Prevention.

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PA7-2

DO YOUTH ACCESS LAWS FOR TOBACCO INFLUENCE SMOKING HABITS IN ADULTHOOD?

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The 1992 Synar amendment incentivized US states to adopt policies that restricted youth access to tobacco. Evaluations of these policies have not yielded consistent results, leading some to question their cost-benefit ratio. Yet if adolescence is a period in which smoking habits are formed, youth-access laws may influence later life smoking patterns by reducing the quantity and frequency of smoking in adolescence. To our knowledge, the relation between the adolescent policy environment and subsequent adult smoking behaviors has not yet been examined. We analyzed young-adult smoking data from the Current Population Survey Tobacco Use Supplement, 1998 through 2006-07 administrations. Subjects (N=54,427) were young adults, aged 21 to 30 at time of survey, and born between 1976 and 1985. Smoking outcomes included having smoked 100 cigarettes across the lifespan ("initiation"), not smoking in the past year among initiated lifetime smokers ("cessation"), and smoking fewer than 10 cigarettes a day ("light smoking") among current smokers. Policy-exposure was imputed based on laws in place in subjects' state-of-residence at age 15. Multinomial logistic regression analyses included state, birth year and survey wave as categorical covariates, in addition to other demographics. Results: Minimum legal age for tobacco purchase predicted reduced initiation, but only among males. Vending machine regulations and restrictions on promotional free distribution of cigarettes predicted a higher rate of cessation among smokers (N=21,730), while minimum purchase age predicted a higher rate of cessation among male smokers only. Vending machine regulations also predicted light smoking among current smokers (N=15,463). On the other hand, a number of policies had no significant effects on any outcome. Conclusion: Some youth access policies exhibit substantial effects on reduced smoking or cessation among young adult smokers. These results provide evidence that a subset of youth access restrictions may be important for long-term harm reduction. Small effects for other youth access policies cannot be ruled out.

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PA7-3

THE EFFECT OF A CAMPUS-WIDE SMOKE-FREE AIR POLICY – 2-YEAR LONGITUDINAL STUDY

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Purpose: This study was conducted to investigate the effect of a campus-wide smoke-free air policy on college students' tobacco use attitudes and behaviors.

Methods: A pre- and post-control group design, with a nested longitudinal cohort, was used. A total of 3266 students from two large Midwestern universities were surveyed in Fall 2007 (t1) before one of the two universities implemented a campus-wide smoke-free air policy, including outdoor areas, in January 2008. In Fall 2009, a total of 3207 students from the two universities were recruited and surveyed using the same method as in the baseline survey. Changes between the two periods were analyzed using SAS 9.2. The longitudinal panel sample was recruited from volunteers who participated in the baseline cross-sectional survey. Those volunteers were sent an e-mail inviting them to participate in an online version of the cross-sectional survey in Fall 2008 (t2), Spring 2009 (t3), and Fall 2009 (t4), yielding four waves of longitudinal data. The HLM 6.08 program was used to analyze change trajectories of variables of interest using full maximum likelihood estimation.

Results: The proportion of current cigarette smokers significantly decreased from 16.5% at t1 to 12.8% at t4 for the intervention campus, whereas it did not change for the control campus in the cross-sectional comparisons. A similar finding was observed in the longitudinal panel comparisons where it decreased from 14.7% at t1 to 11.4% at t4 for the intervention campus, while no change was observed in the control campus. Parallel changes were observed in the average amount of cigarettes smoked per day, perceived peer smoking, smoking norms, attitudes toward regulation of smoking, quit attempts during the past 6 months among smokers, and perceived visibility of messages about smoking restrictions on campus, dangers of smoking, and ways to quit smoking.

Conclusions: Substantially favorable and meaningful changes occurred to college students' tobacco use attitudes and behaviors as a result of the implementation of a campus-wide smoke-free air policy.

This study was conducted while the first author was at Indiana University. Supported by RTI International grant # 5-312-0210172.

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PA7-4

THE EFFECTIVENESS OF TAX AND PRICE POLICIES FOR TOBACCO CONTROL: IARC CANCER PREVENTION HANDBOOK 14

Frank J. Chaloupka*, University of Illinois at Chicago, on behalf of the Handbook 14 Working Group

Article 6 of the WHO Framework Convention on Tobacco Control calls for Parties to use tax and price policies on tobacco products to decrease tobacco use. In May 2010 experts from 12 countries (the Working Group) met at The International Agency

for Research on Cancer (IARC) in Lyon, France to develop Volume 14 of the IARC Handbooks of Cancer Prevention series on the evidence for the effectiveness of tax and price policies in tobacco control, to be published in summer 2011. Draft papers presenting and assessing the evidence on the following topics were developed by the experts in an eight months period prior to the meeting: overview of tobacco taxation; tobacco industry pricing strategies and tax related lobbying; tax, price and aggregate demand for tobacco; tax, price and adult tobacco use; tax, price and tobacco use among young people; tax, price and tobacco use among the poor; tax avoidance and tax evasion; and the economic, and health impact of tobacco taxation. Subsequently, papers were peer-reviewed, revised and re-submitted for final discussion at the meeting in Lyon where a consensus evaluation of 18 concluding statements using the pre-established criteria of the IARC Cancer Prevention Handbooks took place. Studies published (or in press) in the openly available scientific literature were the main source of evidence for the review and evaluation; other publications were included when appropriate. For 12 of the 18 conclusions, the experts agreed that there was sufficient evidence of effectiveness of increased tobacco excise taxes and prices in reducing overall tobacco consumption and prevalence of tobacco use and improvement of public health, including by preventing initiation and uptake among young people, promoting cessation among current users, and lowering consumption among those who continue to use. For the remaining concluding statements the evidence was strong (4) or limited (2). The evidence presented and assessed in IARC Handbook volume 14 documents to the scientific community, policymakers, and governing bodies the effectiveness of tax and price policies in the control of tobacco use and improvement of public health.

IARC Handbook Volume 14 is funded by the European Commission Seventh Framework Programme through a comprehensive grant proposal that also encompasses original research on price and tax policies for better control of tobacco in Europe (PPACTE)(EC FP7 Grant Agreement HEALTH-F2-2009-223323).

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PA7-5

EFFECTS OF A COMPREHENSIVE STATEWIDE SMOKE-FREE LAW ON ENVIRONMENTAL AND BEHAVIORAL OUTCOMES

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Background: Enacting smoke-free laws have become a focus of comprehensive tobacco control across the United States. The goal of this study is to evaluate the effects of Minnesota's statewide smoke-free law on environmental and behavioral outcomes among young adults one year after the law went into effect (October 1, 2007).

Methods: Telephone surveys were conducted before and after Minnesota's statewide smoke-free law went into effect (6-12 months prior, 0-6 months prior, 0-6 months post, and 6-12 months post). Participants included young adults from a population-based cohort in Minnesota (n=1,446) and from four other upper Midwest states that serve as a comparison (n=238; North Dakota, South Dakota, Kansas, and Michigan). Chi-square analyses and generalized linear mixed-effects models were used to assess the relationship between the statewide smoke-free law and outcomes one year later.

Results: Young adults in Minnesota reported it was more difficult to find a place to smoke (compared to six months ago), it was harder to find a place to smoke specifically in restaurants and bars, and that smoking should be ban in restaurants and bars. No differences were observed between the Minnesota and comparison youth on smoking behavior. However, after the law went into effect, a greater proportion of Minnesota participants (compared to those in the comparison group), reported that restrictions in bars/restaurants was a reason why they most recently tried to quit smoking.

Conclusions: Significant differences were observed between the Minnesota and comparison participants within the first year of Minnesota's statewide smoke-free law. Changes in environmental outcomes may be an initial step in reduced smoking. In addition, after the law went into effect, a greater proportion of youth in Minnesota attribute quit attempts to smoking restrictions. A longer follow-up period may be needed to observe differences in smoking behavior.

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PAPER SESSION 8: MOTIVATION TO QUIT: TREATMENTS TO TARGET MOTIVATION OR INCREASE ACCESS TO CESSATION TREATMENT

PA8-1

INTEGRATION OF SMOKING CESSATION INTO HOMECARE SERVICES FOR OLDER ADULTS

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Background: Over 7 million adults receive homecare in the United States due to chronic medical conditions (often tobacco-related) or functional/cognitive decline. Smoking is not routinely addressed in the homecare system due to unclear training requirements, time constraints, and competing priorities. This project assessed the utility and feasibility of integrating smoking cessation services within the homecare delivery system in order to mitigate barriers to access and utilization experienced by seniors receiving these services.

Methods: A systems-level approach to integrating smoking cessation services in a homecare service agency in NYC was used. Key-informant interviews were used to determine points of intervention, assess provider scope of practice, policies, challenges and available resources. Focus groups were used to assess Home Health Aides' (HHA) and nurses' tobacco-related knowledge, practices and training needs. Data were used to develop provider-specific interventions- HHA(s) were trained to assess and report tobacco use; nurses were trained to document and deliver smoking cessation services using Motivational Interviewing techniques. Data systems were modified to include smoking cessation service delivery using a Stages of Change framework. Process evaluation was used to assess feasibility and utility of this method.

Results: 100 HHA(s) and 23 nurses received smoking cessation training. HHA(s) indicated inadequate knowledge about tobacco; nurses indicated lack of self-efficacy and skills in addressing the issue with their clients. Preliminary data indicate the training and materials were well received by HHA(s) and nurses, and that the information was appropriate for their practices, but documentation systems were not unanimously appreciated. Post-intervention data indicate that approximately 5% of clients are smokers.

Implications: Addressing tobacco control in the homecare system is an important but overlooked intervention. Integration of smoking cessation services within the homecare system requires a systematic approach to needs assessment, and systems changes are feasible if both provider and administrative needs are met.

This study was conducted at Columbia University, College of Dental Medicine, New York, NY. Supported by the American Legacy Foundation and Columbia University, College of Dental Medicine.

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PA8-2

EFFECTIVENESS OF A DIRECT-TO-SMOKER OUTREACH INTERVENTION OFFERING FREE TREATMENT TO THE POPULATION OF SMOKERS IN A HEALTH CARE SETTING

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BACKGROUND: The health care system is a key channel for delivering treatment to smokers. Brief interventions are effective but clinicians do not reliably offer them. We hypothesized that tobacco treatment use and quit rates could be increased in a health care system by offering treatment directly to all smokers separate from office visits. We tested the feasibility and effectiveness of a population-based direct-to-smoker (DTS) outreach program offering free tobacco treatment to smokers in a health care system.

METHODS: A randomized controlled trial of 590 smokers at 1 community health center compared usual care (n=177) to usual care plus DTS outreach (n=413). The DTS group was sent 3 monthly letters offering free phone consultation with a tobacco coordinator who offered fax-referral to the state quitline and up to 8 weeks of free nicotine patches (NRT). Outcomes, assessed at 3-month follow-up, were the percent of smokers who used any tobacco treatment (counseling or meds), used NRT, used counseling, and self-reported 7-day and 30-day point prevalence tobacco abstinence.

RESULTS: 43 (10.4%) of 413 smokers in the DTS group accepted the treatment offer; 42 (98%) requested NRT and 30 (70%) were referred to counseling. At 3-month

follow-up, in an intention-to-treat analysis adjusted by logistic regression for age, sex, and race, a higher proportion of the DTS group, compared to controls, had used NRT (11.6% vs. 3.9%, OR 3.34;95% CI 1.47-7.57, p=.004), used any tobacco treatment (13.8% vs. 7.3%, OR 1.99,95% CI 1.05-3.75, p=.035), and reported tobacco abstinence for the past 7 days (5.3% vs. 1.1%, OR 5.21,95% CI 1.21-22.7, p=.027) and past 30 days (4.1% vs. 0.6%, OR 8.2,95% CI 1.08-62.5, p=.042). The treatment offer did not increase use of counseling (1.1% vs. 1.7%, p=NS) or non-NRT medication use (3.6% vs. 3.9%, p=NS). Estimated marginal cost per 7-day quit at 3 months was $634.

CONCLUSION: In a real-world effectiveness study, population-based direct-to-smoker outreach offering free tobacco treatment to smokers in a health system is a feasible cost-effective way to increase the reach of treatment (primarily pharmacotherapy) and short-term quit rates in the population.

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PA8-3

DEVELOPMENT OF TARGETED MESSAGES TO PROMOTE SMOKING CESSATION AMONG CONSTRUCTION TRADE WORKERS

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Blue-collar workers, particularly in the construction trades, are more likely to smoke, smoke more heavily, and have less success in quitting compared to white-collar workers. Despite this, little is understood about health communication strategies best suited for this priority population. We sought to understand the individual attitudes and workplace culture of construction trade workers to develop targeted smoking cessation messages. After analyzing 124 questionnaires and focus group data from 32 union carpenters, we designed messages to target three broad groups of workers: carpenters who want to quit smoking; carpenters who were unaware of the union-sponsored smoking cessation program; carpenters who worry about their children smoking. We incorporated additional characteristics (e.g., gender, age, brotherhood, pride in work) into the messages to make them meaningful to this population. We tested 12 different smoking cessation messages with 40 carpenters who currently smoke. Messages were ordered randomly for each participant. We asked them to rate on a 10-point scale how convincing each message was and how much each message made them think of their own life (self-referential thinking). We also asked them to indicate which message was their favorite. Over 50% of current smokers chose the "Your kids do what you do" themed message as their favorite. This was also the message that was rated highest on being convincing (mean=7.72) and self-referential thinking (mean=7.18). The second favorite message reported by 17.5% of workers was "Double Trouble," which explained the combined effects of smoking and workplace respiratory hazards (convincing mean=7.40, self-referential thinking mean=6.88). Younger workers (< 30 years old) without children were less convinced and thought less of their own lives when reading the "Your kids do what you do" message; however, 57% of younger workers and 35% of those without children still chose this at their favorite. This study is an important step to understanding the cultural beliefs and attitudes and in crafting targeted messages that may facilitate smoking cessation in this high-risk group.

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PA8-4

SOCIALIZATION INFLUENCES RESPONSE TO MOTIVATIONAL ENHANCEMENT FOR SMOKING CESSATION AMONG HIV+ SMOKERS

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Antisocial characteristics have been associated with an increased propensity for substance use and dependence, as well as poorer treatment outcomes. Little is known about how such characteristics might influence smoking cessation. In a previous study among smokers living with HIV/AIDS (SLWHA), we found that motivationally enhanced (ME) behavioral treatment was not superior to standard care (SC). We sought to examine whether degree of socialization differentially influenced response to treatment. SLWHA were referred by their physicians for participation in a randomized controlled smoking cessation trial. Participants smoked 5 or more cigarettes per day and could not have contraindications to using the nicotine patch. Participants were randomized to receive either a brief two-session intervention modeled on PHS guidelines, or a more intensive four-session motivational counseling intervention. Participants in both conditions were provided 8 weeks of nicotine patches. Socialization was measured at baseline via the California Psychological Inventory Socialization (CPI-So) scale. 599 participants were screened, 444 randomized: 212 to the ME group and 232 to the SC group. 72% completed the 6-month follow-up visit. 63% were male, 52% white, 16% Hispanic, 18% black. Six-month quit rate by ITT analysis was 9% overall (9% ME, 10% SC, p=0.76). Across groups, CPI-So was associated with increased likelihood of quitting (p<.01). The CPI-So score was associated with increased probability of quitting in the ME group [odds ratio (OR) for quit vs. smoking = 1.09; 95% confidence limits (CL) = 1.03-1.16, p=.002, per unit CPI-So increase], but not in the SC condition [OR = 1.02; CL = .96-1.08, ns]. The CPI-So effect in the ME condition remained significant after adjusting for the effects of gender, age, and nicotine dependence. SLWHA who were more socialized, as reflected in higher CPI-So scores, were more apt to respond to a motivational intervention. Clinicians should consider individual patient differences when selecting behavioral treatment approaches for smoking cessation.

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PA8-5

TRAIT IMPULSIVITY MODERATES RELATIONS BETWEEN CUE-INDUCED CIGARETTE CRAVING AND PREVIOUS CESSATION FAILURES

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Situational factors, such as exposure to smoking cues in the environment (e.g., the sight of a cigarette) have long been recognized as important triggers for cigarette cravings in smokers. Although these cue-induced cravings have been reliably modeled in the laboratory, research on their relationship to cessation failure has yielded mixed results. One possible explanation for these equivocal findings is that their effects are modified by other psychological factors. Impulsivity, a multifaceted construct characterized by impairments in behavioral inhibition, decision-making, and attention, has been shown to be an important predictor of drug use during episodes of craving. The possibility that trait impulsivity could interact with cue-induced craving to predict cessation has not been examined. In this study, we tested the possibility that the relationship between cue-induced cravings and smoking cessation failure would be more pronounced among smokers with high levels of trait impulsivity. Nicotine-dependent smokers (N=155, Mean age=37.8, 37% African American, 26% Caucasian, 28% Hispanic, 17 cigarettes/day, FTND=5.3) were exposed to smoking cues (an unlit cigarette) and neutral cues (a stapler), and reported their cravings (0-100) immediately before and after each exposure. They also completed the Impulsive Sensation Seeking Scale (ISS) from the Zuckerman-Kuhlman Personality Questionnaire and retrospectively reported on their two most recent quit attempts. Consistent with the hypothesis, findings revealed a significant interaction (p<0.05) between smoking cue-induced craving and ISS scores predicting the duration of prior quit attempts. Stronger cue induced-craving was related to shorter previous quit attempts among smokers with higher levels (median split) of impulsivity (b=-2.2, p<0.01), but not among smokers with lower levels of impulsivity (b=0.7, p<0.69). No effects were observed for the neutral cue. Interactions between situational (e.g., environment) and dispositional (e.g., personality) factors should be taken into account when trying to better understand the complex interplay among predictors of smoking cessation failure.

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PAPER SESSION 9: SMOKERS WITH PSYCHIATRIC COMORBIDITY

PA9-1

CHARACTERIZATION OF 72-H CIGARETTE ABSTINENCE EFFECTS IN SMOKERS WITH SCHIZOPHRENIA

Jennifer Tidey* and Suzanne Colby

Current smoking treatments have low effectiveness in smokers with schizophrenia or schizoaffective disorder (SWS) and little is known about factors that affect relapse in these patients. One factor that may contribute to their early relapse is that SWS may experience stronger and more sustained effects of smoking abstinence than heavy smokers without psychiatric illness (CON). In this project, we provide high-value monetary incentives contingent on low breath CO levels in order to compare the effects of

continuous 72-hr cigarette ` in SWS and CON. At a non-abstinent baseline session, participants provide breath CO levels, complete the Questionnaire on Smoking Urges-brief (QSU-brief; Cox et al., 2001) and Minnesota Nicotine Withdrawal Scale (MNWS; Hughes & Hatsukami, 1986). From that point until 72-hrs later, participants are asked to remain continuously abstinent from smoking and return to the laboratory twice daily to provide breath CO samples and complete the QSU and MNWS. In SWS, psychiatric symptoms are also assessed, using the Brief Psychiatric Rating Scale (BPRS; Overall & Gorham, 1962) at baseline and after 72-h abstinence. Preliminary results from 10 SWS and 15 CON indicate that the groups are matched on age (M = 44 yrs), gender (56% male) and number of cigarettes smoked per day (M = 21.8). Breath CO levels average 39 ppm at baseline, 18 ppm after 5-h abstinence and ≤ 4 ppm at each session thereafter, indicating the effectiveness of the abstinence-contingent incentives. QSU and MNWS scores significantly increase in both groups during abstinence (p's < .001). Group x Time ANOVAs indicate that abstinence increases QSU Factor 2 scores and MNWS Depression item scores more in SWS than in CON (p's < .05 for the interactions). Psychiatric symptoms remained stable in SWS, with only anergia tending to increase over time (p = .07). These preliminary results indicate that withdrawal-related depressed affect and urge to smoke to relieve negative affect may contribute to early smoking relapse in SWS.

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PA9-2

HEALTHCARE UTILIZATION AND DISABILITY AMONG SMOKING AND NONSMOKING ADULTS WITH SERIOUS PSYCHOLOGICAL DISTRESS

Hai-Yen Sung, Ph.D.*[1], Judith J. Prochaska, Ph.D., M.P.H.[1], Wendy Max, Ph.D.[1], Yanling Shi, M.S.[1], and Michael Ong, M.D., Ph.D.[2], [1]University of California at San Francisco; [2]University of California at Los Angeles

INTRODUCTION: Persons with mental illness have among the highest smoking rates in the US with associated increases in morbidity and mortality. This study examined the impact of smoking on healthcare utilization and disability among persons with serious psychological distress (SPD).

METHODS: Using data from the 2007 California Health Interview Survey, we compared prescription medication use, mental health provider visits, general medical doctor visits, and number of disability days by smoking status among adults with SPD in the past year, defined as a score of 13 or greater on the Kessler K6 scale.

RESULTS: In 2007, 2.3 million California adults screened positive for SPD in the past year. Among them, 28.5% were current smokers and 20.0% were former smokers. Compared to never smokers, ever smokers were more likely to take prescription medications for mental health problems in the past year (32%, 42%, and 51% for never, current, and former smokers, respectively), had more health provider or other professional visits for mental health problems in the past year (4.6, 9.6, and 9.1 visits, respectively), had more general medical doctor visits in the past year (7.3, 8.2, and 11.8 visits, respectively), and experienced more disability days (unable to work or carry out normal activities) because of mental problems in the past year (49.1, 80.5, and 89.4 days, respectively). After controlling for confounding factors, the differences between current and never smokers, and also between former and never smokers remained significant for the mental health outcome variables but not for general medical doctor visits.

DISCUSSION: Among persons with SPD, smoking is associated with significantly greater mental healthcare utilization and disability days. Former smokers' elevated healthcare utilization and disability days likely reflect the previously documented finding that people often quit smoking once they become very ill. Our findings underscore the importance of identifying public health policies to prevent and treat tobacco dependence among this vulnerable group.

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PA9-3

SMOKING REINFORCEMENT IN ADULTS WITH AND WITHOUT ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)

Scott H. Kollins*, F. Joseph McClernon, Joseph S. English, Benjamin O'Brien, Michelle Roley, and Matt Hallyburton, Duke University Medical Center

Individuals with Attention-Deficit Hyperactivity Disorder (ADHD) smoke at higher rates than the general population, though the reasons for these elevated rates are not well understood. The purpose of this study was to evaluate whether the relative reinforcing effects of cigarette puffs were greater in smokers with ADHD compared to those without ADHD. Smoking reinforcement was assessed in 25 adult smokers (14 with ADHD, 11 controls) using a progressive ratio (PR) schedule wherein the opportunity to smoke standardized puffs of a cigarette was available following a progressively greater number of button presses. A fixed amount of cash ($0.50) was available under a concurrently operating schedule. Two sessions were conducted – one following 24-hour biochemically verified abstinence, and one following smoking as usual. A 2 (Condition: abstinent, satiated) x 2 (Group: ADHD, Control) x 2 (Sex: male, female) mixed model ANOVA was used to analyze the data. There was a significant main effect of Condition ($p<0.0001$) in that smokers in both groups worked more for puffs in the abstinent condition. There was no main effect of Group or Group x Condition interaction for completed ratios for puffs. There was also a main effect of Condition ($p < 0.001$) on total number of ratios completed for both puffs and cash in that more ratios were completed in the abstinence condition. Moreover, there was a trend toward a Group x Condition interaction ($p = 0.06$) in that smokers with ADHD completed more total ratios during the abstinent condition. Contrary to our initial hypotheses, these results suggest that smoking reinforcement is not greater in magnitude for smokers with ADHD compared to non-ADHD smokers during either satiated or abstinent conditions. Task characteristics may have influenced overall responding, as indicated by a general increase in behavioral output during abstinent conditions, an effect that was more pronounced in the ADHD group. To our knowledge, this is the first study to directly compare the effects of smoking abstinence on smoking reinforcement between groups of smokers defined on the basis of psychiatric comorbidity.

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PA9-4

AN ONLINE SURVEY OF TOBACCO USE, INTENTIONS TO QUIT, AND CESSATION STRATEGIES AMONG SMOKERS WITH BIPOLAR DISORDER

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Epidemiologic studies estimate 70% of individuals diagnosed with bipolar disorder smoke cigarettes, yet little is known about their intentions to quit and cessation experiences. This online survey examined tobacco use, quit attempts, and tobacco-related attitudes and intentions among 685 individuals diagnosed with bipolar disorder who smoked at least 100 cigarettes in their lifetime. Data were collected between Nov 2007 and Mar 2008 via a link from the Depression and Bipolar Support Alliance website, the nation's leading mood disorder peer support network. The sample was largely female (67%), aged 26 to 50 (67%), and Caucasian (89%). Less than half (45%) had a college degree, 42% reported household income < $25,000/year, and 58% were presently limited by their mental health symptoms. The sample began smoking at a mean age of 17 years (SD=6) and smoked a median of 7 years prior to being diagnosed with bipolar disorder. Most respondents (87%) were current smokers. Most current smokers smoked daily (92%) and averaged 19 cigarettes/day (SD=11); 44% reported smoking to treat their mental illness and 79% believed excellent mental health was necessary to successfully quit. Of current smokers, less than a third reported that a psychiatrist (32%), therapist (23%), or case manager (8%) had advised them to quit smoking. Nevertheless, most expressed a desire to quit (74%); had tried to quit in the past year (65%); and currently planned to quit smoking (67%). Ex-smokers (13% of sample) had quit a median of 2.7 years; 45% quit "cold turkey"; 23% used nicotine replacement. Most ex-smokers (64%) rated their mental health as poor or fair at the time they quit smoking. At the time of the survey, however, ex-smokers were more likely to describe their mental health as in recovery than current smokers (57% vs. 40%, p=.011). Smokers with co-occurring disorders face special challenges when trying to quit smoking. Few mental health providers meet clinical practice guidelines addressing tobacco use. The high response rate to this online survey shows that the internet may be a particularly useful channel for recruiting consumers with bipolar disorder into tobacco cessation treatments.

Study supported by the UCSF Smoking Cessation Leadership Center (#4722sc) with support from the Legacy Foundation (A111933) and the Robert Wood Johnson Foundation (prime grant #047139).

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PA9-5

EFFICACY OF SEQUENTIAL USE OF FLUOXETINE FOR SMOKING CESSATION IN ELEVATED DEPRESSIVE SYMPTOM SMOKERS

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Fluoxetine, a selective serotonin reuptake inhibitor (SSRI), was examined in the treatment of smokers with elevated depressive symptoms. Specifically, this randomized, open label clinical trial was designed to evaluate the efficacy of three logical, real-world alternatives for providing smoking cessation treatment to smokers with elevated depressive symptoms, but not meeting diagnostic criteria for major depressive disorder (MDD). In a sample of 216 smokers (mean CES-D = 11.41), participants were randomly assigned to either: 1) brief standard behavioral smoking cessation treatment with transdermal nicotine patch (ST), 2) concurrent antidepressant pharmacotherapy with fluoxetine (20 mg.) + ST (CON/ST), or 3) sequential antidepressant pharmacotherapy with fluoxetine (20 mg.) + ST (SEQ/ST) wherein fluoxetine was started 8 weeks prior to and extended throughout ST. Findings indicate that sequential fluoxetine treatment resulted in significantly higher point prevalence abstinence than concurrent fluoxetine treatment at 12-month follow-up (31.2% vs. 22.7%, odds ratio=1.65, 95% CI=1.07-2.54, $p < .024$). Furthermore, sequential fluoxetine treatment, as compared to concurrent fluoxetine treatment, resulted in significantly lower levels of depressive symptoms throughout smoking cessation treatment ($p < .025$) and significantly lower nicotine withdrawal-related negative affect ($p < .004$) and urges to smoke ($p < .012$) immediately after quitting. Analyses examining whether these reductions served to mediate the relationship between sequential fluoxetine treatment and improved smoking cessation outcomes will be presented. Findings suggest the benefits of treating elevated depressive symptom smokers using fluoxetine in a sequential manner, beginning 8 weeks prior to and continuing throughout smoking cessation treatment. Theoretical and clinical implications of these findings are discussed.

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PAPER SESSION 10: TOBACCO QUIT LINES: HOW TO GET SMOKERS AND PROVIDERS TO USE THIS EVIDENCE-BASED TREATMENT

PA10-1

CLINICIAN FACILITATION OF QUITLINE UTILIZATION BY SURGICAL PATIENTS

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Background: Surgery represents a teachable moment for smoking cessation. Quitting can both decrease perioperative complications and improve long-term health, but it is difficult for surgical providers to provide the extended follow-up that increases the chances of success. Telephone quitlines that provide counseling support are efficacious in helping cigarette smokers quit. This study developed and tested a clinician-delivered intervention to facilitate quitline utilization by adult patients scheduled for elective surgery.

Methods: Patients (n=300) scheduled for elective non-cardiac surgery were recruited regardless of their interest in quitting smoking. Participants were randomized to either receive the quitline utilization intervention (requiring approximately 3 min, focused on encouraging quitline use) or a brief stop-smoking intervention of similar duration that did not specifically encourage quitline utilization. Trained clinicians delivered both interventions. The primary outcome was the utilization rate of a quitline accessed through a dedicated toll-free telephone number, with utilization defined as completing at least one full counseling session.

Results: Subject characteristics were similar between the two groups. Records from the designated quitline documented that 29 subjects (19.5%) in the quitline intervention group and no subjects in the control group completed the first full counseling session ($P<0.0001$). There were no significant differences in the self-reported point prevalent and continuous abstinence rates between groups at either 30 or 90 days postoperatively, although rates tended to be higher in the quitline intervention group.

Conclusions: Clinicians can effectively facilitate quitline utilization by surgical patients. Further work is necessary to evaluate the efficacy of this approach in terms of long-term abstinence from cigarette smoking.

This study was supported by grant RC-2006-0007 from Clearway Minnesota.

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PA10-2

THE RELATIONSHIP BETWEEN REACH AND SPENDING FOR U.S. QUITLINES

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Telephone quitlines have become a critical component of tobacco cessation programs. In 2008, CDC set a goal for states to invest $10.53 per smoker on quitline services and medications and to reach 6% of tobacco users with quitline services annually. Yet tobacco control and cessation budgets have suffered recently; Fiscal Year 2010 showed the first decline in quitline budgets since data collection began in 2004. It is unclear what impact this has had on quitlines' capacity to serve tobacco users. We examined the relationship between quitline spending and reach as measured by the number of unique tobacco users calling for services. The North American Quitline Consortium conducts an annual survey of all 63 publicly funded quitlines in the US and Canada, collecting data on services provided, budgets, funding sources, and promotion and utilization of quitlines. The 2008 survey was fielded from October 2008–March 2009. The 2009 survey was fielded from September 2009–February 2010. All 53 US quitlines submitted a survey for both 2008 and 2009 (100%). Data for FY2008 and FY2009 were collected according to each quitline's fiscal year (85% of US quitlines reported a July-June fiscal year). In 2008, a median of $1.33 was spent per adult smoker in each state or territory on services and medications (n=45, range $0.08-$24.05) and a median of $1.02 was spent per adult smoker on promotions and outreach (n=37, range $0.00-$24.15). In 2009, a median of $1.95 was spent per adult smoker on services and medications (n=51, range $0.14-$20.81) and a median of $0.22 was spent per adult smoker on promotions and outreach (n=44, range $0.00-$2.90). The correlation was very high and statistically significant ($p<.01$) between reach and spending on services and medications for both 2008 ($r2=.81$) and 2009 ($r2=.89$), and lower, but still significant between reach and spending on promotions and outreach for both 2008 ($r2=.37$; $p<.05$) and 2009 ($r2=.42$; $p<.01$). For those states that reached 6% or more of tobacco users in 2009 (n=3), all invested at least $8.85 per smoker. The results suggest that telephone quitlines may be able to reach more tobacco users if they had more financial resources.

The 2008 NAQC Annual Survey was funded by the Centers for Disease Control and Prevention, the American Cancer Society, the American Legacy Foundation, the Robert Wood Johnson Foundation, and Novartis Consumer Health, Inc. The 2009 NAQC Annual Survey was funded by the Centers for Disease Control and Prevention, Pfizer, Inc., the Robert Wood Johnson Foundation, and NAQC membership dues.

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PA10-3

THE ARIZONA SMOKERS' HELPLINE: EXAMINING THE RELATIONSHIP BETWEEN MODE OF ENTRY AND TREATMENT OUTCOMES

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Telephone-based quitlines are widely cited as an effective method to deliver behavioral support for tobacco cessation in the United States. Despite the demonstrable efficacy, quitlines serve less than 2% of all tobacco users annually. Given the low reach of most quitlines, and the need to attain optimal outcomes for those smokers who do call, research focusing on which mode of entry leads to improved quit rates has increased (e.g., television advertisements, direct mail, web campaigns etc.); however, to date, an association between promotion type (i.e., referral type) and subsequent abstinence rates has yet to be examined. The primary aim of this study was to assess the relationship between the mode of entry into a quitline service and subsequent treatment outcomes. A retrospective study using logistic regression analysis of 11,040 Arizona Smokers' Helpline (ASHLine) clients was conducted to determine whether self or medical referrals were related to 7 and 30 day point prevalence tobacco treatment outcomes at 7 months post-quit. A total of 11,040 clients who enrolled in the ASHLine between July 2005 and May 2010 were included in the analysis. The average age of the clients under study was 47.23 (SD = 13.27), with 16% reporting Hispanic ethnicity. The majority of clients in this study were white (90.51%), males (52%) who graduated high school (62.89%).

Average number of years of tobacco use for those included in the study were 28.32 (SD = 13.77). Smokers who were referred to the ASHLine by a healthcare provider - either via fax or passive referral - were more likely to quit smoking than those who self-referred. In addition, several caller characteristics (e.g., cigarettes per day, time after waking, and use of tobacco treatment medication) were related to treatment outcome. Mode of entry into a quitline service for smoking cessation is related to treatment outcomes. Discussion will focus on why those who are self-motivated to call the quitline were less likely to quit than those who were referred by a healthcare provider.

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PA10-4

NETWORK ANALYSIS OF NORTH AMERICAN QUITLINES: MAPPING COMMUNICATION AND COLLABORATION TO IMPROVE TREATMENT

Scott J. Leischow*, Keith Provan, Joe Bonito, Jonathan Beagles, Gregg Moor, and Jessie Saul

Background: The mechanisms by which individuals and organizations make decisions to implement evidence-based practices are not well understood, but the role of social networks in that process have been investigated. This study is designed to better understand the network and communications mechanisms by which stakeholders in the North American Quitline Consortium (NAQC), especially state/provincial-level funders and service providers/vendors, interact, share new knowledge, make decisions about how and when to implement new knowledge, and actually adopt practices that they believe will improve quitline outcomes. Data on network relationships were collected from the 63 quitlines in North America in the first of three years of data collection. More specifically, we collected network data on 4 types of information-sharing ties at 3 levels of intensity; partner trust and reputation; relative influences of funder and providers on decision-making to implement practices; adoption and implementation of 23 quitline practices; and control variables such as spending on quitlines and per capita smokers.

Results: Analysis of the North American quitlines was conducted via UCINet, and this analysis showed modest betweenness centrality (0.272), but when the coordinating organization (North American Quitline Consortium, or NAQC) was included in the model it was clear that it plays a major broker role (0.739). The US and Canadian quitlines were linked, but within-country ties were strongest. NAQC played an important brokering role to link quitlines in the US and Canada. Several quitlines had high reputation, and those quitlines were more likely to play a brokering role between quitlines for information sharing and were more likely to be served by a single provider. Decision-making by funders or vendors regarding implementation of practices was variable, but in Canadian quitlines the funders were most likely to make the decision. Implementation of evidence-based practices was generally high, but variable. Network maps and analyses more demonstrate the relationships, and will be presented.

The National Cancer Institute.

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PA10-5

THE TEXT2QUIT PROGRAM: RESULTS FROM A FORMATIVE EVALUATION OF AN INTERACTIVE MOBILE HEALTH SMOKING CESSATION PROGRAM

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Mobile health applications have shown some promise in helping people quit smoking. This session will review the development and pilot test of a state-of-the-art program for smoking cessation, the Text2Quit program. Text2Quit is a personalized, interactive mobile health program designed around evidence-based principles for smoking cessation. The program provides a series of interactive and personalized text messages over the course of a 3-month period, before and after a participant's quit date. The text program is supported by a personalized web site and periodic emails, which provide further guidance on how to quit. The text messages include educational messages, peer ex-smoker messages, medication reminders and relapse messages. Text2Quit also lets participants text in for support when they need additional motivation or are having a craving. The Text2Quit website supports participant registration and includes a Medication Selector and other tools and resources for quitting smoking. Results from a 4-week pilot test of the system with 24 participants will be presented, and lessons learned discussed.

NIH K07 to Dr. Abroms.

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PAPER SESSION 11: GROWING UP WITH NICOTINE

PA11-1

THE NICOTINIC ACETYLCHOLINE RECEPTOR ALPHA5 SUBUNIT MEDIATES DEVELOPMENTAL CHANGES IN THE EXCITABILITY AND MORPHOLOGY OF MOUSE PREFRONTAL LAYER VI PYRAMIDAL NEURONS

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Here, we show that the nicotinic acetylcholine receptor (nAChR) alpha5 subunit is responsible for normal developmental changes in nicotinic signaling and dendritic morphology in mouse prefrontal layer VI neurons. Pyramidal neurons in layer VI of the medial prefrontal cortex (mPFC) 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 the alpha5 nAChR accessory subunit normally found within mPFC layer VI neurons enhances their response to nicotinic excitation in the adult mouse; however the role of the alpha5 subunit in the excitation of these neurons during postnatal development is not known. We sought to answer this question using a mouse line in which the alpha5 subunit has been genetically deleted. In mPFC layer VI neurons from wildtype mice expressing the alpha5 subunit, there was an increased excitatory response to nicotinic stimulation (with acetylcholine in the presence of atropine) during development that peaked at postnatal week three. In alpha5 knockout mice, by contrast, this normal developmental change in nicotinic excitation was absent and the response to acetylcholine was significantly lower compared with wildtype mice at each age examined. Since the alpha5 subunit is responsible for developmental changes in nicotinic excitation during an important period of brain growth and circuit refinement, we next sought to test whether its presence alters the morphology of the mPFC or layer VI neurons by crossing alpha5 knockout mice onto a strain whose nAChR alpha4 subunits are tagged with the YFP motif. We found here that a high proportion of layer VI neurons in mice from both genotypes had long apical dendrites extending into layer I of the mPFC at postnatal week three. In wildtype mice, however, the proportion of such neurons was greatly reduced by adulthood. In adult alpha5 knockout mice, by contrast, the proportion of layer VI neurons with apical dendrites reaching layer I remained high, suggesting retention of an immature phenotype. These novel results suggest that the nAChR alpha5 subunit mediates developmental changes in mPFC layer VI neuron excitability and morphology.

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PA11-2

A HIGH SCHOOL BASED SMOKING CESSATION INTERVENTION COMBINING CONTINGENCY MANAGEMENT OF TOBACCO ABSTINENCE AND COGNITIVE BEHAVIORAL THERAPY

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In response to the marked need for more effective methods to help adolescents quit smoking, our group has developed a novel behavioral therapies intervention with several innovative features including: (a) recruitment and treatment delivery at high schools, (b) use of abstinence based, progressive ratio Contingency Management (CM) facilitated by urine cotinine tests, and (c) combination with Cognitive Behavioral Therapy (CBT). In two pilot trials, this intervention yielded robust end-of-treatment abstinence rates (Krishnan-Sarin et al., 2006; Cavallo et al., 2007). This report compares the efficacy of different components of this intervention in a randomized controlled trial. Eighty-two adolescents smoking an average of 14 (SD 6.2) cigarettes per day with average mFTQ scores of 5.4 (SD 1.8) and urine cotinine levels of 1091 (SD 546) ng/ml were randomized to receive CM alone, CBT alone or CM in combination with CBT. Of these, 88% (n=72) initiated the four-week treatment period. All participants were reinforced for attendance and those in the CM condition were also reinforced for tobacco abstinence. Sixty-seven percent (n=55) of those randomized completed the treatment phase and there were no significant differences in retention by treatment group. There was a significant decrease in cigarette

use across treatment groups across time (Random effects regression model, t=7.12, p <.00). Simple ANOVA comparisons by treatment group indicated significant differences in abstinence rates (F=6.46, p <.05) over the treatment period with the CM alone group having better treatment outcomes than the CBT alone group (t=2.87, p<.05). Of the 55 participants who were retained at week 4, 7-day biochemically confirmed point prevalence (PP) rates were at 0% for the CBT alone group and at 45% for the CM/CBT and 60% for the CM alone groups (X2=14.96, p = .00). Similar significant results were also observed in the entire sample (assuming that dropouts smoked; X2=11.3, p = .00) with 7 day PP rates at 0% for CBT, 36% for CM-CBT and 38% for the CM group. These results support the utility of this intervention for smoking cessation in adolescents in a high school setting.

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PA11-3

A PRELIMINARY EVALUATION OF NICOTINE ADDICTION STAGING BASED ON NICOTINE WITHDRAWAL SYMPTOMS

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Context: Patient histories suggest that as physical dependence on nicotine develops smokers experience more severe withdrawal symptoms when deprived of nicotine: first wanting, then craving, then needing. We hypothesize that these symptoms provide a pathophysiologic basis for staging the severity of developing nicotine addiction.

Objectives: To determine if adolescent symptom reports are consistent with the hypothesized sequence of symptom development, and if so, to determine if the stages differ in relation to measures of nicotine addiction.

Design: In a cross-sectional study, an anonymous self-completed survey was administered to adolescents in Florida in 2010.

Participants: A convenience sample of 349 students in grades 9-12 that had recently used tobacco.

Main Outcome Measures: The combinations of withdrawal symptoms reported were compared to the hypothesized sequence of symptom development (wanting, then craving, then needing) to determine if these were consistent. Subjects in each stage were compared in regard to the Modified Fagerström Tolerance Questionnaire, the Hooked on Nicotine Checklist, the Autonomy Over Smoking scale, and other measures.

Results: Surveys were completed by approximately 97% of students present. The combination of withdrawal symptoms reported was consistent with the hypothesized progression in 99.4% of subjects. 347 of 349 subjects were unambiguously assigned to a stage based on their responses to just 3 questions. The severity of nicotine addiction as gauged by multiple measures increased in a stepwise fashion from stage to stage.

Conclusions: The data support patient histories that the severity of withdrawal symptoms increases in stages over time from wanting, to craving, to needing. These symptoms suggest that a clinical staging system can be objectively based on the pathophysiology of nicotine addiction. While staging has many immediate research applications, its utility for clinical practice would need to be established through further research, which might examine tailoring treatment by stage of addiction.

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PA11-4

PARENT AND PEER INFLUENCE ON ADOLESCENT SMOKING IN MID-ADOLESCENCE

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This study explores the relation between parent and peer smoking across adolescent development and the growth in cigarette smoking across the high school years, through using piecewise latent growth modeling over a nine year period (Grades 4 – 12). Although the literature is somewhat controversial, there is some suggestion that parent smoking is predictive of initiation of smoking (Conrad et al., 1992), but peer smoking is more predictive of regular smoking (Ellickson et al., 2003). In this paper, we attempt to understand the influence of exposure to parent and peer smoking at varying developmental stages on smoking in mid-adolescence (grades 9 – 12). For parent smoking, we examined the effect of initial level at grade 4 and growth from grades 4 – 7 (late childhood); 7 – 9 (early adolescence) and 9 – 12 (mid-adolescence); for peer smoking we examined the effect of initial level at grade 7, and growth from grades 7 – 9, and grades 9 - 12. We hypothesized that parent smoking in late childhood would indirectly influence adolescent smoking through peer smoking in early and mid adolescence. Further, Blanton et al. (1977) showed an indirect path from parent smoking through social images to subsequent smoking. Thus this indirect pathway, through social images in grades 4 – 7, was also included in the model. The final model, after removing non-significant paths, fit the data well (X2 (281, n = 1015) = 435.03, p<.001; CFI = .986; TLI- .983, RMSEA = .031, 90% C. I. = .027, 035). A Sobel test showed several significant indirect paths from parent use through peer use to adolescent use. These included the paths from parent's initial smoking, the slope across childhood and the slope across mid adolescence through the initial level of peer use, and slopes across early and mid adolescence. The path from parent use in childhood though social images to peer use was also significant. Findings suggest that parent use in childhood and mid-adolescence has a maintaining effect on subsequent adolescent use through the indirect effect on peer use, most likely through selecting peers who smoke. A potential mediating mechanism is children's social images of smokers.

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PA11-5

NICOTINE EXPOSURE DURING DEVELOPMENT DIFFERENTIALLY ALTERS NICOTINIC RECEPTOR EXPRESSION AND FUNCTION IN DAMS AND OFFSPRING

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Nicotine (NIC) exposure during development produces adverse behavioral consequences for both parents and progeny. In mice, dams exposed to NIC display alterations in maternal behavior, while offspring exposed to NIC throughout development exhibit long-term changes in locomotor activity and increased sensitivity to NIC reward. The current study extends our previous findings on the neurochemical effects of developmental NIC in adult offspring (PND 60-70) from dams exposed to NIC (200 µg/ml for ~60 days) in drinking water containing 2% saccharin (for 28 days prior to breeding, throughout pregnancy and until weaning on PND 21; SRNT, 2009). In the current study, data from dams were compared to the progeny with respect to changes in nicotinic receptor (nAChR) binding and function in striatum and hippocampus. Controls received only saccharin solution over the same period. Autoradiography data from NIC-treated dams showed increased [125I]epibatidine binding and no change in α-[125I]bungarotoxin binding in striatum and hippocampus, indicating increases in non-α7 nAChRs. Neurotransmitter release assays showed NIC-evoked striatal [3H]DA and hippocampal [3H]NE release decreased by a maximum of ~75% in adult female mice orally self-administering NIC for 60 days. NIC exposure during development resulted in long-term alterations in NIC-evoked striatal [3H]DA release and increases in hippocampal [125I]epibatidine binding, consistent with results obtained in adults treated with NIC. Antithetically, NIC-evoked hippocampal [3H]NE release was increased by a maximum of 124% in the adult offspring exposed to NIC during development, α-[125I] bungarotoxin binding was increased in striatum and hippocampus, and [125I]epibatidine binding was not increased in striatum. Of note, all of the latter findings are in contrast to those observed in adults treated with NIC. Thus, NIC exposure from inception until PND 21 (equivalent to 3 trimesters of human development) differentially alters nAChR expression and NIC-evoked neurotransmitter release, providing evidence that exposure to NIC during development produces long-lasting alterations in neurochemistry and behavior that extend into adulthood.

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PAPER SESSION 12: SEX HORMONES: INFLUENCES ON CRAVING, NICOTINE METABOLISM, CUE RESPONSE, AND CESSATION

PA12-1

EFFECT OF HORMONAL CONTRACEPTION ON NNAL AMONG ADOLESCENT FEMALE SMOKERS

Kat Harrison, M.P.H.*, Alicia Allen, M.P.H., Karen Hanson, Ph.D., Sharon Allen, M.D., Ph.D., and Dorothy Hatsukami, Ph.D., University of Minnesota

Introduction: Adolescent female smokers using hormonal contraception (HC) report greater cravings for cigarettes then both adolescent females not using HC and adolescent males. One potential explanation for this difference is the role of hormones on nicotine metabolism. In a paper by Benowitz and colleagues, nicotine metabolism was shown to vary in women on HC compared to women not using HC. Potential effects of hormones could be further characterized by NNAL, a biomarker of exposure to cigarette smoke. This study aims to identify the differences in the NNAL between three groups of adolescents: female smokers on HC (F-HC), female smokers not on HC (F-no HC), and male smokers (M).

Methods: Data was collected from a smoking cessation study that enrolled adolescents aged 13 and 19, who smoked 10 or more cigarettes per day for at least 6 months, were not using other tobacco or nicotine products regularly, were motivated to quit smoking, were not abusing alcohol or drugs and had no emotional problems within the past year. Self-reported data was collected on demographics, smoking and substance use behavior, and HC use. Urine samples were collected from subjects and analyzed for total NNAL (pmol/mg creatinine). Subjects (n=100) were analyzed by group: F-HC (n=33), F-no HC (n=27) and M (n=40). Group differences in demographics, smoking behavior, and NNAL values were investigated by ANOVA/MANOVA using SAS 9.2.

Results: Mean age of subjects was 16.60±1.20 years. There were no significant differences in demographics or smoking characteristics between groups at the p=0.05. The F-HC group had the highest levels of NNAL compared to the F-No HC and M groups (1.00±0.89 vs. 0.46±0.31 vs. 0.71±0.59; respectively). Group status (f value=5.75, p=0.021) and alcohol use (any vs. none; f-value=14.05, p-value=0.003) were identified as significant predictors of NNAL values. No other demographic or smoking behavior variables were identified as significant predictors.

Conclusion: This study suggests that biomarkers of the exposure to nicotine may vary based on the use of HC. More research is needed to confirm this observation and investigate the mechanisms involved.

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PA12-2

CHANGES IN OVARIAN HORMONES PREDICT SMOKING BEHAVIOR IN WOMEN

Crystal Edler Schiller, M.A.*, Michael E. Saladin, Ph.D., Kevin M. Gray, M.D., Stephanie R. Shaftman, M.Sc., M.S., S. Ashley McCullough, B.S., Erin M. Klintworth, B.A., Karen J. Hartwell, M.D., and Matthew J. Carpenter, Ph.D., Medical University of South Carolina

Among women, smoking behavior fluctuates across menstrual cycle phases, yet the influence of ovarian hormones on specific smoking behaviors has not been examined directly. The purpose of this investigation was to examine pretreatment smoking behaviors among regularly menstruating women (N=93) enrolled in a smoking cessation trial. The ovarian hormones estradiol and progesterone were examined at the initial evaluation (i.e., baseline) and one week later at an ad lib smoking topography session designed to examine specific smoking behaviors (e.g., puff duration and volume). A hormone change index was calculated for estradiol and progesterone by subtracting the hormone level at baseline from the hormone level at the ad lib smoking session. Regression analyses examined the variance in smoking behavior accounted for by each hormone change index while controlling for age and baseline Fagerstrom Test for Nicotine Dependence scores. Changes in progesterone accounted for 4% of the variance in mean puff duration for the first cigarette smoked in the ad lib smoking session, and decreased progesterone predicted increased mean puff duration (t=-1.95, p=0.055). Changes in estradiol accounted for 5% of the variance in mean puff volume for the entire ad lib smoking session, and decreased estradiol predicted increased mean puff volume (t=-2.13, p=.036). Results are consistent with those from previous studies demonstrating increased craving during the premenstrual phase, a period characterized by decreasing estradiol and progesterone levels. It appears that the change in hormone levels over time is a crucial variable for understanding cyclic changes in smoking behavior. Ovarian hormone function represents a promising candidate for examining the neurobiological mechanisms of smoking behavior among women. This line of research may lead to novel pharmacological treatments for nicotine dependence in women. In addition, information about the influence of ovarian hormones on smoking behavior could be used to enhance cognitive-behavioral treatments for smoking cessation by helping patients to identify biological triggers for smoking.

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PA12-3

REWARD-RELATED BRAIN ACTIVITY DURING SMOKING CUE EXPOSURE IS MODULATED BY MENSTRUAL CYCLE PHASE

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When estradiol levels are higher in female rats, which corresponds to the follicular phase of the human menstrual cycle they will learn to self-administer nicotine and escalate to higher doses faster than either males, or female rats with higher concentrations of progesterone, which corresponds to the luteal phase of the human MC. Further, previously learned self-administration behavior is harder to extinguish in estradiol-elevated female rats, suggesting that drugs and their predictors are more rewarding during this phase. This phenomenon may have important clinical implications, as it suggests that menstrual cycle phase plays a role in relapse. We hypothesized that females in the follicular phase, compared to those in the luteal phase, would demonstrate greater reward-related brain activity during exposure to smoking cues. To test whether the animal findings translate to human behavior we used fMRI to examine brain activity during exposure to appetitive visual smoking cues in female smokers grouped by MC phase (N=11). Follicular phase females demonstrated greater activation in reward-related circuitry including the interconnected medial orbitofrontal cortex (mOFC), ventral striatum, insula and amygdala during smoking cue- compared to nonsmoking-cue exposure. These preliminary findings corroborate the animal literature by demonstrating a stronger reward-related pattern of activity in follicular females, and suggest that exteroceptive appetitive smoking cues are more rewarding during the follicular phase. Appropriate interventions that reduce the salience of cues, or that reduce the probability of an early lapse, may improve relapse rates in women who initiate smoking cessation treatment while in the follicular phase.

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PA12-4

DO MEASURES OF OVARIAN HORMONES PREDICT SMOKING CUE-ELICITED CRAVING?

Michael E. Saladin*, Kevin M. Gray, Matthew J. Carpenter, Karen J. Hartwell, Stephanie R. Shaftman, S. Ashley McCullough, Erin M. Klintworth, and Crystal Schiller, Medical University of South Carolina, Charleston, SC

The effects of ovarian hormones on important smoking outcomes such as craving has generally been studied by assessing these behaviors in women smokers who are either in the follicular or luteal phase of their menstrual cycle. However, since there is substantial individual variation in estradiol and progesterone levels in each phase of the menstrual cycle, the phase distinction is an imprecise proxy of ovarian hormone levels. Additionally, while static measures of these hormones may be important, it may also be the case that changes/fluctuations in ovarian hormone levels impact measures of craving. The primary objective of the present study is to examine the predictive relationship between static and dynamic plasma levels of estradiol and progesterone and craving elicited in a human laboratory cue reactivity protocol. Briefly, 93 women smokers received an initial assessment to determine study eligibility, nicotine dependence severity, etc. Approximately one week later, participants were administered a standardized cue reactivity assessment where the Questionnaire of Smoking Urges–Brief (QSU-B) was used to measure craving after exposure to smoking-related cues (cigarette & lighter) and matched neutral cues. Estradiol and progesterone levels were derived from plasma samples collected at the time of the initial assessment (T1) and the laboratory cue reactivity assessment (T2). The primary predictor variables were absolute levels of estradiol and progesterone at T1 and T2, change in estradiol and progesterone (T2

level-T1 difference); primary outcomes were QSU-B factor and total scores (difference score = post-smoking cue – post-neutral cue rating). Preliminary regression analyses revealed that change in estradiol was predictive of QSU-B factor 1 craving magnitude (desire/intention to smoke). This significant inverse relationship (t=-2.29, p=.02) was evident after controlling for level of nicotine dependence and age of participant. No other hormone measures were related to craving. The results suggest that change in estradiol level may be an important predictor of cue-elicited craving and that increasing levels of estradiol may be protective against craving.

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PA12-5

ASSOCIATIONS BETWEEN PROGESTERONE:ESTRADIOL RATIO AND SMOKING SYMPTOMATOLOGY IN ADULT FEMALE SMOKERS

Daniel T. Kebed, B.B.M.E., Alicia M. Allen, M.P.H.*, and Sharon S. Allen, M.D.

Background and Objectives: Recent studies have indicated that sex hormones may influence drug-seeking behavior. The purpose of this study is to investigate associations between progesterone:estradiol (P:E) ratio and smoking related symptomatology in female smokers during ad libitum smoking.

Methods: Using a within-subject design, participants who meet the inclusion criteria completed two data collection time points, Time 1 and Time 2, during the two different randomly assigned menstrual phases (follicular and luteal). Measured variables include serum estrogen and progesterone levels, and subjective measures of smoking symptomatology including Minnesota Nicotine Withdrawal Symptoms (MNWS), Questionnaire of Smoking Urges – Brief (QSU-B), and Modified Cigarette Evaluation Questionnaire (mCEQ). Change scores were computed by subtracting Time 1 from Time 2 values of P:E ratios and smoking symptomatology scores. Analysis was conducted using SAS 9.2 with p-value of 0.05 as measure of statistical significance.

Results: Average age, number of daily cigarettes, and time to first morning cigarettes after waking were 30.1±6.68 years, 14.0±6.25 cigarettes, and 33.0±39.4 minutes, respectively. Average age at smoking initiation was 16.8±3.00. Results showed significant association between changes in P:E ratio and changes in craving reduction (mCEQ subscale, p=0.02), and trend towards association with changes in craving (MNWS subscale) which did not reach statistical significance (p=0.06). No other significant associations or trends were observed. Conclusion: Results suggest that changes in sex hormones may be associated with some aspects of smoking symptomatology such as craving and craving reduction during ad libitum smoking. Additional work is needed to understand how these observations may influence smoking cessation efforts.

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PAPER SESSION 13: RELAPSE AND RELATED FACTORS: ROADBLOCKS TO CESSATION SUCCESS

PA13-1

BUILDING A CLINICALLY-RELEVANT LABORATORY MODEL OF SMOKING RELAPSE

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Most smokers who attempt to quit smoking lapse, and nearly every smoker who lapses, suffers a relapse. Despite recognition that treatments must target the biopsychosocial processes that turn lapses into relapses, therapies designed to target these processes have not been effective. Efforts to improve such interventions must be built on a clearer understanding of the mechanisms that drive the progression from lapse to relapse. Laboratory-based experimental investigations hold considerable promise for uncovering these mechanisms, but it has been challenging to develop clinically relevant models of smoking relapse in the laboratory. This study sought to fill this methodological gap and address fundamental, but still unanswered, questions for the field: Does a smoking lapse causally contribute to relapse, and what factors mediate this association? A sample of n=63 smokers who were motivated to quit was recruited from the community and randomized to one of two experimental conditions after a 48 hour abstinence period: (1) programmed lapse (n=31; smoke two cigarettes) or (2) no lapse (n=32; time-based control). They were then followed for 14 days, during which their smoking status and status on other biopsychosocial states (e.g., craving, mood) were tracked. The main outcome, time to relapse post manipulation, was defined using a standard clinical definition, smoking for 7 consecutive days. Results revealed that participants in the lapse condition relapsed significantly more rapidly compared to participants in the no lapse condition (median time to relapse = 2 vs. 4 days; HR = 2.12, p=.04). Preliminary analyses of the mechanisms underlying this effect indicate that increases in craving were responsible for the effect of lapse on relapse in the lapse condition only: the programmed lapse caused significant increases in craving which then led to a relapse. These data represent some of the first experimental evidence that smoking lapse causes clinically significant levels of smoking and that this process is mediated by craving. Future research will use this experimental paradigm to advance a detailed understanding of the processes that underlie smoking relapse.

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PA13-2

BEHAVIORAL ECONOMIC ANALYSIS OF CRAVING FOR TOBACCO: EFFECTS OF CUES, WITHDRAWAL, AND HYPOTHETICAL OUTCOMES

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Behavioral economics (BE) is a hybrid discipline that integrates concepts and methods from psychology and microeconomics. A BE approach has been increasingly applied to understand subjective motivation for tobacco (i.e., craving) by translating self-reported desire for cigarettes into more objective indices of tobacco demand. In this study, we used BE to quantify motivation following two known elicitors of craving, environmental smoking cues and nicotine withdrawal. In addition, because previous studies have largely used hypothetical BE measures, we examined the relationship both between choices for hypothetical and actual rewards, and self-reported consumption and actual consumption of cigarettes. Participants were 44 daily smokers (15+/day) who participated in two 3-hour laboratory sessions, both including a cue reactivity paradigm and withdrawal manipulation (satiation vs. 12hrs. enforced abstinence). The design was a mixed 2 (cue type) x 2 (deprivation status) design. Participants were assessed for subjective craving, affect, psychophysiological arousal (heart rate), and choices for cigarettes vs. money in a cigarette purchase task (CPT). Participants were given a $10 budget and access to up to 10 cigarettes at prices from $0 to $10/cigarette. Money and cigarette outcomes for one randomly selected choice were provided to the participant for mandatory 2-hour self-administration period with no other access to tobacco (closed economy). Significant main effects and interactions were observed for craving (ps < .005) and elements of affect (ps < .01), but no effects were observed on arousal or the BE measures. Very high, statistically significant correlations were evident between choices for hypothetical and actual rewards (ps < .0001), and between self-reported consumption and actual cigarette consumption (ps < .0001). Although the BE indices were not sensitive to changes in craving, the close correspondence between hypothetical and actual behavior support the approach in trait assessment of tobacco motivation. Potentially important methodological dimensions of this study, which employed a CPT for actual cigarettes for the first time, will be discussed.

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PA13-3

COPING WITH CRAVING TO SMOKE: ACCEPTANCE VERSUS SUPPRESSION

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Most treatments for substance use disorders emphasize skills for coping with drug craving. However, little research has addressed how the use of specific coping strategies affects subjective experience and drug use behavior on a situational basis. In the current study, 162 adult daily smokers who planned to make a quit attempt within six months were randomly assigned to view one of three brief slide presentations prior to smoking cue exposure: rationale and instruction in using an acceptance or suppression strategy to cope with craving, or a neutral magazine article (control group). Outcomes measured following cue exposure included craving intensity, affect, smoking-related

thought frequency during a 3-min period, self-control performance (handgrip squeeze duration), and a behavioral choice task (i.e., participants specified the lowest amount of money they would accept to delay smoking). Participants were also asked to attempt to quit smoking for the three days and then completed follow-up measures including self-efficacy for cessation. Contrary to hypotheses that acceptance would be more effective than suppression, a series of ANCOVA analyses using pre-cue exposure scores as covariates indicated that both the acceptance and suppression groups reported significantly reduced craving and greater positive affect following cue exposure, and greater self-efficacy for cessation at the three-day follow-up, compared to the control group (all p's < .05). The suppression group reported a significantly lower number of smoking-related thoughts compared to the acceptance and control groups ($p < .05$). However, contrary to hypothesis, the suppression group demonstrated no evidence of a rebound effect in craving or thought frequency once they stopped actively suppressing. There were no significant differences among the groups on self-control performance, the behavioral choice task, or number of cigarettes smoked during the three-day follow-up. Findings suggest equivalence between acceptance and suppression as short-term coping strategies. Therefore, the potentially important role of moderator variables will be discussed.

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PA13-4

FEATURES OF WITHDRAWAL SYMPTOM TRAJECTORIES AS PREDICTORS OF SMOKING CESSATION OUTCOME

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Following the approach used previously by Piasecki and colleagues, we applied hierarchical linear modeling to data from the first seven days of abstinence following participation in a clinical trial to model person-specific withdrawal symptom trajectories. The combined data set (55.2% female; average age 45.3 yrs) came from one study involving two forms of NRT (patch vs spray, n=600) and another involving a bupropion vs. placebo comparison (n=555). The withdrawal symptom modeled was the sum of symptom ratings (1=not present; 4=severe) for craving for cigarettes and urges to smoke, defined as "craving to smoke". Four parameters of withdrawal trajectories were calculated: slope of symptom severity, quadratic curvature of symptom severity, mean severity across the seven days, and volatility (scatter of observations around the person-specific regression curve). Correlations among slope, curvature, and intercept were low (< 0.15) indicating near independence of these parameters, except that lower average symptom level was correlated with less downwards curvature (r=0.35). Person-specific random components for slope, curvature, mean severity, and volatility were all highly statistically significant ($p < 0.001$). When regressed against continuous abstinence at end of treatment, the person-specific slope, level, and volatility were statistically significant ($p \leq 0.001$) with odds ratios of 0.77, 0.62, and 0.76, respectively, but the person-specific curvature was not statistically significant (p=0.47). Statistical significance of the person-specific withdrawal symptom trend parameters were maintained ($p \leq 0.002$ for average level, slope, and volatility) when other covariates (age, gender, nicotine metabolic ratio, race, Fagerström score, cigarettes per day, and medication used) were added to the equation to predict continuous abstinence status at end of treatment. These results indicate that significant individual differences exist with regard to the time course of withdrawal and that variations in withdrawal time course are significant predictors of abstinence.

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PA13-5

EFFECTS OF THE EX MASS MEDIA SMOKING CESSATION CAMPAIGN BY EDUCATION AND RACE/ETHNICITY

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The EX campaign is a national mass media campaign designed to promote smoking cessation among lower income and blue-collar smokers of diverse race/ethnicity. A 2010 evaluation shows that respondents who demonstrated confirmed campaign awareness had a 24% greater chance of making a quit attempt between baseline and follow-up (OR=1.24; p=.048) compared with those who were not aware (Vallone, 2010). However, a recent review of the literature indicates that cessation media campaigns are "often less effective" among socioeconomically disadvantaged populations (Niederdeppe, 2008). This is the first study to examine the effectiveness of the EX campaign by education and race/ethnicity. Longitudinal data were collected from a sample of 18-49 year old "current smokers," from eight U.S. Designated Market Areas (DMAs or "media markets"). The baseline survey was conducted with 5,616 eligible respondents, selected using a list-assisted, random-digit-dial method, in the spring of 2008, prior to the national launch of the media campaign. The follow-up survey was conducted approximately six months after the campaign launch, in the fall of 2008, with a total of 4,067 respondents. This generated a follow-up response rate of 73% and an overall response rate of 48% among known eligible households. Multivariable regression analyses were conducted within racial/ethnic and educational strata to assess the strength of association at six months post launch between confirmed awareness of EX and: (1) a cessation-related cognitions index, and; (2) quit behavior. Confirmed awareness of EX increased favorable cessation-related cognitions among Hispanics (OR=4.3, p=.028), and quit attempts among non-Hispanic blacks (OR=3.3, p=.001), and increased favorable cessation-related cognitions (OR=2.6, p=.037) and quit attempts (OR=2.1, p=.016) among smokers with less than a high school education.

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PAPER SESSION 14: DOPAMINE AND SERATONIN: SMOKING AND THE HAPPY TRANSMITTERS

PA14-1

DETERMINATION OF METHYLATED CPG SITES IN THE PROMOTER REGION OF CATECHOL-O-METHYLTRANSFERASE (COMT) AND THEIR INVOLVEMENT IN THE ETIOLOGY OF TOBACCO SMOKING

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We previously reported that catechol-O-methyltransferase (COMT) is significantly associated with nicotine dependence (ND) in humans. In this study, we examined whether there exists any difference in the extent of methylation of CpG dinucleotides in the promoter region of COMT in smokers and nonsmokers by analyzing the methylation status of cytosines at 33 CpG sites through direct sequencing of bisulfite-treated DNA (N = 50 per group). The cytosine was methylated at 13 of 33 CpG sites, and two of these sites showed significant differences between smokers and matched nonsmoker controls. Specifically, in the -193 CpG site, the degree of methylation was 19.1% in smokers and 13.2% in nonsmokers ($P < 0.01$). This finding was confirmed by methylation-specific PCR using an additional 100 smoker and 100 nonsmoker control samples, which showed the degree of methylation to be 22.2% in smokers and 18.3% in nonsmokers ($P < 0.01$). For the -29 CpG site, the degree of methylation was 9.2% in smokers, whereas no methylation was found in nonsmoker controls. Together, our findings provide the first molecular explanation at the epigenetic level for the association of ND with methylation of the COMT promoter, implying that methylation plays a role in smoking dependence.

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PA14-2

NICOTINE-MEDIATED ACTIVATION OF DOPAMINERGIC NEURONS IN DISTINCT REGIONS OF THE VENTRAL TEGMENTAL AREA

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Nicotine activation of neuronal nicotinic acetylcholine receptors (nAChRs) in the ventral tegmental area (VTA), a key brain region in the mesocorticolimbic circuitry, is necessary and sufficient for nicotine reinforcement. However, recent data indicate that the VTA can be sub-divided into anterior (aVTA) and posterior (pVTA) regions. To test the hypothesis that nicotine activated the VTA in a region-selective manner, C57BL/6J

mice were challenged with nicotine and activation of midbrain dopaminergic (DAergic) neurons was analyzed by measuring c-Fos expression in tyrosine hydroxylase-positive neurons. A rewarding dose of nicotine selectively activated DAergic neurons within the pVTA but not the aVTA. Current-clamp recordings from DAergic neurons in C57BL/6J mouse midbrain slices revealed that physiologically relevant concentrations of nicotine directly activated a subset of pVTA DAergic neurons but had little effect on DAergic neurons within the aVTA. To test the hypothesis that nAChR subunit gene expression differed between DAergic neurons in the aVTA and the pVTA, we laser dissected DAergic neurons from each sub-region and compared nAChR subunit gene expression via quantitative RT-PCR. DAergic neurons from the pVTA expressed higher levels of alpha4, alpha6, and beta3 subunit transcripts, compared to aVTA DAergic neurons. Activation of nAChRs containing the alpha4 subunit (alpha4* nAChRs) was critical for pVTA DAergic neuron activation: Nicotine failed to activate pVTA DAergic neurons in alpha4 knock-out animals; whereas selective activation of alpha4* nAChR by nicotine, in mutant mice expressing alpha4* nAChRs 50-fold more sensitive to agonist (Leu9'Ala mice), significantly activated pVTA DAergic neurons. VTA infusions of the alpha6* nAChR antagonist, alpha-conotoxin MII (E11A) significantly blocked activation of pVTA DAergic in both WT mice and in Leu9'Ala mice indicating that alpha4 and alpha6 subunits coassemble to form functional receptors in these neurons. Our data indicate that nicotine selectively activates DAergic neurons within the pVTA via alpha4 alpha6* nAChRs and that these receptors represent novel targets for smoking cessation therapies.

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PA14-3

DIFFERENTIAL EFFECTS OF H1 AND 5HT2 ANTAGONIST TREATMENT ON NICOTINE SELF-ADMINISTRATION IN RATS WITH LICKING OPERANT RESPONSE

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Tobacco smoking addiction is characterized by repeated self-administration of nicotine by placing the drug delivery device in the mouth. Even though the smoke is inhaled rather than ingested, the repeated hand-to-mouth self-administration is essentially a consummatory act. Rat models of nicotine self-administration using lever pressing operant responses have successfully demonstrated the reinforcing effects of nicotine. However, the tenacity of the nicotine reinforcement in the lever press paradigm is quite modest compared with the addiction to tobacco smoking seen in humans. We have developed a paradigm in which rats lick one of two spouts to trigger IV delivery of nicotine. This combines a consummatory act of self-administration with rapid delivery of nicotine. We have found that rats will lick hundreds of times per nicotine infusion. In the current study, using the operant licking nicotine self-administration model with young adult Sprague-Dawley rats we tested the effects of pyrilamine an antagonists of H1 histamine receptors (0, 10, 20 and 40 mg/kg) and ketanserin an antagonist of 5HT2 serotonin receptors (0, 0.5, 1 and 2 mg/kg) in dose ranges that we have found in previous studies to significantly reduce operant lever press nicotine self-administration. The H1 antagonist pyrilamine significantly reduced operant licking nicotine self-administration. The dose threshold for effect was lower in the operant licking paradigm than in the operant lever press paradigm. For nicotine infusions per session the threshold for significant reduction with pyrilamine was 20 mg/kg. For the number of correct side licks 10 mg/kg of pyrilamine also caused a significant reduction. No effects of pyrilamine were seen on incorrect side licks. In contrast, the 5HT2 antagonist ketanserin was ineffective in reducing nicotine self-administration within the same dose range, which we had earlier found to effectively reduce operant lever press nicotine self-administration. These data show that a rat model incorporating consummatory aspects of tobacco addiction can provide added specificity concerning possible new avenues of treatment to combat tobacco addiction.

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PA14-4

IMAGING DRUG-INDUCED DOPAMINE RELEASE IN RHESUS MONKEYS WITH [11C]PHNO VERSUS [11C]RACLOPRIDE PET

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Background: The radiotracer [11C]PHNO may have advantages over other dopamine (DA) D2/D3 receptor ligands because as an agonist it measures only the high affinity - functionally active - D2/D3 receptors and not the low affinity receptors. Ginovart et al. (2006) demonstrated improved sensitivity over [11C]raclopride for measuring amphetamine-induced changes in synaptic DA. Our aim was to take advantage of the strength of [11C]PHNO for measuring the small DA signal induced by nicotine. Marenco et al. (2004) reported a nicotine challenge (0.01-0.06 mg/kg, IV) yielded only a 5% reduction and an amphetamine challenge (0.4 mg/kg, IV) a 28% reduction in [11C]raclopride binding potential in monkeys. In this study we compared the sensitivity of [11C]PHNO PET to that of [11C]raclopride PET with nicotine- and amphetamine-induced DA release in nonhuman primates.

Methods: Four adult male rhesus monkeys were imaged on a FOCUS 220 PET scanner after injection of a bolus of [11C]PHNO or [11C]raclopride in 3 conditions: baseline; pre-injection of nicotine (0.1 mg/kg bolus + 0.07 mg/kg infusion over 30 min); pre-injection of amphetamine (0.4 mg/kg, 5 min prior to radiotracer injection). The mass dose of each radiotracer was held constant within each animal between scans. DA release was measured as change in binding potential (BPND). BPND was estimated with simplified reference tissue model (SRTM) using the cerebellum as the reference region.

Results: With [11C]PHNO, nicotine administration resulted in a decrease of 10±8% in BPND in the caudate and 11±8% decrease in the putamen. Amphetamine administration resulted in a decrease of 48±4% in the caudate and 49±12% in the putamen. With [11C] raclopride there was a nicotine-induced increase in BPND of 3+1% in the caudate and decrease of 7±4% in the putamen. Amphetamine administration resulted in a decrease of 36±14% in the caudate and 34±14% in the putamen. Discussion: Our preliminary results some improvement in sensitivity to drug-induced DA release for [11C]PHNO over [11C]raclopride in the caudate and putamen. We are currently investigating the utility of [11C]PHNO in predominantly D3 regions and increasing our sample size.

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PA14-5

THE DOPAMINE D3 RECEPTORS IN THE BASOLATERAL AMYGDALA AND THE LATERAL HABENULA MODULATE CUE-INDUCED REINSTATEMENT OF NICOTINE-SEEKING BEHAVIOUR

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Background: The dopamine D3 receptors (DRD3) have been implicated in the processes underlying relapse to drug seeking and drug-cue-associations. We have previously shown that systemic administration of a selective DRD3 antagonist significantly reduces cue-induced reinstatement of nicotine-seeking in rats. The current study sought to delineate the neural substrates mediating this effect. Methods: Rats were trained to lever press for intravenous infusions of nicotine under a fixed ratio (FR) schedule of reinforcement. Nicotine infusions were associated with illumination of a cue-light. Upon stabilization of the behaviour, extinction training was conducted where lever pressing had no consequences. Subsequently, reinstatement testing was performed where active lever responding was assessed upon reintroduction of the cues after local infusion of the DRD3 selective antagonist SB 277011A, or vehicle, into discrete brain areas, namely; the basolateral amygdala (BLA), the nucleus accumbens (NAcc) and the lateral habenula (LHb).

Results: SB 277011A (0.01 microgram/0.5 microlitre/side), infused into the BLA or the LHb but not the NAcc ($p<0.01$, $p<0.05$ and $p>0.05$ respectively, compared to vehicle) significantly attenuated cue-induced reinstatement of nicotine-seeking behaviour. Moreover, intra-BLA infusion of SB 277011A (1 microgram/0.5 microlitre/side) had no effect on food taking under a FR schedule.

Conclusion: The effect of DRD3 antagonism on cue-induced reinstatement of nicotine seeking appears to be mediated through the BLA and the LHb. Conversely, the NAcc DRD3 appear to have no significant role in cue-induced reinstatement. The current study supports an important role for the BLA in cue association processes and conditioned reinforcements. Interestingly, the current findings suggest an important role for the

LHb DRD3 in cue-induced reinstatement of nicotine seeking. Further investigation is warranted to explore the exact role of the LHb DRD3 in different aspects of nicotine seeking behaviour. Importantly, the current study supports a strong potential for the use of DRD3 selective antagonists as therapeutic agents for the prevention of relapse to smoking in humans

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PAPER SESSION 15: THE CHALLENGE OF SECOND-HAND SMOKE

PA15-1

RELATIONSHIP OF PASSIVE CIGARETTE SMOKING TO OTITIS MEDIA (OM) IN CHILDREN - EPIDEMIOLOGICAL STUDY

Zsuzsanna Csákányi*, Antal Czinner, and Gábor Katona

Otitis media (OM) is the most common disease of childhood, with its 90% prevalence in the first two years of life. The etiology and pathogenesis of the disease is multifactorial. Regarding the high incidence of OM, it represents a major health problem and consequential high health costs. The hypothesis that OM in children are caused by inhalation of second-hand smoke has been accepted by many. However, empirical evidence for this is scarce. The aim of our study was assessing the impact and possible determinant factors of environmental tobacco smoking (ETS) on OM through a prospective, case-control study via standardized questionnaire method. The main issue is the relationship of passive smoking to OM development and prevalence and the possible determinant factors of the disease. The following items were investigated: (1) The potential effect of ETS on OM; (2) The role of maternal education; (3) Potential effect of maternal smoking during pregnancy; and (4) The effect of ETS duration to OM per week. The study was performed at Heim Pal Children's Hospital, ENT Department, Budapest, Hungary from January to December 2009. A total of 218 questionnaire data were analyzed, out of these 80 children were in the case group (children living in smoking family) and 138 children were in the control group (non-smoking family). Descriptive statistics, linear and logistic regression model analysis had been performed. Significant deterioration could be detected in the case group in incidence of ear surgeries, living in rural area, and prevalence of OM in children being around a household smoker for at least one hour per week. These children are nearly four times more likely to have four or more lifetime episodes of otitis media than unexposed children. In the case group the incidence of OM was elevated in comparison with the general observation of decrease of this disease with age. No positive correlation was found between childhood OM and maternal smoking during pregnancy, maternal education, and flat size. Our results emphasize the harmful effects of ETS as a potential causative factor to OM and draw attention the importance of tobacco control.

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PA15-2

INCREASING PREVALENCE OF SMOKE-FREE HOMES AND DECREASING RATES OF SUDDEN INFANT DEATH SYNDROME IN THE UNITED STATES: AN ECOLOGICAL ASSOCIATION STUDY

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Background: SIDS is the leading cause of death among infants in the post neonatal period. Purpose: The present study utilizes an ecological design to analyze the relationship between concurrent temporal trends in SIDS rates and prevalence of smoke-free households with infants in the United States, controlling for an important risk-factor, infant supine sleep position.

Methods: Annual state-specific SIDS cases were computed using period linked birth/infant death files; the prevalence of 100% smoke-free homes with infants using Tobacco Use Supplement to the Current Population Survey data, and percentage of infants in supine sleep position from national infant sleep position data, for years 1995-2006. Incidence rate ratios relating trends in SIDS cases and risk factors were determined using time-series negative binomial regression. Population-level health effects were assessed with SHS exposure PAFs and excess attributable SIDS deaths.

Results: For every one percent increase in the prevalence of smoke-free homes, SIDS rates decreased 0.4% from 1995 to 2006, controlling for supine sleep position. Nationally, 534 less infant deaths attributable to SHS exposure were incurred in 2006 than in 1995 due to an increasing prevalence of 100% smoke-free homes with infants. Cumulatively, 4,402 (lower estimate) to 6,406 (upper estimate) excess SIDS cases were attributable to SHS exposure in the home over the study period.

Conclusions: The uptake of voluntary restrictions on smoking inside the home may present a public health benefit for infants in their first year of life. The present results warrant further individual level research linking postnatal secondhand smoke exposure and SIDS.

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PA15-3

SALIVA COTININE LEVELS OF BABIES AND MOTHERS LIVING WITH SMOKING FATHERS UNDER DIFFERENT HOUSING TYPES IN HONG KONG: A CROSS-SECTIONAL STUDY

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Background: After the Smoking Ordinance enacted in HK since 1/2007, shifting of smoking from outdoor to home was found, home becomes a major source of secondhand smoke (SHS) exposure of nonsmokers.

Objectives: It aimed to assess the SHS exposure of babies and mothers living with smoking fathers of two housing types by using a biomarker.

Methods: Trios of smoking father, non-smoking mother and a baby under 18-months were recruited from Maternal and Child Health Centres (MCHCs) from 6/2008 to 10/2009. Consented couples completed the baseline survey including demographic data, fathers' household smoking behaviors and mothers' actions in protecting babies from household SHS exposure. Saliva samples from baby and mother were collected and then sent to the National University of Singapore for cotinine analyses. Log-transformations were used for the saliva cotinine due to skewed data. There were 2 housing types (public/private) and father was asked if they smoked at home (yes/no). MANOVA was used to compare the babies' and mothers' cotinine levels when fathers smoked at home under the 2 housing types.

Results: 1,158 trios were consented. 1,142 mothers' and 1,058 babies' samples were assayed. The mean age of the fathers and mothers was 35.5(±7.0) and 31.2(±4.9). The mean mothers' cotinine level was 12.15ng/ml (±61.20) while babies' was 2.38ng/ml (±6.01). 606 and 501 trios were living in public and private housing. Fathers' smoked at home led to higher mothers' and babies' saliva cotininary (mean log of mothers' cotininary: 0.14±0.62 vs. 0.05±0.55, p=0.06; babies: 0.16±0.38 vs. 0.07±0.34, p=0.003). Housing types influenced babies' cotinine level (public: 0.17±0.37; private: 0.10±0.36, p=0.01). MANOVA showed that fathers smoked at home (Λ=0.99, p=0.01) and housing types (Λ=0.99, p=0.01) were positively related to the saliva cotinine levels.

Conclusions: Father smoked at home and the housing types have greater impact on babies' saliva cotininary, showing that they were highly exposed at home and in public housing environment. HK government should promote smoke-free homes and to provide more smoking cessation services to minimize the household SHS exposure to babies.

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PA15-4

SCHOOL ABSENTEEISM IN CHILDREN LIVING WITH SMOKERS

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BACKGROUND: Secondhand smoke (SHS) exposure causes substantial morbidity among children. A study of 12 communities in California found that SHS exposure was associated with increased school absenteeism, but there have been no national

studies examining the relationship between SHS exposure and school absenteeism. Using national data, we assessed this relationship and examined the impact of children's absenteeism on maternal work absenteeism.

METHODS: We examined data on children ages 6-17 from the 2005 National Health Interview Survey (NHIS) and the 2000-2007 Medical Expenditures Panel Surveys (MEPS). We analyzed both surveys because the NHIS is better able to measure SHS exposure, while the MEPS has greater sample size and detail on all family members. Exposure measures were living where adult residents smoke in the home (NHIS) and living with adult smokers (MEPS). Outcomes were days of school missed per year due to illness/injury. We also assessed annual days of work mothers lost to care for someone else as a function of children's exposure-induced school absences (MEPS). We controlled for child age, sex, and race; parent income and education; number of parents/adults and children in the home; and geographic region.

RESULTS: In both samples, the exposure was associated with increased likelihood of any school absenteeism (NHIS OR 1.37, 95% CI 1.11-1.69; MEPS OR 1.24, 95% CI 1.15-1.34); and increased days of absenteeism (NHIS 4.06 vs. 3.26, 95% CI for difference 0.24-1.45; MEPS 3.09 vs. 2.40, 95% CI for difference 0.51-0.88). In the NHIS sample, there was a significant dose response for the relationship between number of adults smoking in the house and annual number of days a child age 6-11 missed school (0 smokers, 3.11 days; 1 smoker, 4.15 days; ≥2 smokers, 6.25 days). In the MEPS sample, exposure-induced absenteeism among children led mothers on average to miss 0.15 more days of work to care for another person (95% CI 0.06-0.24).

CONCLUSIONS: Using a national sample, living with a smoker is associated with a reduction in children's ability to attend school, which in turn is associated with workplace absenteeism for working mothers.

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PA15-5

SECONDHAND SMOKE IN OKLAHOMA: WHAT SMOKERS DO TO PREVENT HARM

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Introduction: No level of secondhand smoke (SHS) exposure is safe. Adults and children exposed to SHS are more likely to suffer from heart disease, lung disease, and cancer. Few studies have examined actions that smokers take to prevent exposure to self and others and what sociodemographic variables are associated with those actions.

Methods: This telephone-based cross-sectional survey of 1,531 Oklahoma smokers was designed to determine the presence of, and variables associated with, home smoking bans and car smoking bans. Data analysis included univariate and multivariate methods appropriate for weighted data. Odds ratios and 95% confidence intervals were reported.

Results: Only 38.1% of smokers reported full home smoking bans and 15% reported car smoking bans (where SHS is especially concentrated). Among smokers with at least one quit attempt in the past 12 months, the only variable associated with home smoking bans was living with a non-smoker (OR = 2.14, 95% CI 1.43, 3.20). Among smokers with no quit attempts, some day smoking (compared to every day, OR = 2.68, 95% CI 1.50, 4.79), younger age (OR = 2.48, 95% CI 1.63, 3.77), and the presence of children in the home (OR = 2.33, 95% CI 1.51, 3.48) were all associated with home smoking bans. Among younger smokers, smoking some days (compared to every day) (OR = 2.11, 95% CI 1.23, 3.93) and lower education levels (OR = 2.49, 95% CI 1.46, 4.24) were associated with car smoking bans. Among older smokers, knowledge that SHS is very harmful to one's health (OR = 2.61, 95% CI 1.52, 4.46), some day smoking (compared to every day, OR = 4.71, 95% CI 2.60, 8.55), higher income OR = 2.19, 95% CI 1.25, 3.86), and the intent to quit (OR = 0.38, 95% CI 0.17, 0.88) were all associated with car smoking bans.

Discussion: While smokers in Oklahoma do not readily take actions to prevent harm to others from SHS, a few variables were associated with willingness to do so. Results from this study underscore the need for continued education about the danger of SHS and the importance of promoting personal actions among smokers to reduce exposure to SHS.

Oklahoma Tobacco Settlement Endowment Trust.

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PAPER SESSION 16: TACKLING DISPARITIES AMONG SMOKERS: THE ROLE OF RACE, ETHNICITY, AND EDUCATION

PA16-1

REACHING LOW INCOME SMOKERS: ONE THING TO DO AND ONE THING NOT TO DO

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People living in poverty have a high smoking prevalence. While these smokers want to quit, they are less likely to try, use evidence-based methods or be successful. Identified barriers include poor discrimination between effective and ineffective methods of quitting and little knowledge about accessible and effective treatment. In this RCT, 245 smokers seeking services from the Salvation Army were randomly assigned to either a brief intervention (N=124) or a control group (N=121). The brief intervention (13.6 minutes) consisted of (1) completion of a worksheet about their perceived effectiveness of different treatments followed by a presentation of actual effectiveness to create a teachable moment, (2) a brief discussion of previous quit attempts to reinforce the use of an evidence-based method, and (3) a brief review of information about the Wisconsin Tobacco Quit Line (WTQL). All subjects took a survey immediately after the intervention and 80% were successfully contacted for a telephone survey a month later. Contrary to the literature, quitting using medication or counseling or both was seen as more effective than using will power alone by both groups. Contrary to predictions, smokers given the brief intervention rated themselves less ready to quit and less confident that they would be successful if they tried. Possibly, their learning actual success rate of various methods, which was far less than perceived, had a discouraging effect. Consistent with predictions, experimental subjects were more likely than controls to self-report contact to the WTQL following the intervention (18% vs. 7%). While there were no differences between groups on most measures of quitting during follow-up, intervention subjects were more likely to report cutting down a lot than control subjects (47% vs. 29%). Intervention subjects also had a higher evaluation of Salvation Army services than control subjects. It's concluded that brief interventions in a community agency deserves additional study, especially triage to quit lines but that information about the effectiveness of various treatments might better be presented in relative rather than absolute terms to avoid discouragement.

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PA16-2

SOCIAL COHESION AFFECTS SMOKING CESSATION AMONG AFRICAN AMERICANS THROUGH PSYCHOSOCIAL MEDIATORS

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Social cohesion, the trust and connectedness between people living within a defined geographic area, is hypothesized to affect health behaviors in a number of ways, including via psychosocial mechanisms. Greater social cohesion has been associated with a lower likelihood of smoking in prior cross-sectional research, but the direct and indirect relationships between social cohesion and smoking cessation have not been previously studied. The current work extends the literature by investigating the relationship between social cohesion and smoking cessation among 399 African American adult smokers (48% male; 75% < $30,000 annual household income) from Houston, Texas, who were attempting to quit. Continuation ratio logit models (SAS PROC GENMOD) were used to examine the effect of social cohesion on biochemically verified, continuous abstinence from smoking through 26 weeks post-quit using an intent-to-treat approach. Single mediator models (R GLM) using 1000 bootstraps explored whether social support, affect, depression, and/or stress at post-quit Day 3 mediated the direct effect. Results indicated that social cohesion was a significant predictor of continuous smoking abstinence over and above the effects of age, gender, education, income, employment status, and marital status ($p = .05$). Specifically, greater social cohesion was associated with a higher likelihood of continuous abstinence through 26 weeks post-quit (OR = 1.06, CI = 1.00 – 1.13). Social support, affect, depression, and stress each mediated the effect of social cohesion on abstinence in adjusted models ($p's < .05$). Social support and positive affect were positively associated with social cohesion and abstinence, whereas negative affect, depression, and stress were negatively associated with social

cohesion and abstinence. Our results add to a growing literature highlighting the role of the social context in shaping behavior change and extend those findings to smoking cessation. Results suggest that policies and interventions aimed at increasing the social cohesiveness of neighborhoods may facilitate smoking cessation through effects on social support, affect, depression, and stress.

This research was supported by the National Cancer Institute (R01CA094826 and R25CA57730), the Centers for Disease Control and Prevention (K01DP001120), and the National Institutes of Health through MD Anderson's Cancer Center Support Grant (CA016672).

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PA16-3

PHYSICIAN ADVICE TO QUIT AND QUITTING BEHAVIORS AMONG BLACK MALE SMOKERS

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Background: Black males in the United States bear the greatest burden of tobacco-related cancers. However, little is known about how to help Black male smokers quit.

Objectives: This study examines the association between physician advice to quit and quitting behaviors among Black male current smokers aged 18 and older (n=1208).

Methods: Cross-sectional data from the 2006-2007 Tobacco Use Supplements to the Current Population Survey were used to estimate the prevalence of physician advice to quit; factors associated with receipt of physician advice to quit; and the associations between physician advice to quit and intention to quit and quit attempts among Black male smokers. Multivariate logistic regression models were run separately for receipt of advice to quit in past 12 months, intentions to quit in 30 days, and quit attempts in the past 12 months.

Results: Sixty-two percent of Black males reported receipt of physician advice to quit. Smokers with an annual family income less than $25,000 had lower odds of receiving physician advice to quit (OR =0.59, 95% CI = 0.35, 0.98). Black men who received advice to quit were more than twice as likely to report intention to quit compared to men who did not receive advice to quit (OR =2.17, 95% CI = 1.23, 3.38). Advice to quit was not associated with having one or more quit attempts.

Conclusions: Physician advice to quit is associated with motivation to quit, but not with quit attempts among Black male smokers. Strategies are needed to increase the implementation, reach, and effectiveness of evidence-based strategies for Black males who bear a disproportionate burden of tobacco-related cancers.

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PA16-4

INFLUENCE OF TRADITIONAL TOBACCO USE ON SMOKING PATTERNS AMONG AMERICAN INDIANS

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Aims: To examine the influence of traditional tobacco use on smoking cessation among American Indian adult smokers.

Design, setting and participants: A cross-sectional survey of self-identified American Indians was conducted from 2008 to 2009. A total of 998 American Indian adults (18 years and older) from the Midwest, participated in the study.

Measurements: Traditional tobacco use and method of traditional use were both assessed. Commercial tobacco use (current smoking) was obtained through self-reported information as well as the length of their most recent quit attempt. We also assessed knowledge and awareness of pharmacotherapy for current smokers.

Findings: Among participants in our study, 33.3% were current smokers and they reported smoking an average of 10 cigarettes per day. American Indian current smokers who used traditional tobacco had higher abstinence rates compared to those who do not use traditional tobacco ($p<0.05$). However, it appears that this protective effect of traditional tobacco use is diminished if the person smokes traditional tobacco. Finally, very few (less than 20% of current smokers) were aware of more recent forms of pharmacotherapy such as Chantix or Bupropion.

Conclusions: The major finding in this descriptive study of American Indian smokers is that traditional use of tobacco is not a detriment to quitting, and may in fact be correlated with greater cessation. However, this protective effect appears to diminish considerably if the person smokes traditional tobacco. Significantly more research is needed, both to verify these findings related to the influence of traditional tobacco use and to create more effective, culturally-tailored smoking cessation programs for American Indian smokers.

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PA16-5

DISPARITIES IN SMOKING BEHAVIORS: RACE, ETHNICITY, AND EDUCATIONAL ATTAINMENT

Nina S. Wampler, D.Sc., M.P.H.*, Mignonne C. Guy, Ph.D., Joseph Bonito, Ph.D., and Scott J. Leischow, Ph.D., University of Arizona

Disparities in smoking behavior vary by race and ethnicity. Some of this disparity may be moderated by education level. With a grant from the National Cancer Institute, we examine the effect of education level on the association between race and ethnicity and current smoking status, because smoking status has been shown to be associated with both education, as well as race and ethnicity. A look at the bivariate relationship of race and ethnicity with smoking status showed the following smoking prevalences: non-Hispanic Asians: 9.9; non-Hispanic American Indians/Alaska Natives: 35.1. By education level, the current smoking prevalences(%) were: ≤ 8: 17.9; 9-11: 33.5; 12 or GED: 24.8; 13-15: 20.7; 16+: 9.5. We analyzed five years of Behavioral Risk Factor Surveillance System (BRFSS) data, 2005-09. Using logistic regression for complex samples, due to the weighted sampling structure of BRFSS, we used race and ethnicity, age, sex, marital status, and geographic region, with and without education level. Without controlling for education, the odds ratios and 95% confidence intervals for race and ethnicity (non-Hispanic White as referent) were: Hispanic 0.74 (0.71-0.77); non-Hispanic African American 0.88 (0.85-0.90); non-Hispanic Asian 0.44 (0.40-0.48); and, non-Hispanic American Indian/Alaska Native 1.90 (1.78-2.02). After adding education to the base model: Hispanic 0.50 (0.48-0.52); non-Hispanic African American 0.78 (0.76-0.81); non-Hispanic Asian 0.48 (0.44-0.53); and, non-Hispanic American Indian/Alaska Native 1.65 (1.54-1.76). Our models show an interaction between education level and race and ethnicity for African Americans and Hispanics. The smaller sample size of Asians and American Indians/Alaska Natives may have resulted in insufficient power to detect this interaction effect. While we controlled for education, disparities in smoking status by race/ethnicity persist. Smoking cessation interventions that take into consideration educational attainment are needed to address these social disparities in tobacco use.

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PAPER SESSION 17: THE HEAVY ISSUE OF WEIGHT: FROM GENETICS TO CLINICAL TRIALS

PA17-1

THE SELECTIVE 5-HT2C RECEPTOR AGONIST, LORCASERIN, REDUCES INDICES OF NICOTINE REWARD AS WELL AS FOOD INTAKE IN THE RAT: IMPLICATIONS FOR SMOKING CESSATION THERAPY

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Selective agonists at the 5-HT2C receptor have attracted interest as therapies for obesity. The most advanced compound of this class, lorcaserin, has recently completed two Phase III trials, which support the potential of this drug class for the treatment of obesity. It is becoming increasingly recognised that there is considerable overlap in CNS systems that may regulate behaviours related to excessive feeding and the intake of drugs of abuse. Indeed we have previously demonstrated that the prototypic 5-HT2C agonist, Ro60-0175, reduces nicotine self-administration and hyperactivity (Grottick et al., 2001, Psychopharmacology 157: 292-298). Accordingly in the present series of studies we have evaluated lorcaserin against aspects of nicotine reward. Male Sprague-Dawley

rats sensitized to a daily regimen of nicotine, the acute injection of nicotine (0.1-0.4mg/kg s.c.) produced a dose-related hyperlocomotor response. Pretreatment with lorcaserin (0.1-1mg/kg s.c.) produced a dose-related attenuation of this effect. In separate experiments, male Long Evans rats were trained to self-administer nicotine (0.03mg/kg/infusion) made available under an FR5 schedule of reinforcement. Under baseline conditions the rats typically received 20-25 infusions per 1h session. Pretreatment with lorcaserin (0.3-1mg/kg s.c.) produced a dose-related decrease in the number of infusions earned per session. Effects of lorcaserin against both nicotine hyperlocomotion and self-administration were blocked by the 5-HT2C antagonist SB-242084 (0.5mg/kg). In tests of reinstatement, animals previously trained to self-administer nicotine followed by extinction training, reinstatement of self-administration behaviour was reliably attained by the presentation of a nicotine prime (0.15mg/kg) and cues associated with drug taking (compound cue). Lorcaserin (0.3-1mg/kg s.c.) administered prior to the presentation of the compound cue reduced the subsequent reinstatement of nicotine responding. Lorcaserin itself did not reinstate nicotine taking behaviour. Thus the clinical application of this drug class may extend beyond obesity to conditions relating to substance abuse including smoking cessation.

This work was partially funded by CanCog Technologies and by a CIHR grant awarded to Dr. Paul Fletcher.

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PA17-2

NEURONAL, CELLULAR, AND MOLECULAR BASIS OF NICOTINE-INDUCED HYPOPHAGIA

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Weight concerns can drive smoking behavior, particularly in adolescents; however, the mechanisms for nicotine's effects on weight are unknown. We found that nicotine and cytisine dose-dependently limited weight gain, body mass index, and food intake in mice. The nicotinic antagonist mecamylamine had no effect on its own but blocked nicotinic-induced hypophagia while the non-brain-permeant antagonist hexamethonium did not. The activity of proopiomelanocortin (POMC) neurons of the arcuate nucleus is a key component leading to a decrease in food intake and in increased metabolism. We found that POMC KO mice failed to show nicotinic-induced hypophagia, confirmed that POMC neurons express nAChRs and that nicotinic agents dose-dependently increased POMC neuron activation. Furthermore, these data suggest that a decrease in tonic inhibition of POMC neurons also contributes to these effects. Using pharmacological compounds with activity at selected nAChR subtypes, mice lacking individual nicotinic receptor subunits and adeno-associated viruses carrying shRNAs to down-regulate specific nAChRs in the arcuate nucleus, we found that nicotinic agonists can induce hypophagia by activating ß4 subunit-containing nAChRs. In addition, the data suggest that activation of α7 nAChRs may increase food intake. Taken together, our data delineate a specific pathway underlying nicotine's effects on food intake and identify the molecular mechanisms involved. Thus, activation of POMC neurons via ß4-containing nAChRs can induce hypophagia and limit weight gain. These results provide a mechanism for the decreased weight in smokers and suggest that nicotinic agonists selective for ß4-containing nAChRs might be useful for weight control.

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PA17-3

CLARIFYING THE LINK BETWEEN SMOKING STATUS AND BMI: THE ROLE OF CESSATION DURATION

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With obesity rates rising and recent evidence suggesting a link between the onset of diabetes and those who recently stopped smoking, there is an increasing need to better understand the associations between smoking and weight status. Further, research is needed to clarify changes in weight status that occur following smoking cessation. The current research examined (1) the association between smoking status and BMI and (2) weight status as a function of duration of quit among former smokers using nationally-representative data from the 2005 and 2007 Health Interview National Trends Surveys. Weight status was determined by BMI, and participants were classified as overweight/obese or not. Smoking status distinguished between current, former, and never smokers. Duration of quit among former smokers was categorized as: less than 6 months, 6-12 months, and 1-5 years. Logistic regression analyses were conducted, controlling for age and gender. First, former smokers were more likely overweight/obese than current or never smokers (OR= 1.31; 95% CI= 1.13, 1.51). Among former smokers, those who had quit smoking for 1-5 years were more than two times as likely to be overweight or obese, compared to those who had quit smoking for 6-12 months (OR= 2.16; 95% CI= 1.05, 4.45). Former smokers were equally likely to have attempted to lose weight in the past 12 months across duration of quit ($\chi 2$= 0.52, p= .67). Together, these results offer some additional clarity on how weight status may change following smoking cessation. Findings further suggest that 6-12 months following smoking cessation may be a critical time to intervene to prevent overweight/obesity.

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PA17-4

ON THE GENETIC AND ENVIRONMENTAL RELATIONSHIP OF BODY MASS INDEX, SMOKING INITIATION AND NICOTINE DEPENDENCE IN A POPULATION-BASED SAMPLE OF TWINS

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Genetic factors have consistently been demonstrated to influence individual differences in body mass index (BMI) and nicotine dependence (ND), with twin and family studies estimating heritabilities in the order of 0.70 and 0.60 respectively. While cross-sectional studies of ND are typically supportive of a negative relationship between smoking and BMI, a positive association is supported by the observations that, within smoking cohorts, heavy smokers tend to be of increased bodyweight compared to light smokers. Elucidation of the genetic and environmental mechanisms underlying these associations remains an important public health endeavor. It is possible that these traits share common liability influenced by genetic and/or environmental factors. The purpose of this study was to examine phenotypic associations between BMI, smoking initiation and ND and subsequently test for shared genetic and environmental liability in a population-based sample of twins from the Virginia 30,000 study (n=14,177, 63.9% female). Results indicated that males had significantly greater BMI, daily cigarette consumption and rates of ND than females (p<0.001). Nonparametric correlations revealed small but significant negative associations of BMI and cigarette consumption (r=-0.023, p=0.029) and smoking initiation (r=-0.025, p=0.005) in females. However, in males, there were small but significant positive associations of BMI and cigarette consumption (r=0.062, p=1.04E-5) and smoking initiation (r=0.060, p=1.29E-7). A small but significant positive association was found between BMI and ND (r=0.018, p=0.037). Univariate analyses estimated the additive genetic effects as 0.753 for BMI and 0.435 for average number of cigarettes consumed. Bivariate analyses indicated a significant genetic correlation between BMI and cigarette consumption, rG= 0.166. To test for shared genetic and environmental liability between BMI, smoking initiation and ND, a trivariate modified causal-contingent-common pathway model will be applied which accounts for the contingency of ND on smoking initiation. Results support the possibility of familial factors to predispose to both body composition and nicotine-use.

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PAPER SESSION 18: RAPID RESPONSE PAPER SESSION

PA18-1

CHRONIC CONTINOUS SAZETIDINE-A INFUSION DECREASES NICOTINE SELF-ADMINISTRATION IN RATS

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Sazetidine-A is a selective nicotinic alpha4beta2 nicotinic receptor desensitizing agent and partial agonist. It has been shown in our previous studies to significantly reduce nicotine self-administration after acute or repeated injections. In the current study, we continuously (sc) administered sazetidine-A to young adult female Sprague-Dawley rats by Alzet osmotic minipumps (Model 2ML4) at doses of 0, 2 or 6 mg/kg/day (N=8-10/group). This continuous infusion provides a steady rate of drug delivery over a period of weeks. Sazetidine-A effects on IV nicotine self-administration were examined in repeated 3-hour sessions. With the constant infusion, we could distinguish the effects of the sazetidine-A across the 3-hour session without the varying pharmacokinetics seen after an acute injection. In the 3-hour nicotine self-administration sessions we saw initial bursts in responding for nicotine followed by declines to a lower plateau of undulating levels of self-administration. The 6-mg/kg/day sazetidine-A dose significantly ($p<0.025$) reduced overall nicotine self-administration compared with vehicle control across the session without observed disruption of the initial burst of response or the subsequent lower plateau of undulating levels of self-administration. The sazetidine-A induced significant reductions in nicotine self-administration during the first two weeks of treatment. The lower 2-mg/kg/day sazetidine-A infusion dose was not found to be effective. Sazetidine-A provides an overall suppression of nicotine self-administration, which continues to be effective with two weeks of continuous infusion. Sazetidine-A is a promising candidate to develop as a new treatment to help people successfully quit smoking.

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PA18-2

EFFECTS OF CHRONIC VARENICLINE IN MICE: COMPARISON TO NICOTINE

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Varenicline, currently one of the more successful treatments for smoking cessation, is thought to be selective for the alpha4beta2 subtype of the nicotinic acetylcholine receptor (nAChR). We were interested in exploring the capacity of varenicline to regulate expression of various nAChR subtypes. Mice of the C57Bl/6 strain were chronically treated with varenicline at doses of 0, 0.2 and 1 mg/kg/hr or with nicotine at doses of 0, 0.5, and 4 mg/kg/hr for 10-14 days. Mice were withdrawn from varenicline (12 hr), or from nicotine (2 hr), before brain dissection. After withdrawal from varenicline, brains of some mice were dissected into 14 regions for membrane binding experiments. Kd values determined in select regions were unaffected by chronic treatment. Epibatidine binding (with and without cytisine at a concentration that selectively inhibits the alpha4beta2-nAChR subtypes, as well as with and without A85380 at a concentration that selectively blocks all beta2-nAChR subtypes) was determined for all 14 regions. As with chronic nicotine treatment, chronic varenicline produced upregulation of alpha4beta2-nAChR and did not upregulate alpha3beta4-nAChRs. Other brains from varenicline-treated or nicotine-treated mice were analyzed autoradiographically for higher resolution. High-affinity epibatidine sites with and without selective inhibition by cytisine, as well as high-affinity alpha-conotoxin MII sites, were quantitated. Response to chronic varenicline varied among brain regions and receptor subtype in a similar manner to chronic nicotine. Alpha4beta2-nAChR subtypes were up-regulated, whereas alpha6beta2-nAChRs were down-regulated.

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PA18-3

THE MAJOR IMPACT OF SMOKING ON RISK OF CARDIOVASCULAR DISEASE AND MORTALITY IN POSTMENOPAUSAL WOMEN

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Background: Cigarette smoking poses substantial health risks, yet its importance is often underestimated. Unlike diabetes or stroke, now recognized to confer coronary heart disease (CHD) risks comparable to preexisting CHD, the diagnosis of smoking does not automatically trigger aggressive medical intervention to reduce morbidity and mortality. Ironically, smoking may confer risks comparable to CHD.

Methods: We compared health risks among 116,838 postmenopausal women by baseline smoking status: current smokers (n=8,070), former smokers (n=50,300), never-smokers (n=58,468), and further stratified by baseline CHD status (Y/N), yielding 6 categories. We calculated age-adjusted rates/10,000 and multivariable-adjusted hazard ratios (AHR) for cardiovascular disease (CVD, including myocardial infarction (MI), CHD (composite of MI, angina, percutaneous transluminal coronary angioplasty, coronary artery bypass grafting), and stroke), all-cause mortality, and major categories of cause-specific mortality.

Results: Over 12 years, there were 11,483 CVD events and 10,611 deaths. Regardless of CHD status, risks of all disease outcomes were consistently highest among current-smokers, intermediate among past-smokers, and lowest among never-smokers. Never-smokers without CHD had the lowest age adjusted rates of all-cause mortality (59, 56-62), while current-smokers with CHD had the highest (343, 244-486). Current-smokers without CHD had higher all-cause mortality than never-smokers without CHD (AHR 2.89, 2.70-3.09) and never-smokers with CHD (AHR 1.39, 1.19-1.62). Current-smokers without CHD also had similar risk of stroke as never-smokers with CHD (AHR 0.90, 0.68-1.18).

Conclusions: Current-smokers without CHD were almost 3 times as likely to die as never-smokers without CHD, and 39% more likely to die than never-smokers with preexisting CHD. Results demonstrate the striking health risks of cigarette smoking itself as a disease, and underscore the need for an aggressive and systematic treatment program for smoking in postmenopausal women.

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PA18-4

EFFECTS OF ACUTE NICOTINE AND ALCOHOL ON THE RATING OF ATTRACTIVESS IN SOCIAL SMOKERS AND ALCOHOL DRINKERS

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Alcohol consumption has long been associated with risky sexual behaviours, although the mechanisms that underlie these effects remain relatively poorly understood. Anecdotally, acute alcohol consumption is believed to increase the perceived attractiveness of others, an effect that has received some experimental support. Furthermore, nicotine has been shown to increase the reward value of natural reinforcers in animals and to increase the attractiveness of faces in humans. As nicotine and alcohol are often consumed together, we examined the effects of acute nicotine and alcohol consumption on ratings of facial and non-facial stimuli. 95 (49% male) social smokers and alcohol drinkers consumed either an alcoholic or placebo beverage and subsequently smoked a nicotinized or denicotinized cigarette whilst completing a computer-based task that rated the attractiveness of male faces, female faces and landscapes on a 7-point scale. A 2 (target: face, landscape) x 4 (group: placebo/placebo; placebo nicotine/alcohol; nicotine/placebo alcohol; nicotine/alcohol) ANOVA indicated a significant main effect of group ($F[3, 91] = 2.94$, $p = 0.037$). Further analyses using independent t-tests revealed significantly higher ratings in the nicotine/alcohol group ($M = 4.29$, $SD = 0.50$) compared to the placebo/placebo group ($M = 3.86$, $SD = 0.64$). In addition, there were no significant

group differences in changes in cigarette craving, alcohol craving, positive affect or negative affect (ps > 0.05). These findings indicate that alcohol and nicotine via smoking when administered together increase ratings of attractiveness compared to placebo. Ratings were also higher for nicotine/placebo alcohol and placebo nicotine/alcohol groups compared to placebo but this difference did not reach statistical significance, suggesting the effects of nicotine and alcohol worked additively to increase ratings of attractiveness. Furthermore, these effects were independent of increases in subjective craving or mood. These data suggest that co-administration of nicotine via smoking and alcohol increase the affective valence of stimuli, which in turn may play a role in their continued use.

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PA18-5

CAUDATE ACTIVATION DURING A BEHAVIORAL CONTROL TASK IS NEGATIVELY CORRELATED WITH SMOKING STEREOTYPY

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Aims: Nicotine dependence (ND) is a multidimensional syndrome and smokers exhibit variability on ND factors including tolerance, drive, and preference for smoking over other reinforcers (Shiffman, Waters & Hickox, 2004). Whereas research has examined the validity of ND dimensions, little work has investigated potential neurocognitive correlates. In the current analyses we examined relations between one ND factor —'Stereotypy' or the degree to which smoking is inflexible across situations and time—and brain activation during inhibition of prepotent responses on a Go/NoGo task. We hypothesized these variables would be correlated given both reflect behavioral control over a prepotent/overlearned response.

Methods: 33 adult smokers were fMRI scanned while completing a variant of the Go/NoGo task with three trial types (Chikazoe et al. 2007): frequent Go (75%), infrequent Go (12.5%) and Stop (12.5%); SOA = 800 ms. Using FSL, we modeled Behavioral Control (BC)-specific activation (Stop > Infrequent Go) and correlated this contrast with Stereotypy scores on the Nicotine Dependence Symptom Scale (NDSS; Shiffman, Waters & Hickox, 2004).

Results: Mean Stereotypy scores and task performance were comparable to those observed in previous studies. Across the sample, BC-specific activation was observed in striatum, insula, and temporal gyrus. Regression analyses revealed negative correlations between Stereotypy and BC-specific activation in dorsal striatum—a region involved in the habit learning, even after controlling for a measure of general ND (FTND).

Conclusion: These findings provide initial evidence that ND phenotypes map on to neural substrates underlying basic cognitive processes. Specifically, the results suggest that the tendency toward inflexibility of smoking behavior is inversely related to brain circuitry activated during the control of prepotent responding, and further suggests such inflexibility is mediated via striatal habit learning areas.

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NEW INVESTIGATOR AWARD PAPER SESSION

NIPA-1

TEMPTATION, SHAME, AND ADDICTION: TOBACCO USERS' AND RECENT QUITTERS' EXPERIENCES WITH SMOKE-FREE REGULATIONS

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A growing body of literature has documented the success of smoke-free legislation in promoting cessation and a reduction of smoking. However, less attention has been paid to how these effects have been achieved. This abstract presents the results from interviews and focus groups with Minnesota smokers who were asked about their experiences with smoke-free regulations.

Methods: Fifteen in-depth phenomenological interviews and fifteen focus groups were conducted with tobacco users and recent quitters formerly enrolled in cessation programs provided by ClearWay Minnesota. Data were collected in the three months after smoke-free legislation was adopted in Minneapolis/St. Paul, and were stratified by participant tobacco use status and residence in a smoke-free regulated community. Travel to communities with a different smoke-free regulation was examined. Essential themes were extracted using NVivo 7 software.

Results: Smokers reported smoke-free legislation forced them to confront their addiction. They experienced apprehension, frustration, and panic anticipating smoking restrictions. This resulted in a mix of anger against government intrusion and self-loathing and shame at their inability to quit. Both tobacco and non-tobacco users felt that smoke-free regulations contributed to stigmatizing smokers. Smokers and non-smokers also reported that smoke-free legislation reduced the temptation to smoke. The physical absence of cigarette smoke and groups of friends using tobacco in bars and restaurants made it easier for recent quitters to maintain their quit attempt, and reduced tobacco use for smokers. The inconvenience of going outside to smoke was reported to have a similar effect.

Discussion: For recent quitters, smoke-free legislation appears to support quitting by removing the temptation of it and making it inconvenient. They are painfully confronted by their addiction and the stigmatization of smoking. The majority of smokers who do not quit because of smoke-free legislation continue to suffer from these effects. Tobacco control programs should consider how these individuals might be supported in their struggle with tobacco dependence.

Evaluation contract from ClearWay Minnesota.

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NIPA-2

FAX TO QUIT PLUS ACADEMIC DETAILING: LINKING SMOKERS VISITING CLINICS TO STATE QUITLINES

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'Fax to Quit' programs have shown promise to increase quitline utilization by linking a higher proportion of tobacco users visiting primary care clinics to state-based quitlines. This study represents the first large clinical trial assessing the impact of enhanced academic detailing as a strategy to boost Fax to Quit referrals to a state quitline.

Objective: We evaluated a Fax to Quit alone program (F2Q) compared to a Fax to Quit plus Enhanced Academic Detailing program (F2Q + EAD) with F2Q + EAD comprising ongoing training/technical assistance and performance feedback at these clinics.

Methods: Forty-nine clinics were randomized to receive F2Q or F2Q +EAD. Clinic referral rates, quitline-patient contacts, and "quality contacts" (when referrals result in the individual enrolling in quitline counseling services) were measured over 12 months.

Results: Fax-referrals to the Wisconsin Tobacco Quit Line increased in both groups (1 or more referrals were made by 9 of 25 F2Q clinics and all 24 F2Q +EAD clinics); however, the referral rate (total number of referrals per provider) was almost 5 times greater for F2Q + EAD compared to F2Q (7.9 vs. 1.6, p=.001).

Conclusions: Fax to Quit plus Enhanced Academic Detailing shows promise as an innovative, effective strategy to link more tobacco users who visit their primary care physician to telephone cessation quitlines.

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NIPA-3

CESSATION INDUCTION FOR UNMOTIVATED SMOKERS: A RANDOMIZED CLINICAL TRIAL OF NRT SAMPLING

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Approximately 60% of smokers do not make a quit attempt each year. For these unmotivated smokers, novel strategies for cessation induction are necessary. This study reports on a large (N=849) nationwide, population-based RCT of a novel intervention to induce quit attempts and cessation. Smokers unmotivated to quit in the next 30 days, with no prior history of using nicotine replacement for cessation, were recruited via proactive, online channels, and randomized to a 6-week phone-based intervention of either 1) practice quit attempts (PQA; i.e., the behavioral exercise of going for a few hours/days, without pressure to formally quit, to learn more about the process of quitting and effective behavioral tools for doing so), vs. 2) PQA + NRT sampling. Both groups were time-matched for treatment intensity. Availability of NRT (lozenge) during the period of practice quitting was hypothesized to increase readiness to quit, self-efficacy, and

familiarization with evidence-based pharmacotherapy. Interim outcomes at 3 months suggest that, relative to the PQA group, smokers in PQA+NRT group were more likely to make any quit attempt (33% vs. 25%; OR=1.4; 95% CI: 1.1-1.9), and a 24hr quit attempt (26% vs. 20%; OR=1.4; 95% CI: 1.0-1.9). The PQA+NRT intervention resulted in higher rates of 7-day self-reported point prevalence abstinence at 3 months (12% vs. 8%; OR=1.6; 95% CI: 1.0-2.5). Analyses revealed significant group*time interactions with greater increases in both readiness to quit (p<.001) and self-efficacy (p<.001) within the PQA+NRT group. The magnitude of cessation effects is comparable to other methods to induce cessation (e.g., physician advice) that, in contrast to current study, rely primarily on persuasive messaging. Sampling NRT during a short period of trial abstinence may be a novel, behaviorally based method for cessation induction appropriate for those who have not responded to motivational messages. If so, this intervention may readily translate to the clinical setting because it is simple and easy to implement. Data from final, six-month outcomes will be available for conference proceedings.

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NIPA-4

ASSOCIATION OF THE CHRNB2 GENE AND DSM-IV NICOTINE DEPENDENCE SYMPTOMS

Helen M. Kamens*, Matthew B. McQueen, Robin P. Corley, Michael C. Stallings, John K. Hewitt, and Marissa A. Ehringer, Institute for Behavioral Genetics, University of Colorado, Boulder, CO

Nicotine binds to nicotinic acetylcholine receptors and studies in animal models have shown that receptors containing the beta2 subunit mediate nicotine behaviors. Moreover, variation in this subunit has been associated with abstinence rates following smoking treatment (Conti et al. 2008, Perkins et al 2009). In the current study we examined the genetic association between variation in the gene that codes for the beta2 subunit of the nicotinic acetylcholine receptor subunit (CHRNB2) and DSM-IV nicotine dependence symptoms. One thousand five hundred and twenty Caucasian, non-Hispanic subjects were used in this study. Subjects were probands, siblings and their parents collected at the University of Colorado as part of a longitudinal study of adolescent and early adulthood antisocial drug dependence. Ten SNPs spanning the CHRNB2 gene were selected based on prior literature (Conti et al 2008) and genotyped. FBAT was used to examine associations between CHRNB2 SNPs and DSM-IV symptom count of nicotine dependence. Symptom counts were corrected for age, sex and clinical status prior to the association analysis. Results provided evidence that a SNP in CHRNB2 (rs7543174, p less than 0.01) is associated with number of nicotine dependence items in this study population. Subjects homozygous for the minor allele (C; MAF equals 0.17) exhibit a greater number of tobacco dependence symptoms compared to heterozygous individuals or those homozygous for the major allele (T). We determined that three of the seven DSM symptoms explain the association, including: (1) tolerance, (2) nicotine is used in larger amounts or over a longer period than intended, and (3) a great deal of time is spent in obtaining or using the substance. These data provide evidence that variation in the beta2 subunit of the nicotinic acetylcholine receptor may be important for nicotine dependence liability.

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POS1-1

SECONDHAND SMOKE EXPOSURE AMONG ADULTS ADMITTED TO AN ACUTE-CARE GENERAL HOSPITAL: COMPARISON OF SERUM COTININE SCREENING AND CHART REVIEW

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BACKGROUND: Secondhand smoke (SHS) exposure increases a nonsmokers' risk of lung cancer and cardiovascular disease (CVD) but receives scant attention in health care settings. Little is known about how often SHS exposure is assessed in hospitalized patients or about the prevalence of biochemically measured SHS exposure in this population.

METHODS: To address these gaps, we studied a random 40% sample (n=1015) of all adult (>=18 years old) patients admitted to a 950-bed acute-care general hospital in Boston, MA, during 5 weeks in 2008. Smoking status and SHS exposure were assessed by hospital chart review and by cotinine assay of an admission blood sample. Smoke exposure was defined as: <0.2 ng/ml=no SHS exposure; 0.2-0.49 ng/ml=low level SHS exposure; 0.5-14.9 ng/ml= significant SHS exposure or light smoking; 15+ ng/ml= current smoking.

RESULTS: Among the sample of 1015 adults, 189 (18.6%) were current smokers; 43 (4.2%) had significant SHS exposure; 77 (7.6%) had low-level SHS exposure; and 706 (69.6%) were SHS-unexposed. Among the 826 nonsmokers (cotinine <15 ng/ml), those with SHS exposure compared to those without SHS exposure were more likely to be male (p=.04), below age 65 years (p=.03) and have Medicaid or no insurance (p=.05). They did not differ significantly in race or admitting service. In a multiple logistic regression that included all these covariates, significant associations were seen for younger age (p=.001) and male gender (p=.02). Results did not change when the analysis was repeated using a definition of >=3 ng/ml to define current smoking. SHS exposure was assessed in only 10 (1%) of hospital charts; 6 (0.6%) of patients had SHS exposure noted in the chart. Only 1 of these had biochemical evidence of SHS exposure.

CONCLUSIONS: Among a large random sample of adults admitted to an urban acute-care general hospital, 11.8% of all patients and 14.5% of nonsmokers had biochemical evidence of SHS exposure. SHS exposure was almost never assessed by the clinicians caring for these patients. This is a missed opportunity to assess and educate nonsmokers about avoiding SHS exposure.

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POS1-2

TOBACCO INDUSTRY MARKETING PROMOTIONS CONTINUE TO PLAY A ROLE IN TOBACCO SUSCEPTIBILITY AND USE: FINDINGS FROM THE NORTH CAROLINA YOUTH TOBACCO SURVEY

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Tobacco industry "societal alignment" strategies have resulted in well-publicized efforts to ostensibly prevent minors from participating in tobacco promotion campaigns. Data from the North Carolina (NC) Youth Tobacco Survey (YTS) indicate that industry efforts are unsuccessful. The tobacco industry spends billions of dollars on advertising and promotion including distribution of free samples, t-shirts, lighters, hats and more. The NC YTS measures tobacco use behaviors, attitudes, and susceptibility among middle- and high-school students every two years. We developed a risk profile to address the impact of industry promotion and other factors on susceptibility. The findings from 2005 to 2009 suggest that high school students who are susceptible to using cigarettes (i.e., respond affirmatively to the possibility of trying tobacco in the next year) consistently report the willingness to use or wear tobacco industry promotional items. The risk profile developed with the 2009 NC YTS data elaborates on other factors, including having friends who smoke, that when combined with tobacco industry promotion are associated with susceptibility. These findings suggest youth are susceptible to tobacco product advertising and promotion and greatly influenced by their social networks. We discuss potential implications for youth prevention campaigns and directions for further research.

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POS1-3

TWITTER = QUITTER? A CONTENT ANALYSIS OF TWITTER QUIT SMOKING GROUPS

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Twitter, a free social networking and micro-blogging service, is a novel technology whereby individuals communicate via short text messages called "tweets", which have a maximum of 140 characters. Tweets are received by "followers" nearly instantly on their mobile phones and personal Twitter web pages. Created in 2006, Twitter has grown to >100 million users worldwide, with 65 million tweets/day in June 2010 or 750 tweets/second. Used primarily by commercial marketers and PR firms, Twitter is so new that few academics have published on it, and no studies have tested its potential for health promotion. Twitter may be particularly appealing to smokers given commonalities in the personality traits of heavy texters and smokers (i.e., high sensation seeking and impulsivity). This study examined the activity and popularity of Twitter quit smoking groups and analyzed tweet content in relation to tobacco treatment clinical guidelines. Using key words of quit or stop smoking, a total of 179 Twitter groups were identified, created between 7/2007 and 8/2010. The groups had a median of 76 followers and 9 total tweets; 26% of sites had >100 tweets. Total tweets and followers were positively correlated (Spearman's rho=.53, p<.001). In August 2010, 53 groups (30%) were still active with a median of 19 tweets that month. Many Twitter groups linked to commercial sites (44%), 27% had tweets on e-cigarettes, and 17% delivered tobacco news alerts. Only 7 of the 179 groups elicited peer-to-peer support, and in these groups, 34% of posted tweets were responses to fellow group members; content related to quit dates, benefits of quitting, alternative treatments (e.g., chlorella, laser, self-hypnosis), and quitting "cold turkey." The use of Twitter has grown exponentially. Study findings demonstrate interest in Twitter for creating social networks for quitting smoking; however, existing groups are very large, lack interactivity among members, and few tweets are consistent with clinical guidelines. Future research is needed to leverage the popularity and innovative technology of Twitter for disseminating evidence-based tobacco treatment strategies on a national and global scale.

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POS1-4

SMOKELESS TOBACCO MARKETING IN APPALACHIAN OHIO

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Federal legislation to restrict marketing of tobacco products – including smokeless tobacco – has recently been enacted. In an effort to learn about the marketing of smokeless tobacco (ST) to rural populations, retail outlets licensed to sell tobacco products were studied in the Appalachian region of Ohio. Observational data were collected from a stratified sample of retail outlets within three geographically separated Ohio Appalachian counties. From an estimated 300 retail establishments, a random sample was drawn, stratified by counties. Trained observers were sent to survey the current marketing of ST products. Initial surveys were conducted in 2009-10 before the implementation of the federal marketing regulation was enacted in June 2010. Post-regulation surveys were repeated in August 2010. Results: Using sampling with replacement (for retail outlets that no long sold tobacco or were out of business), observation of outdoor and indoor ST marketing was completed (n=86). Most tobacco-licensed businesses sampled were convenience stores (48%). At baseline, 75% of businesses surveyed had interior or exterior advertising for ST (n=66). Of all stores with ST ads, 44% had ads less than 3.5 feet from the ground, included ST branded functional items (such as mirrors, change cups, etc) (24%), included illuminated ads (5%), or ST branded decals on the counter or floor (12%). Statistical comparisons before and after the federal regulation change will be conducted for the frequency, type, and location of indoor and on-site ST advertising.

Conclusion: ST advertising is an important presence at tobacco-licensed businesses in rural Appalachian Ohio retail outlets. The majority of businesses had ST advertising in place, in a variety of forms. Changes following the federal regulations will be discussed.

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POS1-5

ADOLESCENT SMOKERS WHO HAVE NOT YET SMOKED 100 LIFETIME CIGARETTES: RISKS OF ESCALATION AND OPPORTUNITIES FOR CESSATION

Arthur V. Peterson, Jr.*, Patrick M. Marek, Kathleen A. Kealey, Jonathan B. Bricker, and Evette J. Ludman

Adolescent light smokers are an ongoing important population for research, both because they are at high risk for progression to heavy smoking, and because they may be good candidates for cessation. Indeed, most of these are included in the most common definition of 'smoker', which specifies two simultaneous characteristics: (current) smoking once a month or more, and (history) having smoked more than 100 lifetime cigarettes. But what about adolescent light smokers who have not yet smoked more than 100 lifetime cigarettes? To what extent do they escalate from light smoking to heavy smoking? And, to what extent do they quit on their own? To answer this question, we examined smoking progression, and smoking cessation, among a population-based well-followed cohort of 1,093 teen smokers proactively recruited with no restriction on number of lifetime cigarettes. We found that 50.1% of the population of adolescent smokers had smoked fewer than 100 lifetime cigarettes. Further, the percent quit (six-month-prolonged abstinence) at the two-year follow-up was much higher among those who at baseline had not yet smoked 100 cigarettes: 27.9% vs. 8.4% ($p<.01$). The percent that progressed to daily smoking at the two-year follow-up was substantially different among those who at baseline had not yet smoked 100 cigarettes. Investigation into subgroups of lifetime number of cigarettes between 10 and 100 was also informative with respect to how the number of lifetime cigarettes predicted smoking progression and cessation. These results suggest that adolescent smokers who had not yet smoked 100 cigarettes are an important group of adolescent smokers to include in further research and intervention efforts. Secondary prevention for this group could prevent escalation of smoking, and potentially increase the natural quit rate.

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POS1-6

SMOKING CESSATION INTERVENTIONS OFFERED TO FRENCH ADULT LIGHT SMOKERS: A HETEROGENEOUS POPULATION WITH SPECIFIC NEEDS

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Aims: We addressed the understudied topic of cessation interventions for adult light smokers (one to ten cigarettes daily). We identified cessation aids offered in French cessation services and their impact on cessation outcomes at one-month follow-up.

Methods: We retrospectively analysed data from 36,594 smokers in cessation services nationwide. Smokers could be offered pharmacotherapy as well as cognitive behavioural therapy (CBT). Bivariate methods and multivariate logistic regression analyses were used.

Results: Light smokers were 1.23 times more likely to drop out than heavy smokers. 13.3% were abstinent at follow-up versus 14.5% for heavy smokers ($p=0.013$). Light smokers were offered pharmacotherapy less often than heavy smokers. Yet, among light smokers, varenicline doubled the odds of abstinence, as did nicotine patch. CBT improved abstinence only when combined with nicotine patch. Intervention outcomes differed according to various profiles: light smokers self-referred or with several previous quit attempts achieved better outcomes than those not interested in quitting or referred through hospitalisation.

Conclusion: Light smokers' poor intervention outcomes might partly be explained by inadequate treatment plans in French cessation services. Our results reveal that pharmacotherapy is effective and that tailored CBT should be offered according to the variety of profiles among light smokers.

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POS1-7

CHANGES IN SOCIAL INEQUALITIES IN MALE SMOKING-ATTRIBUTABLE MORTALITY IN TWO EUROPEAN COUNTRIES

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Background: Past studies have assessed trends in smoking prevalence among different social strata in developed countries. However, we know of no study that quantifies changes in social inequalities in smoking-attributable mortality rates over time. The aim of this study was to assess changes in social inequalities for smoking-attributable male mortality rates by educational level between two time periods in France and Poland.

Methods: The contribution of smoking to adult male mortality in each population was estimated indirectly from disease-specific death rates in that population (using absolute lung cancer rates to indicate proportions due to smoking of mortality from certain other diseases). We applied these methods to male death rates at ages 35–69 years from three different social strata in France and Poland, based on a total of 202,779 deaths. The social strata were low, middle, and high based on completed years of education (less than 12 years, 12 years, and more than 12 years, respectively). For France, the comparison periods were 1990-94 and 1995-99; for Poland, 1995 was compared to 2002.

Results: Smoking-attributable mortality rates were 3 to 6 times higher in the lowest education group as compared to the highest education group in both countries. In France, smoking-attributable mortality rates within each education group remained similar between 1990-94 and 1995-99. Between 1995 and 2002, Poland showed a reduction in smoking-attributable mortality rates by 15%, 4%, and 52% in the low, middle, and high education group, respectively.

Conclusion: Although men in the lowest education group in France were around four times more likely to die from smoking as compared to those in the highest education group, there was little change between the periods studied for this country. While smoking-attributable mortality rates in the highest education group of Polish males decreased much more compared to the lower education groups; declines were seen in all education groups. Mortality rates from more recent years, when tobacco control efforts have accelerated in both countries, will be of interest to confirm these trends.

This study was conducted by Sonica Singhal at Centre for Global Health Research, St. Michael's Hospital. Supported by St. Michael's hospital scholarship of $24,500 from 09/01/2009 to 08/31/2010. No other funding support.

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POS1-9

IMPROPER DISCLOSURE: TOBACCO PACKAGING AND EMISSION INFORMATION

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Cigarette packages in the European Union and Canada currently display the levels of toxic emissions, including tar, nicotine and CO. These numbers are generated under machine smoking regimens that do not represent amounts delivered to individual smokers or level of risk. This study examined how consumers interpret and understand emission information presented on cigarette packages. A mall-intercept study was conducted among adult smokers (n=312) and non-smokers (n=291) in Ontario, Canada. Participants viewed 3 pairs of cigarette packages, which displayed emission information from the EU, Canada, and Australia. In each pair, one pack featured emission information for a typical 4mg ISO tar product and a 10mg ISO tar product. Participants compared the packs on perceived tar delivery, taste, and health risk, as well as the "usefulness" and understandability of the information. Participants were significantly more likely to believe that packages with lower emission numbers would have lower tar delivery (over 89.9% of participants), lower health risk (over 82.9%), and a smoother taste (over 73.9%). In addition, 74% of participants rated the Canadian label with numerical values as providing the "most useful" information; however, 62% also rated this label as most "difficult to understand." Most participants rated the Australian label, in which only text and no numbers are displayed, as "easiest to understand." The findings indicate that printing quantitative amounts of toxic emissions on packs reinforces the false belief that some brands are less harmful than others. The study also suggests that text-only descriptions of chemical emissions and their effects are easier to understand and less prone to misperceptions. Overall, the findings support guidelines under the WHO FCTC treaty recommending that tar and nicotine numbers should be prohibited from packages.

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POS1-10

MOST SMOKERS ARE TRYING TO QUIT A LOT: DATA FROM THE ITC 4-COUNTRY SURVEY

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Remarkably little is known about the amount of quitting activity that goes on. This paper uses data from up to 7 waves of the ITC survey (n>20,000) to estimate the amount of quitting activity and how long smokers remain off cigarette. It also considers the amount of serious thoughts of quitting that does not translate into attempts. Each year around 40% of smokers report quit attempts, reporting an average of 2.1 attempts each, making 0.8 quit attempts year per smoker. However, based on reports of attempts in the last 2 weeks, smokers are making around two attempts per year. Quit attempts that last a shorter duration appear to be more quickly forgotten. In the last month, 41% of smokers reported quit related activity: 14% made quit attempts, another 7% aborted attempts, 4% only plans and 16% only had "serious thoughts." Over a 5-year period around 77% of smokers reported quit attempts, with 9% succeeding (quit for more than a year). Among the remaining 68%, 11% reported an attempt lasting 6 months or more and another 40% attempts of 1-6 months, with only 25% reporting a longest attempt of less than a week. More dependent smokers (using HSI) are less likely to succeed in quitting, but are no less likely to engage in quit-related activity. It appears that the vast majority of smokers are highly motivated to quit and are making frequent quit attempts and/or having serious thoughts about quitting, but that one's ability to remain off cigarettes is constrained by nicotine addiction. When smokers do try to stop smoking, most can refrain from smoking for a week, and about have recently made it to a month or more. Translating more sustained quit attempts into long term abstinence remains a challenge for tobacco control.

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POS1-11

CESSATION ASSISTANCE REPORTED BY SMOKERS IN 15 COUNTRIES PARTICIPATING IN THE INTERNATIONAL TOBACCO CONTROL (ITC) POLICY EVALUATION SURVEYS

Ron Borland, Ph.D.*, on behalf of the International Tobacco Control (ITC) Policy Evaluation Project

Aim: To describe some of the variability across the world in levels of quit smoking attempts and use of various forms of cessation support.

Methods: Use of the International Tobacco Control Policy Evaluation Project surveys of smokers in 15 countries, using the survey wave conducted in 2007 or later if there was more relevant data. Data are provided from Australia, Canada, China, France, Germany, Ireland, Malaysia, Mexico, Netherlands, New Zealand, South Korea, Thailand, UK, Uruguay and the USA.

Results: Reported prevalence of quit attempts in the last year varied from under 20% to over 50% across countries. Smokers varied greatly across countries in likelihood of visiting health professionals, from less than 20% to over 70%. Among those who reported visiting a health professional in the past year, advice to quit varied from around 20% to 70% (from less than 10% to over 50% among all smokers). There was also marked variability in the levels and types of help reported. Some forms of support are not available in some countries. Use of medication was generally more common than use of behavioural support, except where medications are not readily available.

Conclusions: There is wide variation in quitting activity and use of cessation assistance across countries reflecting variations in both the history of tobacco control efforts in a region and the availability and accessibility of support in a country. In countries where most smokers do not visit health professionals regularly, the capacity of the health care system to play a proactive role in facilitating cessation must be limited, and a greater emphasis is needed on other strategies.

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POS1-12

USE OF NICOTINE REPLACEMENT THERAPY (NRT) AMONG CANADIAN YOUTH: DATA FROM THE 2006-2007 NATIONAL YOUTH SMOKING SURVEY

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Nicotine replacement therapy (NRT) has been identified as a best practice in smoking cessation for adults, yet it is currently not recommended for use among youth smokers. The purpose of the present study was to determine the prevalence of NRT use among youth smokers in Canada and examine characteristics associated with its use. Data from 41,886 grade 9 to 12 students who participated in the 2006-07 Youth Smoking Survey (YSS) were used to determine prevalence of NRT use. Logistic regression models were conducted to examine the association between current and ever NRT use by current smoking status, demographic characteristics and exposure to tobacco control programs. In 2006-2007, 20.4% of current and former youth smokers in Canada had ever used NRT and 7.4% were currently using NRT. Prevalence of NRT use was highest among current smokers, older youths, boys, youths who had made previous quit attempts and youths who had no disposable income. Participation in cessation counselling or a quit smoking contest, as well as living in the Prairie regions were all significantly associated with increased NRT use, whereas attending anti-smoking classes in school was inversely associated with using NRT. More research is needed to determine NRT's effectiveness in this unique population and elucidate the mechanisms by which characteristics identified in the current study affect NRT use.

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POS1-13

PUTTING DATA IN THE HANDS OF STAKEHOLDERS: THE EXPERIENCE OF THE TOBACCO INFORMATICS MONITORING SYSTEM (TIMS)

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Objective: To enhance the use and adoption of key tobacco control outcome indicators for program planning, decision-making, surveillance and evaluation, formative research was undertaken to aid in the design and building of an online data portal, the Tobacco Informatics Monitoring System (TIMS).

Methods: Technical requirements for TIMS were developed by reviewing existing tobacco-related data portals (CDC's STATE system, WHO's Core Health Indicators,

California's C-STAT) and financial sites (Yahoo Finance, MSN Money Central, Globefund). Site design included several iterations and involved key informants throughout the process (practitioners, policy-makers, advocates, and researchers), user testing and an expert heuristic evaluation.

Results: Formative research suggested that stakeholders wanted a dynamic database-driven website, with a user friendly and easy-to-navigate front end. Interviews and user testing suggested that stakeholders thought TIMS would facilitate use of tobacco-related data in program planning, decision making, surveillance and evaluation. To meet user needs, TIMS currently houses over 140 indicators related to demographics, tobacco use, smoking cessation, prevention, protection, and public opinion. Users are able to navigate through the site to access millions of unique data points including obtaining results by population (age, sex, education, occupation, and income), geography (national, provincial, and sub-provincial), and multiple surveys spanning multiple years. Display options include table, chart, and map, with dynamic capabilities to sort, group, print, and download.

Conclusions: By providing ready access to analysed data, TIMS has the potential to enable new insights into emerging issues and trends. The site facilitates links between health-outcome results and the decision-making process such as consideration of health equity issues focusing on priority sub-populations and high-risk areas. This information has the potential to inform tobacco control efforts.

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

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POS1-14

THE ETHICAL COMPLEXITIES OF COST-EFFECTIVE TOBACCO CONTROL IN DEVELOPING COUNTRIES

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BACKGROUND: Globally, over 80% percent of tobacco users reside in developing countries and the majority of deaths due to tobacco in the 21st Century will occur in the developing world. Despite evidence supporting the effectiveness of individual tobacco treatment programs, many experts argue for a strict focus on population-based measures like taxes and indoor air laws, which they consider more cost-effective. We sought to examine the validity of these arguments.

METHODS: We searched public databases such as PUBMED, CINAHL, EMBASE, and Google using search terms such as "tobacco control," "treatment," "cost-effectiveness," and "ethics" to conduct a narrative review of the literature on the cost-effectiveness and ethical implications of prioritizing different tobacco control strategies. Specifically, we examined qualitatively the relative cost-effectiveness of each strategy, and the justification of exclusive focus on cost-effectiveness.

RESULTS: Utilitarian proponents of population-based strategies usually understate both the comparative cost-effectiveness of individual treatment programs and pertinent non-economic ethical considerations. Specifically, they ignore highly cost-effective provider counseling programs, and the possible relative cost-ineffectiveness of population-based measures such as media campaigns. We posit the following ethical case for individual tobacco treatment programs in developing countries: they are cost-effective compared to most clinical interventions, and seldom compete with population-based measures; they impose little or no economic burden and stigma on nicotine-dependent users; and they do not abandon an identifiable population close to the onset of tobacco-related disease.

CONCLUSION: A strict population-based focus in tobacco control overlooks the cost-effectiveness of many individual treatment programs, and important extra-utilitarian ethical considerations in their support. In many developing country contexts, tobacco treatment programs are warranted in concert with proven population-based strategies.

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POS1-15

NONDAILY SMOKERS VERSUS NONSMOKERS AND DAILY SMOKERS: DISTINGUISHING CHARACTERISTICS AND FACTORS RELATED TO READINESS TO QUIT

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The increased prevalence of nondaily smoking has implications for tobacco control and cessation. Unfortunately, little is known regarding how nondaily smokers differ from nonsmokers and daily smokers and what predicts readiness to quit among this group. We examined (1) correlates of nondaily smoking versus being a nonsmoker or daily smoker among college students; (2) differences in smoking-related characteristics among nondaily and daily smokers; and (3) correlates of readiness to quit among nondaily and daily smokers. An online survey was administered to 2,265 college undergraduates aged 18-25 years from a two-year college and a four-year university in the Midwest. Assessments included sociodemographics, smoking behavior (days of smoking in the past 30, cigarettes per day [CPD], time to first cigarette, readiness to quit, confidence and motivation to quit), motives for smoking, parental smoking status, and other health behaviors (e.g., alcohol consumption). Results indicated that nondaily smokers were younger than nonsmokers and daily smokers. They were less likely to have children and more likely to have college-educated and nonsmoking parents than nonsmokers. They were less likely to have parents who smoked than daily smokers. Nondaily smokers were also more likely than nonsmokers to use other forms of tobacco, consume alcohol, binge drink, and were less likely to exercise, but were less likely than daily smokers to binge drink. Compared to daily smokers, nondaily smokers smoked fewer CPD, were less likely to smoke within 30 minutes of waking, more likely to be ready to quit in the next month, more confident and motivated to quit, and more likely to smoke for social reasons. Among nondaily smokers, readiness to quit smoking was associated with having nonsmoking parents, no binge drinking in the past month, fewer CPD, and fewer smoking days. Among daily smokers, readiness to quit was associated with being unmarried but having children in the home. Thus, nondaily smokers differ qualitatively from daily smokers and nonsmokers. Distinct correlates of readiness to quit smoking among nondaily and daily smokers suggest different intervention targets.

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POS1-16

ASSOCIATION BETWEEN ALCOHOL AND TOBACCO USE AMONG YOUNG ADULTS ATTENDING BARS

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Alcohol and tobacco use are strongly associated behaviors. Bars and clubs are key venues where young adults use both substances. We examined cigarette smoking and alcohol use among young adults aged 18-29 attending bars and clubs in San Diego, CA (N=1,160), Portland, ME (N=1,031), and Tulsa, OK (N=1,129). Subjects at bars were selected using randomized venue-based sampling to complete written surveys (85% participation rate). We categorized past-month smoking status into non-smoker, occasional smoker, and frequent smoker; with similar categories for past-month drinking and binge drinking. Multinomial logistic regression was used to analyze the association of smoking with drinking and binge drinking, controlling for age, gender, race/ethnicity, and education, using STATA version 11.0. Predicted probabilities of each smoking category were calculated by drinking and binge drinking status. The current smoking rates were high: 52% in Portland, 56% in San Diego, and 59% in Tulsa. Past-month drinking rates were 98% in Portland, 96% in San Diego, and 92% in Tulsa. Past-month binge drinking rates were 77% in Portland, and 79% in San Diego and Tulsa. Smoking was consistently associated with drinking and binge drinking, with predicted probability of smoking increasing with drinking and binge drinking levels, holding demographic variables at mean values. The association between tobacco and alcohol use became stronger with heavier use of either substance. Tulsa showed the strongest association between smoking and both drinking and binge drinking among the three cities. One explanation for this difference may be that smoking is allowed in bars in Tulsa, but not in San Diego or Portland,

suggesting smokefree bar policies may impact tobacco and alcohol pairing. The high smoking and drinking rates in our samples indicate that bars are important venues for tobacco control policies and interventions.

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POS1-17

THE EFFECTS OF ARKANSAS MASTER SETTLEMENT SPENDING ON DISPARITIES IN SMOKING

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Objectives: To determine the effect of Arkansas' Master Settlement Agreement (MSA) spending on disparities in smoking.

Methods: Using BRFSS data, we compared the effectiveness of MSA-funded tobacco control activities on smoking in women (vs. men) and ethnic minorities (vs. non-Hispanic Whites). We estimated changes in annual smoking rates from 1996 through 2009, noting the initiation of MSA-funded programs in 2001. We also used comparison analysis to estimate disparities in smoking between residents of Arkansas (n=53,638) and its 6 neighboring states (n=421,437).

Results: At baseline prior to the MSA-funded programs, male Arkansans smoked more than female Arkansans ($p<0.05$). After MSA programs were in full effect however male smoking declined, eliminating the gender disparity. Male smoking in Arkansas also declined more than in neighboring states ($p<0.05$), suggesting that the decline in male Arkansans' smoking was related to MSA spending. Within Arkansas (but not in neighboring states), Hispanics showed a greater decline in smoking than non-Hispanic whites. At baseline, Hispanics smoked more than non-Hispanic whites, but after MSA programming, Hispanic Arkansans smoked significantly less than non-Hispanic white Arkansans ($p<0.05$).

Conclusions: Arkansas' MSA-funded programs may affect smoking differently in different demographic groups. Policymakers who wish to target spending to the demographic groups with the greatest need should monitor group-level smoking rates.

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POS1-18

THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY AND SMOKING CHARACTERISTICS AMONG PSYCHIATRICALLY HOSPITALIZED ADOLESCENTS

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Across community samples of adolescents, an inverse relationship between physical activity (PA) and smoking behaviors has been consistently demonstrated. However, there is a dearth of information regarding this relationship within clinical populations of adolescents. The purpose of this study is to examine the rates of PA among 191 (mean age=15.4; 63.4% female) psychiatrically hospitalized smokers and to examine whether the extent of PA involvement is related to various smoking-related characteristics. Adolescents who exercised 3 or more days per week were considered physically active (PA). Less than half (45.1%) of adolescent smokers were PA. Linear regression models that included age, gender, PA, and PA by gender interaction were conducted on the subset of smokers to predict the following smoking-related dependent variables: cigarettes per day, expectancies, intention to quit, nicotine dependence and withdrawal symptoms, and self-efficacy. A pattern of statistically significant PA by gender interactions emerged across analyses. PA boys and non-active girls, demonstrated less nicotine dependence ($t=2.75$, $df=186$, $p<.005$), a trend toward fewer cigarettes per day ($t=1.79$, $df=186$, $p=.07$), greater intention to quit smoking upon hospital discharge ($t=2.90$, $df=182$, $p<.005$), negative smoking expectancies ($t=2.62$, $df=186$, $p<.01$) and greater self-efficacy to quit smoking ($t=2.20$, $df=185$, $p<.05$). Further, there was a main effect of PA on lower nicotine withdrawal symptoms ($t=2.21$, $df=179$, $p<.05$). These findings suggest that the inverse relationship between smoking and physical activity demonstrated with community samples of adolescents is only observed in clinical samples of boys. Further research is necessary to determine why PA among girls with mental health problems is associated with worse indicators of smoking characteristics. Examining gender differences in adolescents' motivations for exercise may help to elucidate these relationships. Efforts toward potentially utilizing PA as an intervention for smoking cessation in adolescents (as has been pursued with adults) need to take into account gender differences in the relationship between PA and smoking.

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POS1-19

AN ECONOMIC ANALYSIS OF A SMOKE-FREE RESTAURANT ORDINANCE IN A MIDWESTERN FRONTIER STATE

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The objective of this study was to analyze the economic impact of a smoke-free restaurant ordinance in a Midwestern, frontier state community in the United States. The study methods are described next. Data were obtained from the Office of the North Dakota Tax Commissioner on "Restaurant Taxable Sales and Purchases" and "Total Taxable Sales and Purchases" for the city of Minot, North Dakota. These were used as proxies for restaurant sales and total retail sales, respectively. Data were collected from the first quarter of 1997 through the fourth quarter of 2002. The data were analyzed using linear regression analysis including time and dummy variables for the presence of an ordinance and the four seasons. Restaurant sales were analyzed as a fraction of total retail sales. The results of the study showed the following. The implementation of the smoke-free restaurant ordinance had no significant effect on the fraction of sales that went to restaurants in Minot. Therefore, the results of the study, using classical regression analysis, showed the smoke-free ordinance had no impact on restaurant sales in the city of Minot. This is based on the statistical insignificance of the parameter measuring the smoke-free ordinance. The positive sign in front of the parameter, assuming significance, would have shown an increase in restaurant sales. In conclusion, analysis of six years of sales tax data shows that there was no economic effect of the smoke-free restaurant ordinance on a community in a Midwestern, frontier state. This study found no adverse change in restaurant sales because of the smoke-free restaurant ordinance. This supports the findings of quality studies as analyzed in Scollo et al. - that smoke-free laws have a neutral or positive economic impact.

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POS1-20

FINANCIAL ACCESS TO CESSATION MEDICATIONS IN RURAL PRIMARY CARE PATIENTS

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Objective: The use of cessation medication doubles the chance of quitting smoking. However, medications can be expensive, many are not covered by insurance, and not all are safe for all patients. As part of an RCT comparing video to telephone cessation counseling, we developed a process to help participants select safe and affordable cessation medications. We report here rural smokers' financial access to cessation medications.

Methods: Participants were recruited via rural physician practices. At baseline, staff sent participants' insurance information, current drugs taken, and health screener data to a pharmacist who reported back on cessation medication coverage, cautions, and contraindications. Counselors used a pharmacotherapy guidance form, which included participants' coverage information, to help participant select affordable medications. Counselors applied to pharmaceutical assistance programs for participants who were income eligible. At 3 months post randomization, patients were surveyed on study outcomes, including pharmacotherapy use. We analyzed data from 3-month follow-up surveys as of September 1, 2010.

Results: Of 161 participants, 57% had prescription insurance with 22%, 62%, and 58% eligible for assistance with NRT, Bupropion, and Varenicline, respectively. The average co-pay was $12 for Bupropion, $18 for Varenicline and NRT. Among those with prescription insurance, 65% had at least one cessation medication covered – yielding an overall rate of only 66/161 (41%) with any form of cessation medication coverage. Many (62%) were eligible for free or reduced-cost medication through pharmaceutical assistance programs.

Across all participants, 50% had used some form of cessation medication. The average length of use was 5.5 weeks with an average out of pocket cost of $67.

Conclusion: Smokers face significant financial barriers in obtaining cessation medications. Pharmacotherapy guidance may increase medication use by facilitating decision-making and access to medications.

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POS1-21

FACTORS ASSOCIATED WITH ELECTRONIC CIGARETTE USE AMONG COLLEGE STUDENTS

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The use of e-cigarettes, tobacco-free nicotine delivery systems, is a relatively new and unstudied phenomenon in the US. Due to a limited evidence base, issues of safety and regulation have not been resolved. Although e-cigarettes are marketed as potential reduced exposure products, anecdotal evidence suggests they are also used as smoking quit aids. College students may be especially vulnerable to e-cigarette use, given their high smoking rates and desire to quit. The goal of this study was to measure prevalence and correlates of e-cigarette use in a large sample of college students. In fall 2009, 4,857 students (61% female, 78% White) from 8 colleges in North Carolina completed an online survey. 5% reported ever using e-cigarettes (n=216). Results of multilevel logistic regression analyses showed that ever use of e-cigarettes was significantly more likely among males (AOR=1.45), non-Whites (vs. Whites, AOR=1.87), and those with higher sensation seeking scores (AOR=1.29), but was not associated with use of hookah, marijuana, illicit drugs or binge drinking. Uncertainty about the harm of e-cigarettes compared to regular cigarettes was related to a lower likelihood of use compared to perceptions of greater harm (AOR=3.20; 3% of users), lesser harm (AOR=3.05, 44%) and equal harm (AOR=2.00, 17%). E-cigarette use was more likely among smokers, including current daily (AOR=4.85), nondaily (AOR=5.32) and former/experimental (AOR=4.21) smokers. Current nondaily cigarette smokers were more likely to be current e-cigarette users than daily smokers (AOR=3.5). Quit intentions were not related to e-cigarette use. These findings suggest that among college students, correlates of e-cigarette use are distinct from correlates of cigarette smoking, which typically include binge drinking, marijuana use and other illicit drugs. Use was more common among smokers (though not exclusively), but it is unclear if e-cigarettes are used as cigarette replacements or quit aids. The precision of findings is limited by the low prevalence rate of e-cigarette use, but this study represents the first empirical evaluation of factors associated with e-cigarette use by college students.

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POS1-22

NONDAILY SMOKING PATTERNS IN YOUNG ADULTHOOD

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Evidence is emerging that a substantial proportion of young adult smokers routinely smoke intermittently or less than daily. Longitudinal research is needed to describe the patterns of smoking behavior among nondaily young adult smokers, and improve the understanding of predictors of these smoking patterns. The main goals of the present study are to (1) identify distinct developmental trajectories of nondaily cigarette smoking among young adults aged 18 to 21, and (2) examine factors associated with trajectory group membership.

Methods: Using survey data from a population based cohort study, a sample of 519 young adult nondaily smokers (smoked on 1 to 29 days in the past month) were examined to identify developmental trajectories of cigarette smoking. Latent class growth analysis was applied to extract the number of groups within this sample of young adults (ages 18 to 21), and logistic regression was applied to examine the predictors of group membership.

Results: There were three distinct groups of nondaily smokers among the sample of young adults, characterized by Low (n=248), Medium (n=144), and High frequency (n=127) of smoking. College status, previous quit attempts, attitudes toward the meanings of cigarettes, and situational factors influencing smoking were significant predictors of group membership.

Conclusions: Young adults exhibited three distinct patterns of nondaily smoking behavior. A variety of factors, including educational status, contributed to significant distinctions between these nondaily smoking groups. These results can be used to tailor efforts to promote reduce smoking and increase cessation among specific subgroups of young adults.

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POS1-23

ASSOCIATIONS BETWEEN POSTTRAUMATIC STRESS DISORDER SYMPTOM CLUSTERS AND CIGARETTE SMOKING IN A POPULATION-BASED SAMPLE OF AMERICAN ADULTS

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Understanding the relationship between Posttraumatic stress disorder (PTSD) and cigarette smoking has been difficult due to the symptomatic heterogeneity of PTSD. Different symptom clusters within PTSD may have unique etiologies and may thus play disparate roles in the tobacco dependence process. This study examined lifetime cross-sectional relationships between number of symptoms experienced within four separate PTSD symptom clusters (Re-experiencing [intrusive thoughts and nightmares about the trauma], Avoidance [avoidance of trauma-associated memories or stimuli], Emotional Numbing [loss of interest, interpersonal detachment, restricted positive affect], and Hyperarousal [irritability, difficulty concentrating, hypervigilance, insomnia]) and three indicators of smoking severity: (1) smoking status; (2) smoking heaviness (cig/day); and (3) DSM-IV nicotine dependence. Participants were adult respondents in the National Epidemiologic Survey of Alcohol and Related Conditions who reported experiencing at least one lifetime traumatic stressor (N = 23,653). Separate regression models adjusted for demographics and comorbid psychiatric and substance use disorders were tested for each smoking outcome. Results showed that all four symptom clusters associated with each smoking outcome in single-predictor adjusted models (ps < .0001). In multivariate models including all of the symptom clusters as simultaneous predictors, emotional numbing was the only cluster to retain a significant association with lifetime smoking (OR = 1.30, p < .01). In multivariate analyses of lifetime smokers (N = 10,837), none of the clusters evidenced unique associations with smoking heaviness, and only hyperarousal uniquely associated with nicotine dependence (OR = 1.51, p < .001). These results suggest that: (a) common variance across PTSD symptom clusters contribute to PTSD's linkage with tobacco use, heaviness, and dependence; and (b), certain PTSD symptom clusters may uniquely associate with particular indicators of tobacco use severity. These findings could help to clarify the underpinnings of PTSD-smoking comorbidity and inform smoking interventions for trauma-exposed individuals.

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POS1-24

REPORTED HEALTH EFFECTS OF SECOND HAND SMOKE AND ATTITUDE OF BAR WORKERS TO SMOKE-FREE LEGISLATION IN OSOGBO, OSUN STATE, NIGERIA

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Background: Osun State of Nigeria passed a comprehensive tobacco control law in November 2009. Some efforts are currently being made by advocates in Osun State to begin a process of enforcing this bill. This survey was conducted to evaluate the reported health problems among a group of indoor bar workers and evaluate their perceptions of the dangers of passive tobacco smoking. We also sought to elicit responses from the workers about their awareness of the Osun State Smoke-free legislation and their attitude to it.

Method: All the subjects recruited into the study were male non-smokers. The age range among all respondents was between 17 to 48 years. Interviewer-administered questionnaires were used to elicit responses from respondents recruited into the study.

The questionnaires had sections on knowledge about health effects of passive tobacco smoking and health problems of respondents as well as their attitude towards the recent smoke-free legislation. Attitudinal questions focused on understanding and support for tobacco control efforts in Nigeria and were scored on a 3-point Likert scale.

Results: There were Eighty-two respondents in all. The median duration of exposure to passive smoking was 3.5 months (range 1-7 months). Seventy-nine respondents in reported a poor general health feeling. Cough and nasal irritation were reported in 10 (15%) of the bar workers. Skin irritation were reported in 7 (4.2%) while acute eye irritation and watery discharges were reported in 14 (21%) of the workers in the indoor areas A total of 21 respondents (31%) had taken at least 2 sick days off work within the past month. Forty-three respondents (51%) were aware of the current smoke-free legislation with 30 (67%) having a poor attitude to the law.

Conclusion: Some form of intervention should be planned to enlighten the general public and the bar workers about the existence of the smoke-free legislation. Further studies that would measure the Particulate Matter PM 2.5 should be carried out in bars in the state.

Global smoke-free Partnership.

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POS1-25

PROMOTIONAL PRACTICES FOR R.J. REYNOLDS' CAMEL DISSOLVABLE TOBACCO IN A U.S. TEST MARKET

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Introduction: As the U.S. adult smoking rate continues to decline, tobacco companies are marketing new smokeless tobacco products to maintain their consumer base and recruit new users. The purpose of this study was to assess the availability, price and promotional strategies for R.J. Reynolds' new line of dissolvable tobacco products branded Camel Orbs, Strips and Sticks during their test market in central Indiana, USA.

Methods: Researchers conducted a field audit of five different categories of retail stores (n=81) in the Indianapolis Metropolitan Statistical Area, which included 7 surrounding counties. Data gathered included: store type, location, product placement, forms / flavors carried, price, promotions, and advertisement types, locations and messages.

Results: The product line was carried by 46% (N=37) of stores, most frequently by gas stations (100%) and convenience stores (75%). Most stores (84%) carried all three product forms. Camel Orbs, Strips and Sticks were displayed with other smokeless products (70%), cigarettes (25%) or candy (5%). Prices ranged from $3.59 -$4.19 per unit package. Most stores carried at least 1 promotional item. Free samples of the products were offered in 14% of the stores. In 84% of stores, ads were typically located right next to the new products. Ad messages included: "Dissolvable Tobacco" (60%), "Free Trial" (24%), "Special Price" (24%), "What's Your Style?" (22%), "Now Available" (11%), "Boldly Go Everywhere" (3%), and "Wallet Friendly" (3%). Retailers described product demand as low. Smoking prevalence per Indiana test market county was significantly correlated with the percentage of stores carrying Camel dissolvables (r=0.55, p<.001).

Conclusions: Current retail promotional strategies vary within subsets of the test market region. Promotions suggest a selective, rather than intensive distribution, targeted toward a select consumer audience such as current smokers. This approach appears to support dual tobacco use.

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POS1-26

THE IMPACT OF NORTH DAKOTA'S SMOKE-FREE LAW ON RESTAURANT AND BAR TAXABLE SALES

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According to the U.S. Surgeon General, secondhand smoke causes early death and illness in children and adults who do not smoke. There is no risk-free level of exposure to secondhand smoke and exposure to adults has immediate adverse effects on the cardiovascular system). In April 2005, North Dakota's (N.D.) 59th Legislative Assembly amended ND Century Code (NDCC) 23-12-09 relating to smoking in public places and places of employment. Effective August 1, 2005, the law required most public places and workplaces to be smoke free with some exemptions. Prior to passage of this legislation, some argued that the smoke-free law would be harmful to the hospitality economy in North Dakota. To get an early assessment of the validity of this claim, we examined quarterly taxable sales data from the ND Office of the Tax Commissions from 2003 through the third quarter of 2006 for the North American Industry Classification System Codes of 44 - 45 Retail Trade Sector and the 722 Food Services and Drinking Places Subsector and its industry group subsets of Full-Service Restaurants, Limited-Service Eating Places, and Drinking Places. Comparisons of a given quarter after the law to the same quarter in the previous year before the law were calculated, as well as the fraction of the indicators to the overall retail trade to control for underlying economic trends. Major findings indicate that taxable sales for the Food Services and Drinking Places Subsector and all industry group subsets continued to increase after the smoke-free law was implemented. Year-to-year taxable sales changes after the law were within 1 percentage point of year-to-year changes before the law, indicating the pre-law sales trends were unchanged after the law took effect. Adjustment for the level of retail sales in ND did not alter these conclusions. While subsequent studies with longer post-law follow-up should be undertaken, the initial early data suggest the statewide smoke-free law had a neutral impact on the taxable sales of the restaurant or bar establishments in ND.

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POS1-27

SMOKING AND PHYSICAL INACTIVITY: EVIDENCE ON THE INDIVIDUAL AND STATE LEVELS

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A recent review (Kaczynski et al., 2008) reports most studies have found that smokers are less physically active than nonsmokers, but some studies have found no such negative correlation or even a positive correlation. The present study examined the association between smoking and physical inactivity among respondents from the 2009 Behavioral Risk Factor Surveillance System. We compared physical inactivity for smokers and nonsmokers among non-Hispanic White adults, ages 18 years and over (N=333,885). We limited the analysis to White ethnicity to simplify comparisons across states. Physical inactivity was defined as, "No physical activity or exercise" in the last 30 days. Smokers were more likely to be physically inactive compared to nonsmokers (31.6% vs. 20.2%; OR=1.63 [95% CI: 1.57-1.70]), after controlling for age, sex, and education. When states were ranked in order of smoking prevalence and grouped in tertiles, smokers in high prevalence states were more likely to be inactive (35.8% [95% CI: 34.68-36.99]) compared to middle (30.0% [95% CI: 28.61-31.41]), and lower (27.9% [95% CI: 26.65-29.20]) prevalence states. More interestingly, the same trend was observed among nonsmokers for high (24.1% [95% CI: 23.59-24.57]), middle (20.0% [95% CI: 19.52-20.50]), and low (16.6% [95% CI: 16.16-16.95]) prevalence states. This particular finding—in which inactivity among nonsmokers mirrored that of smokers across states—suggests that, while an association between smoking and physical activity exists on the individual level, other factors such as population norms could significantly contribute to elevated levels of both cigarette smoking and physical inactivity.

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POS1-28

RESULTS AND COST OF A MIXED METHOD APPROACH TO RECRUITING YOUNG ADULT SMOKERS TO A TRIAL EVALUATING AN ONLINE SMOKING CESSATION PROGRAM

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Online recruitment is an emerging strategy for health behavior trials. From September 2007 to October 2009, 3,355 young adults, who were aged 18-30, current smokers, and interested in quitting, were recruited to a trial testing an online smoking cessation program. Online and off-line recruiting strategies were used –online health risk appraisal (HRA; n= 397), online advertisements (n=1426), off-line telephone quit line screener (n=191), and off-line promotion (posters, business cards, press releases; n=1341). Yield rates among eligible smokers varied by method: online HRA (8%; 16/month), online

advertisements (10%; 143/month), off-line quit line screener (23%; 63/month), and off-line methods (122/month; number of eligible smokers unknown). The online HRA recruited the lightest smokers (9.4 cigarettes/day) and the online advertisements the heaviest smokers (19.2 cigarettes/day, chi square =389.57, p<.0001). The online HRA yielded the most employed (69%) and female (67%) smokers and the off-line quit line, the fewest employed (53%) and female (56%) smokers. Online advertisements and off-line promotions recruited the most non-Hispanic white smokers (84%; all p<.05). When examining all smokers identified in the online HRA, more females (9%) and regular smokers (13% of everyday smokers) accepted the invitation than males (6%, chi square =14.22, p=.0002) and light smokers (6% of non-daily smokers, chi square =90.62, p<.0001). Those who enrolled were older (mean age=22.5) than those who did not enroll (mean age=21.5, z=5.33, p<.0001). Cost per participant enrolled differed by method: online HRA ($630.85), online advertisements ($41.35), off-line quit line screener ($132.22), and off-line promotion ($56.23). While the 2009 economic recession and federal tobacco tax increase may account for some of these differences, online and off-line recruiting methods attracted different types of young adult smokers. Online recruitment strategies can be effective, with online advertising being the most effective method in this trial. However, off-line promotions were also relatively effective, too.

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POS1-29

ASSESSING QUITLINE REACH IN THE U.S.: A NATIONAL COMPARISON OF DEMOGRAPHIC AND TOBACCO USE CHARACTERISTICS

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Quitlines are an effective method to deliver behavioral support for tobacco cessation, and can potentially increase access to cessation services for hard to reach smokers such as those from underserved populations or racial and ethnic minority groups. The objective of this study was to compare demographics and tobacco use characteristics of quitline callers to smokers from a nationally representative sample, and to assess the national quitline reach in the U.S. The North American Quitline Consortium (NAQC) conducts an annual survey of all 63 publicly funded quitlines in the U.S. and Canada. All 53 U.S. quitlines responded to the 2009 annual survey conducted September 2009 – February 2010 and reported aggregate data on demographics and tobacco use characteristics of quitline callers. Secondary analysis was performed using data from the 2009 NAQC annual survey and the 2009 Behavioral Risk Factor Surveillance System (BRFSS). Reach was calculated and stratified by race and ethnicity. Descriptive statistics were generated to describe demographics, tobacco use characteristics, and utilization of quitline services across the U.S. Chi square test was used to assess differences between those seeking quitline services and the national population of smokers. Both groups reported a mean age of 42 years; however, those accessing quitline services were more likely to be female (57.4% versus 46.0%, p<0.001). Racial composition and education levels of quitline callers were similar to that reported among all tobacco users. Quitline callers were significantly more likely to report “smoking every day” (97.9% versus 71.1%, p<0.001). Overall reach of U.S. quitlines was 1.16%. Stratified by race and ethnicity, reach ranged from 0.85% for Asians to 1.96% for those who reported a race of ‘other’. With the exception of sex, demographic characteristics of callers to quitlines are representative of current smokers within the U.S. population. Reach of quitlines nationally remains well below the target of 6% set by the CDC. These data provide the first national picture of the population of quitline callers, and can be used to target promotions to increase the reach of quitlines.

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POS1-30

CO-MORBID SUBSTANCE USE BEHAVIORS AMONG YOUTH: ANY IMPACT OF SCHOOL ENVIRONMENT?

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Background: Substance use is common among youth; however, our understanding of co-morbid tobacco, alcohol and marijuana use remains limited. The school-environment may play an important role in the likelihood a student engages in high-risk substance use behaviors, including co-morbid use. Purpose: This study aims to: (1) describe the prevalence of co-morbid substance use behaviors among youth; (2) identify and compare the characteristics of youth who currently use a single substance, any two substances, and all three substances; (3) examine if the likelihood of co-morbid use varies by school; and, (4) examine what factors are associated with co-morbid use.

Methods: This study used nationally representative data collected from students in grades 9 to 12 (n=41,886) as part of the 2006-07 Canadian Youth Smoking Survey (YSS). Demographic and behavioral data were collected including, current cigarette, alcohol and marijuana use.

Results: 6.5% (n=107,000) reported current use of all three substances and 20.3% (n=333,000) of any two substances. Multi-level analysis revealed significant between school variability in the odds a student used all three substances and any two substances; accounting for 16.9% and 13.5% of the variability, respectively. Co-morbid use was associated with sex, grade, amount of available spending money and perceived academic performance.

Conclusions: Co-morbid substance use is high among youth; however, not all schools share the same prevalence. Knowing the school characteristics that place particular schools at risk for student substance use is important for tailoring drug and alcohol education programs. Interventions that target the prevention of co-morbid substance use are required.

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POS1-32

PREDICTORS OF SMOKELESS TOBACCO CESSATION AMONG PARTICIPANTS USING A TELEPHONE QUITLINE

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Introduction: Despite a decreasing prevalence of cigarette smoking, a consistently upward trend has been observed in smokeless tobacco (ST) use in the US. ST use is a well-documented risk factor for a number of ill health effects including oral lesions, cardiovascular diseases, diabetes, and cancers of oral cavity, esophagus, pancreas, and lung. Currently there is limited or insufficient evidence on the effectiveness of quitlines and nicotine replacement therapy (NRT) for ST users. The aim of this study is to determine factors associated with successful ST cessation among tobacco quitline participants.

Methods: Longitudinal data from 282 male ST users who enrolled in the multiple call program of the Oklahoma Tobacco Helpline from 2005 to 2009 were used. Univariate and multiple logistic regression examined associations, and odds ratios (OR) and 95% confidence intervals (CI) are reported.

Results: At 7-month follow-up, 45% of participants reported 30-day abstinence from tobacco. Level of motivation (p=0.0008) and home smoking policy (p=0.045) had significant independent associations with ST cessation. Multiple logistic regression analysis indicated that adjusted odds of 30-day ST abstinence at 7-month follow-up were increased by 1.3 (95% CI: 1.004 – 1.560) times with the completion of each additional scheduled Helpline call. Similarly, among those who had home smoking bans, the adjusted odds of abstinence were increased more than three-fold (OR=3.1, 95%CI: 1.193 – 7.846) compared to those who allowed smoking inside their home. Use of NRT was not independently associated with abstinence.

Conclusion: Tobacco quitlines offer an effective intervention to increase ST abstinence. Rates of abstinence among these participants are higher than other behavioral interventions such as self-help, dental clinic behavioral treatment and group support. Results of this study provide evidence that the higher number of completed scheduled quitline

calls and home smoking bans, which may be a proxy for social influencing factors, are significant determinants of ST cessation.

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POS1-33

ATTITUDES AMONG PROFESSIONALS TOWARDS SOCIALLY VULNERABLE PEOPLE AND SMOKING CESSATION

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Smoking cessation among socially vulnerable people (drug addicts, mentally ill, homeless people) pose a challenge to both public health professionals and social workers. As part of a national intervention project in Denmark, we conducted a survey on attitudes among professionals and socially vulnerable towards smoking cessation. A questionnaire with 25 questions relating to smoking patterns and attitudes towards socially vulnerable people and smoking cessation was distributed nation-wide at 76 treatment facilities and activity centres. The study population included a total of 1,059 leaders, staff members, and socially vulnerable citizens. The prevalence of smoking is a much higher among the socially vulnerable, 61% in our survey compared to 21% of the general population in Denmark. However, just as among the general population, 33% of the socially vulnerable express the wish to quit smoking. Among leaders and staff members, only 19% believe that the socially vulnerable wish to quit smoking and as few as 16% of staff members believe that socially vulnerable people are able to quit smoking. Particularly those members of staff who themselves are smokers express attitudes that could potentially run counter to successful implementation of smoking cessation programmes. 54% of smoking staff members express the opinion that smoking together with the socially vulnerable is a tool that can be used purposefully in working with the vulnerable to improve their lives. Many socially vulnerable express a wish to quit smoking, but structural conditions at treatment centres and activity centres often do not facilitate smoking cessation. One of the most important barriers is attitudes among staff members, in particular staff members who themselves are smokers. This calls for a more professional attitude among staff toward the socially vulnerable, which in turn requires leaders to take responsibility. The results of the survey will be used by the national intervention project as part of an argument to integrate smoking cessation activities in the daily practices of treatment facilities and activity centres.

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POS1-34

YOUTH RISK PERCEPTIONS OF SNUS, ORBS, AND OTHER NEW SMOKELESS PRODUCTS

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New smokeless tobacco products such as Snus and Camel Orbs are being marketed with flavors, colors, and packaging resembling gum or candy. Such packaging, along with an industry promotional campaign pushing them as options for situations in which smoking is not allowed, may make these products especially appealing to youth. As declines in youth tobacco use slow, understanding and addressing youth perceptions of new smokeless tobacco products is critical. The 2009 North Carolina (NC) YTS included a question to assess students perceptions about the comparative risk of these new products to other smokeless tobacco products. Nearly one-third of North Carolina students consider these products to be less risky than traditional smokeless tobacco products. Students who have tried other tobacco products are more likely to perceive new smokeless products such as Snus and Orbs as less risky alternatives. Additionally, NC students who use one form of tobacco are more likely to use other forms, making them vulnerable to the dual-use promotional strategies currently being used to market Snus, Orbs, and similar products. To our knowledge, this is the first attempt to measure youth perceptions of these new products as part of a statewide surveillance effort. These findings suggest youth are susceptible to these new smokeless tobacco products. These findings have potential implications for youth prevention programs and directions for further research.

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POS1-35

SCHOOL HEALTH ACTION, PLANNING, AND EVALUATION SYSTEM/YOUTH SMOKING SURVEY – PRINCE EDWARD ISLAND (SHAPES/YSS-PEI): PRIORITIES FOR ACTION

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The SHAPES/YSS-PEI initiative aims to establish a local, comprehensive system to measure school health that provides student and school level health information. It provides benchmark data for PEI and details of the multiple influences on youth health. As a result, SHAPES/YSS-PEI is planned as a biennial system that will support school, board, and provincial planning. We will present an overview of findings from the PEI YSS (2006-07 and 2008-09), identify priority areas indicated by this evidence, and discuss how PEI stakeholders are addressing student smoking. The YSS is a national survey of student smoking that addresses student attitudes and behaviours. In PEI in 2006-07, data were collected from 4,862 students (grades 5-12) in 25 schools across the province. In 2008-09, data were collected from 3,826 PEI students (grades 6-12) in 58 schools. Preliminary analysis of the 2006-07 data showed that there were significant relationships found between smoking status and school factors such as feeling close to people at one's school and feeling part of one's school. Peer influence was seen with fewer students in elementary and junior high grades reporting that they would smoke a cigarette if one of their best friends offered it to them, compared to students in high school grades. In terms of family influence, students who were smokers were more likely to report that they have a parent, stepparent, or guardian that smokes. On an individual level, fewer smokers than non-smokers reported that they like the way they are. The 2008-09 data reveal similar trends, resulting in continued interest amongst provincial stakeholders in identifying and addressing priorities in student smoking behaviour. Ongoing data collections, such as SHAPES/YSS-PEI, have important implications for planning and policy development. Following our discussion of these two rounds of the PEI YSS, we will discuss the various knowledge exchange activities we engage in to enhance school health capacity by building and nurturing partnerships with diverse stakeholders in order to collectively identify, and address student smoking priorities using local evidence.

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POS1-37

IMPACT OF THE SMOKE-FREE LEGISLATION TO REGULATE THE SMOKING BEHAVIORS OF YOUTH WHO CALLED A SMOKING CESSATION HOTLINE IN HONG KONG

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Objective: To compare the change of smoking places among youth smokers who called Quitline before and after the smoke-free legislation in Hong Kong, and to examine the additional impact of smoke-free legislation over telephone counseling in changing youth's smoking consumption.

Methods: The study compared the baseline profiles of youth smokers who called Quitline before and after the smoke-free legislation, as well as the proportion that reduced smoking at 6 months. Eligible youth smokers were ethnic Chinese, aged 12-25 and smoked at least one cigarette in the past month. A total of 254 and 288 youth smokers were recruited before and after the smoke-free legislation (enacted in January 2007). Z-test was used to compare the proportional outcomes between the two groups, and logistic regression analysis was performed to test the additional impact of smoke-free legislation.

Results: Among the youth callers, 73% were male and 55% aged below 18 years. Half of them started smoking before 14 years old, and the majority (63%) smoked ≤10 cigarettes per day. Most smoked at outdoor public places (71%) and at home (52%). The proportions were similar before and after the legislation. Fewer youth smokers

in the post-legislation group smoked at places for entertainment (24% vs. 12%) and during social events (15% vs. 6%) (P <.001). Adjusting for the smoking profile and other socio-demographic characteristics, youth callers after legislation were 74% more likely to reduce smoking consumption by 50% or more at 6 months. About one-third of youth callers in the post-legislation group responded the anti-smoking legislation had motivated their intention to quit smoking (37%) and they received encouragements from close others to quit smoking (29%). Some were also motivated to encourage other friends to stop smoking (22%).

Conclusions: The smoke-free legislation successfully prohibited youth smokers from smoking at indoor public places and during social gathering, and they did not displace smoking to outdoor public areas or at home. The legislation had an additional impact to reduce youth's smoking consumption at 6 months, and encouraged a social norm of non-smoking.

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POS1-38

TOBACCO USE, EXPOSURE, ACCESS, AND OTHER RELATED RISK BEHAVIOURS AMONG SECONDARY SCHOOL STUDENTS IN CANADA: RESULTS OF THE 2008-2009 NATIONAL YOUTH SMOKING SURVEY

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Objective: To examine use of tobacco among Canadian youth.

Methods: Data are from a secondary analysis of the 2008/09 Canadian Youth Smoking Survey. This nationally representative survey included 29,296 grade 9 to 12 students from randomly sampled public and private schools in all ten provinces.

Results: 11.6% of youth were current smokers, 1.6% were former smokers, and 86.7% were never smokers. Among never smokers, 29.3% were considered susceptible to future smoking. The majority of current smokers (73%) had tried to quit smoking. 30.8% of youth had used cigarillos/little cigars and 28.2% used flavoured cigarettes. 21.4% were exposed to smoking at home every day or almost every day, and 31.9% were exposure to smoking in cars in the previous week.

Conclusion: These data demonstrate the urgent need to continue providing tobacco control prevention programs to Canadian youth. Implications for how the Framework Convention on Tobacco Control can address some of these patterns (such as the high prevalence of flavoured cigarette use) will be discussed.

Propel Centre for Population Health Impact, Dr. Leatherdale is a Cancer Care Ontario Research Chair in Population Studies, the 2008-2009 Youth Smoking Survey is a product of a pan-Canadian capacity building project that includes Canadian researchers from all provinces and provides training opportunities for university students at all levels. Production of this paper has been made possible through a financial contribution from Health Canada.

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POS1-39

QUIT AND GET FIT: DO EXERCISE INTERVENTIONS HELP PEOPLE QUIT SMOKING?

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Evidence from cross-sectional and randomized control studies suggests that pursuing regular exercise during a quit attempt can improve quit rates and reduce nicotine withdrawal symptoms and cravings. The Quit & Get Fit pilot program implemented in Ontario, Canada, integrated smoking cessation support with personal training sessions for physical activity. Over the course of 6 weeks, 124 smokers received 12 personal training sessions and cessation support from a specially trained personal trainer. Data were collected through web-based baseline and follow-up surveys. At the end of intervention, 44.3% of participants reported no smoking, not even a puff, in the 30 days preceding the follow-up (the intention-to-treat (ITT) quit rate was 31.5%) and 34.1% achieved 6-week continuous abstinence (ITT rate – 24.2%). Significant predictors of quitting included participants' age, confidence in quitting and satisfaction with personal trainer's support. There were also some positive changes among participants who remained smokers at the end of intervention (55.7%). Compared to the baseline, more smokers started to have their first cigarette beyond 1 hour after waking (26% vs. 62%, P=0.001). The average number of cigarettes smoked per person per day decreased from 14.5 to 6.4 (P=0.001). Further, both smokers and quitters tended to increase their level of physical activity over time. The proportion of participants not at all engaged in vigorous activities at baseline (18.2%) decreased significantly to 4.5% (P=0.001) at follow-up. At the same time, the proportion of participants engaged in vigorous activities 4 days a week increased from 11.4% to 21.6% (P=0.001). Average time spent doing vigorous physical activities increased from 180 to 240 minutes per week (P=0.001). Similar patterns of change were observed in participants' engagement in moderate physical activity. The findings suggest that Quit & Get Fit is a promising intervention for promoting smoking cessation, reducing consumption of cigarettes and increasing engagement in physical activity. Additional participant follow-ups (3 and 6 months post-intervention) are underway to verify these results.

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POS1-40

PERCEPTIONS ABOUT CESSATION OUTCOMES MODERATE THE EFFECTIVENESS OF A GAIN-FRAMED SMOKING CESSATION TELEPHONE COUNSELING INTERVENTION

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The distinction between prevention and detection behaviors provides a useful guideline for appropriately framing health messages in terms of gains or losses. However, this guideline assumes that everyone perceives the outcomes associated with a behavior in a consistent manner, as either prevention or detection. Men and women's outcome expectations of smoking cessation differ. Thus, the effects of framed smoking messages may be optimized by considering individuals' sex and outcome expectancies. We tested this hypothesis in a secondary analysis of data from a trial evaluating gain-framed smoking cessation counseling (Toll et al., 2010). Smokers (n = 2031) who called a state quitline received either gain-framed or standard care messages. Smokers' beliefs about the positive consequences of stopping smoking (outcome expectancies) were evaluated at baseline. Smoking status and self-efficacy were assessed at 3 months. We conducted intent-to-treat regression analyses to examine outcomes expectancies and sex as moderators of framing effects. The models predicting self-efficacy, $F(7, 1930) = 3.43$, $p < .001$, and quit status were significant, $\chi 2$ model $(7, n = 1988) = 18.80$, $p = .009$, Hosmer and Lemeshow $\chi 2$ $(4, n = 1988) = .26$, $p = .99$. Post hoc analyses revealed that men in the gain-framed counseling condition who had positive outcome expectancies were more likely to quit, OR = 2.51, p =.08, and had more confidence in their ability to quit or to remain abstinent, ß = .22, p < .001, than men who were uncertain of the positive outcome of smoking cessation. These findings suggest that there may be utility in considering sex and individual differences in outcome expectancies when delivering gain-framed health messages.

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POS1-41

EVALUATION OF THE BRIEF WISCONSIN INVENTORY OF SMOKING DEPENDENCE MOTIVES (WISDM) IN AFRICAN AMERICAN (AA) AND EUROPEAN AMERICAN (EA) HEAVY SMOKERS

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Emerging evidence indicates that Nicotine Dependence (ND) is a complex disorder. The 68-item WISDM-68 and newly published Brief WISDM are multidimensional measures of theoretically derived motivations for tobacco use. The WISDM-68 consists of 13 subscales, while the Brief WISDM retains 37 items that load onto 11 subscales. Our primary objective was to validate the Brief WISDM in a large sample, as well as determine any differential expression across AA and EA heavy smokers. Data from our ongoing Mid-South Tobacco Case-Control (MSTCC) and Mid-South Tobacco Family (MSTF: unrelated participants) studies were used, yielding 2,522 heavy smokers (1633 AAs and 889 EAs). Participants smoked ≥ 5 years and ≥ 20 cigarettes per day (CPD) for ≥ 1 year at the interview. AAs and EAs were similar in age (43.1±11.8 vs. 42.3±11.4), % of female (50.1% vs. 52.5%),

post-high school (77.3% vs. 79.1%), % of married (37.3% vs. 41.2%), CPD (26.4±9.6 vs. 27.7±9.1), and FTND score (8.1±1.8 vs. 7.7±2.1). Our results agree with those of reported. Internal consistency for the Brief WISDM subscale was generally lower than the counterpart of the WISDM-68 (Cronbach's α ≥ 0.7 for all except 0.67 for Cue Exposure). Exploratory factor analysis revealed good agreement for item loadings on the 4 Primary Dependence Motives subscales (Automaticity, Loss of Control, Craving, and Tolerance), but considerable disagreements or discrepancies on all Secondary Dependence Motives subscales except Taste/Sensory Processes. Only 1 of 3 items was in agreement for Cue Exposure, Affiliative Attachment, and Affective Enhancement, and 2 of 3 items for the other subscales. In addition, specific item loadings for each subscale varied across ethnicity. Overall, the 37-item Brief WISDM demonstrated reasonable internal consistency in our replication sample. Discrepancies were noted across ethnicities with respect to specific item loadings, particularly those in the Secondary Dependence Motives subscales. Given the large sample, our results provide support regarding the validity of the current brief form, but suggest individual item selections require further investigation.

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POS1-42

VARIABILITY IN SMOKING STATUS, PREFERENCE FOR LOCATION AND TYPE OF TOBACCO CESSATION PROGRAMS BY DEFINITION USED FOR SEXUAL AND GENDER MINORITY (SGM) POPULATIONS

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Introduction: It is not known if a different definition of SGM subtype could affect our understanding of smoking rates, location of cessation program's preferences, and perceived barriers in attending out-of-town programs in this diverse population.

Method: St. Louis Missouri Pride festival attendees in 2009 filled out a 16-question survey. Chi-square test compared smoking status based on method of defining SGM status – behaviorally-defined and the participant's self identification. The Wilcoxon rank sum test compared the two groups' number of responses to cessation places and number of barriers to attending cessation program. Logistic regression model was used for the comparison of SGM subgroup's (lesbian, gay, and bisexual) response to location of cessation place and type of barrier to attending a cessation program.

Results: Within the 597 SGM respondents, for the group of individuals with an incongruent definition of SGM status, no statistically significant difference was observed for smoking status for any SGM subtype. Gay men chose significantly more types of cessation program locations than any other SGM subgroup. Of the self-identified SMG participants, the two most popular places were peer support groups (56%) and health care professional place (49%), though differences were noted by SGM status. Regardless of method of defining SGM, the number of barriers for attending an out-of-town cessation program was similarly reported by SGM subtype.

Conclusion: This study demonstrated that the method of defining SGM subtypes resulted in similar categorization of smoking status. Barriers to attending a cessation program were similar among SGM subtypes but choice of place and number of places for a tobacco cessation program varied. These variations may be associated with success of the program.

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POS1-43

MINNESOTA SMOKING PREVALENCE: 1999-2010

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In 2000, Minnesota began using funds from its tobacco industry settlement to introduce the key components of a comprehensive tobacco control program. The Minnesota Adult Tobacco Survey (MATS) was established as a surveillance instrument to measure outcomes of the program including population trends in the use of tobacco products, attitudes toward smoking restrictions, and exposure to secondhand smoke. MATS is a cross sectional survey that was first completed in 1999 with comparable data collected in 2003, 2007, and 2010. We present the results of the fourth in the series of statewide surveys (MATS 2010). We contrast Minnesota and national smoking prevalence since 1999 with per capita cigarette pack sales during the same time period. MATS 2010 was designed with both an RDD landline sampling frame and an RDD mobile phone sample in a ratio of 85%/15% respectively. The 7,000-sample size was designed to detect a 2.5% decline in smoking with 80% power and at the 95% confidence level. Since 1999 the adult smoking prevalence based on MATS has decreased 6.1 percentage points from 22.1% to 16%. This decrease represents a 26.6 percent change over 11 years. The national rate, based on data from the National Health Interview Survey, has declined from 23.3% in 1999 to 20.6% in 2009. However, since 2004 the rate is essentially unchanged. In parallel with the decline in adult smoking prevalence, Minnesota per capita cigarette pack sales have decreased about 40% since 1999. Nationally, per capita sales have also fallen and are now about 31% lower than 1999. We assert that several key factors have contributed to the falling smoking prevalence in Minnesota in contrast to the flat national prevalence. These include a telephone helpline that serves underinsured and uninsured residents, a comprehensive ban on indoor smoking, a sustained media campaign, and a state-level price increase in tobacco products.

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POS1-44

PREDICTORS OF THE PERCEIVED IMPORTANCE AND SELF-EFFICACY OF SMOKING CESSATION

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Objectives: The perceived importance and self-efficacy are essential proxies for smoking cessation motivation. Our goal is to examine the determinants of the importance and self-efficacy of quitting in an Internet based sample of smokers motivated to quit.

Method: Data were collected from 720 daily smokers (320 males, 400 females, mean age=38.80 SD=12.02) who registered on a smoking cessation website and wanted to be contacted later for proactive counseling in quitting smoking. Measures included background variables (gender, age), items referring the importance of quitting and self-efficacy in quitting, Heaviness of Smoking Index (HSI), Tobacco Dependence Screener (TDS), 11 scales from the Brief Wisconsin Inventory of Smoking Dependence Motives (WISDM-37) questions related to partner's smoking status and household rules related to smoking.

Analysis: Structural equation modeling (SEM) were applied in which importance and self-efficacy of smoking cessation were used as observed outcome variables simultaneously, and all other variables were the predictors including gender, age, HSI and TDS scores, 11 scales of WISDM-37 as latent variables, presence of a smoker partner and household rule of smoking.

Results: The model fit of SEM was adequate. The lower level of importance of quitting was predicted (R2= 8.0%) only by gender (female) and taste-sensory properties scale (from WISDM-37). However, affiliative attachment, cognitive enhancement, craving scales from WISDM-37 and TDS score predicted lower level of self-efficacy in quitting (R2= 18.1%) in a multivariate model.

Conclusions: Importance of quitting is almost independent from the indices of tobacco addiction; however some smoking dependence motives and smoking dependence symptoms are associated with the lower level of perceived self-efficacy related to quitting. Putting more emphasis on these hindering factors in counseling might increase the self-efficacy and the chance of successful quitting smoking.

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POS1-45

PROMOTING SMOKING CESSATION IN PSYCHOSOCIAL REHABILITATION CENTERS: FEASIBILITY AND IMPLEMENTATION OF A MODEL CURRICULUM

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Tobacco is a substantial problem among people with mental illness, with smoking prevalence over 50%. While researchers have described a model tobacco cessation curriculum for use in clubhouse-model psychosocial rehabilitation centers (participatory day centers for adults with severe and persistent mental illness), evaluation of its impact is limited. The North Carolina (NC) Health and Wellness Trust Fund and Southern Regional Area Health Education Center used this curriculum to implement and evaluate

wellness and tobacco cessation groups in nine clubhouses across NC. We conducted an independent process evaluation of the program's implementation using semi-structured interviews with clubhouse staff (n=10). We additionally surveyed clubhouse clients (n=107) on attendance, interest in smoke-free policies, and perceived helpfulness in providing motivation to quit. This process evaluation showed four themes: (1) the groups were implemented and appreciated, (2) clubhouses adopted new policies relating to wellness, (3) technical assistance was vital to implementation, and (4) barriers existed to using the model curriculum as written. A more rigorous outcome evaluation is warranted.

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POS1-46

ASSESSING TOBACCO USE AMONG WEST VIRGINIA LESBIAN, GAY, AND BISEXUAL PEOPLE

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Lesbians, gays, and bisexuals are at elevated risk of tobacco use. Yet, limited data exist on local and regional disparities. The CDC-funded National LGBT Tobacco Control Network calls for local surveys when statewide surveillance systems do not include questions on sexual orientation. West Virginia (WV) has one of the highest rates of tobacco use in the nation; no previous WV surveys have collected information on sexual orientation and tobacco use. With a limited budget, researchers designed an innovative method to assess tobacco use among WV LGBT people in diverse community venues and events, identify evidence of a disparity, and identify preferred modes of communication. Data was collected in four WV cities using electronic survey units and paper surveys. Surveyors worked in six bars and in community events such as a dog show, pride parade, volleyball tournament, movie night, and picnic. Surveyors collected 604 surveys. Seventy-one percent of respondents completed the surveys at festival events and 29% at bars. After excluding non-eligible respondents (straight, under age, and/or residing outside of WV), researchers analyzed results from 386 surveys, finding a smoking rate of 41%. A large disparity in tobacco use exists for WV lesbians, gays, and bisexuals. This research suggests that interventions are warranted and that bar-based interventions may be particularly effective.

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POS1-47

CONTINUING EDUCATION IN TOBACCO CONTROL: ENSURING THE SUCCESS OF A NEW COURSE MODULE ON EVALUATION

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Tobacco and Public Health: From Theory to Practice, is an award-winning, evidence-based online course designed for Public Health Practitioners looking to build capacity in the areas of smoking Prevention, Protection, Cessation and Evaluation. In the 6.5-year lifespan of the course, more than 5,400 participants have enrolled in one or more of the modules. The Evaluation module is a new addition to the course, developed when the tobacco control community determined there was a clear need for a resource for public health professionals evaluating programs and policies related to tobacco control. To ensure the success of the new Evaluation module, a variety of resources were secured, experts in the tobacco control program and policy field were recruited, staff and pilot testers participated of extensive reviews, and all feedback from testers and course participants was monitored. Ongoing monitoring of usership and feedback has revealed the areas in which the course achieved its intended goals as well as the areas that require improvements to meet user-needs. Participants appreciated the easy enrollment, the flexibility to stop and start coursework as needed, the short and easy to understand sections, and interesting assets and use of media. Expert reviewers concluded that module content flowed well and was comprehensive and accurate. Growing usership, completion of the final test and positive end-survey comments indicate the usefulness and success of the module. Ensuring the success of a new continuing education module in tobacco control requires resources, a broad range of expertise, extensive review, and ongoing monitoring of user-feedback. These and other lessons learned will be applied to the implementation of additional modules and adaptations of the course for French-speaking Africa and Spanish Latin America.

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POS1-48

FACTORS THAT AFFECT SMOKING PHENOMENON: A CASE STUDY IN ALEXANDRIA

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Background: The aim of this study is to investigate the factors that affect smoking phenomenon in Alexandria and to assess the level of knowledge, attitudes, and behavior of citizens about smoking problem.

Methods: The study applied a descriptive, cross-sectional study with a random stratified sample based on Alexandria districts, the sample of the study divided into seven major strata based on the districts and Date collected through using individually administered questionnaire. The target population is smokers and non-smokers in Alexandria city aged 15 years and above.

Results: The prevalence of smoking in Alexandria is 35% (51% among males, 11% among females). Cigarettes are the most widespread approximately 63.5% and the proportion of consumption is a pack of cigarettes per day. The phenomenon of smoking is in an inverse relation with educational level. The primary motivator to started smoking, whether male or female, is their smokers' friend's influence (30% for males and 23% for females), and the first reasons to quitting for both males and females is the health hazard of smoking (50% for both). 85% of the population of Alexandria wants to make public places smoke-free by 70% endorsement by smokers and 96% of non-smokers.

Conclusions: This first comprehensive survey in Alexandria shows a strong community support for smoke-free environment. Efforts are needed to implement tobacco control policies, especially smoke-free policies in Alexandria.

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POS1-49

FREQUENCY AND OUTCOME SEVERITY OF ACCIDENTAL INGESTION OF TOBACCO PRODUCTS IN CHILDREN

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The purpose of this review is to assess available published literature related to the frequency and outcomes associated with accidental ingestion of tobacco and pharmaceutical nicotine products among children. Twenty-six years of annual reports published by the American Association of Poison Control Centers (AAPCC) were analyzed for occurrence and outcomes associated with accidental ingestion events involving tobacco and pharmaceutical nicotine products among children. In addition, a literature search and review was conducted of case reports and reviews related to accidental ingestion of tobacco products among children. Over a period of 26 years and of over 48 million total contacts for all product categories combined, 208,566 contacts involving ingestion of tobacco products have been recorded in AAPCC reports. Approximately 89% of these involved children under 6 years old. Over the past 26 years, one fatality associated with accidental ingestion of a tobacco product by a child was recorded. Regarding that single case, the co-ingestion of both cigarettes and diazepam complicates an assessment of a contributory role of tobacco. The rate of serious, non-fatal, outcomes was less than one tenth of one percent. Data from the U.S. Consumer Products Safety Commission National Electronic Injury Surveillance System indicate the frequency of accidental poisoning events reported by hospital emergency rooms is relatively low for tobacco products compared to other consumer products such as prescription and non-prescription drugs, dietary supplements, cleaning products, and personal care products. These findings are consistent with case reports and reviews published in the scientific literature. Findings for pharmaceutical nicotine products are generally consistent with those for tobacco products. Based on this assessment of surveillance and case

study reports, the frequency and severity of outcomes associated with accidental ingestion of tobacco products by young children appears to be relatively low. However, because tobacco products contain nicotine, adults should keep tobacco products out of reach of children.

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POS1-50

IMPACT OF BANNING TOBACCO SALES IN PHARMACIES ON THE SPATIAL DISTRIBUTION OF TOBACCO OUTLETS

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Few U.S. communities ban the sale of tobacco products in pharmacies despite numerous reasons to do so. According to the Economic Census of Retail Trade, approximately 18,000 pharmacies generated $1.52 billion from tobacco sales in 2002. The few studies that examine neighborhood correlates of the availability of cigarettes in pharmacies raise questions about what types of neighborhoods would benefit most from a ban. This geospatial study examined changes in the distribution and density of tobacco outlets in San Francisco, California, the first U.S. city to ban tobacco sales in pharmacies. Change in density (tobacco outlets per 1,000 residents) and proximity (distance to nearest tobacco outlet from pharmacies) were compared across health planning neighborhoods (n=37). Neighborhood demographics were derived from 2007 intercensal estimates of household median income, population density, race/ethnicity and age (percent of residents under 18). The ban reduced the total number of tobacco outlets in the city by 5.5 percent. The average distance to walk from a pharmacy that was banned from selling tobacco to the nearest tobacco retailer was 329 feet (SD=578) – equivalent to about one half of a city block. Overall, tobacco outlet density decreased from 1.54 to 1.46 outlets per 1,000 residents, and change in outlet density varied substantially between neighborhoods (M=-0.11 outlets per 1,000 residents, SD=0.20). Lower income neighborhoods, in particular, derived the greatest benefit from the ban. Expanding the ordinance to include supermarket and mass merchant pharmacies would not alter this conclusion. Thus, policy makers and tobacco control advocates should consider such a ban among the policy options to address inequities in the spatial distribution of tobacco outlets. Their concentration in neighborhoods of social and economic disadvantage is a well-documented problem of environmental justice, and it likely contributes to the strong socioeconomic gradient that underlies smoking prevalence. If these findings generalize to other cities, then banning tobacco sales in pharmacies could help to redress these disparities.

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POS1-51

INDIVIDUAL, SOCIAL AND ENVIRONMENTAL PREDICTORS OF SUCCESSFUL YOUTH SMOKING CESSATION

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Smoking among Canadian youth (aged 15-19) was 15% in 2008, unchanged from 2007 and 2006. While over 60% of youth smokers report wanting to quit smoking and attempting to do so, few succeed. Although there has been considerable research on smoking prevention among youth, little data are available on smoking interventions for this population. Indeed, youth smoker and non-smoker profiles are well documented in the literature, but few studies examine factors associated with successful cessation in youth. The objectives of the current study are to identify individual, social and environmental predictors of successful tobacco cessation within the Precede-Proceed theoretical framework to inform the development of youth cessation programs. Individual-level data from senior students completing the 2008-2009 Youth Smoking Survey (YSS) will be analyzed. The YSS offers a detailed snapshot of Canadian youth smoking behaviour, smoking cessation, perceptions of peer smoking and attitudes towards smoking. Along with student attributes, retrospective information about past smoking behaviour and cessation attempts are reported. Individual, environmental and social predictors as measured by the YSS of youth current smokers and of youth former smokers (who have successfully quit smoking) will be compared with descriptive statistics using univariate analyses such as chi-square tests and t-tests. A mixed regression approach using backward stepwise logistic regression will be used, while maintaining key variables from the Precede-Proceed theoretical framework (i.e., environmental, social & individual factors), to predict youth current smoking and former smoking history. Findings will be reported and submitted for publication to provide information about predictors indicative of successful smoking cessation among youth to inform the development of youth smoking cessation strategies.

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POS1-52

PREDICTORS OF QUIT ATTEMPTS AND SUCCESS OF QUIT ATTEMPTS IN ADULT GENERAL POPULATION SAMPLES: A SYSTEMATIC REVIEW

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The majority of smokers who attempt to stop smoking do so without formal intervention. Knowledge of the predictors of quit attempts and quit attempt success in general population samples may allow for the better targeting of interventions to promote these two events. The literature was searched for studies examining predictors of smoking quit attempts and/or quit attempt success prospectively in adult general population samples. Nine studies met the inclusion criteria and data were extracted independently by two researchers. A high level of methodological heterogeneity between studies examining predictors was found. Through comparison of conceptually similar variables, this review found that motivational factors dominated prediction of quit attempts whereas dependence consistently predicted success. Social grade also predicted success but was only examined in two studies. None of the other socio-demographic factors predicted making a quit attempt or quit attempt success. These findings challenge widely accepted views of predictors. There is a need for a common standard in the definition of quit attempts and quit attempt success to be reached. Similarly, achieving some uniformity in predictor measures is necessary to enable identification of predictors via the pooling of results across studies through formal meta-analysis.

This study was conducted at the Health Behaviour Research Centre at University College London. Supported by Cancer Research UK (grant # C1417/A7972) and affiliated to the UK Centre for Tobacco Control Studies.

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POS1-53

BETA TEST RESULTS OF SMS USA: A TEXT MESSAGING-BASED SMOKING CESSATION PROGRAM FOR YOUNG ADULTS

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Background: Twenty-one percent of young adults smoke cigarettes, yet few smoking cessation programs exist for this population. SMS (Stop My Smoking) USA is a text messaging-based smoking cessation program targeted to young adult smokers ages 18-25 years who are motivated to quit. This innovative smoking cessation program uses technology widely adopted by young adults to deliver a proactive, cognitive behavioral therapy (CBT)-based intervention. We report the findings from a beta test of the SMS program. Outcomes were software program functionality (e.g., automation of program messages, etc), and acceptability of the "text buddy" (pairing with another participant for support through text) and "text crave" (immediate text response to craving) program features.

Methods: Twelve participants were recruited into the beta test. Participants were recruited in Michigan and New Hampshire using traditional (posting flyers in restaurants, laundromats) and online (Craigslist) recruitment strategies. Participants were randomly assigned to either the intervention or attention-matched control arms and received the first week of the arm's text messages. One-on-one qualitative interviews were conducted with participants at the end of the beta test.

Results: Craigslist was a much more efficient method of recruitment compared to more traditional strategies: 75% of participants were recruited online. The SMS program software worked properly: all automated text messages were received by participants; all 'text buddy' messages were routed through the server to their buddy; all ad-hoc

'text crave' messages were received by participants. Text buddy social support and text crave messages were well used by participants, with many accessing the program components at greater frequency than directed. The SMS USA software program worked as intended. The social support and crave support program features were well received by participants and should be considered for inclusion in programs aimed at young adults. Program features and their implications for young adult programming and text messaging-based methodologies will be discussed.

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POS1-55

A REVIEW AND RECOMMENDATIONS REGARDING THE FDA'S EFFORTS TO PROTECT CHILDREN FROM DISSOLVABLE TOBACCO PRODUCTS

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Background: The tobacco industry has a documented history of targeting children and minority groups with tobacco products. In the past two years, R. J. Reynolds has been test marketing new dissolvable tobacco products called Camel Dissolvables. These products come in three shapes – "Orbs," which are pellet-shaped, "sticks" which are toothpick shape, and "strips," which are thin rectangular pieces. The company has presented these products as an alternative way for smokers to enjoy tobacco. Tobacco control groups and some political leaders have voiced concerns that these products are unfairly intended to target children with their bright colors, plastic packages, sweet flavors, making them appear similar to candy. There has also been concern about a risk of acute tobacco poisoning from ingesting these products.

Methods: A review was made of scientific journals, public documents, and media sources relevant to these new products.

Results: Research shows that in the past the FDA has been quick to react in banning similar products such as nicotine lollypops and nicotine gum. Two other products, Ariva and Stonewall, made by Star Scientific, have been challenged but allowed to remain on the market.

Conclusion: In the past, the FDA had limited control over tobacco, but with the new 2009 legislation, the FDA has, and should exercise, the power to remove these products from the marketplace. As currently designed and marketed, these products do not have a social benefit and pose a significant threat to the health and well-being of children and adolescents.

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POS1-56

PEDIATRIC SURGERY AS AN OPPORTUNITY TO CHANGE PARENTAL SMOKING BEHAVIOR

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Objective: Many children are exposed to secondhand smoke in the home. Secondhand smoke exposure poses multiple health risks to children, including increased risks for perioperative complications during and after surgical procedures. In adult smokers, surgery serves as a teachable moment to motivate quitting (i.e., increases spontaneous quit rates). For smokers who are parents, having a child undergo surgery may also serve as a teachable moment to change in smoking behavior. The purpose of this study was to determine if there is an association between children undergoing a surgical procedure and changes in the parents' smoking behavior.

Methods: Secondary analyses were performed on 2005 survey data from the National Health Interview Survey. Analyses included 9,289 parent respondents who provided information on both themselves and their children. Logistic regression analysis was used to evaluate the relationship between a history of surgery in child and change in parental smoking behavior within the year prior to survey.

Results: Of the sampled children, 1,112 (12.6% [95% confidence interval 11.7, 13.4]) lived in a home with at least one person who smoked inside in a usual week. In multivariate analysis of the relationship between parent and child surgical history in the past 12 months and smoking behavior, surgery in either the parent (OR 2.17 [1.54, 3.06]) or child (OR 2.58 [1.54, 4.32]) was associated with an increased likelihood of a quit attempt by the parent, adjusted for sex of parent respondent, parent race, parent age, child age, family income, parent education, asthma history of child, and ear infection history of child. However, these attempts were more likely to be successful only if the parents themselves (OR 2.31 [1.34, 4.00]), and not their child (OR 0.49 [0.19, 1.24]), had surgery within the past 12 months.

Conclusions: Parents who smoke were more likely to make a quit attempt within the past 12 months if their children had surgery within this time. Thus, child surgery serves as a teachable moment for an attempt to change smoking behavior on the part of the parents, but they may require assistance to succeed.

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POS1-57

METHOD OF QUITTING AND SMOKING CESSATION IN A COHORT STUDY OF U.S. SMOKERS

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To continue observations of the natural history of smoking cessation we studied methods of quitting in a population sample using a cohort design and a multivariate logistic regression analysis that controlled for demographics and significant predictors of quitting. Data were used from the Assessing Hard Core Smoking Survey (AHCSS), a national random-digit-dialed telephone survey of 1,000 U.S cigarette smokers (not just hard-core smokers) aged 25 years and older. Assessments of quitting strategies and 30+ day abstinence were successfully made with 748 baseline smokers at 14-month follow-up. Among those who tried to quit (n = 367), the most significant predictor of abstinence was level of nicotine dependence, with less dependent smokers being more likely to quit. Those who were older, who were concerned that smoking might shorten their lives, who did not think that smoking was their main source of pleasure, and who believed that stop smoking medications made quitting easier were more likely to have quit smoking. Those who used abrupt cessation were more successful than those who used gradual reduction, both strategies, or neither strategy. Those who used NRT for more than 14 days were significantly more likely to be abstinent at follow-up than were those who used it for less than 14 days and those who did not use it during the study. A similar variable constructed for use of Zyban was not statistically significant. Although very few people (n = 23) reported that they had attended a stop-smoking clinic or class, those who attended such a class were significantly more likely to have been abstinent than those who had not. Those who switched to another tobacco product (n = 13) were more likely than those who didn't switch to be abstinent from cigarettes at 14-month follow-up. Not surprisingly, however, they were not more likely to be abstinent from all tobacco products. This study can inform larger surveys that will assess the natural history of quitting over time. It shows that methods of quitting can be assessed in the population of smokers, although selection biases are inherent to observational studies such as this.

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POS1-59

ONE CIGARETTE DOES NOT A "SMOKER" MAKE: HOW DO ADOLESCENTS CHARACTERIZE DIFFERENT SMOKER TYPES?

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Studies have demonstrated that clinical- and research-based definitions of what constitute "smoking" and who a "smoker" is often differ from adolescent-derived definitions. The majority of these studies have predominantly collected data using quantitative methods, thus only allowing for adolescents' responses to investigator-driven definitions of smoking typologies. What is less known is how adolescents themselves define smoking types, based on adolescents' own "voices." Using a mixed methods approach, we investigated how adolescents define the term "smoking" and two different smoking labels ("smoker" and "regular smoker") using multiple indicators of smoking behaviors, including smoking frequency, amount of cigarettes smoked, place of smoking, and length of time smoking; and whether differences exist by gender and smoking experience. A school-based sample of adolescents (N = 372) in northern California completed a self-administered questionnaire addressing the above

indicators. A small group of adolescents (n = 40) were then randomly selected and recruited for interviews to elicit more information about their definitions of smokers. Quantitative results indicated that adolescents do not discriminate between "smoker" and "regular smoker" in terms of smoking frequency, amount of cigarettes smoked, and place of smoking. Interview data are also reflective of the survey results. When asked to define a "smoker," the majority (n = 26) of adolescents included regularity and consistency in their response. For example, a smoker "smokes on a regular basis," "does it regularly like a regular routine," and "smokes regularly." The results have important implications for health communication strategies for youth smoking prevention and cessation. Adolescent smokers tend to smoke at low frequencies and amounts, and if consistency and quantity are required in order to be considered a "smoker" or "regular smoker," then researchers, healthcare providers, and interventionists may need to reconsider their terminology when talking to youth about tobacco use, as these terms may not be relevant or applicable.

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POS1-60

DID CLEAN INDOOR AIR POLICIES INCREASE CRIME NEAR BARS AND RESTAURANTS IN ST. PAUL, MINNESOTA?

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To maintain compliance with clean indoor air policies, on-site alcohol-licensed businesses (namely, bars and restaurants) accommodate smokers by allowing smoking outside their establishments. Concerns have been raised that an increase in outdoor smoking around these businesses might increase alcohol-related crime close to the businesses.

Methods: For the period of January 2003 to December 2007, crime data were collected within a 500-foot buffer for all on-site alcohol-licensed establishments in St. Paul, Minnesota. Businesses licensed for on-site alcohol consumption were used as a starting point to draw a 500-foot buffer. Arrest data from the local policy were obtained; each crime was geocoded to include only those crimes, which occurred within the drawn buffer. Relevant types of crimes included serious violent (e.g., aggravated or other assaults, arson, auto theft, burglary, homicide, rape, robbery, theft) and less serious (e.g., lesser assault, disorderly conduct, fighting, liquor law violations, noise violations, public drunkenness, public disturbances) crimes. The enactment of a comprehensive clean indoor air policy on March 31, 2006 was used as the intervention time point in an interrupted time-series analysis. Results from this analysis describe if there were statistically significant changes in crime frequency prior to the policy enactment compared to the period of time after the policy was established (n=261 weeks).

Results: Within a buffer of 500 feet of alcohol-licensed establishments, there were 19,046 serious violent crimes, and 25,351 less serious crimes that occurred over 4 years. Using interrupted time-series analyses to compare the weekly crime rate associated with the smoking ban, there was a non-significant, positive increase in crime associated with the comprehensive clean indoor air policy (p=0.09). Additional sub-analyses by the types of crimes will be conducted.

Conclusion: Our initial analyses suggest there was not a statistically significant increase in crime around licensed alcohol establishments following implementation of the comprehensive clean indoor air policy.

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POS1-61

NON-SMOKING WORKSITES IN THE RESIDENTIAL CONSTRUCTION SECTOR: PERSPECTIVES AND PRACTICES

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Objectives: Blue-collar workers are a recognized priority for tobacco-control. Construction workers have very high smoking rates and are difficult to study and reach with interventions promoting smoke-free workplaces and cessation. This study describes the smoking-related social climate, and experiences with smoking restrictions, in the North American residential construction sector.

Methods: The data source used was a popular internet forum on home building. Participants included a broad and unselected population of employers, employees and free-lance tradespersons working in residential construction. The forum archive contained 10 years of discourse on the subjects of smoking, workplace second hand smoke (SHS) and smoking restrictions on construction sites. Qualitative data analysis methods were used to describe major and minor discussion themes relevant to workplace smoking culture and policies in this sector.

Results: Observed was considerable tension between smoking and non-smoking tradespersons, but also much interpersonal support for cessation and non-smokers rights. Employers and employees described efforts to make construction sites smoke-free, and a movement toward preferential hiring of non-smoking tradespersons was discussed. A critical audience was found wanting detailed scientific evidence on SHS exposure levels and risk thresholds, particularly in open-air workplaces.

Conclusions: Experience with success of smoking bans in other challenging workplaces can be applied to the construction sector. Potential movement of smokers out of the workforce represents a challenge for public health systems to ensure equitable access to cessation supports and services.

Ontario Ministry of Health Promotion.

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POS1-62

PM2.5 CONCENTRATIONS OF RESTAURANT SMOKING VS. NONSMOKING AREAS

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The State of Oklahoma approves certain restaurants to host smoking rooms that are adjacent to non-smoking sections. There is question as to whether the air quality in smoke-free areas can be considered safe. Researchers visited restaurants and bars during typical activity periods in order to observe concentrations in smoking and non-smoking areas at the same time and location. Area based PM2.5 samples were collected from 19 restaurants using the TSI Sidepack air quality monitor along with qualitative data describing the number of smokers present, room volume, and time of day, at entry, 15-minute intervals, and at exit. When comparing the smoke-free sections of a restaurant with an approved smoking room with the concentrations of a smoke free establishment, the average concentration of PM2.5 is nearly 3 times higher than background concentrations. Further, some of the concentrations observed in smoke free locations adjacent to smoking rooms were quite high. In understanding the significance of this result, it should be pointed out that each of the restaurant smoking rooms were behind closed doors and included some sort of a separate ventilation system to assist in the clearance of smoke (per Oklahoma State Department of Health requirements). This result is important for understanding that the presence of a separate smoking room still puts people at risk for PM2.5 exposure.

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POS1-63

YOUNG ADULT SMOKERS' PERCEPTIONS OF CESSATION TREATMENT

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Young adults (ages 18-24) have the highest prevalence of smoking among all age groups, but are less likely than other adults to use evidence-based treatments. Quit rates among young adult smokers may improve with increased utilization of evidence-based treatments. This qualitative study explored young adult smokers': (1) attitudes toward treatment seeking and types of cessation treatments; (2) potential use of online cessation resources; and (3) reactions to potential message concepts to encourage online evidence-based cessation treatment. Eighteen focus groups were conducted in geographically and ethnically diverse US cities with a total of 71 participants (55% female; 61% white); approximately half of the participants were not enrolled in college or did not have plans to enroll. Inclusion criteria included smoking at least 5 cigarettes/day; self-labeling as a smoker; and expressing a desire to quit in the next 3 months.

Across all groups, participants were unaware of available treatment options, except for pharmacotherapies about which they were skeptical and only considered appropriate for "serious" smokers. Primary concerns about quitting included the potential loss of friends who smoke, and fear of the unknown – what quitting will be like and how quitting may redefine who they are and want to be. Participants were receptive to online treatment if it offered a personalized approach, with testimonials and access to tips being appealing. Two main themes emerged about messages that may encourage them to seek treatment: (1) Messages need to be from credible and reliable sources, described as "people like them" who have tried the treatment and successfully quit; and (2) Messages need to reflect that treatment can be individualized, and tailored – not a generic treatment. "Create your own plan" was an appealing message when delivered by a young adult. Results suggest that strategies that increase young adult smokers' knowledge of treatment options, and provide them with a sense of control and "fit" may help to increase their demand for evidence-based treatment.

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POS1-64

RURAL MEDICAID-ENROLLED SMOKERS' EXPERIENCES WITH PROVIDER-DELIVERED TOBACCO DEPENDENCE COUNSELING

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Previous work suggests that smokers expect their health care provider to deliver advice to quit and that they are more satisfied when such advice is given. However, little is known about the specific experiences smokers have had and their attitudes towards different counseling styles. In this qualitative study with rural Medicaid-enrolled smokers we explored perceptions of past provider-delivered tobacco dependence counseling and also discussed the types of messages they would like to hear from providers. A total of 5 focus groups (n=40) were performed with Medicaid-enrolled smokers who resided in the Appalachian region of Ohio. A variety of smoking-related topics were explored, including: (1) past experiences with providers who delivered tobacco dependence counseling; (2) interest in having a provider who delivers such counseling; and (3) types of counseling messages they would like to hear. The focus groups were transcribed and coded independently by two reviewers; consensus was obtained in cases where the reviewers initially disagreed. Most of the participants were dissatisfied with the conversations they have had with providers because it was their impression that they "talked down" to them and gave them little information beyond a simple message like "you need to quit" and "smoking will kill you." However, at the same time they indicated that they would like to have a provider who truly seemed interested in their struggle with dependence, and one who offered tailored messages, support, and cessation resources such as a structured program. Some participants described more positive conversations about smoking cessation with the "city doctors" they have encountered at an academic medical center. In conclusion, these rural Medicaid-enrolled smokers have had negative experiences discussing smoking cessation with their local health care providers. Their suggestions for counseling messages indicate that they would like to have a provider who can deliver the 5A's, tailored to motivational readiness to quit. The information collected in this study is being used in an intervention that will target Medicaid providers in the Appalachian region of Ohio.

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POS1-65

CAPACITY OF DRUG TREATMENT FACILITIES TO TREAT TOBACCO DEPENDENCE

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Background: Over three-quarters of clients in drug treatment smoke cigarettes. Treatment guidelines encourage facilities to adopt a systematic approach to treating tobacco dependence, however, the capacity of facilities to provide treatment, as well as the resources available, are unknown.

Objectives: To describe drug treatment facilities capacity to provide tobacco treatment and resources available for providing treatment.

Methods: A cross-sectional survey is currently underway within a nationally representative sample of 400 outpatient facilities. One person in a leadership position was surveyed at each facility. Surveys were collected by phone, fax, email, or mail, according to responder preference. We report here on 101 facilities; we will report findings from the total sample at the conference.

Results: Global capacity: Significantly fewer facilities reported that their capacity to treat tobacco dependence was good-very good (34%) compared to their capacity to treat tobacco dependence (74%). Capacity and resources for delivering evidence-based treatment: Few facilities (37%) agreed-strongly agreed their facility has protocols, procedures, or curricula that guide staff on how to treat tobacco. Very few agreed-strongly agreed they had the financial resources for providing counseling (17%) or quit smoking medications (13%). Over half reported that staff had not received training specifically for treating tobacco (51%) or on quit smoking medications (59%). However, 55% agreed-strongly agreed that staff has the skills to treat tobacco. Very few agreed-strongly agreed that staff has dedicated time for treating clients' tobacco dependence (25%) or they had a designated leader for tobacco treatment efforts (24%). A cumulative count across all markers of capacity and resources found 11% agreed their facilities had most to all (10-13), 24% had 6-9, and 65% had 5 or fewer capacities to provide tobacco treatment.

Conclusions: Few facilities have a majority of the capacities/resources required to routinely and consistently treat tobacco dependence; this may influence the adoption and maintenance of tobacco treatment.

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POS1-66

YOUNG ADULT SOCIAL SMOKING IN BARS AND CLUBS

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Young adults are the age group at the highest risk for smoking; in addition they are more likely to quit smoking than older age groups. A key part of understanding complex smoking behavior patterns during this time in the lifecourse may be non-daily smoking. Previous research has suggested that social smoking is an important type of non-daily smoking behavior among young adults, though much of this research has been limited to college samples and there is no consensus on how to operationalize it. Bars and clubs are particularly relevant environments for understanding social smoking. Smoking patterns are often context specific and social smoking in particular has been found to occur on weekends; a time when young adults are presumably more likely to be with peers at bars and clubs. In addition, exposure to tobacco marketing in bars and clubs is associated with smoking. The present study uses survey data collected among bar-going young adults (aged 18-29) in San Diego, CA. Subjects were selected to complete written surveys based on a randomized venue-based sampling (85% participation rate, N=2,054). We compare the associations between multiple measurements of social smoking and cessation. Results show that over 70% of those who smoked during the past 30 days (N=1173) self identify as social smokers. Young adults who only smoke with others smoke on an average of 8.66 less days of the past 30 than the mean for all smokers (15.65). Logistic regression was used to analyze the association between measures of social smoking and cessation indicators controlling for demographic factors (age, college status, and race) using Stata 11.0. Results show that behavior variables are more strongly associated with recent quitting, attempting to quit, and intending to quit than self-identifying as a social smoker. Comparing the reduced and full models suggests that measures of social smoking behavior may be more effective with regard to cessation than self ID. While young adults who only smoke with others do so less often, findings show that for bar and club going young adults, smoking alone is positively associated with cessation indicators (OR=5.15, p<.05; OR=2.73, p<.05).

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POS1-67

SOCIAL FACILITATION EXPECTANCIES FOR SMOKING: PSYCHOMETRIC PROPERTIES OF A NEW MEASURE

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Smoking rates are highest in the young adult age group. Many young adults do not smoke daily and may smoke primarily in social contexts. Expectancies about the social outcomes for smoking may be particularly relevant for predicting smoking behaviors among young adults. Several well-established expectancy measures exist; however, none are specifically designed to measure social facilitation expectancies for cigarette smoking. The current study presents preliminary psychometric evaluation of a new measure, the Social Facilitation Expectancies of smoking (SFE) scale. Item content and scoring for this measure were derived from existing items and written feedback from young adults. Items were scored on a five-point scale from 1 (strongly disagree) to 5 (strongly agree). The resulting ten-item self–report measure was administered electronically to undergraduate college students (N=267; 55% Female), including never smokers (n=177) and smokers (n=90; > 1 cig/week). A principal components analysis (PCA) was conducted to explore scale structure. The PCA revealed that a one-factor solution fit best (9 items; 44.1% variance explained; factor loadings from .488-.747). Internal consistency of the 9-item factor was good (Cronbach's alpha = .84). Scale score was calculated as the mean of all item scores. Social facilitation expectancies were significantly higher among regular smokers than among never smokers ($F = 98.34$, $p < .001$, M(SD) = 2.94(.93) and 2.19(.26), respectively). Construct validity was established by regressing regular smokers' SFE scores on the negative social consequences scale from the Consequences of Quitting Smoking Expectancies scale ($F = 30.35$, $p < .001$, $R2 = .256$, $B = .557$). To establish discriminant validity, correlations between SFE score and the four scales of the short version of the Brandon Smoking Consequences Questionnaire (S-SCQ; Myers, McCarthy & MacPherson, 2003) were examined. All correlations were small and not significant (r's < .12, p's > .05). These findings provide initial support for the psychometric properties of this measure. Future research will investigate the predictive utility of this measure in relation to smoking cessation efforts.

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POS1-68

SMOKERS WITH MOBILITY IMPAIRMENTS: SMOKING BEHAVIORS AND USE OF VARIOUS QUIT METHODS

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People with physical disabilities who use assistance to ambulate (i.e., mobility impairments) have greater smoking prevalence (32.5%) than non-disabled people (19.8%). Little is known about their smoking behaviors. Our aims are to report on this, and: (1) prevalence of lifetime use of various smoking cessation methods, and (2) a comparison of lifetime quit methods between our sample and a general population of smokers assessed by telephone survey (n=380; Hughes et al., 2009). We conducted telephone interviews with 91 current (n=79) or former smokers (n=12) with mobility impairments (52.7% Female, 64.8% Caucasian, M Age = 50.0 years; 53.6% earned < $10,000 per year, 52.8% had ≤ high school education). Among current smokers (M=16.9 cigarettes/day, M Fagerstrom = 3.6), 60.8% quit for > 24 hours in the past year, 89.7% wanted to quit within the next 6 months and 57.0% wanted to quit within 30 days (vs. 29% of the Hughes sample). In our sample, the proportion ever using quitlines, individual counseling, and group counseling was 3.3%, 3.3%, and 0% vs. 12%, 9%, and 8% in the Hughes sample. The proportion using nicotine patch, gum, inhaler, and tablet medication (e.g., bupropion) were 44%, 22%, 1.1%, and 9.9% in our sample, vs. 41%, 22%, 7%, and 24% in the Hughes sample. Use of any pharmacological aid was 54.9% in our sample vs. 57% in the Hughes sample. In our study, 75.8% said that they tried to quit "cold turkey." 87.9% received advice to quit smoking by a nurse or doctor. We conducted a single logistic regression to determine which variables (gender, age, education, income, past year quit attempts, time to first cigarette) were associated with ever using any pharmacological cessation aid vs. not using one. Only income was associated with ever use of a pharmacological cessation aid (p=.054); 66.7% of those earning >= $10,000/year used them vs. 46.7% of those < $10,000 per year. People with mobility impairments may be less likely to seek psychosocial treatment than general smokers, but more motivated to quit. Income may be a barrier to using quit smoking medications. Innovative approaches are needed to reach and treat these smokers.

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POS1-69

LINKING GLOBAL YOUTH TOBACCO SURVEY (GYTS) DATA TO SMOKE FREE POLICY AT THE LOCAL LEVEL: THE CASE FOR MÉXICO 2003-2008

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Tobacco smoke causes death, disease and disability and there is no safe level of exposure. As shown in several multinational studies, secondhand smoke (SHS) is present in virtually all public places where smoking is permitted. Since the year 2000, Mexico has applied the Global Youth Tobacco Survey (GYTS) 42 times and there is a measurement available for every major city in each state. As part of the increasing efforts in tobacco control at the local level, in the last 10 years most Mexican states passed new laws or reviewed the previous ones for the purpose of protecting people from SHS exposure. This presentation is aimed at describing whether or not these changes in local legislation are reflected in adolescents' self-reported exposure to other people's smoking in public places.

METHODS: We compared the proportions of adolescents exposed to SHS in public places in cities with and without legislation on this matter.

RESULTS: For each wave of the survey (2003, 2005, 2006, and 2008), the proportion of Never Smokers exposed to SHS in public places ranged between 30% and 53%. Among Current Smokers, exposure to SHS in public places ranged from 63% to 79%. For both groups, never smokers and current smokers, we did not find statistically significant differences in self-reported exposure to SHS in public places between cities with and without local laws promoting smoke-free inner environments. Neither have we found any pattern that might suggest a reduction in self-reported exposure to SHS over time. When cities with two measurements (2003 and 2006) were compared, we did not observe statistically significant reduction in exposure to SHS.

CONCLUSIONS: Despite progress in legislation for tobacco control at the local level, SHS exposure is still a public health priority in Mexico. We recommend that penalties for failing to comply with legislation should focus on businesses rather than individual smokers and should be serious enough to deter violations.

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POS1-70

ASBESTOS EXPOSURE, ASBESTOS RELATED DISEASE, AND SMOKING IN LIBBY, MONTANA

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Residents of Libby, Montana, are victims of a "slow-motion technological disaster" due to decades of local mining and processing of asbestos-contaminated vermiculite and widespread exposure in homes and the workplace. For those with asbestos exposure, smoking cessation is considered key to preventing and reducing morbidity associated with asbestos related disease (ARD), because smoking and asbestos exposure synergistically compound the risk of developing lung cancer. This study examined smoking behavior among Libby residents with ARD and/or asbestos exposure. Surveys were mailed to 1011 randomly selected community residents and a random sample of 99 ARD patients. Response rates were 52% (n = 528) in the community sample and 68% (n = 68) in the ARD

patient sample. Logistic regression tested associations between exposure/ARD status and current smoking status. Negative binomial regression tested associations with cigarettes smoked per day (CPD). Age, gender, drinking frequency, income and marital status were included as covariates. An ARD diagnosis was reported by 36% of respondents (patient [n= 68]; community [n =140]). Of those without ARD, 40% reported occupational asbestos exposure, 35% reported household exposure, 9% reported ambient exposure, and 15% reported no exposure. Among respondents without ARD no difference in smoking prevalence occurred between those who reported exposure (11%) and those who did not (10%; p = .935). Smokers with occupational asbestos exposure reported a greater number of CPD than those without exposure (risk ratio = 1.70, p < .05). The prevalence of smoking was slightly, but not significantly, lower in those with ARD (10%) than those without ARD (14%; p = .16). Those with ARD reported smoking fewer CPD than those without ARD (risk ratio = 0.83, p < .05). Results indicate two important points for expanded intervention: a non-trivial percentage of people diagnosed with ARD continue to smoke, as do individuals who are at future risk of developing ARD due to previous asbestos exposure. Continued efforts and additional resources may be needed to reach these populations with state-of-the-science smoking cessation efforts.

The Voices of Libby, Survey Project, R. J. Cline, PI, conducted as part of a larger investigation, National Center for Vermiculite and Asbestos-Related Cancers, funded by the Environmental Protection Agency (EM-83299701-0), John C. Ruckdeschel, PI.

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POS1-71

TOBACCO AND MARIJUANA USE AMONG ADOLESCENTS AND YOUNG ADULTS: A SYSTEMATIC REVIEW OF THEIR CO-USE

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Tobacco (TOB) and marijuana (MJ) are two of the most widely used drugs by adolescents and young adults, yet the literature on the co-use of these substances has not been systematically reviewed. We conducted a systematic review of articles published between 1999 and 2009 that examined: (1) use patterns of TOB and MJ, (2) correlates or consequences of co-use, or (3) interventions for TOB and MJ co-use. Key search words were tobacco, nicotine, or cigarette and marijuana or cannabis; selection was restricted to English language publications with participants between 13-25 years. A total of 171 studies were identified: 135 examined TOB and MJ co-use, of which 14 examined simultaneous use (e.g., blunts); 60 examined correlates or consequences of co-use; and 2 studies tested interventions for co-use. Cross-sectional (93/103 relationships; 90%) and longitudinal (58/72; 81%) studies showed consistently strong relationships between TOB and MJ use. Studies of correlates and consequences of co-use were coded based on the percentage of positive/negative, null, or indiscriminate findings and the total number of relationships examined. Correlates with 3 or more relationships supporting a significant association with co-use were shared environment in twin studies (3/4; 75%), African-American ethnicity (5/6; 83%), and individual characteristics (e.g., sensation-seeking personality traits, delinquency; 11/15; 73%). Exacerbation of mental health symptoms (5/5; 100%) and behavioral consequences (e.g., driving while intoxicated; 3/5; 60%) were identified as significant consequences of co-use, while health problems (3/9; 33%), quit attempts or relapse to either substance (5/12; 42%) and affective consequences (attitudes, motives; 2/5; 40%) were not. Only two studies tested interventions and neither reported significant reductions in the co-use of TOB and MJ. A sufficient literature base has documented that TOB and MJ use are strongly related in young people, yet few consistent correlates and consequences of co-use have been identified. Greater study is needed to identify correlates and consequences of co-use to inform the development of future interventions.

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POS1-72

EVALUATING THE EFFECTIVENESS OF A TRADITIONAL SMOKING CESSATION SYSTEM FOR SMOKERS OF LOW EDUCATION

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Background: Smoking is associated with social disadvantage. Ontarians with secondary education or less (LE) have significantly higher smoking rates than those with higher education (HE). In 2008, LE smoking prevalence was 28% compared with 16% for HE.

Methods: This study assesses the effectiveness of Ontario's smoking cessation system (OSCS) for LE smokers aged 24 years and older. The OSCS includes a helpline, annual quit contest, cessation services for hospitalized smokers, a program that provided free NRT and psychosocial counselling. This assessment synthesizes information collected from four sources: the longitudinal Ontario Tobacco Survey (OTS) (n=4,501), an environmental scan, key informant interviews (n=19), a street intercept survey with current smokers and recent smokers (n=100). Analysis of the OTS adjusted for differences in age, sex, and smoking status.

Results: Environmental scan showed that the current OSCS is reaching less than 5% of LE smokers, even though 12% report they want to quit in the next month (OTS). After adjusting for confounders, the LE smokers have higher adjusted odds ratio (AOR) for smoking daily (AOR=2.5; 95% Confidence Interval (CI): 1.81-3.34) and for being heavily addicted (AOR: 1.6; 95% CI: 1.23 to 2.12) compared to HE smokers. LE respondents smoke more cigarettes per day (mean=17) than HE smokers (mean = 13) (p-value<0.001). Despite their desire to quit, LE smokers have limited awareness of services to help them quit or reduce their smoking. Data from the interviews show that most LE smokers (n=59) did not know where to go for help. Compared to HE smokers, LE smokers were significantly less likely to have used an evidence-based therapy six months prior to their interview (AOR=0.66; 95% CI=0.48-0.91) and were 27% less likely to attempt to quit within one year (AOR=0.7; 95% CI; 0.53-0.99). LE smokers were 43% less likely to successfully quit than HE smokers (AOR=0.6; 95% CI; 0.35-0.92).

Conclusion: Changes to existing smoking cessation services in Ontario are needed in order to more effectively reduce the smoking prevalence in this population.

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POS1-73

PERCEIVED NICOTINE DEPENDENCE AMONG ADOLESCENT NEVER-SMOKERS: REPLICATION WITH THE NICOTINE DEPENDENCE IN TEENS STUDY (NDIT)

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Recent research suggests that some adolescent never-smokers exposed to secondhand tobacco smoke endorse symptoms of nicotine dependence (Bélanger et al., 2008; Racicot et al., 2010). The aim of the present study was to replicate and extend these findings by evaluating covariates of perceived nicotine dependence among adolescent never-smokers using measures of nicotine dependence in adolescents. Seventh grade students (N = 1,267) attending 10 Montreal schools participated in NDIT. Never-smokers included 829 adolescents (mean age = 12.7, standard deviation = .4; 49.8% female) who had never smoked a cigarette, not even a few puffs. Only these never-smoking participants were retained for analyses. Students rated their perceived level of physical addiction (0 = not at all, 3 = very) and mental addiction (0 = not at all, 3 = very), and the frequency of needing a cigarette (0 = never, 3 = often). Perceived nicotine dependence was coded as the sum of these items (range 0 – 9). Covariates included age, sex, language spoke at home (e.g., English, French), other tobacco product use, alcohol use, and social smoke exposure (parents, siblings, peers). Consistent with previous independent findings, 6.2% of never-smoking adolescents endorsed at least one nicotine dependence symptom. Multivariate linear regression (R squared = .032) indicated that more frequent alcohol use (t = 3.0, p ≤ .01) and greater peer smoking (t = 2.1, p ≤ .05) were associated with more perceived nicotine dependence symptoms, whereas speaking English at home was associated with fewer endorsed nicotine dependence symptoms. Adolescents observing their friends smoke cigarettes may perceive that they are dependent on nicotine due to social modeling. Alternatively, nicotine exposure through secondhand smoke may exert pharmacological effects on the addiction pathway. Measuring secondhand smoke with cotinine would enable researchers to objectively evaluate the effects of pharmacological exposure to nicotine. Future research should identify the longitudinal predictors explaining the development of nicotine dependence among never-smoking adolescents.

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POS1-75

PATTERNS OF CIGARILLO USE AMONG YOUNG ADULTS IN TWO URBAN CENTRES

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Cigarillo smoking accounts for the largest share of non-cigarette tobacco use among youth and young adults. The variety of flavours, colourful packaging and sale prices as low as $1 are aimed at attracting new smokers. New legislation now bans the sale of flavoured and single cigarillos in Canada. Our study aimed to: (1) learn about patterns of cigarillo initiation and use, and the associations with cigarette initiation and use; and (2) assess the effects of the new legislation on cigarillo use. A total of 133 participants from the Greater Toronto Area, Ontario and Edmonton, Alberta completed the baseline survey prior to the implementation of the cigarillo sales ban. Eligible participants were 19-29 years of age, had smoked cigarillos in the past 30 days, and resided in either survey site. Participants completed a 30-minute online survey that included questions on cigarillo and cigarette use, social influence, beliefs about cigarillo use and the impact of cigarillo sales ban. Preliminary analysis consisted of descriptive statistics. Overall, cigarillo users were aged 23.5 years on average, primarily male (75%), and more likely to be blue-collar workers (63%). Frequency of cigarillo use was mostly split into two categories: less than once a week (32%) and 2-6 times per week (32%). Patterns of use indicate that cigarillos are largely smoked socially. Co-use with cigarettes and marijuana was high (74% and 72%, respectively). The majority of respondents began smoking cigarettes before smoking cigarillos (76%). In response to the cigarillo sales ban implementation, respondents indicated that they would primarily smoke fewer cigarillos (46%). Results from work currently underway – a post-implementation survey, in-depth interviews and focus groups – will also be presented. Knowledge gained from this study will assist policymakers and decision makers in developing relevant policy and tobacco control programs aimed at decreasing the prevalence of cigarillo use and associated use of other tobacco products.

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POS1-76

PREDICTORS OF SUCCESSFUL QUITTING AND SELF-ENGAGEMENT AMONG RECALCITRANT SMOKERS AFTER A TWO-YEAR SMOKING CESSATION TRIAL

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Introduction: Cigarettes smoking could be conceptualized as a chronic condition that requires repeated treatments. Few studies have looked at re-engagement of recalcitrant smokers after 1-2 years of smoking cessation treatment.

Objective: This study is to identify significant predictors of quit status, sustained abstinence, and self-engagement at 36 months among smokers who were unable to quit after repeated interventions over a 24-month period.

Method: Smokers were provided free pharmacotherapy (NRT or buproprion) and varying level of counseling at 6-months intervals for 24 months. Participants who were still smoking at 24-months were followed for an additional 12 months. Quit status and self-engagement outcomes were assessed. Bivariate relationships were examined to identify significant predictors of 7-day point-prevalence quit status, 6-month sustained abstinence, and self-engagement in any cessation medication use.

Results: Among 372 recalcitrant smokers, 30% engaged in cessation treatment by using pharmacotherapy at 12 months. Prior pharmacotherapy use ($\chi 2 = 26.01$, $p < .0001$), higher importance of quitting ($t = 3.14$, $p < 0.01$), and higher autonomous motivation to quit ($t = 2.65$, $p < 0.01$) significantly predicted cessation medication use. At 12-month follow-up, 9% recalcitrant smokers were quit and 5% attained sustained abstinence. Use of NRT or bupropion ($\chi 2 = 8.07$, $p < .01$) and higher importance of quitting ($t = 3.21$, $p < 0.01$) significantly predicted higher sustained abstinence at follow-up.

Discussion: Recalcitrant smokers often continue to engage in treatment and continue to have successful quit attempts. Among these recalcitrant smokers, experience of pharmaco-therapy use and high motivation predict continued cessation medication use, which in turn is associated with a higher likelihood of quitting.

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POS1-77

PREDICTORS AND BELIEFS ASSOCIATED WITH USING CAMEL SNUS IN A YOUNG ADULT WEST VIRGINIA TEST MARKET

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Camel Snus is a smokeless, spitless tobacco product test-marketed in 2007, in West Virginia before its national U.S. release in 2009. West Virginia is an ideal test-market for new tobacco products, with high rates of smoking and smokeless tobacco and highest use among young adults. Knowledge, attitudes, beliefs, and utilization of Camel Snus were assessed among a young adult college population. Following informed consent, 662 surveys were completed in March-April 2008, with adult college students at least 18 years old on three campus sites in Morgantown, WV. Descriptive analyses, chi-square analyses, and logistic regression analyses were conducted using SPSS 18.0. Most respondents were: 18-24 years old (75.1%); White (91.9%); with equal males (50.3%) and females (49.7%). There were 43 respondents (6.5%) who had ever used Camel Snus, and among them: 62.8% were current smokers; 48.8% were current smokeless tobacco users; and 32.6% used both cigarettes and smokeless tobacco. Chi-square tests found those more likely to use Camel Snus were: male (P=0.000); current smokers (p=0.003); current smokeless tobacco users (p=0.000); thought snus was a less harmful way to get nicotine than other smokeless tobacco products (p=0.000); ever tried to quit smoking (p=0.001); and agreed snus would be a good way to get nicotine in places that did not allow smoking (p=0.026). Respondents less likely to use Camel Snus thought it was more addictive than cigarettes (p=0.002). Logistic regression models found significant predictors for ever used Camel Snus to be male gender [OR=2.0; p=0.022] and used smokeless tobacco in the past 30 days [OR=4.2; p=0.002]. Camel Snus is not the tobacco product of choice among young adult college students in the WV test-market studied; however, male gender and current smokeless tobacco use were predictive of ever using snus in this sample. Beliefs related to addictiveness, harm, and convenience of nicotine delivery were also related to utilization. New tobacco products, promoted and marketed to potentially receptive target audiences, remain important for study, especially among young adults in high tobacco use areas.

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POS1-78

THE CHARACTERISTICS AND SIGNIFICANCE OF LATE-ONSET DAILY SMOKING

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Despite the well-documented health hazard, people still initiate a smoking career. In developed countries, the tobacco epidemic is in a later stage, characterized by both a general decline in smoking prevalence and more smoking in lower socioeconomic classes. The vast majority of adult smokers have started during their teenage years. Adolescence is considered a critical phase in smoking development, and research on smoking initiation and interventions have been focused on this group. Concerning adult smoking, most research efforts are focused on predictors for continuing or quitting smoking. The main aim of the present study was to investigate initiation of smoking after the adolescent period. A secondary aim was to investigate if socioeconomic status was associated with smoking initiation post adolescence. We used data from The Norwegian Longitudinal Health Behaviour Study (NLHB); a longitudinal study of adolescents' health and health related behaviour, following a cohort of adolescents from age 13 to 30. One-third of the daily smokers at age 30 initiated daily smoking after the age of 18. There was also a clear and consistent association between socioeconomic status (SES) and late-onset smoking. There was no significant association between quitting smoking and SES, and late-onset smoking may be an important mechanism behind social differences in smoking in addition to previous findings of differences in quitting rates. The results suggest that some smokers

initiate smoking after adolescence, but this group has traditionally not been targeted to prevent smoking uptake. In addition, late onset smokers may be an important group to study to better understand SES differences in smoking.

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POS1-79

DETERMINATION OF THE LEVELS OF NNAL, ISO-NNAL AND NNA IN CONTEMPORARY US AND SWEDISH SMOKELESS TOBACCO PRODUCTS

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Objectives: IARC Monograph 89 summarised the presence of 28 chemical agents in smokeless tobacco products (STPs) including a number of nitroso species such as N-nitrosonornicotine (NNN), 4-(N-methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK) and 4-(N-methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL). Over the last 20-30 years there have been a significant number of studies characterising the contents of NNN and NNK in STPs, and research has shown changes in levels of these compounds over this time period. However, the nitrosamines NNAL, 4-(N-methyl-N-nitrosamino)-4-(3-pyridyl)-1-butanol (iso-NNAL) and 4-(N-methyl-N-nitrosamino)-4-(3-pyridyl)-butanal (NNA) have received significantly less attention. Given the lack of pertinent information in this area, a survey of the levels of NNAL, iso-NNAL and NNA was considered necessary to more fully characterise the chemistry of currently available STPs.

Method: 73 STPs available on the Swedish and US markets were sampled in August 2010, consisting of 32 Swedish loose and pouched snus products and 41 US products including chewing tobacco, dry snuff, pellets, moist snuff, snus, and plug. STPs were sampled to include products from all major manufacturers. Analysis for NNAL, iso-NNAL and NNA was conducted at BAT's analytical laboratory using a method developed for this study: STPs were spiked with deuterated internal standards, hydrated and extracted with methanol. The extracts were cleaned-up using ion exchange SPE. The nitrosamine levels in the resulting samples were quantified by LC-MS/MS.

Results: Significant differences were found in the levels of the nitrosamines across different tobacco product types. NNAL and iso-NNAL were measured at levels up to 2500 ng/g of NNAL and 900 ng/g of iso-NNAL. Analysis of NNA showed this compound to be unstable, with degradation occurring both within STPs and in the SPE column. However, without SPE clean-up, NNA contents were estimated to be present at levels up to 200 ng/g.

The study was funded by British American Tobacco.

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POS1-80

YOUNG ADULT SMOKING CESSATION: ATTITUDES, MOTIVATION, AND STRATEGIES FROM A QUALITATIVE FOCUS GROUP STUDY

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West Virginia has the second highest rate of adult smoking in the U.S., with highest tobacco use among young adults (45.7%) and an unmet need for successfully tailored cessation programs targeting young adult smokers. In March-April 2009 survey data were collected from young adult college students (N=118) who were 18-25 years of age and current smokers (smoked at least one cigarette in the past 30 days). Follow-up focus groups were conducted in September 2009, with a sub-sample of the study population (N=10) to get qualitative data on young adult smoking in terms of cessation behavior, attitudes, motivation, and quitting methods. Focus groups were audio-taped and transcribed by a trained research assistant using NVivo 8.0 software. The following qualitative findings and key themes related to attitudes, motivation, and cessation strategies were identified: Focus group respondents said price was a major motivating factor to quit smoking; Participants who smoked on a regular basis said they wanted to quit in the near future; Participants were unfamiliar and not interested in assisted quitting methods or nicotine replacement therapy (NRT), with a few recalling negative experiences with NRT patch and gum; Participants emphasized they would try NRT if it were cheaper or free (i.e., samples); NRT cost was the main reason cited for lack of use in quit attempts. A majority of respondents (60%) had ever smoked hookah pipes, but did not view this as harmful or as a form of 'smoking.' A majority also reported at least one quit attempt (90%); however, assisted cessation methods, including NRT, were not commonly used, which need to be promoted and tailored for young adults. NRT samples could be offered in school or community-based cessation programs to better engage youth. Hookah may be emerging as an important form of tobacco among young adults, especially college students, and cessation programs should recognize hookah, educating that its use is harmful. A better understanding of young adult attitudes, motivation, 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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POS1-81

PATTERNS AND PREDICTORS OF SMOKING ABSTINENCE AMONG ACTIVE SMOKERS ENROLLED IN THE NEW YORK-EARLY LUNG CANCER ACTION PROGRAM (NY-ELCAP)

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Given the potential opportunity for health care providers to use screening results to personalize tobacco-related health hazards, lung cancer screening has been proposed as a "teachable moment" for delivery of tobacco cessation treatment. Greater understanding of the rates and factors associated with smoking cessation would facilitate the design and implementation of tobacco cessation treatments within lung cancer screening programs. We examined a large population of current smokers who participated in a lung cancer screening program (NY-ELCAP), a multi-site, single-arm study examining the utility of low dose CT scan for early detection of lung cancer. This presentation will analyze data from the subset of 2079 NY-ELCAP participants who were current smokers at enrollment and will: (1) Describe the extent to which current smokers who sought lung cancer screening (baseline) reported being motivated (stage of change) to quit; (2) Examine rates of smoking abstinence one year following enrollment; (3) Describe the use of evidence-based smoking cessation approaches following enrollment; and (4) Identify demographic, smoking history, screening result and smoking-related health belief factors associated with smoking abstinence. At baseline, 46.7% were seriously thinking about quitting within the next 6 months (contemplation) and 31.6% were seriously thinking about quitting within the next 30 days and had made a quit attempt in the past year (preparation). At one-year follow-up, 16.1% reported smoking abstinence, and 60.3% had tried to quit since enrollment. Use of evidence-based cessation pharmacotherapy and counseling was low with 28.8% reporting "cold turkey", 27.5% tapering/cutting down, 19.1% NRT, and 7.1% using bupropion as a quitting method. All other approaches (including Quitline) were used by less than 10%. Smokers who had more education, smoked fewer cigarettes, were less nicotine dependent, were more worried about lung cancer and reported being in contemplation or preparation stage of change at enrollment were more likely to report smoking abstinence at follow-up. Baseline scan results were not associated with smoking abstinence.

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POS1-82

THE EFFECTS OF SMOKING STATUS, URINATION FREQUENCY, WATER INTAKE, AND COFFEE CONSUMPTION STATUS ON BLADDER CANCER RISK

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Introduction: Experimental studies suggest that the tobacco consumption increase the incidence of bladder cancer and that increased urination frequency may reduce bladder cancer risk.

Material & Methods: The analyses included 1,136 incident cases with bladder cancer and 1,138 controls from 1998 to 2001. We evaluated the effect of smoking status, coffee consumption, urinary frequency, and water intake on risk of bladder cancer in a multicenter study in Spain.

Results: Current smokers (men: OR, 7.4; women: OR, 5.1) and former smokers (men: OR, 3.8; women: OR, 1.8) had significantly increased risks of bladder cancer compared with nonsmokers. We observed a significant positive trend in risk with increasing duration and amount smoked. Compared with risk in current smokers, a significant inverse trend in risk with increasing time since quitting smoking blond tobacco was observed (> or =20 years cessation: OR, 0.2). Cumulative occupational exposure to environmental tobacco smoke seemed to confer increased risk among female nonsmokers but not among male nonsmokers. Subjects who drank at least 1,400 ml per day experienced a significant 80% reduced risk of bladder cancer compared to those who did drank less than 400 ml of water per day (p<0.0001). Compared with non-smokers who did not urinate at night, current smokers who did not urinate at night had an OR of 7.0, whereas those who voided at least twice per night had an OR of 3.3(p=0.0005). The OR for ever-consumed coffee was 1.25. Coffee consumption was higher in smokers compared to never smokers. The OR for drinking at least 4 cups/day was: 1.13 in current smokers and 1.57 in former smokers, and 1.23 in never smokers.

Conclusions: The tobacco consumption is associated with an increased incidence of bladder cancer. Our findings suggest a strong protective effect of nocturia on bladder cancer risk, providing evidence in humans that bladder cancer risk is related to the contact time of the urothelium with carcinogens in urine. The modest increased bladder cancer risk among coffee drinkers supports the hypothesis that coffee is a weak carcinogen, although results may, in part, be explained by residual confounding by smoking.

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POS1-83

THE ROLE OF PARENT/ADOLESCENT COMMUNICATION AND PEER SMOKING IN ADOLESCENT BELIEFS ABOUT THE RISKS OF SMOKING AND SMOKING A WHOLE CIGARETTE

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Objective: Past research suggests that smoking exposure increases the risk of smoking in adolescents by negatively influencing beliefs about the personal immediate harm of smoking; adolescents believe smoking is less personally harmful. We sought to assess whether parent-adolescent communication at baseline (age 14) protected adolescents who never smoked a whole cigarette at baseline from smoking a whole cigarette 18 months later, by influencing beliefs about the personal and immediate harm of smoking.

Methods: Our sample was 276 14 year olds (50% female, 41% non-Caucasian) taking part in a three wave longitudinal study of antismoking parenting practices and smoking. We controlled for the race, sex, peer and household smoking, parental education, and whether parents warned children of smokings risks. Data were analyzed with a Structural Equation Model (SEM), with indirect effects estimated using delta method standard errors.

Results: Thirteen percent of participants smoked a whole cigarette at 18-month follow-up. The SEM fit the data well, $\chi2(28,n=276) =36.50$, p=.18. Only peer smoking had a significant effect on smoking at follow-up (Beta= .11, z=2.04, p=.04). Regarding the mediators, parent-adolescent communication (Beta= .05, z=4.29, p<.0001) and peers smoking (Beta= -.05, z= -3.89, p<.0001) had significant direct effects on personal immediate harm beliefs. There were no direct effects on general immediate harm beliefs. Regarding indirect effects, peer smoking had a significant positive (Beta= .03, z= 2.01, p=.04, 95%CI=.001, .07), whereas parent-adolescent communication had a significant negative (Beta= -.04, z= -2.01, p=.04, 95%CI= -.08, -.001) indirect effect on smoking a whole cigarette at 18-month follow-up.

Conclusions: The findings suggest that one way to possibly counter the significant effect of peer smoking on smoking risk beliefs and smoking behavior is parent-adolescent communication. By keeping communication channels open with youth, parents may be able to influence adolescents' perceptions about the risks of smoking and decrease the likelihood adolescents will smoke.

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POS1-84

THE CHALLENGES AND ASSETS OF TEEN SMOKING CESSATION

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Currently, 20 percent of high school youth smoke. Effective tobacco treatments are available for these youth. The American Lung Association's (ALA) Not-On-Tobacco (N-O-T), is proven effective smoking cessation program listed among the National Registry of Evidence-based Programs and Practices. Typically, adolescent smoking cessation research examines either a program's overall effectiveness or the associated aspects related to successful cessation. This study synthesizes four N-O-T studies to address some of the major questions in the field of teen cessation (who joins? who stays and why? and who quits?). We addressed who joins youth smoking cessation programs by describing the sociodemographic and smoking related characteristics of teen smokers who participated in N-O-T. Who stays and why was evaluated by examining N-O-T recruitment barriers/successes and teen perceptions of N-O-T facilitator characteristics. While, youths who quit smoking was explored by identifying predictors (e.g., smoking history, intervention readiness, and social context) associated with smoking cessation, reduction, and acceleration in N-O-T participants. Overall, we found that teens who joined N-O-T started smoking at an earlier age, were more likely to be poly-tobacco users, were more dependent on nicotine, had made more previous quit attempts, and were more deeply embedded in smoking contexts than comparative samples of teen smokers. N-O-T participants who stayed in the program rated facilitator characteristics of trustworthy, cares about students, and confidential as the most important. While, recruitment presented some challenges, N-O-T recruitment utilizing active recruitment techniques such as maximized interpersonal contact involving one-on-one conversations proved to be effective. Among those who quit, N-O-T more than doubled their odds of quitting with youth who reduced smoking being similar to those who quit. While youth smoking cessation poses numerous barriers, empirical evidence has shown that using behavioral-based model cessation programs can be successful in reaching those who want these effective programs and that teens will join, they will stay, and they will quit.

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POS1-85

ARE CANADIAN SMOKERS BECOMING MORE RESISTANT TO QUITTING?

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Background: It has been hypothesized that, as tobacco use becomes less normative, smokers as a group will be more resistant to quitting. However, few studies have presented evidence of hardening at a population level. Purpose: To determine whether the population of smokers is hardening among a nationally representative population sample.

Methods: We used data from the 2000 to 2009 Canadian Tobacco Use Monitoring Survey (CTUMS), an annual population-representative survey of smoking behaviour in Canadian residents aged 15 and above. The 47,037 current smokers surveyed were classified as "hardcore" if their Heaviness of Smoking Index score was 5 or 6. We examined the proportion of current smokers classified as "hardcore" ("hardcore" proportion) over the study period in absolute terms and in relation to trends in smoking prevalence by age and sex. Trend analyses used logistic regression models appropriate to the multiple complex survey samples.

Results: Between 2000 and 2009, Canadian smoking prevalence decreased (from 24.4% to 17.5%; test for trend: p<0.001) and so did "hardcore" prevalence (from 2.5% to 1.3%; test for trend: p<0.001) and the proportion of "hardcore" smokers within the smoking population (from 10.3% to 7.2%; test for trend: p=0.002). Compared to females and those under age 25, respectively, males and adults aged 25+ were more likely to be classified as "hardcore" (p<0.001). The gender- and age-effects did not vary over time (p>0.05). Adjusting for sex, age, marital status, and education, we found a statistically significant decrease in smoking prevalence (p<0.001), "hardcore" prevalence (p<0.001) and "hardcore" proportion (p<0.01).

Conclusions: "Hardcore" smoking, defined based on high nicotine dependence, has previously been shown to predict continued smoking. We found no evidence of Canadian smokers becoming more resistant to quitting, as "hardcore" prevalence and proportion of current smokers classified as "hardcore" decreased in Canada over the last decade.

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POS1-86

SECOND-HAND SMOKE EXPOSURE IN THE HOME AND NEUROBEHAVIORAL DISORDERS AMONG CHILDREN IN THE UNITED STATES

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Objectives: The association between parent-reported post-natal second-hand tobacco smoke (SHS) exposure in the home and neurobehavioral disorders (attention deficit/hyperactivity [ADHD], learning disability and conduct disorder) independently and combined among children below twelve years of age in the United States was examined using the 2007 National Survey on Children's Health. We further investigated the excess neurobehavioral disorders attributable to SHS exposure in the home in 2007.

Methods: Multivariable logistic regression models accounting for potential confounders and complex survey designs to evaluate associations.

Results: Six percent of 55,358 children (<12 years), corresponding to a weighted total of 48.4 million children across the US were exposed to SHS in the home. The weighted prevalence and 95% confidence intervals of each of the child neurobehavioral outcomes were 8.2% (7.5, 8.8) with learning disability, 5.9% (5.5, 6.4) with ADHD, and 3.6% (3.1, 4.0) with behavioral/conduct disorders. Children exposed to SHS at home had a 60% increased odds of having two or more child neurobehavioral disorders relative to children not exposed to SHS. Male children in general had significantly higher risk. Older children, especially those aged nine to eleven years, and those living in households with highest poverty levels were at greater risk. In absolute terms, 274,100 excess cases in total of these three disorders could have been prevented had the children been not exposed to SHS in their homes.

Conclusions: The present findings underscore the health burden of childhood neurobehavioral disorders attributable to SHS exposure in homes in the U.S. and requiring further investigation.

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POS1-87

SMOKE-FREE HOME POLICIES AMONG NEW MOTHERS, 2004-2008

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Objective: To determine the prevalence and characteristics of new mothers more likely to have an incomplete smoke-free home policy.

Methods: We analyzed Pregnancy Risk Assessment Monitoring System data collected 2-6 months postpartum from 42,208 women who delivered a live birth in 5 states (AR, ME, NJ, OR, WA) from 2004-08. Postpartum smoke-free policy was defined as incomplete (smoking allowed in some rooms, at some times, or anywhere inside the home) and complete (no smoking anywhere inside the home). We calculated prevalence and 95% confidence intervals (CI) of women reporting an incomplete postpartum policy, and tested for differences by smoking status (smoked during and after pregnancy, quit during pregnancy and relapsed, quit during pregnancy and remained quit postpartum, non-smoker) and demographic characteristics using chi-square tests. We calculated risk ratios (RR) estimating the association between an incomplete postpartum smoke-free policy and smoking status, adjusted for demographic characteristics. Data were weighted to represent women delivering live births in each state.

Results: The overall prevalence of an incomplete postpartum smoke-free policy was 5.4% (95% CI: 5.2, 5.7). Women with the highest prevalence of an incomplete postpartum smoke-free policy were smokers during and after pregnancy (21.4%), from Arkansas (14.6%), non-Hispanic Blacks (13.5%), <20 years old (12.4%), women with household income <$10,000 (11.5%), unmarried (10.2%), on Medicaid (9.7%), and women with <12 years education (9.5%). After controlling for demographic characteristics, women who smoked during and after pregnancy (RR=3.8, 95% CI: 3.3, 4.4), women who quit during pregnancy and relapsed (RR=2.2, 95% CI: 1.8, 2.7), and women who quit during pregnancy and remained quit postpartum (RR=1.4, 95% CI: 1.0, 1.9) were more likely to have an incomplete postpartum smoke-free home policy compared to non-smokers.

Conclusion: Women with higher prevalence of an incomplete postpartum smoke-free home policy, including current and former smokers, should be targeted for interventions to eliminate secondhand smoke exposure of infants and other non-smokers in the home.

PRAMS data collection is supported by CDC and state health departments; no additional funds were used for the analysis of the data and preparation of this abstract.

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POS1-88

PATTERNS AND CORRELATES OF TOBACCO USE AMONG YOUNG ADULTS AT COLLEGE AND UNIVERSITY IN ONTARIO

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This study describes college and university students' smoking behaviours and examines whether socioenvironmental and personal characteristics experienced during adolescence are differentially associated with their current tobacco use. A secondary data analysis of a dataset of 4,914 Ontario postsecondary students was employed. Measures include: school status (college versus university), demographics (age, gender, year of study and living arrangement), control variable (single-parented versus two-parented), smoking behaviours (age of initiation, smoking before or after enrolment and smoking frequency), personal characteristics (age of onset of alcohol use and relative age) and socioenvironmental variables (family and high school connectedness). Chi-square tests and a t-test determined the differences between college and university smokers. Logistic regression analyses determined how personal and socioenvironmental factors are differentially associated with college and university students' current smoking status. Results show more college students (37%) than university students (21%) smoke and more began smoking prior to post-secondary school (93% and 84% respectively). College students also started smoking at a younger average age (14.9 years and 15.5 years, respectively). Early age of onset of alcohol use increased the odds of current smoking (main effect model, OR = 8.56 CI = 6.47, 11.33), especially for university students (interaction effect model, b = 2.35 CI = 7.50, 14.64). Higher levels of high school connectedness were associated with decreased odds of current smoking but for university students only (interaction effect model, b = -0.15 CI = 0.84, 0.88). This is the first known Canadian study to examine college and university students separately. The results reveal that different tobacco control programming is required for college and university students, and early alcohol prevention and school engagement programs for adolescents may prevent current tobacco use. Given that both educational pathway and tobacco use are associated with socioeconomic status; future research may consider examining additional socioeconomic-related variables.

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POS2-1

CHANGES IN SMOKING EXPECTANCIES DURING A PHARMACOLOGICAL TRIAL FOR SMOKING CESSATION BY END-OF-TREATMENT SMOKING STATUS

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Objectives: Smoking expectancies are related to smoking consumption and predict smoking cessation. Little is known about whether expectancies change during smoking treatments, consistent with changes in smoking behavior. This study examined reported changes in smoking beliefs during an 8-week smoking cessation trial, which evaluated the safety and efficacy of the monoamine oxidase B inhibitor Selegiline hydrochloride versus placebo.

Methods: Participants were classified as "Quit" (n=18) "Reduced" (n=34) or "Not Quit" (n=49) by 7-day point prevalence abstinence at the end of treatment. Expectancies were assessed at randomization, one week after the target quit date, and at the end of treatment.

Results: Beliefs about smoking assessed prior to the quit attempt were not associated with cessation outcomes. Participants who quit smoking reported a reduction in expectations that smoking would reduce negative affect, boredom, and cravings and increase social facilitation while participants who did not quit smoking reported an increase in negative social impression beliefs. There were gender differences in beliefs related to negative affect reduction, negative physical feelings, social facilitation, and cravings and significant Gender x Smoking Status interactions for health risk and weight control beliefs. There were no significant effects of medication on expectancies.

Discussion: Baseline expectancies were not associated with abstinence outcomes; however, expectancies changed over time with changes in smoking and the greatest changes were seen with smoking abstinence. Information about the relationship between smoking beliefs and behaviors may be used to enhance or tailor smoking cessation treatments.

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POS2-2

DEVELOPING A NOVEL HIGH SCHOOL BASED INTERVENTION TO MOTIVATE A TOBACCO-FREE LIFESTYLE

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Recent reviews have highlighted the importance of developing more potent tobacco prevention and cessation programs for adolescents (e.g., Grimshaw & Stanton, 2006). Behavioral reinforcement programs that provide incentives for maintaining abstinence from cigarettes have been shown to be effective at motivating changes in smoking behaviors in both adult and adolescent smokers in clinical and community settings (e.g., Krishnan-Sarin et al., 2007; O'Connor et al., 2006). We have developed and are in the process of evaluating a novel incentive-based intervention to motivate high school students to adopt a tobacco-free lifestyle. The program has been implemented in two high schools, one in Connecticut and one in upstate New York. Focus groups of students (male and female, smokers and nonsmokers) and school officials were conducted within each school before and after a pilot period of program implementation, to help develop and refine the intervention and its execution. All students (smokers and nonsmokers) were encouraged to enroll in the program and pledge to be tobacco free for the rest of the school year. All enrollees were entered into weekly drawings for gift cards, which were provided only if the winners had not smoked and were biochemically confirmed to be tobacco free. Periodic special events were held to reinforce the tobacco free message, to recruit students to join the program, and to offer additional incentives for participation. The main endpoints for this study are enrollment into the program and changes in smoking behaviors. Overall, the program was well accepted by both students and faculty, with 69% of students in the NY high school and 71% of students in the CT high school enrolled into the program. Ongoing analyses are examining evidence from surveys and focus groups administered before and after program implementation to assess changes in susceptibility to smoke, as well as student and administrator reactions to the incentive program.

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POS2-3

EFFECTIVENESS OF PROMOTING SMOKING CESSATION THROUGH THE QUIT TO WIN CONTEST IN HONG KONG: THE 6-MONTH FOLLOW UP OF A RANDOMIZED CONTROLLED TRIAL

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Introduction: In 2009, a Quit to Win Contest was held in Hong Kong to attract the community to quit smoking. In this study, we aimed to assess the effectiveness of using proactive telephone brief advice, SMS messages, and self-help materials to help contestants quit smoking.

Methods: The study recruited 1,119 daily smokers from shopping malls and housing estates throughout HK. 1,003 smokers who had mobile phone to receive SMS were consented and randomly allocated into 3 groups: TEL group, n=338; SMS group, n=335; CONTROL group, n=330. After recruitment, subjects in the TEL group received a 5-mins call from a cessation counselor within 7 days while SMS group received 8 SMS text messages within 1 month, both contents included quit advice with specific health hazard warnings and hotlines. All subjects received a self-help quitting guide.

Results: Most subjects were male (82%); 72% were in middle age (30-59 years) and 13% were elderly (≥ 60 years). Most subjects (72%) started smoking before the age of 20 and 33% smoked heavily according to the Heaviest of Smoking Index (HSI). During the recruitment, 66% subjects intended to quit in the next 7 days. Similar profiles were found in the 3 groups (P-values ranged from 0.38 to 0.94). All subjects were followed up at 6-month and the overall response rate was 70%. By intention to treat, the quit rate (7-day point prevalence) was 22.2% in the TEL group and 20.5% in the pooled SMS and control group (P=0.52). Overall, 55% in the TEL group and 58.9% in the pooled SMS and CONTROL group reduced their cigarette consumption and/or had made a quit attempt at 6-month follow up (P=0.24).

Conclusions: The Contest successfully captured the interest and attracted many older smokers to quit. In general, the Quit to Win Contest (21%) achieved a higher quit rate as compared to a pilot adult-Quitline in HK (12%). Additional brief telephone counseling on smoking health hazards seems to have some impacts to help people quit smoking and regulate their smoking behaviors. Since the project is still in the progress of 12-month follow-up, the long-term effect of the two additional smoking cessation approaches still need to be further confirmed.

This study was funded by the Hong Kong Council on Smoking and Health.

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POS2-4

EFFICACY OF SMOKING CESSATION INTERVENTIONS FOR YOUNG ADULTS: A META-ANALYSIS

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Although young adult smokers (ages 18-34) comprise a substantial segment of the population, few smoking cessation trials focus exclusively on young adults. When they are included in intervention trials, their outcomes typically are pooled with older participants, which makes it difficult to assess whether evidence-based interventions are effective for young adults per se. The extensive treatment outcome literature for adult smokers provides an opportunity to address the question of the efficacy of interventions for this age group. This study reports results of a meta-analysis of published studies that provided additional subsample results for 18-24 year old participants specifically for this analysis. Potential studies were identified from Treating Tobacco Use and Dependence: 2008 (Fiore, Jaen, Baker, et al) augmented by a PubMed search of the recent literature. From a total of 103 eligible studies, 45 authors were contacted to provide data for the meta-analysis and 13 provided the requested additional data. The treatments involved pharmacotherapy and/or cognitive behavioral treatment. The number of studies and treatment arms was insufficient to assess distinctive benefits for any particular intervention. The data from these 13 studies yielded 18 total effect sizes. Across all relevant studies, both intent-to-treat (ITT) and complete cases (CC) meta-analyses indicated that

any type of intervention (vs. any type of control group) was associated with a greater rate of cessation at both the first (OR=1.54 ITT; and OR=1.77 CC) and last (OR=1.48 ITT; OR=1.52 CC) time point measured. For all analyses there was no heterogeneity of individual study size effects based on both Q-values and the more conservative I-squared index. This preliminary meta-analysis is encouraging that existing evidence-based treatments that form the foundation of clinical practice guidelines are efficacious for the growing population of young adult smokers.

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POS2-5

TRAJECTORIES OF NICOTINE AND CANNABIS USE AMONG ADOLESCENTS IN TREATMENT FOR ATTENTION-DEFICIT/HYPERACTIVITY DISORDER AND SUBSTANCE USE DISORDERS

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Objective: Cigarette smoking is common in adolescents with attention-deficit/hyperactivity disorder (ADHD) and substance use disorders (SUD). However, little is known about the relationship between nicotine and cannabis use trajectories in the context of treatment for both ADHD and SUD. To address this research gap, we report collateral analyses from a 16-week randomized, controlled trial (n = 303) of osmotic-release methylphenidate (OROS-MPH) in adolescents with ADHD concurrently receiving cognitive behavioral therapy (CBT) targeting non-nicotine SUD.

Methods: Participants completed nicotine and cannabis use self-report at baseline and throughout treatment. Analyses were performed to explore the relationships between nicotine use, cannabis use, and other factors, such as medication treatment assignment (OROS-MPH versus placebo).

Results: Baseline (pre-treatment) cigarette smoking was positively correlated with cannabis use ($p < 0.05$). Negligible decline in cigarette smoking during treatment for non-nicotine SUD was observed in both medication groups. Among baseline regular cigarette and cannabis users (using both on > 50% of days), SUD treatment responders (> 50% reduction in days per week of cannabis use) also reduced cigarette use (from 6.7 ± 0.1 [mean ± SE] to 4.7 ± 0.5 days smoking per week [$p = 0.0008$]; from 10.8 ± 1.1 to 6.2 ± 1.1 cigarettes per day [$p = 0.0007$]).

Conclusions: Significant reduction in cannabis use during non-tobacco SUD treatment was associated with modest reduction in cigarette smoking. Stimulant treatment for ADHD was not associated with increased cigarette smoking.

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POS2-6

A PRELIMINARY STUDY OF REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION FOR SMOKING CESSATION IN SCHIZOPHRENIA

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Background: Persons with schizophrenia are more likely to smoke cigarettes and experience more difficulty in quitting than the general population; thus better treatments for this population are needed. Previous studies have shown that repetitive transcranial magnetic stimulation (rTMS) to the dorsal lateral prefrontal cortex (DLPFC) reduced cigarette craving and consumption in non-psychiatric smokers. rTMS may also improve cognitive performance providing further rational for its use in persons with schizophrenia who are believed to smoke in part for the pro-cognitive effects of nicotine. The aim of this study was to determine the safety and efficacy of rTMS, in combination with transdermal nicotine patch (TNP), for the treatment of nicotine dependence in schizophrenia.

Methods: Participants with a diagnosis of schizophrenia or schizoaffective disorder were enrolled in a 10-week randomized, double blind, sham-controlled trial in which they received active (n=6) or sham (n=7) rTMS (20 Hz to the DLPFC) in weeks 1-4 (5 sessions/week). All participants received weekly behavioural counselling and TNP in weeks 3-9.

Results: Data were analysed using an intention-to-treat approach. Active rTMS did not increase abstinence rates at trial end point. Mixed model analyses did not identify effects of treatment on weekly outcome measures but there was a significant effect on craving assessed immediately pre- and post-TMS treatment: in the sham group scores on the Tiffany Questionnaire of Smoking Urges increased following TMS during week 1, presumably due to the acute abstinence imposed by the 30-minute treatment session; active TMS attenuated this increase ($p=.03$). rTMS was well tolerated and did not influence Positive and Negative Symptoms of schizophrenia ($p=.95$).

Conclusions: This preliminary study found rTMS was safe to use in smokers with schizophrenia, although no effects on smoking abstinence rates were identified. rTMS may still provide a useful adjunct to standard tobacco treatments in this hard to treat population due to its potential to reduce cigarette craving and improve cognitive function.

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POS2-7

A COMPARISON OF ADHERENCE MEASURES FOR SMOKING CESSATION PHARMACOTHERAPY AMONG AFRICAN AMERICAN SMOKERS

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Smoking cessation pharmacotherapy noncompliance is a concern since it limits the effectiveness of these treatments. Little attention has been devoted to measuring adherence in smoking cessation RCTs. Steady-state blood levels are the gold standard, but are invasive and costly. Other methods, including pill counts and participant self-report are more practical, but little is known about their relationship to steady-state blood levels. This study investigated the relationship between varenicline steady-state blood levels; pill counts (obtained for 3 days prior to the blood collection); and self-reported adherence (measured via 3-day recall and a visual analog scale (VAS) asking participants to indicate their adherence by placing an X on a line between 0% and 100%) collected at Day 12 among participants enrolled in a pilot study of varenicline for African American smokers. Day 12 was selected as the time point for these analyses because steady-state had been reached and to optimize the number of participants still on protocol. Participants were predominantly female (62.5%), average age was 46.9(SD=11.5) years, and participants averaged 18.1(SD=6.7) cigarettes per day. Participants included in our analyses provided information for 3-day recall (Mean (M)=92.1% adherence), VAS (M=92.6% adherence), pill count (M=86.6% adherence), and steady state levels (M=6.4ng/ml) for the Day 12 time period (n=56). Controlling for weight and gender, significant correlations ($p<0.05$) were found between steady-state blood levels and adherence reported on the VAS ($r = 0.28$), 3-day recall ($r = 0.48$), and pill count ($r = 0.52$). Correlations between pill count and VAS was 0.47, and between pill count and 3-day recall was 0.73. These results demonstrate the complexity of measuring adherence. Although the concordance between pill count and varenicline steady-state levels was higher than for self-report, biological factors other than easily assessed variables such as weight and gender may influence varenicline plasma levels. The strong association between 3-day recall and both objective measures supports the use of self-report as a reasonable but imprecise approximation of adherence.

The pilot study 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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POS2-8

VARENICLINE VERSUS BUPROPION XL FOR ADOLESCENT SMOKING CESSATION: A RANDOMIZED, DOUBLE-BLIND PILOT STUDY

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Objective: Despite tremendous potential public health impact, little work has focused on developing evidence-based smoking cessation treatments for adolescents, including pharmacotherapies. No prior studies have explored the feasibility and safety of varenicline and bupropion XL, two potentially promising pharmacotherapies, as smoking cessation treatments in adolescents.

Methods: Treatment-seeking older adolescent smokers (ages 15-20) were

randomized (double-blind) to varenicline (n = 15) or bupropion XL (n = 14), with 1-week titration and active treatment for 7 weeks. Structured safety, tolerability, and efficacy assessments (intent-to-treat cotinine-confirmed 7-day point prevalence abstinence) were conducted weekly.

Results: There were no serious adverse events. No participants discontinued varenicline due to adverse events. Two discontinued bupropion XL, one due to increased anxiety and another due to "feeling too focused." Participants receiving varenicline reduced from 14.1 ± 1.6 (mean ± SE) to 0.9 ± 0.6 cigarettes per day (CPD) (27% achieved abstinence), while those receiving bupropion XL reduced from 15.8 ± 1.2 to 3.1 ± 1.4 CPD (14% achieved abstinence).

Conclusions: These preliminary results support the feasibility and safety of conducting adequately powered, placebo-controlled efficacy studies of varenicline and bupropion XL for adolescent smoking cessation.

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POS2-9

VARENICLINE FOR SMOKING CESSATION: NAUSEA SEVERITY AND VARIATION IN NICOTINIC RECEPTOR GENES

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Nausea occurs in as many as 40% of individuals following the use of varenicline (an alpha4 beta2 nicotinic acetylcholine receptor (nAChR) partial agonist) for smoking cessation and is a common reason for patient discontinuance of the medication. This study determined the association between 45 common and 127 rare sequence variants in 10 nAChR subunit genes and the severity of nausea at 21 days after initiating the standard, FDA-approved varenicline regimen. Included in the analysis were 430 participants from a randomized clinical effectiveness trial who subsequently volunteered to provide a biospecimen for DNA genotyping (mean age = 49.4 years; 67.4% female). Evidence for significant association between common single nucleotide polymorphisms (SNPs) in CHRNB2 and nausea severity was obtained after adjusting for age, gender, and correlated tests (all P(ACT)<.05). Individuals with the minor allele of SNPs in this gene experienced less nausea than did those with the more common allele. These results, both the involved SNPs and the direction of the allelic associations, are consistent with previously reported findings for CHRNB2 and the occurrence of nausea and dizziness as a consequence of first smoking attempt in adolescents and with the known neurophysiology of nausea. A substantial proportion of smokers seeking to quit could be at risk for increased nausea following use of varenicline by virtue of their nAChR genotype. Given that nausea is the most common reason for discontinuance of this otherwise effective medication, further pharmacogenetic investigations into this phenotype are warranted.

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POS2-10

TOBACCO DEPENDENCE TREATMENT FOR HOSPITALIZED SMOKERS: A PILOT RANDOMIZED, CONTROLLED TRIAL USING VARENICLINE

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Despite clear reasons to quit, patients with medical illness continue to smoke at high rates. The hospital can be an important opportunity for tobacco dependence interventions, but randomized, controlled-trials (RCTs) in this setting are limited, with none to date utilizing varenicline. This pilot study evaluates a treatment intervention, including varenicline and face-to-face outpatient treatment, on abstinence rates, withdrawal, motivation, utilization of treatment, and medical outcomes, among hospitalized smokers. Seventy-nine smokers admitted to a university-based hospital with various diagnoses were enrolled in a randomized, double-blinded, placebo-controlled trial from August 2007 to March 2009. The primary outcome was exhaled, carbon monoxide confirmed, 7-day point abstinence at 24 weeks following discharge. Overall abstinence at 24 weeks was 27%. There was no difference in abstinence rates between varenicline and placebo treatment groups (23% vs. 31%). Adjusted odds ratio for varenicline compared with placebo was 0.34 (95% CI 0.1-1.23). Among subjects who adhered to the medication protocol, there was a non-statistically higher abstinence rate at 24 weeks in the varenicline group compared with placebo (80% vs. 56%; p=0.2). Over 40% of all subjects utilized outpatient treatment and those subjects had significantly higher abstinence rates compared with those who did not (53% vs. 8.5%, p<0.01). Overall adverse events were similar in both treatment groups (65% varenicline vs. 51% placebo; p>0.2) with the only significant difference being higher rates of nausea in the varenicline group (25% vs. 5%; p<0.01). During the follow-up period, 23 subjects were re-hospitalized or treated in the emergency room with no significant differences between treatment groups. This first pilot RCT of varenicline used in the hospital produced some hypothesis-generating findings. Lessons learned regarding implementation of a varenicline-based hospital protocol are discussed. Based on the small sample, conclusions regarding effectiveness of varenicline in this setting are limited but no significant adverse events were noted.

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POS2-11

TIME COSTS ASSOCIATED WITH TELEMEDICINE COUNSELING FOR SMOKING CESSATION

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Significance innovative efforts are needed to provide effective smoking cessation counseling to smokers in rural areas. Telephone- and telemedicine-based approaches have the potential to improve rural access to specialized treatment. A distinction between these interventions is participant's time. Although it is an important economic cost, patients' time is infrequently considered in cost-effectiveness models. We calculated the time costs associated with attending a telemedicine-based intervention for rural Kansas smokers. Methods Connect2Quit tests telemedicine video counseling for smoking cessation in the patient's medical home (ITM) versus in-home telephone counseling (QL) in rural Kansas. Based on hourly wage, time to clinic, miles to clinic, cost per mile ($0.50), and session length, we computed the cost to participate in ITM sessions. Results For people with a valid address in ITM, n=121, the mean distance from home to clinic was 13.6 ± 38.9 miles. The two-way travel cost averaged $13.62 ±38.9. The mean two-way drive time in minutes was 37.3 ± 79.5. Applying the hourly wage plus 25% for fringe benefits, the two-way time cost was $26.20 ± $72.81 (range, $0.35- $741.78). The first session is 45 minutes, sessions 2-4 are 20 minutes each. Participant's time costs to attend all four ITM sessions was to $32.56. Combining driving and time costs, participants bore a mean economic cost of $58.76 for ITM. Conclusion The economic cost to participate in the ITM smoking cessation program was $58.76. While costs were born principally through time, these costs might affect some smoker's willingness to participate in the in-office video-based counseling. Other than quit lines, specialized tobacco treatment is not available in rural Kansas. If session adherence and duration is the same across conditions, study costs will total $32.56 for QL participants. Further work is needed to determine if these economic costs are associated with differential participation in ITM vs. QL counseling.

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POS2-12

ECONOMIC ANALYSIS OF A CLINICAL SMOKING CESSATION INTERVENTION IN A TERTIARY CARE CARDIAC CENTRE

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Introduction: From the perspective of the hospital, the objective of this study was to estimate the cost savings realized by a systematic smoking cessation intervention provided to patients admitted to the University of Ottawa Heart Institute (UOHI), a tertiary care cardiac hospital. The clinical intervention being examined was the Ottawa Model for Smoking Cessation (OMSC), that involves systematically identifying, treating (with

bedside counseling and pharmacotherapy), and offering follow-up support to smokers for up to 6 months.

Methods: A costing model was developed in order to estimate both the costs of operating the program and the savings resulting from reduced hospitalizations. Resource-use data was derived from actual OMSC operating costs and the costs of hospitalization for specific case mix groups were derived from the Ontario Case Costing Initiative. To derive estimates of the potential benefits of the OMSC intervention on re-hospitalization, data from a previous study by Mohiuddin (2007) was used.

Results: In 2008-2009, UOHI treated 1491 smokers with CHD using the OMSC protocol. The projected continuous abstinence rate at 24 months was 30.0% in the intervention group and 23.5% in the usual care group. The intervention was estimated to prevent 35 hospitalizations due to myocardial infarction, 27 hospitalizations due to unstable angina, 4 hospitalizations due to arrhythmias, and 9 hospitalizations due to heart failure. The total operating cost of the OMSC program was $229,904. The total cost savings due to reduced re-hospitalizations were $471,679. Return on investment was 205% (calculated by dividing program costs into program savings) and, overall, 477 hospital days were prevented over the study period.

Conclusion: Provision of the OMSC to patients admitted to hospital with CHD may lead to cost savings due to a reduction in cardiovascular re-hospitalization.

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POS2-13

THE EFFECT OF SMOKING STATUS AT DIAGNOSIS ON SURVIVAL IN CANCER PATIENTS

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Background: Smoking is the largest preventable risk factor associated with the development of cancer; however, there is limited data demonstrating the effects of smoking status at the time of cancer diagnosis and long-term survival in cancer patients.

Methods: A standardized assessment of smoking status was collected on over 12,000 patients at Roswell Park Cancer Institute from 1982-98. Survival data on 5434 patients completing the assessment within 30 days of cancer diagnosis were analyzed to assess the impact of smoking status at diagnosis on disease specific survival (DSS) and overall survival (OS). Patients were categorized as Current (C), Recent Quit (RQ, quitting within 12 months of assessment), Former (F, more than 12 months since quitting), and Never (N) smokers. Comparisons were made using logistic regression and Cox proportional hazards analysis.

Results: Disease sites included head and neck, lung, bladder, colon and rectum, prostate, breast, leukemia, melanoma, esophagus, stomach, ovary, uterus, and cervix. The median age was 58.9, 45% were male, and 97% were Caucasian. Disease stage at presentation included 38% local, 29% regional, and 31% distant. Smoking status in men was reported as 17% C, 11% RQ, 46% F, and 26% N. Smoking status in women was reported as 18% C, 9% RQ, 26% F, and 47% N. When adjusted for disease site, age, gender, and race C smokers had decreased DSS as compared with RQ, F, and N smokers ($p<0.05$) and decreased OS as compared with RQ, F, and N smokers ($p<0.05$). When adjusted for additional factors including diagnosis date, stage, and pack years, C smokers had decreased DSS as compared with F smokers ($p<0.05$) and decreased OS as compared with F and N smokers ($p<0.05$). Further analyses demonstrate gender and disease site-specific differences in the effects of smoking status at diagnosis on survival.

Conclusions: Smoking status at the time of cancer diagnosis significantly impacts both DFS and OS in an overall population of cancer patients with disease sites representing both traditionally tobacco related and non-tobacco related cancers. Data justify incorporation of accurate tobacco use assessments for all cancer patients.

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POS2-14

PHARMACOLOGIC UNDERTREATMENT OF SMOKING COMPARED TO OTHER CHRONIC DISEASES

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Background: Tobacco dependence is now recognized as a chronic relapsing disorder that resembles other chronic medical diseases such as hypertension, hyperlipidemia, diabetes, and asthma. Effective medications exist to treat all these conditions, and appropriate treatment often requires repeated courses or long-term use of pharmacotherapy. However, pharmacologic treatment of tobacco dependence appears to be underutilized by smokers and underprescribed by clinicians.

Objective: To compare the odds that a smoker will receive a prescription medication for tobacco dependence to the odds that individuals with other chronic conditions will receive medications for those conditions.

Methods: We used 2005-2007 data from the National Ambulatory Medical Care Survey, a random survey of US office visits to physicians, to compare the treatment of chronic health conditions of individuals with tobacco dependence, hyperlipidemia, asthma, hypertension, type 2 diabetes, and depression.

Results: Records were reviewed of 38,004 patients with at least one of the above conditions, representing 1,220,006,374 visits. From 2005-2007, 4.4% of all self-reported smokers received a prescription to treat tobacco dependence, compared to 57.4% of patients with hypertension, 46.2% with diabetes, 47.1% with hyperlipidemia, 42.6% with asthma/respiratory disease, and 53.3% with depression, respectively (all $P < 0.0001$). In a multivariate logistic model adjusting for 8 demographic and clinical variables, the odds ratios for treatment of hypertension, diabetes, hyperlipidemia, asthma/respiratory disease, or depression compared to smoking were, respectively, 32.8, 20.9, 16.5, 22.1, and 24.3 (all $P < 0.0001$).

Conclusion: Despite 7 FDA-approved medications, tobacco dependence is widely undertreated compared to other common chronic conditions. Greater acceptance by clinicians and patients of smoking as a chronic relapsing disorder may promote enhanced use of these treatments.

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POS2-15

A COMPARISON OF CIGARETTE SMOKING PROFILES IN OPIOID-DEPENDENT PREGNANT PATIENTS RECEIVING METHADONE OR BUPRENORPHINE

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Background: Opioid agonist administration is associated with increased cigarette smoking in non-pregnant patients. In pregnant patients, the relationship between cigarette smoking and opioid-agonist treatment is unknown. Aims: To compare cigarette smoking profiles during second and third trimesters in opioid-dependent pregnant patients receiving methadone or buprenorphine.

Methods: Participants were opioid-maintained pregnant patients (N=131) who completed a multi-site double-blind, double-dummy, randomized controlled trial comparing maternal/neonatal safety and efficacy of methadone (n=73) and buprenorphine (n=58) during pregnancy. All participants were enrolled between May 4, 2005 and October 31, 2008, and signed local IRB-approved informed consent for study participation. The change in the number of cigarettes per day (CPD) smoked, per self-report, over the course of the study between methadone and buprenorphine treatment groups was compared using a two-sample t test.

Results: Smoking data were available for 124 participants (95% of total sample). The mean (SD) CPD at study entry was 12.4 (7.0) and 10.9 (8.0) for the methadone (n= 67) and buprenorphine (n=57) groups, respectively (p=0.28). Over the course of the study, the mean (SD) number of CPD was 12.4 (6.7) and 10.5 (6.3) for the two treatment groups (p=0.11). Two participants in each group reported no smoking at study entry and over the course of the study. Smoking data at delivery were available for 114 participants (87% of total sample). The mean (SD) change in CPD for each week in the study was -.08 (.50) and -.06 (.58) for the methadone (n=61) and buprenorphine (n=53) groups, respectively (p= 0.14).

Conclusions: Results support high rates of smoking, with little decrease during pregnancy, among opioid-dependent patients, regardless of the type of agonist-medication received. Continued analyses will be conducted, including the use of a longitudinal random effects model, to assess for any subtle differences in smoking between treatment groups. Further research comparing methadone and buprenorphine with regard to their interactions with cigarette smoking during pregnancy is needed.

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POS2-16

PHYSICIAN UTILIZATION OF SMOKING CESSATION TREATMENTS VIA AN ELECTRONIC MEDICAL RECORD SYSTEM IN A PRIMARY CARE SETTING

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Even brief interventions by physicians increase patients' cessation, but physician treatment remains sub-optimal. Electronic medical records (EMRs) have the potential to increase physician adherence to health guidelines and could improve tobacco dependence treatment. A cross-sectional EMR chart review was conducted at a University internal medicine practice from January 2001 to June 2009. Data were collected regarding gender, age, tobacco consumption, comorbidities, office counseling, referral to tobacco programs, and prescription of pharmacotherapies. 277 patient charts were evaluated, with slightly more women (53%) and ages ranging from 20 to 93 (mean 52). Patients smoked a mean of 15 cigarettes per day for 27 years. In terms of treatment delivered, 89% of smokers received counseling in the office, 41% were referred to cessation services, 11% received nicotine replacement therapies (NRT), and 12% received non-nicotine cessation medications. Women had a higher trend to be referred to cessation programs than men (46% vs. 35%; p=0.06). Smokers age 51-64 were referred more (56%) while those 35 or younger (28%) and 65 and older (32%) were referred less (p<0.01). Smokers of 20 or more cigarettes per day were more likely than those who smoked less than 10 cigarettes per day to be referred to cessation programs (51% vs. 28%; p<0.01) and had higher trends to receive NRT (16% vs. 7%; p=0.07) and non-nicotine medications (17% vs. 5%; p=0.07). Smokers with anxiety disorders were more likely to receive NRT than those without anxiety (20% vs. 9%; p=0.04) and were more likely to be referred to a cessation program (55% vs. 38%; p=0.05). Smokers with hypertension were prescribed NRT non-statistically less often (6.5%) than smokers without hypertension (13%) (p=0.095). While physicians in this setting had fairly high rates of counseling and referral, treatment was lower, especially among younger and older smokers, smokers of fewer cigarettes per day, and those without co-occurring psychiatric conditions. Primary care providers should continue to be encouraged to utilize proven tobacco treatment resources in all groups of smokers.

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POS2-17

THE ASSOCIATION BETWEEN POSTTRAUMATIC STRESS SYMPTOMS AND SMOKING STATUS IN A DOUBLE-BLIND PLACEBO-CONTROLLED TRIAL OF BUPROPION AMONG SMOKERS IN EARLY ALCOHOL RECOVERY

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Significant associations between posttraumatic stress disorder (PTSD) symptoms and poor smoking cessation outcomes have been well-documented (Lasser et al., 2000) and the clinical significance of evaluating smoking cessation interventions for these smokers has been underscored (Zvolensky et al., 2008). The present investigation prospectively evaluated the role of PTSD symptoms in smoking cessation outcomes in a double-blind placebo-controlled trial of bupropion. We hypothesized that PTSD symptom severity and diagnostic status would predict positive smoking status and higher smoking rates at each follow-up interval. The sample consisted of 145 smokers (117 men; mean age = 50.9, SD = 7.80) in alcohol recovery (2-12 months of alcohol abstinence at time of enrollment) who were smoking an average of 21 cigarettes per day (SD = 11) at baseline. Participants were recruited from a VA facility and the community. Participants were randomly assigned to receive bupropion or placebo for 8 weeks starting 7 days prior to quit day. All participants received 7 counseling sessions starting 1 week before their quit day and the nicotine patch for 7 weeks starting on their quit day. PTSD symptoms were assessed at baseline using the PTSD Checklist (PCL; Weathers et al., 1993); mean baseline score was 40 (SD=12). PTSD symptom severity was associated with positive smoking status at 12- and 24-weeks post-cessation (r's = .19, .23, respectively; p's < .05), and smoking rate at 7-, 12-, and 24-weeks post-cessation (r's = .26, .33, .38, respectively; p's < .05). PTSD diagnostic status (PCL cut-off of 48; Prins et al., 2010) predicted smoking rate at 24-weeks post-cessation (r = .43, p < .05), despite a significant association between PTSD diagnostic status and motivation to quit smoking at baseline (r = .25, p = .01). Logistic regression analyses indicated that PTSD symptom severity significantly predicted positive smoking status at 1-week post-cessation in the placebo condition (Wald statistic = 5.50; p = .01), but not the bupropion condition (p > .05). Clinical implications and future research directions will be discussed.

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POS2-18

EFFICACY OF AN EMERGENCY DEPARTMENT-BASED CESSATION INTERVENTION FOR SMOKERS WITH ALCOHOL OR SUBSTANCE USE DISORDERS

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Objectives: To determine the efficacy of an emergency department-based smoking cessation intervention for subjects with alcohol or substance use disorders.

Methods: Secondary analysis of data from a randomized trial run from 1/06-9/07 at an urban ED that treats 90,000 adults/year. Adults aged 21 and older, who smoke at least 10 cigarettes/day and discharged from the ED were randomized either to Usual Care (UC), receiving a brochure describing the health risks of smoking and containing contact information for local cessation programs and the state Smokers' Quitline, or Enhanced Care (EC), receiving the brochure, a brief negotiated interview, 6 weeks of nicotine patches, and a phone call at 3 days. Interventions were performed by a peer educator trained in tobacco treatment. Telephone follow-up was performed at 3 months by an assistant blinded to group assignment. Substance use was identified by self-report with brief validated instruments.

Results: 340 subjects were enrolled, mean age 40.2 years, 51.8% female, 56.5% self-pay/Medicaid. Baseline demographic, clinical, and tobacco use variables were comparable between groups. The EC (N = 171) and UC (N = 169) arms showed similar cessation rates at 3 months (14.1% v. 12.5%, respectively). Of all subjects, 88 (25.9%) screened positive for alcohol or drug misuse. Subjects who screened positive for use of alcohol or illicit substances who received EC were more likely to be tobacco-abstinent at three months than those who received UC (14.6% v. 0%, P = 0.015). Similarly, subjects endorsing alcohol or substance use randomized to EC were more likely to self-identify as nonsmokers at three months than those randomized to UC (12.5% v. 0%, P = 0.03). Group assignment did not affect outcome in subjects without alcohol/substance use disorders (7-day smoking point prevalence for EC and UC 15.7% and 17.7%, respectively, P = 0.73).

Conclusions: Smokers with an alcohol or substance use disorder receiving an intervention were more likely to quit smoking at 3 months than those receiving usual care. This finding requires further study, and suggests that smokers with substance use disorders are amenable to tobacco treatment in the ED.

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POS2-19

SELF-REPORTED AND BIOCHEMICALLY CONFIRMED ASSESSMENTS OF TOBACCO USE IN HEAD AND NECK CANCER PATIENTS DURING DEFINITIVE RADIOTHERAPY OR CHEMORADIOTHERAPY

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Background: Tobacco use is the largest preventable risk for the development of cancer, but little is known about the accuracy of self-reported (SRTU) vs. biochemically confirmed (BCTU) tobacco use during cancer treatment.

Methods: Patients with measurable squamous cell carcinoma of the head and neck (HNSCC) treated with definitive radiotherapy or chemoradiotherapy were eligible for voluntary unpaid enrollment. Entry and weekly SR tobacco use was measured in combination with BC tobacco use using serum cotinine assessments. The study was approved by the Institutional Review Board of the University of Kentucky.

Results: Interim analysis of the first 50 patients demonstrates 80% are male, median age is 56 (range 39-75), 92% are Caucasian, 92% are stage III-IVB, 28% have laryngeal cancer, 64% have oropharyngeal cancer, and 84% were treated with CRT. Median smoking history was 30 pack years (range 3-138). Any history of tobacco use was positive in 84%. Prior cessation was reported in 48% of overall patients (median duration 3-5 years). At diagnosis, 40% of patients were SRTU positive (2% smokeless); however, 48% were BCTU positive at least once during treatment. SRTU changed in 30% of all patients between diagnosis/initial consult and week 1 of treatment; 20% of baseline negative SRTU converted to positive SRTU and 55% of baseline positive SRTU converted to negative SRTU at week 1 of treatment. During the final week of treatment (in patients completing at least 4 weeks of treatment), 17% of patients had positive

SRTU, but 25% had positive BCTU. Two (4%) patients did not complete treatment due to toxicity and both continued had positive SRTU and BCTU at the last assessment. Data demonstrate considerable variability in cotinine levels within individual patients over the course of treatment.

Conclusions: Data demonstrate significant discrepancies between SRTU at diagnosis as compared with SRTU during treatment and between SRTU and BCTU in HNSCC patients. Confirmation of tobacco use in cancer patients is feasible and adds significant accuracy to the assessment of tobacco use during cancer treatment.

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POS2-20

ASSIGNING DOSE OF NICOTINE GUM BY TIME TO FIRST CIGARETTE, RATHER THAN CIGARETTE CONSUMPTION

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Nicotine gum is a proven effective aid to cessation that comes in two doses – 2 mg and 4 mg. In the US and other countries, smokers are allocated to the higher 4 mg dose based on their daily cigarette consumption; e.g., in the US, those who smoke ≥25 cpd use the 4 mg dose. However, time to first cigarette (TTFC) may be a better measure of dependence (especially as cigarette consumption drops with smoking restrictions), making it of interest to assess the efficacy of the gum when smokers are assigned to 4 mg gum based on TTFC≤30 minutes. Confirming efficacy is particularly important because the TTFC algorithm allocates more light smokers to the 4 mg dose, and in a randomized, double-blind, placebo-controlled trial that allocated smokers randomly to placebo, 2 mg or 4 mg gum (Garvey et al, 2000), the quit rates for less-dependent smokers were actually slightly (non-significantly) lower when they were treated with 4 mg gum. Therefore, in a re-analysis of this trial, we evaluated the efficacy of the gum in smokers who received the dose dictated by the TTFC algorithm (n=192 vs. matched placebo, n=203). Continuous abstinence at 30 days was the primary outcome. Smokers dosed with nicotine gum according to the TTFC algorithm achieved significant efficacy, with active treatment resulting in 2.2 times the abstinence rates observed under placebo. (Similar results were seen at 14, 60, 90, and 180 days.) We also examined the abstinence rates among the subset of smokers (n=181) who would be shifted from the 2 mg to the 4 mg gum under the TTFC algorithm [< 25 cpd but TTFC≤30 minutes]. Among those using the 4 mg gum assigned by TTFC algorithm (n=81), active gum was significantly superior to placebo (RR=2.3, p<0.002). Among those who used the 2 mg gum based on the cpd algorithm (n=100), results were only marginally better than placebo (RR=1.6, p<.09). Smokers 'promoted' to the 4 mg by the TTFC algorithm achieved higher abstinent rates than those using 2 mg gum based on the cpd algorithm. This preliminary analysis suggests that assigning dose of nicotine gum based on TTFC is an effective and appropriate means of dose allocation.

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POS2-21

CIGARETTE SMOKING AND MOTIVATION TO QUIT AMONG ADOLESCENTS ENROLLING IN A CANNABIS CESSATION TREATMENT STUDY

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Objective: Cigarette smoking and cannabis use commonly co-occur in adolescents. Enrollment in cannabis cessation treatment might be an opportunity to intervene with cigarette smoking. However, little is known about enrollees' co-occurring smoking behavior and motivation to quit cigarettes.

Methods: In an ongoing adolescent (ages 14-21) cannabis cessation study, participants that smoked cigarettes provided baseline self-report information on smoking behavior (30-day Timeline Follow-Back), dependence (Modified Fagerström Tolerance Questionnaire [mFTQ, range 0-9]), and motivation to quit (intention to quit in next 30 days or next 6 months, range 1-10).

Results: Of 70 participants evaluated, 38 (54%) smoked cigarettes. Cigarette smokers used cannabis more heavily than non-cigarette smokers (mean±SE 11.5±1.6 puffs per day versus 6.5±1.1, p<.05). Cigarette smokers, on average, smoked 6.7±1.0 cigarettes and were modestly dependent (mFTQ 4.2±0.2). Intention to quit in the next 30 days was modest (5.6±0.6) and higher in the next 6 months (7.7±0.5).

Conclusions: A substantial percentage of adolescents enrolling in a cannabis cessation study smoke cigarettes and are, on average, modestly nicotine-dependent. Given their modest intention to quit, many might be amenable to smoking cessation interventions. As cigarette smoking may be associated with heavier cannabis use, smoking cessation strategies targeting enrollees in cannabis cessation treatment may potentially impact smoking and cannabis outcomes.

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POS2-22

PROVIDING FREE NICOTINE REPLACEMENT THERAPY AND COUNSELING TO DISADVANTAGED POPULATIONS: EFFECTIVENESS AND PREDICTORS OF CESSATION

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Background: Tobacco dependence disproportionately burdens smokers with socio-economic, psychiatric and healthcare accessibility challenges. Improving cessation rates in these smokers may require tailored interventions. The objectives of this study were to determine the long-term effectiveness of providing free nicotine replacement therapy (NRT) plus counseling to these populations and to identify the factors, which predict cessation.

Methods: 11 Community Health Centres serving disadvantaged populations enrolled eligible patients in this open-label study. Up to 10 weeks of free NRT (tailored in type and dose) was provided at 3 in-person counseling visits (2 weeks, 4 weeks and 4 weeks of NRT, respectively) and was contingent on attending the visits. Follow-ups were conducted at end of treatment, and 6 and 12 months post-treatment.

Results: 487 smokers (53% female, mean age 46.2 years) enrolled. 61% of subjects were currently unemployed, 38% did not have a high school diploma, and 50% had an annual household income less than $20,000. A history of mental illness or substance abuse was reported by 50% and 34% of subjects, respectively. Only 51% of participants completed the treatment. Quit rates were 49%, 17% and 24% at end of treatment, 6 months and 12 months post-treatment, respectively. Few baseline factors predicted cessation at 6 and 12 months. The strongest predictor of cessation at both post-treatment times was treatment completion (6-month OR=3.1, 95%CI: 1.4-6.9; 12-month OR=4.1, 95%CI: 1.6-10.6). Factors that predicted treatment completion were: post-secondary education (OR=1.7, 95%CI: 1.1-2.5), unemployment (OR=1.7, 95%CI: 1.1-2.6), and absence of substance abuse history (OR=1.7, 95%CI: 1.1-2.6). Neither low income nor mental illness diagnoses were significantly associated with either successful quitting or treatment completion.

Conclusions: Offering 10 weeks of free tailored NRT plus individual counseling to disadvantaged smokers can improve their chances of long-term abstinence, however success appears to be highly dependent on the completion of treatment. This suggests that emphasis needs to be placed on retaining disadvantaged populations in treatment.

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POS2-23

SMOKING CESSATION TREATMENT USING VARENICLINE IN A PATIENT POPULATION WITH MOSTLY HEART AND LUNG DISEASES - A FOLLOW-UP STUDY OF REPORTED POSSIBLE SIDE EFFECT SYMPTOMS AND SUCCESS RATES AT 3-, 6-, AND, 12 MONTHS

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Soon after introduction of varenicline (Champix; Pfizer AB, Sweden) in Sweden, various symptoms were reported as side effects in media including psychiatric

symptoms. However, as smoking cessation itself give rise to similar symptoms, because of abstinence, it is difficult to rule out the cause. In the present study, we studied symptoms appearing after smoking cessation treatment using varenicline. All consecutive patients, receiving this drug between 2007 - 2009 were included. All had earlier, in accordance to the treatment program, used NRT replacement drugs with no success. All got motivational interviewing (MI) therapy together with varenicline, which is the second choice therapy at our department. The main aim was to register in a systematic way all symptoms appearing after the start of the smoking cessation. Also, the success rate was registered. Therefore, a structured interview/ questionnaire containing several questions about side effects was performed during treatment and after 12 months. Subjects: 204 patients, mostly with heart and lung diseases, who had got 213 treatments were identified during this period; mean age 52.7 (range 22-80) years; 54.9% were women. Information on all patients at least in part could be received; 168 (78,9%) were eligible 12 months after quitting date. Results: at 12 months follow-up 38.1 % were not smoking. Additional 33 patients had stopped smoking for at least 6 months, thus, altogether, making a 6 months success rate of 45.5%. The 3 months success rate was 57.8%. 116 (54.5%) reported symptoms/ possible side effects of smoking cessation/ varenicline. These were in most cases mild; most frequent symptom was nausea (32.9%). The psychiatric symptom depression (Swedish "nedstämdhet") was reported by 20 subjects (9.4%). No suicidal attempt or thoughts were reported by anyone. Conclusion: Good success rates were found in our treatment program using varenicline for smoking cessation in patients with mostly heart and lung diseases. There were several reported symptoms/ possible side effects, however psychiatric symptoms were reported not more than expected during quitting smoking; no serious side effects were observed.

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POS2-24

INFLUENCE OF ENVIRONMENTAL AND INTERNAL CUES ON RELAPSE TO SMOKING 6 MONTHS POST-TREATMENT IN A LARGE SCALE, OPEN-LABEL SMOKING CESSATION STUDY

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Background: In laboratory settings, drug-associated cues have a demonstrable capacity to promote continued drug-taking behaviour. Several studies have shown that environmental cues associated with smoking can increase the urge to smoke. The objective of this study was to assess the role of smoking-associated cues in promoting relapse in treatment-seeking smokers.

Methods: This secondary analysis was conducted using data collected in the Community Pharmacy arm of the STOP Study, an open-label trial evaluating real-world effectiveness of nicotine replacement therapy (NRT) in combination with behavioral intervention through a pharmacist, free of charge to treatment-seeking smokers. Individuals were eligible to participate if they were residents of Ontario, wanted to quit smoking in the next 30 days, smoked 10 or more cigarettes per day and did not have a contraindication for NRT. Eligible participants enrolled online and were randomized to receive either 1 or 3 semi-structured brief counseling sessions from a participating community pharmacist, in addition to 5 weeks of NRT. 7273 participants enrolled in the study, 3268 and 3404 completed the end-of-treatment and 6-month follow-up, respectively, and 2033 completed both follow-ups.

Results: Participants were 42.7 (SD: 12.7) years old; 54.7% female. The 7-day point prevalence of abstinence (95% CI) was 41.1% (39.4-42.8) and 23.6% (22.2-25.1) of respondents at end-of-treatment and 6-months, respectively. The rate of relapse at 6-months was 47.4% (95% CI: 44.1-50.7). The cause for relapse most frequently identified was stress (74.7%), followed by seeing someone smoke (31.2%), drinking alcohol (18.7%) and living with a smoker (14.5%). The frequency of these reports did not vary between the less and more counseling-intensive arms of the study ($p > 0.06$).

Conclusion: Smoking-associated environmental cues are among the factors that smokers perceive as impediments to maintaining their early success at quitting smoking, but internal cues such as stress are more likely to result in relapse. Counseling around relapse prevention should focus more on stress management strategies than on environmental cues.

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POS2-25

PREDICTORS OF ADHERENCE TO BEHAVIORAL COUNSELING AND PHARMACOTHERAPY AMONG FEMALE PRISONERS ENROLLED IN A SMOKING CESSATION TRIAL

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Despite decreases in smoking prevalence in the US, prevalence of smoking among prisoners is 70-80%, which is 3 to 4 times higher than in the general population. Adherence to counseling and to nicotine replacement therapy (NRT) has been related to successful cessation; engaging in both is more effective than either alone. Thus, we examined (1) predictors of adherence to counseling, to the nicotine patch, and to both and (2) the relationship between patch adherence and counseling adherence in the context of a cessation trial targeting female prison inmates. The parent intervention study involved 10 weekly group-counseling sessions based on mood management training and NicoDerm CQ nicotine replacement patches. Participants were asked to make a quit attempt between weeks 3 and 4. Previous reports from this study demonstrated that the number of sessions attended and compliance with nicotine replacement was significantly related to smoking cessation outcomes. Measures included baseline sociodemographic, smoking-related, and mental health variables in relation to ≥ 80% adherence to behavioral counseling, to nicotine patch, and to both. Of 242 participants, 16.34% were adherent to neither the patch nor counseling, 21.78% were adherent to the patch but not counseling, 16.83% were adherent to counseling but not the patch, and 45.05% were adherent to both the patch and counseling. Adherence to either was related to adherence to both ($p<.001$). Multivariate analyses indicated that older age of smoking initiation ($p=.01$), higher baseline cigarettes per day ($p=.03$), and having received substance abuse treatment ($p=.04$) were significant predictors of adherence to counseling. Predictors of adherence to the patch included greater highest smoking level in the past ($p=.07$) and greater number of prior quit attempts ($p=.09$). Predictors of adherence to both included greater number of prior quit attempts ($p=.04$) and longer time since the most recent quit attempt ($p=.17$). Understanding the factors related to adherence is important for designing strategies to increase adherence to both attendance and NRT. Thus, future research should determine appropriate ways to increase adherence.

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POS2-26

USE OF, AND INTEREST IN, SMOKING CESSATION STRATEGIES AMONG DAILY AND NONDAILY COLLEGE STUDENT SMOKERS

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While daily smoking in the U.S. is declining, nondaily smoking (smoking some days but not every day) is increasing; yet, little is known regarding how to address cessation among nondaily smokers. We examined the use of and interest in cessation strategies among daily and nondaily college student smokers. An online survey was administered to 820 undergraduates aged 18-25 reporting smoking in the past 30 days at a two-year college and a four-year university. We examined sociodemographics, smoking-related factors (confidence/motivation to quit, readiness to quit, perceived harm of smoking, motives for smoking), depressive symptoms, and daily vs. nondaily smoking status as factors associated with use of and interest in cessation strategies–traditional behavioral interventions, technology-based behavioral interventions, and pharmacotherapy. Overall, 59.3% were nondaily smokers, with the average number of days of smoking in the past 30 days being 9.49 (SD=9.24). More daily (24.9%) than nondaily smokers (17.9%) have never tried to quit ($p=.01$). More nondaily (54.6%) than daily smokers (49.0%) have attempted to quit without assistance. Daily vs. nondaily smokers were

more likely to have used behavioral interventions (20.7% vs. 5.9%, p<.001) and pharmacotherapy (33.4% vs. 9.1%, p<.001). Correlates of interest in traditional behavioral interventions included older age (p=.02), lower parental education (p=.02), lower confidence in ability to quit (p=.004), higher motivation to quit (p=.002), and having depressive symptoms (p=.002). Correlates of interest in technology-based interventions included lower confidence in quitting (p=.004), higher motivation to quit (p=.001), having depression (p=.03), and smoking for social reasons (p=.04). Correlates of interest in pharmacotherapy included being white (p<.001), lower confidence (p<.001), higher motivation (p<.001), having depressive symptoms (p=.05), and being a daily smoker (p=.004). Behavioral interventions may be appropriate for the broad range of college student smokers. The use of pharmacotherapy for nondaily smokers warrants further exploration, as these approaches were of most interest to both daily and nondaily smokers.

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POS2-27

CONTINGENCY MANAGEMENT PROMOTES SMOKING ABSTINENCE IN RESIDENTIAL SUBSTANCE ABUSE TREATMENT PATIENTS

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Few smokers in residential substance abuse treatment receive smoking cessation treatment despite high smoking prevalence rates and serious health consequences. In this pilot study, we examine effects of contingent reinforcement for smoking-negative carbon monoxide (CO) and salivary cotinine (COT) samples on outcomes in residential patients not receiving smoking treatment. Participants (N = 80) were adults with alcohol, cocaine, and/or heroin abuse/dependence, who smoked daily [CO > 8ppm verified], wanted to quit, and were otherwise eligible. Participants were randomized to 12 weeks of: (a) brief advice and abstinence monitoring (AM; n=42), or (b) the same advice and monitoring plus incentives for smoking negative CO (≤ 8 ppm) and COT(< 10 ng/ml) tests [AM+CM; (n=35)]. CO tests and brief advice were 4x/week in weeks 1-4, 2x/week in weeks 5-8, and 1x/week in weeks 9-12. COT tests were 1x/week. In addition, AM+CM participants earned ≥ 1 chance to draw a card and receive a prize for each negative test. Cards were drawn from a guaranteed prize bowl (35 cards: 26 $1 prize cards, 8 $20 cards, 1 $100 card) during week 1 and an intermittent prize bowl (500 cards: 219 $1 cards, 30 $20 cards, 1 $100 card) during Weeks 2-12. Draws escalated for successive negative tests, and were reset for positive tests or unexcused absences. Outcomes were assessed at Week 12 and Month 6. Percent of negative CO tests was greater in the AM+CM compared to AM condition [median (IQR) 48.1% (55.5%) versus 10.6% (22.1%); p < .05], as was LDA based on CO [3 (8) days versus 1 (2.5) day; p < .05], without differences on negative COT tests [0.0% (9.1%) versus and 0.0% (0.0%)]. At Month 6, patients in AM+CM were more likely than in AM to have negative CO and COT tests [CO: 38.1% versus 9.4%; cotinine: 26.1% versus 2.9%, p<.05]. Self-reported smoking and substance use did not differ by condition at Month 6 (p>.05). Average (SD) reinforcement earned was $103 ($207) in the AM+CM condition. Overall, results support the use of CM to promote smoking abstinence and are similar to other published efforts in that they highlight the need for enhanced treatments to improve outcomes in this difficult population.

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POS2-28

INTEGRATING THE "OTTAWA MODEL" FOR SMOKING CESSATION INTO PRIMARY CARE PRACTICE: A CLUSTER RANDOMIZED TRIAL

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Aim: The aim of this study is to determine whether the Ottawa Model for Smoking Cessation (OMSC) increases the rate which evidence-based smoking cessation treatments are delivered by practitioners in primary care settings and smoking abstinence and examine the incremental impact of providing telephone-based follow-up support to patient's as part of the OMSC.

Methods: A two-group pre-post cluster randomized controlled trial was conducted. Eligible clinics were randomly assigned to the OMSC group or OMSC + follow-up counseling (FC) group. Both groups were supported in implementing a multi-component intervention program, which involved: outreach facilitation; practice tools and prompts, training, and performance feedback. Practices assigned to the FC group were also able to refer patients to a telephone-based follow-up support program. An exit survey was completed with a sample of daily smokers from each study clinic pre-and-post implementation of the intervention program and patient's were contacted 4-months later to assess smoking outcomes. All data was analyzed using multi-level hierarchical modeling.

Results: Seven family medicine clinics (115 providers) were enrolled in the study. 12,585 patients were screened and 835 eligible smokers (mean age 45.3, 42% male) took part in the study. A significant increase in provider delivery of smoking cessation treatments and patient quit attempts was documented in both groups at the post-intervention assessment with no differences between groups. The effect estimates for pre vs. post intervention for both groups combined were: "ask" (OR 1.5 95% CI 1.1-2.0); "brief advice" (OR 2.0 95% CI 1.5-2.7); "assist" with cessation (OR 2.30, 95%CI 1.70-3.12); quit attempt (pre: 31% vs. post: 38%, p<0.001). Differences in 7-day point prevalence abstinence were not statistically significant. The FC group did not further increase smoking abstinence among participants.

Conclusion: The introduction of the OMSC in primary care settings can significantly enhance provider performance in the delivery of evidence-based smoking cessation strategies and quit attempts. The added value of adjunct telephone counseling was not supported.

Canadian Tobacco Control Research Initiative, Ontario Tobacco Research Unit, and Ontario Ministry of Health and Long Term Care.

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POS2-29

LIGHT AND INTERMITTENT SMOKING CESSATION, REDUCTION, AND MOTIVATION CHANGE IN A PREDOMINANTLY HISPANIC SAMPLE

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Few studies have focused on smoking cessation for light and intermittent smokers (fewer than ten cigarettes per day). This study assessed the efficacy of a brief smoking cessation intervention for light smokers in a predominantly Hispanic community sample. Predictors of quitting were also assessed. Two hundred and fifty light and intermittent smokers (87% Hispanic; 52% males) between the ages of 18 and 74 (M= 42.49 years, SD= 12.67) were recruited primarily from a family health clinic. Participants completed baseline measures assessing demographics, tobacco use and history, stage of change, and perceived competence (PCS). Participants were randomly assigned to an immediate (II) or delayed (DI) brief cessation intervention. At a 3-month follow-up, participants' smoking status, stage of change, and PCS scores were assessed. Logistic and linear regression models were used to assess predictors of smoking cessation, reduction, motivation change, and PCS. Independent variables included intervention assignment, age, smoking rate at baseline, and motivation to quit. Using an intent-to-treat approach and adjusting for relevant covariates, results indicated that intervention assignment was not associated with cessation (8.1% II v 11% DI), reduction (38.2% II v 29.1% DI), or PCS. However, participants in the II were 3.59 times more likely to increase readiness to quit relative to those in the DI (45.8% II v 27.9% DI). The present study observed no significant differences in cessation and reduction rates between intervention conditions. However, significant increased readiness to quit was observed in the II compared to the DI, which is promising in promoting the likelihood of future cessation, perhaps with longer-term follow-up periods. Future directions include making efforts to promote retention, continuing to refine intervention intensity and content, and including longer follow-up periods to capitalize on readiness increases to promote cessation.

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POS2-30

SMOKING AND ACTIVITY RESTRICTION IN A MOBILITY IMPAIRED POPULATION

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People with physical disabilities who use assistance to ambulate (i.e., mobility impairments) have a higher smoking prevalence (32.5%) than non-disabled people (19.8%). One possible explanation is that the restriction of valued activities (social,

professional, or pleasurable) due to mobility impairment interferes with smoking cessation. We explored this hypothesis in a sample of smokers with mobility impairments. Participants were included if they used equipment to ambulate (e.g., cane, wheelchair, leg braces) for at least 1 year, reported at least one restricted activity, and smoked ≥ 3 cigarettes per day. Participants (n = 43; 49% Female, 58% Caucasian, M Age = 49.2, M Cigs/day = 14.8) were interviewed over the phone regarding their smoking history, motivation to quit smoking (1-10), and restriction of valued activities. Regarding activity restriction, participants were asked (1) if they had been forced to restrict any valued social, professional, or pleasurable activity due to mobility limitations (yes/no), (2) if they had found a replacement for their most important restricted activity (yes/no), and (3) to rate their satisfaction with any replacement activity on a scale of 1-10. Chi-squares were used for categorical variables and t-tests were used for continuous variables. Seventeen participants (39%) found a satisfactory (i.e., rated satisfaction as 5 or greater) replacement for their most important restricted activity, while 26 (61%) either had not found a replacement activity or were not satisfied with their replacement. Participants with satisfactory replacements were more motivated to quit smoking (p = .02) and were more likely to report that they were planning to quit in the next 30 days (p = .02). When classified into stages of change, those with satisfactory replacements for lost activities were more likely to be in the preparation stage (i.e., were planning to quit within 30 days and had attempted to quit at least 1x in the past year) and less likely to be in the pre-contemplation or contemplation stages (p = .02). Additional research attention should be focused on treatments for smoking cessation that increase engagement in valued activities.

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POS2-31

SEXUAL AND GENDER MINORITY CURRENT SMOKERS VIEWS ABOUT SMOKING CESSATION OPTION

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Introduction: Research finds high rates of smoking in the sexual and gender minority (SGM) community. Some research suggests this population makes fewer cessation attempts than the general population. Information is needed to understand factors contributing to cessation attempts by this population.

Purpose: To examine views about quitting smoking from SGM who currently smoke.

Methods: SGM completed surveys at four Pride Festivals in the Midwest. SGM current smokers (n= 1127) answered questions related to their readiness to quit smoking, actions to take if they wanted to quit smoking, and rated a list of clinical guideline endorsed methods and other methods for quitting smoking on a 1 (not all effective) to 5(very effective) scale.

Results: In this sample, 17% indicate they are currently trying to quit smoking, 18% plan to try to quit in the next 30 days, 38% indicate thinking about quitting in the next 6 months, and 28% indicated they do not think about quitting. The most common actions a person would take to stop smoking include: Quit cold turkey on my own (37%), ask my partner to support me (37%), use medications to help me quit (18%), talk to my doctor about a plan to quit (16%), and Attend SGM tailored smoking cessation group (14%). Use of e-cigarettes (8%) was more highly endorsed than: calling the state telephone quitline (3%), receiving individual counseling (3%), or joining a quit smoking group program (7%). The following methods were rated as the most effective on a 1 – 5 scale: having my partner support me (3.2); avoiding situations in which I usually smoke (2.9); avoiding places that allow smoking (2.7), and using medication (2.4).

Conclusions: While 35% of SGM current smokers are considering quitting smoking, a low level of endorsement of most evidence-based treatment options raises concerns for successful quit attempts. Because partner support was rated highly as an action taken and as an effective method for quitting, it is likely to be an important component of any cessation treatment option for the SGM population. Increasing knowledge about and confidence in evidenced-based cessation methods is needed for this population.

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POS2-32

BODY COMPOSITION AND METABOLIC RATE CHANGES IN WOMEN DURING A SMOKING CESSATION ATTEMPT

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Objective: The potential for weight gain poses a significant barrier to smoking cessation, particularly among women. However, little is known about specific changes in body composition and metabolic indices during a cessation attempt.

Methods: As part of an ongoing parent study exploring menstrual cycle effects on smoking cessation, 43 women underwent an evaluation of body composition (BOD POD air displacement plethysmography) before and after a one month randomized trial of varenicline versus nicotine patch.

Results: On average, women reduced from 15.1 ± 0.8 (mean ± SE) to 1.0 ± 0.3 cigarettes per day, a 92 ± 2% reduction. The range in % reduction varied from 35-100%. Participants gained 1.5 ± 0.3 kg mass, including 0.9 ± 0.3 kg fat mass and 0.6 ± 0.3 kg fat free ("lean") mass, and resting metabolic rate increased by 18.1 ± 6.8 kcal/day. Regression analyses examined the variance in the body composition and metabolic rate accounted for by percentage reduction in cigarettes per day. Smoking reduction accounted for 9.4% of the variance in fat free mass change ($p < 0.05$) and, at trend level, accounted for 9% of the variance in resting metabolic rate change ($p = 0.05$). It did not significantly account for variance in fat mass. In this preliminary analysis effects were not moderated by drug.

Conclusions: Weight gain associated with smoking reduction during a cessation attempt in women may be lean, rather than fat, mass. Additionally, metabolic rate may increase, rather than decrease, with smoking reduction, in contrast to previous research suggesting metabolic rate decreases with smoking cessation. Information about body composition early in a quit attempt may prompt additional healthy behaviors that minimize weight gain during cessation.

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POS2-33

TO QUIT OR NOT TO QUIT: REACH AND ENROLLMENT OF A NATIONWIDE CLINICAL TRIAL

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Proactive recruitment is an important method to reach a broad spectrum of smokers, not just those who want to quit. Based on a large, nationwide, telephone based clinical trial in which participants were proactively recruited through online channels, we describe: (1) uptake and enrollment of two competing treatment alternatives (cessation vs. non-cessation), and (2) predictors of selection into either option. Following completion of a brief health survey to determine study eligibility, smokers were presented with two study options: one for those who wanted to quit in the next 30 days (cessation arm) and the other for smokers who intended to quit at some later date (non-cessation arm). Of 4,543 smokers who met eligibility criteria for both arms, 1,947 (43%) declined both, 679 (15%) opted for the cessation arm, and 1,917 (42%) opted for non-cessation. Those who expressed interest in either option were subsequently mailed consent forms and invited for formal enrollment. Of these, 283 (42% of 679) and 849 (44% of 1917) smokers successfully enrolled in the cessation and non-cessation arms, respectively. Smokers who opted for cessation were younger ($p<.001$), less likely to be white ($p=.003$), and had lower educational attainment ($p<.001$). As expected, they were also more motivated to quit in the next 30 days (Mean 6.5 vs. 2.6 on 0-10 scale; $p<.001$), reported greater social support for cessation (13.9 vs. 10.3 on 5-25 scale; $p<.001$), and expressed greater confidence to quit (5.1 vs. 4.0 on 0-10 scale; $p<.001$). There were no differences in measures of stage of change. With regard to smoking history, smokers who opted for cessation reported a higher incidence of prior quit attempts (92% vs. 83%; $p<.001$), a greater number of prior quit attempts (4.8 vs. 2.8; $p=.001$), and higher rates of prior medication use (34% vs. 19%; $p<.001$). There were no differences on levels of smoking, age of first use, or nicotine dependence. Most smokers when reached via proactive methods are unmotivated to quit but are receptive

to non-cessation treatment options. Current motivation and past behavior is predictive of who selects cessation vs. non-cessation options.

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POS2-34

AN INNOVATIVE METHOD TO MASS DISTRIBUTE PRESCRIPTION DRUGS FOR SMOKING CESSATION: A PROOF-OF-CONCEPT TRIAL

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Background: Varenicline and bupropion are effective pharmacotherapies for smoking cessation, but their population-level impact is limited because many clinicians do not proactively discuss pharmacotherapy options with their smoker patients.

Objective: Demonstrate an innovative method for smokers to enroll via the internet in a protocol engaging their physician in a discussion of smoking cessation treatment with varenicline or bupropion, to be provided free of charge.

Methods: Participants visited the study website, provided consent and completed an on-line assessment. Individuals were excluded if less then 18 years old, smoked less than 10 cigarettes per day or did not intend to quit in the next 30 days. Eligible participants received a personalized script to take to their physician, who could prescribe varenicline or bupropion for 12 weeks, or nothing. Signed scripts were faxed to a central pharmacy that couriered the medication to the patient. Follow-up questionnaires were completed online at 4, 8 and 12 weeks and 6 months after start of treatment. Results: In two months 883 participants enrolled in the study, of whom 493 (55.8%) visited their physician to have the script signed (258 varenicline, 235 bupropion). They were 45 (+/-12) years old, 59% female; 50% of them had high school education or less, 45% were not employed and 68% smoked 20 or more cigarettes daily. They reported an average of 9.4 (+/-1.4) and 7.8 (+/-2.1) on a 10-point scale for importance and confidence to quit. Those who did not visit a physician were younger ($p<0.001$) and reported less importance ($p=0.037$) and confidence ($p=0.043$) to quit. The 7-day point prevalence quit rate at end-of-treatment for the overall group was 56.3%. Analysis comparing cessation outcomes in varenicline, bupropion and no-drug groups will be also presented.

Conclusions: This is a feasible method for increasing physician engagement in smoking cessation involving the use of varenicline and bupropion, and producing a quit rate that is comparable to clinical trials. Large scale implementation is feasible for targeting a large number of smokers to reduce the overall prevalence of smoking in the population.

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POS2-35

THE PROMIS SMOKING INITIATIVE

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This presentation introduces the PROMIS smoking initiative. PROMIS is the Patient-Reported Outcomes Measurement Information System, an ongoing cooperative research program to develop, validate, and standardize item banks to measure symptoms and health status domains (e.g., anxiety, alcohol use) relevant to a range of chronic medical conditions (e.g., cancer, heart disease). The PROMIS smoking initiative has the goal of developing, evaluating, and making available a psychometrically sound item bank that can form the basis for standardized assessment of smoking behavior and biopsychosocial constructs that can be used to predict smoking outcomes. In order to identify measures and domains of interest, we consulted current literature reviews on assessment in cigarette smoking, conducted literature searches on smoking assessment, and consulted federal resources that house smoking assessment items (e.g., the CDC). Key theoretical domains included: smoking and quitting history, nicotine dependence, withdrawal, self-efficacy, and smoking motivation. Overall, more than 1,350 existing smoking assessment items were identified across domains. Expert reviews of these items eliminated redundant or poorly worded items across questionnaires within domains, winnowing these items down into a subset of 230 items representative of each of the smoking domains. Focus groups and cognitive interviews were conducted to ensure content domain coverage and to finalize the item bank. Over the next three years, this item bank will be fielded in multiple representative samples composed of thousands of smokers to examine factor structure of the item bank and use Item Response Theory to calibrate the items and examine their psychometric properties and validities. Through selection of exemplar items and scales, standardization of measurement, and wide dissemination of access to assessment instruments, the PROMIS smoking project is a first step towards achieving a unified measurement framework for smoking. Ultimately, the smoking item banks will be incorporated into the larger PROMIS repository for wide dissemination and use by researchers and clinicians.

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POS2-36

EFFECTIVENESS OF PROVIDING FREE BUPROPION AND COUNSELING THROUGH PRIMARY CARE CLINICS

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Background and Objective: Bupropion hydrochloride SR is a prescription smoking cessation medication that can double a smoker's odds of successfully quitting, however many smokers do not utilize this medication in their quit attempt, nor is it frequently prescribed by practitioners. The objective of this pilot study was to assess the effectiveness of a protocol whereby primary care practitioners provided free bupropion plus individual counseling to their patients who wanted to quit smoking.

Methods: Participating Family Health Teams and Community Health Centres in Ontario, Canada implemented this open-label protocol at their clinics and offered up to 8 weeks of free bupropion plus a minimum of 3 individual counseling visits to their medically suitable patients who wanted to quit smoking. Smoking outcomes were obtained at follow-ups completed 6 and 8 weeks after participants started bupropion.

Results: 296 participants enrolled at 22 sites (range 2-39 participants/site). Participants were 51% female with a mean age of 48 years (SD: 13). 68% had at least a high school diploma, 29% had full-time employment, and the median annual household income was between $20-40,000 CAD. Participants smoked an average of 21 cigarettes per day, 37% smoked within 5 minutes of waking and 18% reported current depression or anxiety. At the end of 8 weeks of treatment, 52% had been abstinent for at least the past 7 days and 42% had been abstinent for at least the past 30 days. Of those who had not quit at the end of treatment, 75% had quit for at least 1 day and 79% had reduced their cigarette consumption by at least 50%. Results of regression analyses will be presented.

Conclusion: Offering free bupropion with counseling via primary care practitioners is an effective way to increase utilization of this medication and resulted in high cessation rates at the end of an 8-week treatment protocol. The findings of this study are comparable to those recently published in a study of bupropion in primary care settings and support the real-world effectiveness of bupropion with counseling as treatment for tobacco dependence.

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POS2-37

SELF-EFFICACY FOR QUITTING SMOKING: CAUSE OF, OR REFLECTION ON, BEHAVIOR CHANGE?

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Social-learning theory views self-efficacy for future behavior change as a causal factor in that behavior change. However, recent clinical research suggests that self-efficacy to quit smoking is only weakly related to long-term cessation unless current smoking is controlled. This suggests that self-efficacy may reflect, rather than cause, behavior change, a view posited at the time Bandura first proposed the concept of self-efficacy. To address this issue of directionality, we determined whether self-efficacy ratings predict immediately subsequent smoking abstinence or vice versa. We related daily ratings of self-efficacy for abstaining the next day to actual abstinence (CO<5 ppm) on the prior vs next day, to test whether self-efficacy reflects or causes, respectively, smoking behavior change. All data were from two very similar studies evaluating the short-term

effects of medication, nicotine patch (n=209) or varenicline (n=123), versus placebo on smoking abstinence during weeklong simulated quit attempts. Each study involved a cross-over design in which subjects received both medication and placebo conditions in consecutive phases in counter-balanced order, with an ad lib smoking washout period in between. Generalized Mixed Models were employed to examine each relationship, controlling for medication condition, cigs/day, FTND, and other study conditions. Results were very consistent between studies in showing that the association was essentially bi-directional: daily self-efficacy predicted next day's abstinence in the patch and varenicline studies (Betas=0.02210 and 0.0258, respectively, both p<.001), and current day's abstinence status predicted self-efficacy for abstaining the next day, F(1,91)=93.52 and F(1,71)=13.28, respectively, both p<.001. Our results indicate that over short periods of time, self-efficacy for abstaining is predictive of subsequent abstinence, and current abstinence is predictive of subsequent self-efficacy, suggesting mutual influence. These findings may be specific to self-efficacy for brief smoking abstinence, particularly on the next day, and may not apply to self-efficacy for a long-term, permanent quit attempt.

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POS2-38

EFFICACY AND SAFETY OF A NOVEL NICOTINE MOUTH SPRAY IN SMOKING CESSATION: A RANDOMIZED, PLACEBO-CONTROLLED, DOUBLE-BLIND, MULTI-CENTER STUDY WITH A 52-WEEK FOLLOW-UP

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In an effort to create a flexible and discreet product for smoking cessation to be taken when cravings emerge regardless of the immediate social circumstances, a new form of nicotine replacement treatment, a nicotine mouth spray, has been developed. The spray, delivering a metered dose of 1 mg nicotine per spray, allows fast oral transmucosal absorption of nicotine. The primary objective of the current study was to evaluate the efficacy of the mouth spray versus placebo to achieve self-reported, CO-verified continuous abstinence from week 2 up to week 6, 24 and 52. Participants were instructed to use a full dose treatment during the first 6 weeks, followed by another 6-week period of tapering down and finally an additional 12 weeks of occasional use if needed. Secondary objectives of the study included assessments of safety, compliance, relief of craving and withdrawal symptoms, and overall product acceptability. The study enrolled a total of 479 smokers motivated to quit (active 318, placebo 161) at three European sites. On average, participants were 47 years (S.D. = 11, min-max = 18-75), smoked 23 cigarettes/day (8.7, 4-65), had a CO of 27 ppm (10.5, 10-68) and an FTND of 5.3 (2.2, 0-10). 56% of participants were males. Continuous abstinence rates up to 6, 24 and 52 weeks (active vs. placebo) were 26% vs. 16% (OR 1.8, p=0.014), 16% vs. 7% (OR 2.5, p=0.006) and 14% vs. 6% (OR 2.7, p=0.007), respectively. The nicotine mouth spray was well tolerated and the most commonly reported adverse events were hiccups, throat irritation, headache and nausea. In conclusion, the data shows that the new nicotine mouth spray is a safe and effective aid in smoking cessation.

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POS2-39

EFFECTS OF D-CYCLOSERINE ON NEUROCOGNITION AMONG COCAINE-DEPENDENT VOLUNTEERS BEING TREATED FOR CIGARETTE SMOKING

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Cocaine-dependence is associated with neurocognitive impairment, and decreased neurocognitive performance has been associated with poor treatment outcomes. Therefore, neurocognitive impairment is an important target for treatment. The current between-subjects, placebo-controlled study examined changes in neurocognitive performance as a function of receiving either D-cycloserine (50 mg/wk: N=16) or placebo (N=13) in cocaine-dependent volunteers seeking treatment for their cigarette smoking. Outpatient treatment visits were conducted 3 times a week for 4 weeks. At each visit, participants' smoking and recent drug use were assessed, and both cue-exposure therapy and cognitive-behavioral therapy sessions were conducted. Study medication was administered once weekly. Participants were predominately male (82.8%), African-Americans (79.3%), in their late 40s and averaged a high school level of education. Participants were relatively heavy cigarette smokers (breath CO = 25.6±12.9, FTND=5.6±1.9). In terms of cocaine use, they were all crack-cocaine users and reported using in 14.7±10.7 of the last 30 days, and had been using for 18.1±7.1 yrs on average. Neurocognitive assessments were administered at baseline, as well as weeks 2 and 4 of the study and included the Hopkins Verbal Learning Task-R, Stop-Signal Task, Dual N-Back Task, and Continuous-Performance Test II. Additionally, all participants were administered the Vocabulary and Matrix Reasoning subtests of the Wechsler Adult Intelligence Scale III. Primary outcomes for neurocognitive assessments will include accuracy (%) as well as speed (ms), and all data will be presented with regard to nicotine and cocaine use as applicable. This study represents the first evaluation of the effects of DCS on neurocognitive function in cocaine-dependent smokers.

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POS2-40

EMOTION DYSREGULATION AND PERCEIVED BARRIERS TO CESSATION AMONG SMOKERS WITH ASTHMA

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Despite the known negative effects of smoking on lung function, individuals with asthma have been shown to smoke at higher rates than individuals without asthma (McLeish & Zvolensky, 2010). Given the effects of smoking on asthma severity, smoking cessation is an important clinical and public health goal among this population. Thus, it is important to understand factors that contribute to greater difficulties with smoking cessation. One such factor in this regard is emotion dysregulation (Carmody, 1989). Defined as difficulties in managing one's emotions when experiencing negative emotion or distress (Gratz & Roemer, 2004), emotion dysregulation has been shown to predict perceived barriers to cessation among adult smokers (Gonzalez, Zvolensky, Vujanovic, Leyro, & Marshall, 2009). However, the effect of emotion dysregulation on perceived barriers to cessation among smokers with asthma as well as the role of the specific facets of emotion dysregulation have yet to be examined. Thus, the purpose of the current study was to examine the predictive ability of specific emotion regulation deficits in terms of perceived barriers to cessation among adult smokers with asthma. Participants were 117 regular daily smokers (n = 61 males; Mage = 38.32, SD = 12.04) with self-reported physician-diagnosed asthma. As expected, after controlling for the variance accounted for by gender, negative affect, smoking rate, and asthma control, emotion regulation deficits significantly predicted addiction-related and external barriers to cessation, accounting for 17.5% of unique variance in each outcome variable. In terms of specific subscales, clarity, awareness, and impulse control were significant predictors of addiction-related barriers and clarity was a significant predictor of external barriers. Difficulties in emotion regulation did not significantly predict internal barriers to cessation. These findings suggest that smokers with asthma who have difficulties with emotional awareness and clarity and controlling pumsles when upset perceive greater barriers to cessation. Interventions that target these deficits may improve smoking cessation efforts among this high-risk population.

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POS2-41

MENTHOL SMOKING IN HISPANIC LIGHT AND INTERMITTENT SMOKERS

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Research suggests that menthol smoking is associated with reduced smoking cessation in light smokers, yet few studies have addressed menthol use in light and intermittent and/or Hispanics. The purpose of this study is to assess theoretically and empirically derived correlates of menthol smoking and the impact of menthol smoking on cessation and increases in readiness in Hispanic light and intermittent smokers. A community sample of 162 Hispanics who smoked between 1 cigarette a month and 10 cigarettes per day participated in a study of the effectiveness of a brief motivational cessation intervention. Participants were randomized to an immediate or a delayed intervention condition (delivered at the three-month follow-up). Baseline measures included a question regarding the type of cigarette smoked, demographics, three questions extracted from the Daily Drinking Questionnaire, the short form Stage of Change scale,

the Fagerstrom Test for Nicotine Dependence, the Decisional Balance measure, and the Treatment Self-Regulation Questionnaire. At the 3-month follow-up, smoking status and stage of change were assessed. Univariate logistic regressions were performed to assess baseline correlates of menthol use. Two hierarchical multivariate logistic regressions were performed to assess the impact of menthol use on cessation and readiness increases, while controlling for demographics and intervention condition. An intent-to-treat approach was employed for the cessation model. Results indicated that 18% of participants smoked menthol cigarettes. However, after employing error control, no significant correlates of menthol use were observed. In addition, menthol smoking was not significantly associated with cessation ($\chi 2$ (1) = .092, p= .76) or motivation to quit ($\chi 2$ (1) = .494, p= .48). These findings suggest that Hispanic light and intermittent menthol smokers may be a heterogeneous group and menthol smoking may not impede cessation and motivation change toward quitting smoking. It may be that the influence of menthol smoking on cessation is less pronounced in Hispanic light and intermittent smokers relative to heavier smokers or other ethnocultural groups.

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POS2-42

TOPIRAMATE FOR SMOKING CESSATION

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Introduction: Topiramate blocks AMPA and kainate glutamate receptors and facilitates GABAergic neurotransmission. These effects may be important in the treatment of tobacco dependence. The present study compared the effects of 1) topiramate (TOP), 2) topiramate/nicotine patch (TOP/NIC), and 3) placebo (PLC) on smoking cessation rates and related measures in treatment seeking smokers.

Methods: We conducted a randomized trial in which subjects and research personnel were blinded to TOP vs. PLC but not to the TOP/NIC patch condition. Measures were taken at baseline and weekly for 10 weeks. Topiramate was administered for 10 weeks and titrated up to 200 mg/day. The smoking quit date (QD) was scheduled after 2 weeks of medication treatment. Nicotine patch (21mg/24 hours) was started on the QD in subjects randomized to the TOP/NIC condition. Main outcome measures were 4-week continuous abstinence rates (CAR; biochemically confirmed), scores on the Minnesota Nicotine Withdrawal Scale (MNWS) and on the modified Cigarette Evaluation Questionnaire (mCEQ), and weight.

Results: 57 subjects met study criteria and were randomized to treatment. Groups were similar on baseline measures. The end of treatment 4-week CAR was 1/19 (5%) in the PLC group, 5/19 (26%) in the TOP group, and 7/19 (37%) in the TOP/NIC group (p=0.061). There was a trend toward a significant difference on total MNWS score by treatment group over time (p=0.067): TOP subjects reported a significant reduction in total MNWS score (p=0.021) and on the irritability/anger subscale (p=0.003) vs. PLC. There was also a significant reduction over time in the mCEQ "reward" subscale for TOP (p=0.046) and for TOP/NIC (p=0 .038) vs. PLC. The PLC group gained 0.36 pounds per week vs. a 0.43 pound decrease in the TOP group and a 0.06-pound decrease in the TOP/NIC group (p=0.001). Paresthesia was the only adverse effect observed significantly more frequently in subjects on TOP vs. PLC (p=0.011).

Conclusions: TOP may reduce the rewarding effects of smoking, and reduce symptoms of nicotine withdrawal. TOP, alone or in combination with the nicotine patch, may aid in smoking cessation, and attenuate weight gain.

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POS2-43

PROJECT IMPACT: A PHARMACOTHERAPY PILOT TRIAL INVESTIGATING THE ABSTINENCE AND TREATMENT ADHERENCE OF LATINO LIGHT SMOKERS

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Light smoking is particularly prevalent among Latinos as compared to other non-Latino smokers. Nicotine replacement (NRT) and varenicline are effective medications for smoking cessation for moderate-heavy smokers; however these treatments have not been tested with light smokers and there are no treatment guidelines for the use of these therapies with light smokers. This pilot trial tested the efficacy of NRT and varenicline in increasing smoking abstinence among Latino light smokers.

METHODS: We utilized a 3-group (NRT, varenicline, & vareniciline placebo) randomized design. Latino light smokers (<10 cpd) received 12 weeks of either NRT, varenicline, or placebo with ongoing medication management visits. At the end of treatment, cotinine and CO tests confirmed abstinence. Descriptive statistics were used to summarize our findings.

RESULTS: 33 participants were randomized to one of 3 treatment groups (11 to NRT, 10 to verenicline and 12 to placebo). Participants were 48% male with a mean age of 42.3. Participants were 36% Puerto Rican; 36% Dominican; 12% Columbian; 6% Mexican; 6% Guatemalan; and 4% "Other." In total, 44% of participants in the varenicline group were abstinent at the end of treatment, 0% of placebo participants, and 14% of NRT participants. The mean percentage of medication adherence days during treatment was 74.5% in the varenicline group, 54.2% in the NRT group, and 43.5% in the placebo group.

DISCUSSION: This preliminary pilot study represents the only investigation that specifically targets light smokers using these treatments and the only study testing these treatments with Latino light smokers. Findings from the current study showed varenicline to be associated with greater levels of abstinence at the end of treatment as compared to NRT & placebo. Our sample also showed poor adherence to all treatments, which is consistent with past studies showing poor adherence to be a significant barrier to treatment success among Latinos. These findings are an important first step considering there are no guidelines for treating light smokers. Larger studies that fully test these treatments and incorporate novel medication adherence components are needed.

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POS2-44

PROVIDER-DELIVERED CESSATION COUNSELING AMONG MEDICAID ENROLLEES IN OHIO'S APPALACHIAN REGION: A QUALITATIVE STUDY BASED ON THE THEORY OF PLANNED BEHAVIOR

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Smoking prevalence among Medicaid enrollees in Ohio's Appalachia region is more than twice as high as the state estimate. Providers can play a role in cessation, however adherence to tobacco dependence treatment guidelines is low. We conducted a qualitative study to determine if the Theory of Planned Behavior (TPB) could explain providers' provision of cessation counseling to smokers enrolled in Medicaid Managed Care Plans (MMCP) in Ohio's Appalachian region. We conducted qualitative interviews with nine nurses and nine physicians in Ohio's Appalachia region. We interviewed nurses in focus groups and physicians one-on-one. Interviews explored the constructs of the TPB model: (1) Attitudes: Perception of MMCP smokers' interest in receiving physician-delivered cessation counseling; perceptions of how MMCP smokers would embrace a cessation program; (2) Normative Beliefs: Perception of MMCPs interest in adopting a comprehensive cessation program; (3) Perceived Behavior Control: Perceived ability to deliver a cessation intervention. Normative beliefs did not strongly influence providers. Nurses doubted MMCPs would financially support a cessation program and providers had mixed views. Physicians noted they currently provide some cessation counseling without reimbursement. Based on responder comments, attitude was the biggest determinant of whether the provider delivered counseling. Providers indicated they were confident in their ability to provide counseling and did not believe counseling interfered in the provider-patient relationship. However, providers generally believed interventions are ineffective in smokers unwilling to quit. As a result, most respondents, particularly nurses, indicated they do not pursue counseling with unmotivated patients. Providers indicated they provide limited counseling to unmotivated patients. This behavior appears driven by the attitude that cessation interventions are ineffective in patients unwilling to quit. This attitude could result in missed opportunities to increase quit attempts among this subset of smokers. Providers should be educated on the benefits of brief motivational interventions for counseling unmotivated smokers.

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POS2-45

A COMPREHENSIVE TOBACCO-CESSATION TREATMENT FOR CANCER PATIENTS: 12-MONTH FOLLOW-UP ABSTINENCE RATES

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Cancer prevention via smoking cessation has been touted as necessary for many years. However, the majority of cancer centers in this country and around the world do not provide smoking-cessation services to their current patients, cancer survivors or their surrounding communities. Consistent with the mission of its cancer prevention division, the University of Texas M. D. Anderson Cancer Center launched a large-scale, multidisciplinary, and comprehensive tobacco treatment program (TTP) that is free of charge to all active and surviving cancer patients. By the end of 2010, the TTP will have served 2,578 (arrived) patients and conducted 23,787 appointments since its inception in January 2006. Over the last 3 years our new patient totals have ranged from 560-595 per year, serving patients from over 40 MD Anderson clinical departments. In 2010, 66.5% of our patients lived in the Houston Metro area, while 22.5% reside outside Houston but within Texas; 10% are located in other states and 1% in other countries. Our patients have smoked an average of 16 cigarettes per day for 32 years. They consume an average of 4 alcoholic beverages each week, with approximately 13% reporting a form of hazardous drinking behavior. Over 48% of them met criteria for one or more comorbid psychiatric diagnoses. Of those with current psychiatric disorders, over half (55%) report more than one disorder. At the one-year follow-up, 30%-50% of our total patients were abstinent, with a 7 day point prevalence. This compares favorably to highly motivated populations of healthy smokers, which is reported to range from 23% with bupropion to 28%-31% with varenicline. Among those who did not quit entirely, smoking was reduced from 18.12 cigarettes per day at baseline to 9.11, a mean reduction of 9.01 cigarettes per day (50%). The conceptualization, the roadblocks and possible future directions of the program will be discussed.

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POS2-46

SMOKING CESSATION IN PATIENTS WITH SEVERE ILLNESS IN A UNIVERSITY MEDICAL CENTER – THE MODEL OF THE COMPREHENSIVE CANCER CENTER FREIBURG, GERMANY (CCCF)

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Smoking cessation influence the progress of several diseases in a positive way and hospitalized patients are especially receptive to cessation advice. Structured counselling of smoking in-patients is rarely available in German hospitals. The CPMT has implemented structures to identify smoking patients, to provide them with counselling based on Motivational Interviewing, to enhance their motivation to quit and to refer them to suitable cessation programs offered by external providers. Enrolled patients receive continued telephone support by the CPMT. Follow-up data on all enrolled patients over a period of 12 months are being analysed. CPMT structures and a screening system for smoking patients have been successfully implemented in 22 out of 24 departments. A network of 52 regional cessation providers has been established. After 18 months out of 703 counselled smoking patients, 53% joined the project: 36% had oncolological, 19% cardiovascular, 12% pulmonal, 3% traumatological, 10% other diseases and 5% were pregnant. 62% were male, of a median age of 52 years and had a FTND of 5.7. Despite only 30% of patients initially wished to use evidence based cessation support, 85% used it after our counselling. The cessation therapy is individually tailored to the patients need: 43% were referred to an external behavioural therapy program with or without support of medication, 15% used medication only and the rest were only supported by CMPT or quit lines. Only 7% patients dropped out. We found a dose response effect between the amount of our support calls and the abstinence rate up to more than 50% after 3 months. Patients with different severe diseases, different needs and low initial intention to quit did successfully quit smoking during their inpatient hospital treatment. This program will now be implemented at other CCCs in Germany with the underlying aim to contribute to advancing cancer prevention in Germany.

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POS2-47

DIFFERENCES IN SMOKING-RELATED SYMPTOMS AT BASELINE BY DEPRESSIVE SYMPTOM STATUS IN ADULT FEMALE SMOKERS

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Introduction: Many women smokers have untreated depressive symptoms (DS), and they are often grouped with women who have no depressive symptoms (No-DS). The influence of DS on ability to quit smoking is unclear, and characterizing baseline withdrawal symptomatology in this group of women is important to develop tailored treatment regimens. This study examined the effect of DS status on withdrawal and premenstrual symptomatology during ad libitum smoking in adult women smokers.

Methods: Data was taken at baseline, during ad libitum smoking, from an ongoing study which recruited women aged 18-40, smoking at least five cigarettes per day (cpd), not on psychotropic or hormonal medications, and in stable health. Subjects were stratified into two groups: (1) those meeting lifetime criteria for MDD/DS based on Composite International Diagnostic Interview (CIDI) and/or Patient Health Questionnaire-9 (PHQ9) (DS group); and (2) subjects not meeting criteria for MDD/DS (No-DS group). Subjects with active MDD within the past six months were excluded. To measure premenstrual symptoms, smoking urges, and withdrawal symptoms, subjects completed the Premenstrual Assessment Form (PAF), the Questionnaire on Smoking Urges-Brief (Brief QSU), and the Minnesota Nicotine Withdrawal Scale (MNWS), respectively.

Results: Subjects (n=129) were, on average, 29.3±7.0 years old and 42% were non-white. The DS group (n=64) smoked significantly fewer cpd compared to the no-DS group (n=65, 11.9±4.6 vs. 15.1±6.6; respectively, p=0.002). There were no other significant demographic differences. Controlling for cpd, a significant difference was found in MNWS total (No-DS: 0.4±0.6; DS: 0.8±0.8, p=0.003), seen in the items of restlessness, depressed mood, insomnia, and difficulty concentrating. No other significant differences were found in PAF, QSU, or MNWS scales.

Conclusion: Women smokers who experience depressive symptoms may have more difficulty with concentrating, restlessness, depressed mood, and insomnia during ad libitum smoking compared to those who have not experienced depressive symptoms. Future studies should examine the potential impact of this relationship on cessation outcomes.

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POS2-48

EFFECTS OF NICOTINE ON EEG AND AFFECT IN ADOLESCENT FEMALES WITH MAJOR DEPRESSIVE DISORDER: A PILOT STUDY

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Background: Given that smoking is typically initiated during adolescence, and that this period in brain development appears to be uniquely sensitive to nicotine, depressed youth may be most susceptible to nicotine's neuromodulatory and mood-altering effects. Electroencephalographic (EEG) studies suggest that individuals with Major Depressive Disorder (MDD) exhibit hypofunction (indexed by increased EEG alpha) in the left frontal lobe, a region implicated in positive affect regulation. Smoking/nicotine has been shown to shift frontal EEG activation to the left hemisphere in healthy smokers.

Objectives: This pilot study investigated whether acute nicotine administration in adolescent female smokers with MDD would alter resting EEG activity and measurements of affect. Methods: Subjective mood ratings and EEG recordings were acquired before and two hours after administering a transdermal placebo or nicotine (21 mg) patch to eight adolescent female smokers with MDD.

Results: Most notably, nicotine induced a modest increase in alpha1 amplitude in the right hemisphere and simultaneously decreased left-favoring alpha1 amplitude asymmetry. It also attenuated left alpha1 and alpha2 amplitude in the central region. Consistent with nicotine's stimulatory action, decreased theta amplitude in the parietal region of the right hemisphere was also observed. No accompanying mood alterations were found, although smoking withdrawal and craving as well as physical symptom scores were reduced with nicotine.

Conclusions: The results of this pilot study, the first to examine the electrocortical effects of nicotine in depressed adolescents, indicate that nicotine modulates EEG asymmetry measures, laying the stage for further research regarding the role of nicotine on affective neurocircuitry in this population.

This pilot study was supported by the University Medical Research Fund (UMRF) of the Royal Ottawa Mental Health Group.

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POS2-49

DEVELOPMENT AND PILOT TESTING OF A WEB-BASED INTERVENTION FOR COLLEGE SMOKERS

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College offers a unique opportunity to encourage young adult smokers to quit before they progress to lifelong nicotine dependence. The majority of smoking prevention programs are targeted towards adolescents, leaving a dearth of secondary prevention programs for the population with the highest smoking prevalence (ages 18-24). We addressed this gap by designing a cessation intervention specifically for college students. A prior randomized trial by Simmons and Brandon (2007) demonstrated that a group-based smoking intervention based on cognitive dissonance theory produced changes in intentions to quit smoking among this population. Given the popularity and use of the Internet among this age group, we integrated the cognitive dissonance paradigm into a web-based experiential smoking intervention, thereby increasing potential reach. The development of this novel intervention presented unique challenges with respect to technical constraints, interactivity, and appeal to young-adults. With the assistance of a multidisciplinary team, an original, young-adult oriented website was created with the capability to collect metrics about how the users interact with the website. Based on feedback obtained from college students, we included relevant graphics, statistics, and content topics (e.g., short-term health and appearance effects, costs of smoking). Our prototype website was pilot tested to assess all intervention components (e.g., navigation, format, playback and video recordings via web camera). Pilot testing was completed with 20 college smokers (55% female) who had a mean age of 20.2 and smoked an average of 63.5 cigs/week. Revisions to graphics and content (e.g., role of tobacco companies) were made based on participants' feedback. Overall, participants responded favorably to the website, with 88% reporting that they would recommend the site to a friend and 95% reporting increased intentions to quit smoking. Participants' comments and suggestions will be summarized. Additionally, steps in the website development process will be delineated, along with challenges encountered. Findings will inform the development of web-based interventions targeting young adults.

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POS2-50

SMOKING-RELATED ABSTINENCE EXPECTANCIES AMONG WHITE AND AFRICAN AMERICAN SMOKERS

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Abstinence-related smoking expectancies are conceptualized as the range of consequences that smokers anticipate from quitting. These expectancies are multidimensional and have been shown to predict tobacco dependence, withdrawal severity, motivation to quit, and abstinence self-efficacy, among other variables. It has yet to be investigated how these expectancies relate to ethnic identity, thus the goal of the current study was to explore abstinence-related expectancies in White and African American smokers. African American smokers tend to be more dependent, are more likely to suffer from smoking-related illnesses, and, although they smoke fewer cigarettes, are less likely to make quit attempts when compared to White smokers. The wealth of literature highlighting this health disparity indicates this population warrants further study. Participants were 185 White and 151 African American adult smokers of at least 10 cigarettes per day who completed the Smoking Abstinence Questionnaire (SAQ), a measure of abstinence-related expectancies, in addition to other smoking-related measures. Consistent with hypotheses, African Americans held weaker expectancies for the efficacy of professional treatment and pharmacotherapy in aiding them during cessation, had stronger expectancies for optimistic outcomes, and expected less withdrawal than Whites. These findings suggest that African Americans may regard smoking cessation as less difficult than Whites in some respects, a perception upon which to capitalize when developing cessation interventions tailored towards African American smokers. However, it may also be the case that African Americans' weaker expectancies for the effectiveness of professional intervention could be a barrier to seeking treatment.

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POS2-51

VARENICLINE IN HEAVY DRINKING SMOKERS: EFFECTS ON SMOKING AND DRINKING AND SAFETY AND TOLERABILITY

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Varenicline, an approved smoking cessation pharmacotherapy, results in greater smoking abstinence rates than bupropion and may also yield better smoking cessation outcomes than nicotine replacement therapy. Recent evidence also suggests that varenicline may be a promising potential treatment for alcohol dependence. Nevertheless, varenicline has not been tested in heavy drinking smokers. Extended pretreatment with varenicline may result in better smoking cessation outcomes than the standard 1-week lead in period, and this has also not been assessed. We conducted a pilot study to obtain preliminary information about the effect of varenicline on drinking behavior and the effects of extended pretreatment on smoking. Thirty heavy drinking smokers received smoking cessation counseling and were randomly assigned to receive either an extended 4-week pretreatment with varenicline 2mg daily or the usual 1-week pretreatment. To accomplish this, one group received active medication for 8 weeks (extended pretreatment) and the other group received 3 weeks of placebo followed by varenicline for 5 weeks (usual pretreatment). The day before the week 4 quit date, participants received advice to abstain from drinking for the first 2 weeks of quitting smoking or to reduce their drinking. Four out of 15 participants in the extended pretreatment condition reported continuous smoking abstinence over the last 4 weeks of treatment compared with 2 out of 15 participants in the usual pretreatment condition. Extended pretreatment was also associated with significantly greater reductions in cigarette smoking over the entire study period. Participants who received varenicline during the first 3 weeks also reported significantly greater reductions in alcohol craving and numerically fewer heavy drinking days (22.7%) compared to those who received placebo (38%)(d=.60) and these differences persisted during the open-label phase. Varenicline was well tolerated; there were no reports of suicidality. Findings from this preliminary study suggest that varenicline may be a promising strategy for concurrently promoting smoking cessation and reducing heavy drinking in a heavy drinking population.

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POS2-52

NICOTINE DEPENDENCE AS A MODERATOR OF A QUITLINE-BASED MESSAGE FRAMING INTERVENTION

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High nicotine dependence is a reliable predictor of difficulty quitting smoking and remaining smoke-free. Previous research also suggests that the effectiveness of various smoking cessation treatments may vary by nicotine dependence level. Nicotine dependence, as assessed by Heaviness of Smoking Index total scores at baseline, was evaluated as a potential moderator of a message-framing intervention provided through the New York State Smokers' Quitline (free telephone based service). Smokers were exposed to either gain-framed (n = 810) or standard-care (n = 1222) counseling and printed materials. Those smoking 10 or more cigarettes per day and medically eligible were also offered a free 2-week supply of nicotine patches, gum, or lozenge. Smokers were contacted for follow-up interviews at 3-months by an independent survey group. There was no interaction of nicotine dependence scores and message condition on the likelihood of achieving 7-day point prevalence smoking abstinence at the 3-month follow-up contact. Among continuing smokers at the 3-month follow-up, smokers who reported higher nicotine dependence scores were more likely to report smoking more cigarettes per day and this effect was greater in response to standard-care messages than gain-framed messages. Smokers with higher dependence scores who received standard-care messages also were less likely to report use of nicotine medications compared with less dependent smokers, while there was no difference in those who received gain-framed messages. These findings lend support to prior research demonstrating nicotine dependence heterogeneity in response to message framing interventions and suggest that gain-framed messages may result in less variable smoking outcomes than standard-care messages.

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POS2-53

DEVELOPMENT OF A BRIEF MOTIVATIONAL INTERVENTION TO FACILITATE ENGAGEMENT OF SMOKING CESSATION TREATMENT AMONG INPATIENT DEPRESSED SMOKERS

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The overall objective of this research program is to develop a smoking cessation intervention for psychiatric inpatient cigarette smokers with depression. Using a motivational interviewing (MI) intervention we intend to facilitate engagement in an outpatient treatment for nicotine dependence with demonstrated efficacy. The two-phase project includes: Phase 1: Treatment Development; Phase 2: Pilot Randomized Trial comparing MI to provision of resource information only. We report on results from Phase 1. Fifteen smokers with depression (46.7% Female; mean age = 44.5) who were receiving inpatient psychiatric services completed the MI protocol and provided ongoing feedback regarding their experiences and perceptions of the intervention. Iterative feedback along with the recommendations of the hospital and study staff, was used to modify and refine a new single session MI protocol. Qualitative and quantitative evaluations supported the Acceptability of the MI intervention and excellent therapist Adherence to the MI protocol. Smoking Outcomes. Upon admission, smokers on averaged consumed 19.97 cigarettes per day and presented with a moderate level of nicotine dependence (mean FTND=6.07). Prior to the MI intervention, smokers presented with a range of motivation to make changes in their smoking with a majority reporting intentions to smoke the same or reduce the amount they smoke. On self-report assessments of barriers to cessation, smokers ranked concern with weight gain highest followed by difficulty managing urges, given past experiences quitting. We observed positive shifts towards intentions to quit smoking after the MI intervention. Upon discharge, 46.7% reported interest in cessation treatment and 13% engaged in our 8-week counseling and nicotine patch treatment within one-month. During the 6-month follow-up period, 40% of MI participants made an attempt to quit smoking and an additional 27% reduced the amount that they smoked. We expect that as a result of this project, we will have developed a brief intervention that will dramatically increase utilization of smoking cessation programs among this high-risk population.

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POS2-54

EFFECTIVENESS OF VARENICLINE COMBINATION THERAPY IN REAL LIFE SETTING: PAF DATABASE STUDY

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Varenicline is a licensed drug for smoking cessation in many countries worldwide. Nevertheless, there are few studies showing its performance in real life setting, in particular in association with other drugs usually prescribed in this clinical scenario. The aim of this study was to evaluate the effectiveness of varenicline mono- or combined-regimen in a sample of patients from a specific cardiovascular smoking cessation service in São Paulo city- Brazil.

Methods: We investigated continuous abstinence rate (CAR) after 12 months from starting varenicline. Varenicline users were identified from the records of the "Programa de Assistência a Fumantes" PAF Database (Heart Institute - São Paulo, Brazil). Varenicline was prescribed to 408 patients in our program. 351 patients agreed to use the medication and had follow-up information for 52 weeks. The investigated variables were gender, age, nicotine dependence, clinic and psychiatric comorbidities. Use of combination therapy of varenicline with antidepressants or bupropion (or both) was also analyzed.

Results: Overall abstinence rate at 52 weeks was 42.7%. Patients on varenicline monotherapy (229) presented CAR of 38.7%; patients on both varenicline and antidepressive (53) presented a CAR of 45.3% (p=0.05; OR (95%CI) 1.9 (1.0-3.7)); patients on varenicline + bupropione (49) presented a CAR of 55.1% (p=0.01; 2.3 (1.2-4.4)) and patients on a three drug regimen (20) presented a CAR of 70% (p=0.002; 5.4 (1.9-15.4)). Use of combination therapy was still significantly associated with a higher CAR even after adjustment for age, gender, previous depression diagnosis and Fagerstrom score.

Conclusion: The prescription of varenicline for smokers in real life settings proved to be safe and effective. These results are better than those from all varenicline trials. The combined therapy with bupropion or other antidepressants drugs seems to improve the abstinent rates. Our results suggest the necessity to perform randomized clinical trials to test this hypothesis.

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POS2-55

UP IN SMOKE? COGNITIVE-BEHAVIORAL MOTIVATIONAL ENHANCEMENT +/- NICOTINE REPLACEMENT THERAPY FOR ADOLESCENT SMOKERS

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Cigarette smoking is a worldwide health concern, with smoking behaviors typically emerging during adolescence. Although considerable research has evaluated prevention strategies to keep adolescents from initiating smoking, less work has focused on developing therapies for adolescent smokers. Of available treatments, psychosocial interventions, such as motivational enhancement (ME) and cognitive behavioral therapy (CBT), are effective in reducing adolescent smoking. Nicotine replacement therapy (NRT) in combination with CBT (group therapy) modestly increase abstinence rates (Moolchan et al., 2004), but information on treatments that incorporate NRT into psychosocial interventions is limited. We therefore assessed the early efficacy of a smoking cessation program tailored to adolescents (ages 14-21). Six sessions of one-on-one cognitive behavioral motivational enhancement (CBME) were provided in conjunction with an optional, four-week treatment of open-label NRT (NicoDerm CQ). The CBME program combined motivational enhancement techniques, cognitive behavioral therapy, youth-oriented materials and peer-to-peer delivery. From 163 inquiries regarding the study, 41 youth consented to participate and 34 initiated study procedures (71% male, 29% female, avg. age = 18.8 years old). The average number of cigarettes smoked per day at entry was 12.7 (s.d. 7.9), and 94% of the participants were daily smokers. Participants attended an average of 4.3 counseling sessions. 81% accepted NRT and 73% provided data for the final session. Significant declines were oberved in nicotine dependence ($p < .001$) on the Cigarette Dependence Scale (CDS-12; Etter et al., 2003) and nicotine withdrawal on the Minnesota Nicotine Withdrawal Scale (M-NWS; Hughes and Hatsukami, 1986) by the end of the intervention period. Initial efficacy results suggest that a treatment combination of CBME and NRT is effective in reducing nicotine dependence in adolescents.

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POS2-56

IS TREATMENT OF TOBACCO USE ASSOCIATED WITH PSYCHIATRIC RE-HOSPITALIZATION?

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Beliefs exist in the clinical, research, and public arenas that tobacco use serves as a form of self-medication for persons with psychiatric disorders. If true, one would expect psychiatric symptoms to worsen and mental health service use to increase following treatment of tobacco use. In a randomized controlled trial, we tested this hypothesis in a sample of 224 smokers (59% male, age M= 40 yrs, 63% Caucasian) recruited from an inpatient psychiatry unit. All patients were offered nicotine replacement during hospitalization to manage withdrawal. Treatment participants also completed

a stage-tailored computer intervention, received a manual, 30-min counseling session and up to 10-wk of nicotine patch post-hospitalization. Treatment was tailored to smokers' readiness to quit; intention to quit smoking was not required for participation (79% recruitment rate). Participants in the two conditions were comparable at baseline on all measured demographic, clinical and tobacco use variables. Confirmed cessation rates were 4.4%, 6.6%, 12% and 8.9% for control participants and 14%, 15.5%, 19.4% and 20.5% for treatment participants at months 3, 6, 12 and 18 follow-up, respectively; $\chi 2$ (df)=14.7 (1) $p<0.001$ for condition in a GEE-based logistic regression; retention >80% at all timepoints. The psychiatric rehospitalization rate over the 18-month follow-up period was 46%, which was comparable to California statewide data (44% in a reported 12-month period). Rehospitalization was unrelated to quit status and significantly higher for control versus intervention participants (138 vs. 94 rehospitalizations, t-test = 2.01, df=222, p=.046). In univariate tests, African American race, psychotic symptoms at baseline, lower income, and prior hospitalizations also predicted rehospitalization. In a multivariate negative binomial regression model, prior hospitalizations ($p<.001$) and treatment condition (p=.032) remained significant predictors of future rehospitalizations, while race, psychotic symptoms and income did not. The findings indicate that treating tobacco dependence predicted reduced, rather than increased, mental health service use in smokers with serious mental illness.

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POS2-57

CIGARETTE SMOKING PREDICTS POORER TREATMENT OUTCOMES FOR ALCOHOL DEPENDENCE

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Background: Despite consistent evidence of a strong link between tobacco and alcohol use, few studies have examined pre-treatment smoking status as a potential predictor of alcohol dependence treatment outcomes. Extant studies are mixed in their conclusions; where associations between smoking and alcohol outcomes have been reported, smoking has been linked to both better and worse treatment effects. Thus, we examined smoking status as a predictor of treatment outcomes in a randomized, controlled trial of citalopram vs. placebo to promote abstinence or significant reduction in alcohol use in treatment-seeking outpatients with alcohol dependence.

Methods: Participants were alcohol dependent adults (n=184) without current mood, anxiety, psychotic, or other substance use disorders who were participating in a pharmacogenetics trial of a selective serotonin reuptake inhibitor. All participants received motivational interviewing and compliance enhancement therapy (MI-CET) in addition to citalopram (n=122) or placebo (n=62). Participants were classified as current smokers (n=56; 30%) if they reported smoking 100+ cigarettes over their lifetime and smoking any amount within the month prior to screening. Severity of alcohol dependence was assessed using the Alcohol Dependence Scale (ADS), and alcohol craving was measured with the Obsessive-Compulsive Drinking Scale (OCDS).

Results: After controlling for age, treatment group assignment, treatment goal (abstinence vs. reduction), ADS scores, and baseline drinking, current smokers had a higher percent of heavy drinking days (p=.001) and lower percent of days abstinent ($p < .02$) during the treatment period. Alcohol craving did not differ by smoking status either at baseline or during the treatment period.

Conclusions: Pre-treatment smoking status may serve as a clinical indicator for worse alcohol treatment outcomes, but this finding was not attributable to increased alcohol craving among smokers. Future work will explore alternative mechanisms underlying the relationship between smoking status and alcohol outcomes.

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POS2-58

DOES DISTRESSED MOOD REDUCE THE LIKELIHOOD OF SMOKING CESSATION IN NEWLY DIAGNOSED CANCER PATIENTS?

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For smokers diagnosed with cancer, cessation is associated with improved survival, less treatment complications, and lower risk of disease recurrence. Despite the compelling medical reasons for quitting, cancer is fraught with emotional challenges that can result in distressed mood. Although distressed mood may activate a patient to quit, it is also plausible that it may hinder cessation efforts. Pooled data were analyzed from 185 smokers who participated in a cessation trial targeting tobacco dependent, recently diagnosed cancer patients scheduled for surgery. All were provided cessation counseling and NRT. Smoking abstinence was biochemically verified and measured at hospitalization, 3 and 6 months following hospitalization. The Hospital Anxiety and Depression Scale (HADS) was used to measure distressed mood. Longitudinal point-prevalence outcomes were fitted with HADS anxiety (HADS-A) and depression scores (HADS-D) in two logit Generalized Linear Mixed Models. Longitudinal smoking outcomes were predicted by the HADS-A scores assessed in the preceding time points in a lagged model to ensure clear temporal causality. A parallel model was fitted with HADS-D scores. Altogether 555 longitudinal observations were included. In both models, there were significant interactions between time and distressed mood ($p = 0.015$ and $p = 0.011$ for HADS-A and HADS-D, respectively) on smoking abstinence. Further, odds ratios of smoking abstinence were tested using a clinical cutoff score of HADS > 8. Abstinence at 3 months was significantly lower among patients who at hospital admission exceeded the anxiety cutoff than the non-anxious (OR=0.884, 95% CI=0.808, 0.969). Similarly, patients depressed at hospitalization were significantly less likely to abstain than the non-depressed (OR=0.906, 95% CI=0.822, 0.998). However, HADS-A and HADS-D scores at 3 months did not reliably predict abstinence at 6 months, perhaps due to lower anxiety (from 8.4 at baseline to 6.8 at 3 months) and depression (4.9 to 4.6). These findings suggest that smokers should be screened for distressed mood and that strategies for coping with distressed mood be integrated into cessation efforts.

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POS2-59

INTEGRATING TOBACCO TREATMENT INTO THORACIC ONCOLOGY SETTINGS: A PROCESS EVALUATION

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Tobacco treatment is not routinely provided in oncology clinics despite benefits to cancer treatment efficacy. We conducted a pilot study (n=49), integrating tobacco treatment (12 weeks of varenicline plus proactive motivational counseling) into thoracic oncology settings at Massachusetts General Hospital. We report process evaluation data regarding: (1) clinic integration, (2) intervention tailoring to cancer treatment, and (3) intervention adherence. Of the 187 patients who smoked, 93% were screened for the study. Intervention participants completed a median of 9 counseling sessions, 2 more than planned. 73% of intervention participants took varenicline ≥1 month and 50% completed the full course; many continued varenicline despite side effects. Integration into clinics was achieved by nominating a nurse advocate, meeting individually with clinicians, and attending clinic meetings. We identified patients during initial thoracic oncology and surgery visits by screening the electronic health record, adding standardized tobacco questions to the clinic intake form, and tailoring recruitment to clinic flow. The counseling intervention was flexible in modality, content and timing to accommodate variations in diagnosis and treatment (63% of participants were diagnosed with cancer by study end; time to treatment, if any, varied [Mdn: surgery=48 days, radiation/chemo=41 days, surgery+chemo/radiation=8 days]). To maximize adherence, we (1) distinguished between varenicline vs. cancer treatment side effects and (2) negotiated doses/medication breaks during cancer treatment. In sum, we successfully integrated tobacco treatment into thoracic oncology settings. Recruitment was facilitated by obtaining clinic buy in and integrating into clinic flow. Since time to diagnosis and treatment (if any) and treatment type was highly variable, flexibility in treatment modality and timing facilitated patients taking more counseling calls than expected. By tailoring pharmacotherapy dosing to reduce side effects and interactions with cancer treatment, we obtained acceptable pharmacotherapy adherence. Lessons learned can inform integration of tobacco treatment into oncology care.

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POS2-60

NEURAL CORRELATES VARY WITH STRATEGIES TO RESIST THE URGE TO SMOKE IN RESPONSE TO EXPOSURE TO SMOKING-RELATED CUES

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OBJECTIVE: Craving to smoke during a smoking quit attempt is associated with relapse. In this ongoing study, we aim to characterize the brain activation patterns correlated with specific strategies that nicotine dependent smokers used to resist cue-induced craving in the MRI scanner.

METHODS: Thirty-two nicotine dependent smokers underwent a BOLD fMRI scan with presentation of visual smoking cues, neutral cues, and rest periods in a block design under two conditions: allowing craving and resisting craving. Data was analyzed with FSL 4.1.5 focused on the smoking cues versus neutral cues contrast, using cluster thresholding (Z>2.3 and corrected cluster threshold of p=0.05) at individual and group levels. Regions of interest are reported from the resist condition in the smoking minus neutral contrast.

RESULTS: Participants were able to significantly reduce their subjective rating of craving on a scale of 0-10 (p=.0003) between the two scanning conditions. Analysis of the entire group with FLAME1 showed activation in the left ACC, left PFC and OFC. The most commonly used strategies to resist the urge to smoke were distraction (40%) and contemplating the adverse effects of smoking (22%). Comparing the top two strategies, distraction (n=13) and contemplation of the adverse effects of continued smoking (n=6), with a fixed effects analysis revealed differing patterns of regional brain activation. Distraction compared to rest activated a broad network of regions including right PFC, right OFC, and bilateral precuneus, bilateral mid temporal cortex, bilateral inferior parietal cortex and bilateral angular gyri. In contrast thinking about the negative effects of smoking activated the left ACC and small area of the bilateral PFC. Increased activation was seen in left ACC and bilateral PFC during distraction compared to adverse effects contemplation. In contrast no activations were seen comparing adverse effects to distraction.

CONCLUSIONS: Distinct neural activation patterns are seen with different strategies to resist craving. These discrete areas of activation are a potential focus for cognitive strategies, medication or neuromodulation with non-invasive devices.

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POS2-61

GENETIC EPIDEMIOLOGY OF CIGARETTE AND SNUS USE IN ADULT SWEDISH TWINS

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Objectives: We investigated the role of genes and environment in cigarette smoking and Swedish smokeless tobacco (snus) use in a population-based sample of Swedish twins 20-47 years old who participated in the baseline assessment of a prospective study of smoking cessation.

Methods: Detailed cigarette and snus use histories were obtained via web questionnaire and telephone interviews from 19,073 Swedish twins in 2004-2005. Standard univariate and bivariate biometrical modeling was undertaken, including age regression and age x genotype and age x shared environment interaction.

Results: The prevalence of lifetime cigarette smoking was similar in males and females and declined with age. Snus use was much more prevalent in males than in females and declined significantly with age in males. The contribution of genetic and environmental factors to the liability to cigarette was stable across the age range in males, with significant heritability and a limited role of shared environmental factors. However, heritability of snus use declined significantly across the age rage, while shared environmental factors became more important. In females, heritability significantly increased with age and shared environmental effects decreased for cigarette and snus use. The results for any tobacco use were similar for males and females. The bivariate analyses indicated significant overlap in genetic influences on cigarette and snus use in males and females. In addition, independent genetic factors accounted for a significant proportion of liability to snus use. Similarly, specific environmental factors were partly shared between the two forms of tobacco use and partly specific. Shared environmental factors only contributed significantly to cigarette use in women.

Conclusions: The role of genetic and environmental factors in liability of smoking depended on sex and type of tobacco use. While there appeared to be significant overlap in genetic factors to cigarette and snus use, snus-specific genetic factors also accounted for a significant proportion of the genetic variance.

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POS2-62

MOTIVATION TO QUIT: A COMPARISON OF THE EFFECT OF NEGATIVE SELF-EVALUATION MOTIVATION AND AUTONOMOUS MOTIVATION ON SMOKING OUTCOMES

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Although alternative theories of health behavior suggest different constructs should be targeted for facilitating behavior change, studies rarely examine the interrelationships and relative predictive power of alternative constructs. In this study, we compared motivational constructs drawn from self-determination theory (autonomous regulation and controlled regulation) and social cognitive theory (negative self-evaluative emotions) as predictors of smoking behavior change among college students. Data were drawn from a cluster randomized trial examining the efficacy of Motivational Interviewing (MI) for smoking cessation relative to an attention control (MI for increasing fruit and vegetable intake). Participants with complete data (N=303) from 30 college fraternities and sororities who smoked within 30 days of enrollment received up to 4 sessions of MI in each arm and competed assessments of the number of days smoked in the past 30-days, number of cigarettes smoked, autonomous regulation, controlled regulation, and negative self-evaluative emotions at baseline, the end of treatment, and 6-month follow-up. At baseline, autonomous and controlled regulation, but not negative self-evaluative emotions were significantly related to the number of cigarettes and days smoked (r=.16 to .24, p's<.01). Latent curve modeling that assessed relationships over time revealed that only autonomous regulation continuously increased, and that the increase only in autonomous regulation was related to decreases in smoking over time (r=.32 and .31). Treatment group assignment did not affect these relationships. Results suggest that autonomous motivation from self-determination theory is a more powerful predictor of smoking behavior change than negative self-evaluative emotions from social cognitive theory, and may be a preferred target of interventions.

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POS2-63

SEPARATE AND COMBINED EFFECTS OF ZYBAN AND CHAMPIX ON SPECTRAL EEG IN TOBACCO ABSTINENT SMOKERS

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Background: Electroencephalographic (EEG) recordings in daily cigarette smokers have shown that nicotine increases electrocortical arousal as indexed by increased power of fast frequency waves (alpha2 & beta). During smoking abstinence, cortical deactivation is observed by slow frequency (alpha1, theta & delta) power increases, which has been related to depressed mood and increased irritability. The effectiveness of existing smoking cessation aids is relatively modest. While improved efficacy of combined nicotine replacement therapies (NRT) has received some support, treatment response to combinations of non-nicotine based pharmacotherapies is unknown. Bupropion (Zyban®) and varenicline (Champix®), two non-NRTs, decrease smoking cravings and withdrawal symptoms via different pharmacological mechanisms. Objectives: This pilot study examined the effects of an acute dose of Champix and Zyban alone and in combination compared to placebo, on electrocortical activity in tobacco abstinent smokers.

Methods: Participants attended four randomized testing sessions within a double-blind

design. Two capsules were administered each session: (1) two placebo capsules; (2) placebo and Champix (0.5 mg); (3) placebo and Zyban (150 mg); (4) Champix and Zyban. Spectrally analyzed, eyes-closed frontal and parietal EEG recordings (3 min) of 14 overnight and morning abstinent smokers (6 females) were obtained for each session.

Results: The combination treatment induced a decrease of the alpha1 power in the parietal region compared to placebo. Zyban induced a decrease of alpha1 power in left versus right frontal region, and tended to decrease alpha2 power in the left versus right parietal region. Champix reduced alpha2 and beta2 power in the left versus the right parietal region and also decreased beta2 power compared to placebo in the parietal region.

Conclusions: This pilot study, the first to examine the acute separate and combined effects of two non-nicotine based anti-smoking therapies on electrocerebral activation, showed distinct different pharmaco EEG profiles that may have implications for cessation treatment.

This pilot study was supported by grants to Verner Knott from the Canadian Institute of Health Research (CIHR) and the Natural Sciences and Engineering Research Council (NSERC).

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POS2-64

CULTURAL COMPETENCE IN TOBACCO CESSATION TREATMENT: THE TEACH PROJECT FOR FRANCOPHONES

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Background: There is a need for cultural competence in tobacco cessation treatment, especially among linguistic minorities, who may face additional barriers to treatment. Seven per cent of the Ontario population is Francophone, and smoking is substantially higher among Francophones even when controlling for socio-economic status and education.

Objectives: Project TEACH pour les francophones is a university-accredited certificate program designed to train Francophone health care practitioners in intensive smoking cessation counseling. This program is a culturally appropriate adaptation of the TEACH (Training Enhancement in Applied Cessation and Counselling) Project and could serve as a model for others' development of culturally appropriate education programs and clinical resources.

Methods and Results: First, TEACH for Francophones carried out a review of French-language clinical tools and client resources and compiled these into a document that has been disseminated to over 500 practitioners and groups via Web-based and direct contact requests. This document identifies gaps in the literature and comprises a catalogue of available cessation resources for practitioners and clients. In order to identify stakeholders' needs, an assessment was conducted through an anonymous online survey, regional focus groups, and key informant interviews. Forty-nine health care professionals were consulted, and the results guided subject matter experts in adapting educational and clinical materials. Since then, TEACH has trained over 100 Francophone health professionals in the delivery of intensive tobacco cessation interventions. Mean course overall satisfaction evaluation ratings of 4.77 (where 5 = highest/best), as well as follow-up data and sustainable community of practice engagement, demonstrate how TEACH can serve as a model of a comprehensive, culturally appropriate clinical training initiative to support capacity-building and practice change. This poster presentation will discuss the project's model, methodology, and evaluation results, with lessons learned and implications for other cultural adaptation/knowledge translation initiatives.

Ontario Ministry of Health Promotion.

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POS2-65

DOES PARENTAL DISAPPROVAL AND SMOKING STATUS INFLUENCE ADOLESCENT SMOKING CESSATION EFFORTS?

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Parents have known to impact adolescent smoking cessation behaviors. To further explore this relationship, we examined the influence of parental disapproval and parental smoking status on smoking cessation behaviors among daily-smoking adolescents seeking treatment, as well as the effect of parent and adolescent gender on this relationship. We analyzed the baseline data of a sample of 184 high school-aged treatment-seeking adolescent daily smokers participating in a smoking cessation program. At intake, participants completed questions on parental disapproval of smoking ("If your mother/father knows you smoke, how does she/he feel about your smoking?"), parental smoking status ("Does your mother/father currently smoke daily?"), and past smoking cessation efforts defined as "the number of quit attempts that lasted longer than 24 hours" and "the longest number of days of abstinence". Results indicated that girls and boys did not differ in the number of quit attempts but girls were likely to be abstinent longer (OR = 20.34, $p < .01$). For the overall sample, mother's smoking status (B = .78, t (184) = 2.50, $p < .01$) and mother's disapproval of smoking (B = -.56, t (184) = -2.88, $p < .01$) were associated with greater number of quit attempts. Additionally, having a non-smoking father was predictive of more days of abstinence (B = 2.36, $p < .01$, OR = 10.63). The interaction of gender with father's smoking ($p < .01$) and with mother's disapproval of smoking ($p < .01$) showed that parents' smoking status and disapproval of smoking influence the duration of abstinence differently for boys and girls. When boys and girls were examined separately, the influence of father's non-smoking status on duration of abstinence was significant for girls only (girls: n = 89, OR = 10.62, $p < .01$) and mother's non-smoking status were significant for boys only (boys: n = 95. OR = 5.29, $p = .01$). In conclusion, parents exert strong influence on adolescent smoking cessation, and this association appears to be gender-specific. Further research is needed to understand the mechanisms that explain gender differences in parental influence on adolescent smoking cessation behaviors.

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POS2-66

UNDERSTANDING THE SELF-REPORTED REASONS FOR SMOKING AND THE IMPACT OF NICOTINE ON COGNITION IN PEOPLE WITH SCHIZOPHRENIA

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Individuals with schizophrenia have a very high rate of cigarette smoking and nicotine dependence. Elevated smoking, in combination with a reduced quit rate, places this clinical population at a high risk of cardiovascular related diseases significantly reduces life expectancy. We are investigating suggestions that, in contrast to people without schizophrenia, people with schizophrenia smoke in part due to the effects that nicotine has on negative symptoms and cognitive function. However, initial data from a self-report study indicate that in 215 participants (schizophrenia, N = 153; bipolar, N= 62) there were no differences in the level of endorsement of self reported arousal and stimulation motives for the schizophrenia group (M = 1.95, SD = 1.14) compared to a group with bipolar affective disorder (M = 1.84, SD = 1.09). Additionally, there were no statistically significant differences between the schizophrenia and bipolar groups in endorsement of self-reported social or habitual motives for smoking (including stress reduction or addiction). In a separate study we are assessing the effects of nicotine on cognition in schizophrenia more directly. While it is known that presence of nicotine can improve cognition (in particular, visual spatial working memory) in schizophrenia, the specific components of the cognitive task performance that may be affected are unknown. In this study we will identify whether improved visual-spatial working memory performance reflects nicotine affects on visual acuity, retention of spatial information and/or resistance to interference. If nicotine-induced remediation of cognitive deficits contributes to smoking motivation in schizophrenia, then clarification on the crucial aspects of cognition that are affected will identify a potentially important new target in smoking intervention programmes.

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POS2-67

GENDER DIFFERENCES IN SMOKING PROCESSES AMONG SMOKERS WITH ASTHMA

Kimberly M. Avallone, B.S.*, Alison C. McLeish, Ph.D., Emily Jeffries, and Christina M. Luberto, B.A., University of Cincinnati

Despite the known compromising effects of smoking on lung functioning and health, smoking is more prevalent among individuals with asthma compared to those without (McLeish & Zvolensky, 2010). In order to better understand smoking behavior and improve smoking rates among smokers with asthma it is important to understand the processes that underlie their smoking behavior (e.g., smoking motives). Extant research indicates that among smokers in general there are gender differences in smoking motives, such that females report smoking more to regulate affect and avoid withdrawal

states compared to males (Sussman et al., 1998; Livson & Leino, 1988). However, no research, to date, has examined these issues among adult smokers with asthma. As asthma is more prevalent among adult females compared to males (ALA, 2010), such knowledge is critical to help guide interventions and treatment programs for these individuals. Thus, the purpose of the current study was to examine gender differences in smoking processes (i.e., motives for smoking and reasons for quitting) among adult smokers with asthma. The study sample consisted of 118 regular daily smokers (52.6% male, Mage = 38.3, SD = 12.04) with self-reported, physician-diagnosed asthma. There were no significant differences between males and females in terms of age, education level, number of years of regular smoking, smoking rate, and exhaled carbon monoxide level. Independent samples t –tests indicated that there were significant gender differences in terms of smoking motives, specifically habitual [$t(113) = -2.11$, $p < .05$], addictive [$t(113) = -2.80$, $p < .05$], negative affect reduction [$t(113) = -2.10$, $p < .05$], and pleasurable relaxation [$t(113) = -2.17$, $p < .05$]. Significant gender differences also exist with regard to reasons for quitting, specifically those related to social influence [$t(114) = -2.26$, $p < .05$]. In all cases, females scored higher than males. These results suggest that men and women with asthma differ on smoking processes and that smoking cessation interventions may need to be tailored by gender to address these differences.

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POS2-68

YEAR-1 PHARMACY STUDENTS SYSTEMATICALLY VISIT LOCAL SMOKE SHOPS: A PRE-CLINICAL METHOD FOR TEACHING FUTURE PHARMACISTS ABOUT TOBACCO USE AND DEPENDENCE

Hyma P. Gogineni, Pharm.D.*, David P.L. Sachs, Linda Hyder Ferry, M.D., M.P.H., Bonnie L. Sachs, R.N., M.S., and Mary Greas, Pharm.D. Candidate

Introduction: To adapt to FDA regulations, tobacco companies are more aggressively marketing smokeless tobacco products. 2006 Federal Trade Commission data showed that 116 million lbs of smokeless tobacco sold and they spent $354 million in advertising and promotion. Tobacco companies spent $42 million giving smokeless tobacco samples to the public. Smoke shops play a significant role in marketing these products. As part of a pre-clinical, course requirement, Yr-1 Loma Linda University School of Pharmacy (LLUSP) students studied the significance and impact of tobacco marketing at point-of-sale in smoke shops. Goal The 1° goal was to expose pharmacy students to tobacco marketing strategies and the types of tobacco products sold locally. The 2° goal was to observe the false claims made by smoke-shop owners if a customer wants to quit smoking.

Methods: All 73, Yr-1 LLUSP students surveyed 40 smoke shops in San Bernardino and Riverside counties in California, using a 53-item survey developed by the California Department of Public Health. The students focused on advertisements, shelving, and product displays.

Results: Smoke shop employees were knowledgeable about all tobacco products and could rapidly adjust their marketing strategy to an individual customer to most effectively meet that person's needs. The explicit and implicit claims made by the smoke shop employees increased the smoker's willingness to try these products, as an alternative to stopping smoking. Pharmacy students experienced the marketing strategies and claims made by smoke-shop owners firsthand and were even given smokeless-tobacco product samples as an alternative to stopping smoking. Smoke-shop owners claimed to LLUSP students that hookah bars and e-cigarettes are the safest form of nicotine and are equivalent to nicotine medications.

Conclusion: After this study, Year-1 LLUSP students concluded that customer service and convenience are key to any marketing strategy. Pharmacists should be similarly responsive and innovative with their marketing strategies, 1-on-1 in their pharmacies, to motivate, assist, and provide effective treatment so that their patients can successfully stop smoking.

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POS2-69

TOBACCO INTERVENTIONS WITH CO-MORBID POPULATIONS

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Morbidity from non-communicable diseases (NCDs, cardiovascular and chronic respiratory diseases, cancer and diabetes) represent approximately 60% of deaths worldwide, and smoking is strongly implicated in their development and trajectory. This session presents data from a new integrated chronic disease prevention course on screening, assessing and intervening with multiple risk factors, including smoking, in an integrated way.

Objective: To increase capacity among health care providers to integrate tobacco interventions for clients with complex co-morbid conditions – a new course developed as part of the university-accredited TEACH Certificate Program in Cessation Counseling, which has trained >2000 health practitioners from >15 disciplines since 2006.

Methods: A two-day course: INTEGRATED CHRONIC DISEASE PREVENTION: ADDRESSING THE RISKS was developed to target key chronic disease risk factors: smoking, prescription medication, alcohol, nutrition, depression and exercise. The course was piloted with 101 clinicians in 2010, and evaluated using formative and summative evaluations and pre and post Learning Assessments. Content areas included: an integrated model for chronic disease management/prevention, screening and assessing risk factors, integrating motivational interventions and setting practice objectives.

Results: Most represented disciplines were nursing (54.46%) and health educators (20.79%). Practitioners' ratings of confidence and feasibility in implementing knowledge and skills increased significantly post training ($p<.05$), and 97.0% set practice objectives. Overall course ratings were 4.63 out of 5 (5=highest/best). Three- and six-month follow up data will also be presented in this session.

Conclusions: Cessation opportunities with co-morbid patients are often missed due to their medical complexity and acute treatment needs. Yet patient self-management and lifestyle change may be the most enduring and important interventions, and tobacco cessation eliminates a key risk factor. Training health practitioners to integrate cessation as part of an overall strategy in addressing multiple risk factors helps address the burden of NCDs.

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POS2-71

SMOKING CESSATION AND METABOLIC PROFILE: RESULTS FROM A RANDOMIZED CONTROLLED TRIAL

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OBJECTIVE: This data analysis investigated the effect of smoking cessation vs. continued smoking on the metabolic profile of participants in a large, randomized, placebo-controlled clinical trial that evaluated the relative efficacies of 5 smoking cessation pharmacotherapy interventions. Metabolic syndrome (MS) is an under-recognized complication of smoking. Its relationship with smoking cessation is unclear at present.

METHODS: Metabolic laboratory and physical measurements were collected at baseline , 1 and 3 years post-quit attempt. Point-prevalence abstinence was confirmed biochemically at 1 and 3 years. The incidence of MS was calculated based on the ATP III clinical criteria, which requires the presence of 3 out of 6 laboratory or physical findings: abdominal obesity, triglycerides ≥ 150 mg/dL, high density lipoprotein (HDL) < 40 mg/dL for males or < 50 mg/dL for females, systolic blood pressure ≥ 130 mmHg or diastolic blood pressure (DBP) ≥85 mmHg, and fasting glucose (FG) ≥ 110 mg/dL.

RESULTS: Of the 1504 smokers participating in the trial, MS was present in 538 (35.8%) at baseline. Significantly more males than females presented with MS (39.6% vs. 33%, $p=0.008$). At 1 year, 28.9% (n=1028) of clinical trial participants had MS, a significant reduction from baseline ($p<0.001$). At 1 year, there was no significant difference in the incidence of MS between quitters and continuing smokers (31.8% vs. 27.2%). Quitters were more likely to have improved HDL levels (defined as % of males and females greater than 40 mg/dL or 50 mg/dL, respectively) vs. continuing smokers (5.1% vs. 2.2%, $p=0.017$), but were more likely to have increased waist circumferences vs. continuing smokers (3.1 cm ± 10.6 vs. 1.0 ± 6.35; $p=0.002$). While not statistically significant, DBP profiles worsened in quitters vs. continuing smokers (12.8% vs. 8.8%, $p=0.055$). Quitters also gained significantly more weight vs. smokers (4.6 kg ± 5.7 vs. 0.7 kg ± 5.1; $p<0.001$).

CONCLUSIONS: Results suggest that while some cardiovascular parameters, such as cholesterol and FG values improved or stayed the same for quitters at 1 year post-quit, significant weight gain may have increased abdominal obesity.

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POS2-72

PHYSICAL ACTIVITY AND SMOKING CESSATION: PRELIMINARY FINDINGS OF "THE GETTING PHYSICAL ON CIGARETTES" TRIAL

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Research has shown that supervised exercise as an adjunct to NRT facilitates smoking cessation, improves fitness and delays weight gain in women smokers. However, smoking relapse after program termination is a common problem. It is important to determine whether inexpensive home-based exercise maintenance interventions can maintain exercise, weight and fitness gains after cessation program termination, and prevent (reduce) smoking relapse. The purpose of the Getting Physical on Cigarettes trial is to definitively demonstrate whether exercise is a useful adjunct for smoking cessation by helping quitters maintain physical activity routines post-intervention and prevent smoking relapse and weight gain. The trial consists of a supervised exercise and NRT program lasting 14 weeks, which is followed by a home-based exercise maintenance program. The primary outcome measure is continuous smoking abstinence from baseline to week-14, week-26, and week-56. Female smokers (N=420) are randomized on week-8 to one of four conditions: Exercise; Exercise + Booklets (Forever Free series); Control + Booklets; Control. The Exercise groups will be counselled on maintaining exercise in their home environment. Preliminary data (N=118) showed that at the end of the exercise program (week-14) 61 participants (51.7%) were smoke free (confirmed by breath CO levels of less than 10ppm). A Chi square test showed no difference in abstinence across treatment condition (p>.05). Abstinence was however, related to adherence to the exercise program (p<.05). Specifically, 45, 12, and 4 of non-smoking participants attended > 80%, 60-80%, and < 60% of the 14-week program, respectively. Repeated measure ANOVAs (baseline to week-14) revealed improvements in participants' fitness (p<0.001), lung capacity (p=0.001), muscle mass (p=0.001), bone density (p=0.02), and cessation efficacy (p=0.003). Participants' fat mass increased from baseline to week-14 (p=0.011). Overall, these preliminary results suggest exercise may assist cessation when exercise adherence is high while contributing other important health benefits.

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POS2-74

RAISING THE BAR IN CLINICAL TRAINING ON CESSATION: AN INTERNATIONAL PERSPECTIVE - THE TEACH PROJECT (CANADA)

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The TEACH Certificate Program is accredited by three Faculties of Medicine in Ontario, Canada, as well as other accrediting partners and professional regulatory bodies. The 41.5-hour program consists of an online, interactive course; a classroom-based, three-day core course (A Comprehensive Course on Smoking Cessation: Essential Skills and Strategies); and one elective course addressing special populations and tobacco cessation interventions. Course content focuses on evidence-based best practice recommendations, clinical tools and applications, as well as best practices in teaching and learning. Theoretical foundations of TEACH emphasize a constructivist approach where participants learn collaboratively and experientially. All TEACH courses contain a minimum of 50% interactivity, and this is assessed and evaluated by participants for each course. Instructional design in courses includes case examples, small group practice exercises, live clinical demonstrations, video demonstrations, electronic audience voting systems, and large and small group discussion and consultation. A rigorous evaluation plan informs the project, including pre- and post-training learning assessments, formative and summative course evaluations, a formal faculty debriefing meeting, and online follow-up surveys at three and six months post-training. This session will share the development, implementation and evaluation model of TEACH, with over 2000 practitioners from more than 30 disciplines trained since 2006, and over 500 organizations engaged. Mean course overall satisfaction evaluation ratings of 4.73 (where 5 = highest/best), as well as follow-up data and sustainable community of practice engagement, demonstrate how TEACH can serve as a model of a comprehensive, wraparound clinical training initiative to support capacity-building and practice change.

Ministry of Health Promotion, Government of Ontario.

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POS2-75

RAISING THE BAR IN CLINICAL TRAINING ON CESSATION – THE EXPERIENCE OF THE ASSOCIATION FOR THE TREATMENT OF TOBACCO USE AND DEPENDENCE (USA)

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The Association for the Treatment of Tobacco Use and Dependence (www.ATTUD.org) was formed in 2004 to fill a vacuum by creating a professional society for tobacco treatment specialists (TTSs). Prior to this, there was no uniting organization for practicing TTSs. In addiction, before ATTUD there were few networking and collaboration opportunities among these professionals. A core mission of ATTUD is to increase the quality of care for tobacco dependent individuals, and to increase access to evidence based treatments. Membership has grown to a network of over 450 US-based and international tobacco treatment specialists. All have the opportunity to consult with each other through annual meetings, an extremely active listserv, and eventually a journal where best practices and treatment advances can be shared. This presentation will provide an outline of the services ATTUD provides, along with highlights of current standards established for training and the accreditation of TTSs.

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POS2-76

MULTIPLE HEALTH BEHAVIOUR CHANGE ACROSS TIME: THE INTERRELATIONSHIP BETWEEN SMOKING, ALCOHOL AND PHYSICAL ACTIVITY

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Approximately 50 to 80% of individuals participate in multiple unhealthy behaviours including physical inactivity, smoking, and excessive alcohol consumption. Although, public health programs have focused on multiple health behaviours, little is known about how changes in one behaviour can subsequently influence changes in additional health behaviours. This study examined whether health behaviours including smoking, physical activity, and excessive alcohol consumption inter-relate across time in a nationally representative sample. Secondary data analysis was conducted utilizing the longitudinal National Population Health Survey (NPHS) from Statistics Canada. The NPHS includes seven cycles of data collected over 14 years on over 15,000 Canadians aged 12 years and older. Health behaviours that were evaluated included daily alcohol consumption, daily leisure-time energy expenditure, and the number of cigarettes smoked daily. Parallel process latent growth curve modelling was used to predict whether the growth trajectory of one health behaviour was related to the growth trajectory of another health behaviour. During the 14-year period, both daily energy expenditure and alcohol consumption significantly increased, whereas cigarettes smoked per day decreased. Each of the three health behaviours demonstrated a linear trajectory across the seven cycles. Parallel process latent growth curve models showed that: (i) increases in physical activity are correlated negatively with reductions in smoking; and (ii) the rate of change for smoking behaviour was positively correlated with the rate of change for alcohol consumption. These results demonstrate that changes in physical activity as well as alcohol consumption are associated with changes in smoking behaviour. Population-based interventions to increase physical activity and/or reduce alcohol consumption may assist smoking cessation efforts while providing further health benefits beyond that of smoking cessation. Key words: physical activity; longitudinal

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POS2-77

EFFECTIVENESS OF REFERRALS TO QUITLINES IN A REAL-WORLD SETTING

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The efficacy of quitlines for smoking cessation is strongly supported by a number of randomized clinical trials. In contrast, the evidence base for quitline effectiveness is more limited. The current study addresses this evidence gap by providing an estimate of effectiveness for the real-world scenario in which smokers who express interest in

quitting are merely referred to a quitline. As part of a nationwide, population-based clinical trial, smokers who were motivated to quit (N=283) were given a brief prompt to call the quitline in their state. No additional treatment was offered beyond what was provided by the quitline. Data are based on the 221 (78%) participants who were able to be contacted by phone within three months of the quitline referral. Of these, 76 (34%) smokers self-initiated contact with their state quitline, and 145 (66%) did not. Relative to smokers who did not call their quitline, those who did were, at follow-up: a) no more likely to make any self-defined quit attempt (43% vs. 34%; OR=1.5; 95% CI: 0.9 - 2.7), b) marginally more likely to make a 24hr quit attempt (43% vs. 31%; OR=1.7; 95% CI: 1.0 - 3.0), c) significantly more likely to use medications to quit (45% vs. 16%; OR=4.3; 95% CI: 2.3 - 8.1), and d) marginally more likely to be quit (self report of 7-day point prevalence: 22% vs. 12%; OR=2.0; 95% CI: 1.0 - 4.3). Compared to non-callers, quitline callers reported greater increases in self-efficacy to quit (p=.006). Callers and non-callers were equally motivated to quit in the short term (next 30 days) at follow-up. We conclude that few smokers (i.e. approximately one third), when provided with a brief, one-time prompt to call a quitline, actually make the call. Among those who do self-select to use this service, quitlines promote use of cessation medication and yield moderate improvements in cessation. This study provides additional support for the effectiveness of quitlines, but suggests that novel, more intensive interventions to encourage their use could result in substantially greater yield.

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POS2-78

RECENT TRENDS IN THE RELATIONSHIP BETWEEN SMOKING, CESSATION, AND BODY WEIGHT

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While there is prior evidence that smokers gain weight after they quit smoking, at least 2 issues remain important areas of inquiry in more recent population-based cohorts: (1) whether Body Mass Index (BMI) of current smokers differs from ex-smokers and never smokers, and (2) whether there are gender, age, and ethnic differences in the effect of smoking on BMI. Using data from the first wave of the National Epidemiologic Study on Alcohol and Related Conditions (N=43,093), we examined how BMI varied as a function of smoking status: lifetime never smoker or smoker (smoking 100 or more cigarettes lifetime), and among smokers, persistent smoking (any smoking over the past year) vs. quitting, stratified by sex and age. We found very little difference in mean BMI of lifetime never smokers (26.9) vs. smokers (27.0), whereas BMI among smokers who quit (27.8) vs. those who persisted (26.4) was substantially different ($p < .0001$). The strongest effects were evident in the age groups 32 and older, e.g., men age 44-60 who persisted in smoking had an average BMI of 27.0 versus those who quit who had an average BMI of 29.0 ($p < .0001$). These age groups encompassed the average age at which many of the lifetime smokers reported smoking their last cigarette (mean age=40.8). Despite post-cessation weight gain concerns often reported in young women, the BMI difference in ex- (25.6.) vs. persistent smokers (25.7) was negligible. Average BMI was highest among African Americans (AA), lower for Hispanics (HS), and lowest for Caucasians (CA). AA ex- vs. persistent smokers showed greater relative BMI differences, particularly at ages 44-60, but the reverse effect in smokers age 18-31. For the HS respondents, BMI was greater in lifetime smokers vs. never smokers, and like the CA and AA smokers, quitters had the greatest BMI. Thus, in recent cohorts, lifetime smokers did not have a lower BMI than never smokers. However ex-smokers, at least for those aged 32-60, did have a substantially greater BMI across gender and ethnicity. Long-term nicotine exposure could potentially be contributing to metabolic disturbance that becomes particularly apparent when smokers quit smoking.

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POS2-79

NICOTINE ENHANCES COGNITIVE FUNCTION IN NON-SMOKING SCHIZOPHRENIA RELATIVES AND HEALTHY CONTROLS

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Smoking is highly prevalent in schizophrenia and may be a form of cognitive and physiological self-medication. Relatives of schizophrenia patients have heightened risk for schizophrenia, smoking, and cognitive deficits. To differentiate the effect of familial risk for schizophrenia and acute exposure to nicotine on cognitive function, we compared neuropsychological performance among between first degree relatives of patients with schizophrenia (n=16) and healthy controls (n=16), all non-smokers, who were tested while treated with a nicotine patch (7 mg) and placebo. To determine whether nicotine improves cognitive function, healthy controls who were smokers abstained (n=14) or continued smoking as usual (n=14) before testing while treated with nicotine patch (21 mg) or placebo. At baseline testing, there were no cognitive differences between relatives and smoking and non-smoking control groups, indicating no effect of familial risk. For nonsmokers, information processing speed and working memory showed marginal improvement in relatives following drug administration. Additionally, nicotine administration showed a trend for enhancing novelty detection performance for relatives. Finally, treatment improved working memory capacity in healthy controls. No treatment effect was found for smokers. Preliminary findings support that nicotine improves cognition in relatives, who may have sub-optimal cognitive functioning. Individual variability in response to nicotine and baseline cognitive function necessitates a greater number of participants to detect its effects on additional cognitive domains.

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POS2-80

ASSOCIATION BETWEEN SMOKING CESSATION AND SEXUAL HEALTH IN MEN: SUCCESSFUL VERSUS UNSUCCESSFUL QUITTERS

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Introduction: Cigarette smoking represents the most preventable cause of morbidity and mortality in the world today, and is responsible for enormous health-related economic burdens. Among other medical sequelae, erectile impairment has been shown to be associated with chronic tobacco use. The primary aim of the present study was to provide the first empirical investigation of the effects of smoking cessation on physiological and subjective indices of sexual health. Methods: Sixty-five long-term, heavy smoking men participated in a smoking cessation program and were assessed at baseline (while smoking regularly), at mid-treatment (while using a high dose nicotine transdermal patch), and at 4-week follow-up. Physiological and subjective sexual arousal indices, as well as self-reported sexual functioning were assessed during each visit. Results: Intent-to-treat analyses indicated that, at follow-up, successful quitters (n=20), compared to those who relapsed (n=45), showed significant improvements in physiological and subjective sexual arousal. Specifically, men demonstrated enhanced erectile responses, decreased latencies to reach maximum erectile capacity, and faster onset to reach maximum subjective sexual arousal. Although participants displayed across-session enhancements in self-reported sexual function, successful quitters did not show a differential improvement compared to participants who relapsed. Discussion: Smoking cessation significantly enhances both physiological and self-reported indices of sexual health in long-term male smokers, irrespective of baseline erectile impairment. It is hoped that these results may serve as a novel and enticing means to influence men to quit smoking. Increasing successful smoking cessation in men would significantly enhance quality of life, substantially reduce premature death, and alleviate enormous economic burdens caused by smoking-related diseases.

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POS2-81

PREDICTORS OF SELF-EFFICACY JUDGMENTS AMONG ADOLESCENT SMOKERS

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Self-efficacy (SE) - confidence in one's ability to abstain from smoking – predicts the outcome of smoking cessation attempts among adolescents. Increasing SE in treatment may improve cessation rates in this population. In order to modify SE beliefs among adolescent smokers, it is important to identify factors that may influence their SE judgments. This study examined the relationship between SE and several individual difference measures that could impact SE ratings. The sample included 185 daily smokers between the ages of 14 to 18. SE and individual difference variables were assessed approximately 1 week prior to an attempt to quit smoking. Individual difference measures included gender, nicotine dependence (Modified Fagerstrom Tolerance Questionnaire), cigarettes smoked per day, smoking outcome expectancies (Adolescent Smoking Consequences Questionnaire; ASCQ), parental attitudes and policies (views on quitting smoking and smoking in the house), and depressive symptoms (CESD). SE was measured with a novel assessment examining confidence in ability to abstain in 8 high-risk episodes. Variables that were significantly correlated with SE were included in a multiple regression model, in order to determine which variables uniquely predicted SE. The CESD Depressed and Somatic scales, the ASCQ Negative Physical Feelings, Negative Affect Reduction, and Negative Weight Control scales, and participant gender were significantly correlated with SE ($r = -0.159$ to 0.16; $p<0.05$). However, only the ASCQ Negative Affect Reduction ($t=-2.984$; $p<0.01$) and Negative Physical Feelings ($t=2.924$; $p<0.01$) scales significantly predicted SE in the multiple regression model. In this sample of adolescents who were preparing to quit smoking, SE ratings were most closely associated with expectations of positive and negative smoking effects. Expectations about the positive effect of smoking on mood appeared to explain the relationship between depressive symptoms and SE. Surprisingly, measures of smoking exposure were unrelated to SE. Although this is an observational study, it suggests that altering smoking outcome expectancies may yield increased SE judgments in adolescent smokers.

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POS2-82

AMBIVALENCE PREDICTS URGE TO SMOKE AND NEGATIVE AFFECT DURING THE FIRST DAY OF A SMOKING QUIT ATTEMPT

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Ambivalence has been recognized as a central feature of drug addiction. Increased ambivalence prospectively predicts interest in quitting smoking, and the induction of ambivalence is thought to motivate smoking cessation. Ultimately, though, it is the resolution of this ambivalence that may prevent smoking relapse. The exact mechanism linking increased ambivalence to smoking relapse is not well understood. The current research examined, during the first day of a smoking quit attempt, the extent to which quitting smokers' ambivalence about smoking related to urge to smoke and positive and negative affect. We hypothesized that increased ambivalence would be linked to increased negative affect (and decreased positive affect) and an increased urge to smoke during smoking cessation. Participants were cigarette smokers (n = 176) ages 18 to 45 who expressed interest in quitting smoking and were willing to initiate a cessation attempt during the experiment. At baseline, participants completed the FTND and a five-item scale assessing smoking felt ambivalence (SFA). The experiment began 12-hr after participants initiated their quit attempt. They completed the state version of the PANAS to assess current affective state, and they verbally rated their urge to smoke on a scale from 0 (absolutely no urge to smoke at all) to 100 (strongest urge to smoke I've ever experienced). As predicted, SFA was related to urge to smoke ($r=.23$, $p=.009$) and negative affect ($r=.19$, $p=.01$). SFA was unrelated to positive affect ($r=.07$, $p=.37$) and FTND ($r=.09$, $p=.26$). The relationship between SFA and urge to smoke was maintained even after accounting for negative affect (partial $r=.20$, $p=.02$) and FTND (partial $r=.23$, $p=.009$), but the relationship between SFA and negative affect disappeared after accounting for urge (partial $r=.08$, $p=.38$). Data suggest that increased ambivalence is associated with heightened urge reactivity during smoking cessation. Results are discussed with respect to implications for understanding tobacco addiction.

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POS2-83

COGNITIVE EFFECTS OF NICOTINE IN SCHIZOPHRENIA PATIENTS WITH AND WITHOUT CO-MORBID DRUG DEPENDENCE

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In the U.S, the smoking prevalence rate in individuals with schizophrenia (SZ) is 2-3 times higher than the general population. Smoking prevalence among illicit drug abusers is reported to be 71%. Serious mental illness (SMI) also is highly correlated with drug dependence or abuse. Among adults with SMI in 2008, 25% were dependent on or abused alcohol or illicit drugs, whereas the rate among adults without SMI was 8%. Schizophrenia is characterized by a range of cognitive deficits including attention, memory, and sensory gating. Similar cognitive impairments have been reported in drug abusers. The high smoking prevalence among SZ and drug abusers might represent an attempt to self-medicate some of these deficits. Nicotine or smoking a cigarette transiently attenuates some of these deficits in individuals with SZ, and nicotine reversed the sensory gating abnormality in cocaine addicts. However, little is known about such deficits and their potential reversal by nicotine in individuals dually diagnosed with SZ and drug dependence (SZ/DD). To date we have recruited 14 SZ and 5 SZ/DD participants, and 14 normal volunteers (NV). Using a within-subjects design, subjects received a single dose of 0, 1, or 2 mg nicotine nasal spray at each of three experimental sessions. Beginning 5 min after dosing, subjects completed a Continuous Performance Test (CPT), digit-symbol substitution test (DSST), and recognition and working memory tasks. On the DSST there was a main effect of diagnosis on number of symbols attempted and total correct, with NVs performing significantly better than either patient group. There was a nearly significant dose effect, such that the SZ/DD group attempted to complete more symbols following 2 mg nicotine compared to placebo and 1 mg. On the CPT there was a nearly significant main effect of diagnosis on correct responses and errors of commission, with the NVs performing better than either patient group. A significant diagnosis x dose interaction showed that both nicotine doses reduced errors of commission in the SZ group. These preliminary results suggest that nicotine has modest but beneficial effects on cognition for both SZ and SZ/DD groups.

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POS2-84

CUE REACTIVITY AND SMOKING REINFORCEMENT IN SMOKERS WITH AND WITHOUT SCHIZOPHRENIA

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There is a greater prevalence of cigarette smoking among people with schizophrenia than in the general population. Cue-reactivity paradigms have shown that smoking-related stimuli reliably increase ratings of tobacco craving and certain autonomic measures in smokers with and without a diagnosis of schizophrenia. 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 and traditional measures of cue-elicited craving in adult daily smokers who had a DSM-IV diagnosis of schizophrenia or schizoaffective disorder (SCZ, n = 16) and a control group who had no Axis I psychiatric disorders (CTL, n = 16). In two counterbalanced sessions, participants 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 autonomic 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 (FR100 to FR7800). Completion of each ratio was reinforced with one cigarette puff. Compared to 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 and decreased positive mood similarly in SCZ and CTL. In addition, both groups showed a trend toward increased PR breakpoint (total number of responses) after exposure to the smoking cue compared with the nonsmoking cue. 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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POS2-85

THOUGHTS ABOUT ABSTINENCE AMONG TRANSITIONAL-AGE YOUTH IN MENTAL HEALTH TREATMENT

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An estimated 90% of the morbidity and mortality caused by tobacco use can be prevented by quitting before age 30; hence, the critical need for research with youth and young adult smokers to inform cessation strategies. Transitional-age youth with comorbid mental health and/or substance use problems are at particularly high risk for smoking initiation and chronic use, and yet are a group that has received little study. In a sample of 60 ethnically diverse smokers (60% nonwhite, 52% female) between the ages of 13 and 25 years (M=19.5, SD=2.9), this cross-sectional study examined associations between tobacco, marijuana use, and mental health treatment utilization. Participants smoked at least 1 cigarette in the past 30 days (53% were daily smokers) and were recruited from outpatient mental health settings in Northern California; half reported marijuana use in the past 30 days. Nearly half the sample (48%) intended to quit smoking cigarettes in the next 6 months. Desire to quit tobacco and perceived success at quitting was positively correlated ($r=0.38$, $p<0.05$) and differed significantly by stage of change ($p's<.001$): smokers in preparation reported greater desire and perceived success at quitting than smokers in precontemplation or contemplation. Perceived success was inversely correlated with perceived difficulty with staying quit from tobacco ($r=-0.34$, $p<0.05$). Participants who used marijuana in the past 30 days reported greater desire to quit tobacco than marijuana ($t=2.32$, $p<.05$), less perceived success with quitting tobacco than marijuana ($t=-2.10$, $p<.05$), and greater perceived difficulty with staying abstinent from cigarettes than marijuana ($t=3.39$, $p<.05$). The number of outpatient mental health visits in the past 30 days was unrelated to desire to quit or perceived success or difficulty with quitting smoking. The findings suggest young smokers receiving mental health treatment are motivated to quit smoking. Relative to marijuana use, the desire to quit tobacco is higher, though beliefs in their ability to quit and stay quit are lower. Interventions that support transitional-age youth's desire and beliefs in their ability to quit smoking are needed.

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POS2-86

PREDICTORS OF NICOTINE DEPENDENCE TELESCOPING IN ADOLESCENTS WITH BIPOLAR DISORDER AND CO-OCCURRING SUBSTANCE USE DISORDERS: A PILOT STUDY

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Background: Faster progression from the first cigarette smoked to the development of nicotine dependence (ND), a phenomenon known as 'telescoping,' is associated with more difficulty quitting and may contribute to the high rates of smoking and low rates of quitting associated with bipolar disorder (BD). In this pilot study, we examined this phenomenon in adolescents with BD and co-occurring alcohol and/or cannabis use disorders by exploring demographic and clinical variables that predicted the rapidity of ND progression in this patient population.

Method: A subsample of 48 adolescents, 13 to 21 years of age (mean =16.3±1.9), with bipolar I disorder (mean age-at-onset =13.9±2.2) who smoked at least 100 cigarettes over their lifetime and met DSM-IV-TR criteria for ND were used in this secondary analysis; the sample had been recruited to participate in one of two studies involving adolescents with co-occurring BD and substance use disorders (SUDs). Bipolar I disorder diagnoses were determined using two standardized semi-structured psychiatric diagnostic interviews. Exploratory regression analyses were conducted to examine whether age, gender, liking of first cigarette, earliest age-at-onset of an alcohol or cannabis use disorder, age-at-onset of BD, and ordering of BD and smoking ages-at-onset predicted telescoping.

Results: The mean duration from initiation of smoking to onset of ND was 3.23 years (SD= 2.31). Greater liking first cigarette, older BD age-at-onset and, BD onset prior to smoking initiation significantly predicted a more rapid progression from first cigarette smoked to ND (all p values < .05). Current age, gender, and earliest age-at-onset of an alcohol or cannabis use disorder were not significant predictors of telescoping.

Conclusion: Our finding that greater liking of the first cigarette predicts the rate of progression to ND extends observations from general adolescent populations. We also found preliminary evidence to suggest that clinical features associated with BD may influence the progression of ND. However, larger-scale, longitudinal studies are needed to fully evaluate the nature of this interaction.

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POS2-87

TESTING A SELF-DETERMINATION THEORY AND PUBLIC HEALTH SERVICE MOTIVATION ENHANCEMENT FOR MAINTAINING TOBACCO ABSTINENCE

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Background: We report findings of a cessation induction trial of a Self-determination Theory (SDT) and Public Health Service (PHS)-motivation enhancement intervention for tobacco dependence intended to motivate long-term tobacco abstinence and funded by NIH/NCI Health Maintenance Consortium (CA106668).

Methods: 808 smokers over 18 y/o and smoking >5 cigarettes per day were randomized to one of three groups: (1) Standard Intervention (SI; N=321) in which participants met with a counselor and/or physician for at least 8 visits over 12 months, and were asked to include an important other to learn to provide motivational support; (2) Harm Reduction (HR; N=318) received the same intervention as SI, plus were given the option to use tobacco cessation medication to reduce the number of cigarettes they smoke by half; (3) Community Care (CC; N=169) in which participants were provided our previously validated SDT- based intervention. A fourth Historical Control group (N=292) that received information about community resources for cessation, but no SDT-based intervention, was used for comparison.

Results: The SI, HR and CC conditions did not differ in the number of individuals reporting a 12-month prolonged abstinence one year after the intervention had ended (chi-square(2) = 0.26, p = .88). Accordingly, the three interventions (SI, HR and CC) groups were combined. When compared to the historical control, those in the combined intervention conditions had significantly improved 12 month prolonged abstinence compared to Historical Control (7.9% vs. 2.4%, chi-square(1)=10.84, p < .01, Number Needed to Treat (NNT)=18.1). Similar pattern of results was found for other 12-month cessation outcomes (e.g., 7 Day Point Prevalence).

Conclusions: Adding an additional 6 months of treatment support, including an important other session, and offering a harm reduction option, did not increase 12-month prolonged abstinence. However, all three SDT-PHS based groups demonstrated increased 12-month prolonged abstinence compared to a Historical Control that didn't receive a motivation enhancement intervention.

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POS2-88

EFFICACY OF EXTENDED-DURATION COUNSELING VS. SHORTER-DURATION COUNSELING AT 1.25 YEARS POST-CESSATION

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Long-term success rates among smokers trying to quit are disappointing, with only 10-20% abstinent after 1 year of follow-up. Relapse is very common after short-duration counseling programs are completed. We designed a study whose aim was to test the efficacy of extending the counseling period among those interested in quitting from 3 months duration to 12 months duration. Smokers were randomized to one of three cognitive/behavioral counseling-treatment groups: 3-months duration, 6 months duration, or 12 months duration. All subjects received the same in-office treatment for the first 3 months of counseling; those assigned to 6-months and 12-months counseling

received a combination of in-office and phone-counseling sessions in the extended-duration periods. Subjects also received standard nicotine patch treatment for 3 months. We performed a proportional hazards analysis using the National Heart, Lung and Blood Institute definition of relapse (smoking on 7 or more consecutive days, or on 7 or more consecutive occasions) to test the efficacy of 12-months duration counseling. Subjects were followed for 1.25 years, and we combined the shorter-duration counseling groups (3- and 6-months) so as to have greater statistical power to detect a difference between these groups and our counseling group of prime interest, those receiving 12 months of counseling. Those who received 12 months of counseling had the higher likelihood of maintaining abstinence ($p = 0.045$). Approximately 35% of participants were abstinent in the 12-month treatment condition after 1 year of follow-up vs. 10% in the shorter-duration counseling conditions. We conclude that extended-duration counseling schedules may significantly increase the likelihood of successful smoking cessation.

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POS2-89

TOBACCO CRAVING AND COCAINE USE IN SMOKERS WITH AND WITHOUT SCHIZOPHRENIA

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There is a greater prevalence of cigarette smoking among people with schizophrenia than in the general population. Because smoking and use of other drugs covary, we examined illicit drug use in current smokers. We recruited participants who had a DSM-IV diagnosis of schizophrenia or schizoaffective disorder (SCZ, n = 70) and a control group who had no Axis I psychiatric disorders (CTL, n = 97). During a 2-3 hour session, participants completed demographic and research questionnaires, including the Drug Use Survey (DUS), the Tobacco-Craving Questionnaire-Short Form (TCQ-SF), and the Fagerström Test for Nicotine Dependence (FTND). Participants smoked a cigarette at the start of the session and 15 min later gave a breath CO sample and completed the TCQ-SF. SCZ were older than CTL (46.1 vs. 37.2 years, $p < 0.001$). There were more Whites among SCZ than CTL (57% vs. 43%, $p < 0.01$), and more Blacks among CTL than SCZ (70% vs. 30%, $p < 0.01$). The groups did not differ in sex, ethnicity, and marital status. SCZ smoked more cigarettes per day than CTL (21.3 vs. 17.1, $p = 0.01$) and smoked for more years (28.5 vs. 19.9, $p < 0.001$), but the groups did not differ in FTND scores or in age of smoking initiation. Fewer SCZ than CTL reported ever using cocaine more than five times ($p < 0.01$). Fewer SCZ than CTL were current cocaine users, whereas more SCZ than CTL were past users of cocaine ($\chi 2 = 22.52$, $p < 0.0001$). At 15 min post-smoking, SCZ had greater breath CO levels ($p = 0.01$) and TCQ-SF scores ($p < 0.01$) than CTL. Past cocaine use was significantly associated with greater TCQ-SF scores in SCZ, but not in CTL. Although SCZ smoked more cigarettes per day than CTL, they were less likely to be current users of cocaine and other drugs, suggesting that cigarette smoking is not associated with increased illicit drug use in SCZ. However, because more SCZ than CTL were past users of cocaine, clinicians should be vigilant when treating patients in the early stage of their illness, as prodromal and first-episode patients might be more vulnerable to drug use. This study highlights differences in co-morbid illicit drug use in cigarette smokers with and without schizophrenia.

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POS2-90

A RANDOMISED CONTROLLED TRIAL OF MOBILE (CELL) PHONE TEXT MESSAGING SMOKING CESSATION SUPPORT: TXT2STOP

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Background: The STOMP (Stop smoking with mobile phones) trial in New Zealand and Txt2stop mobile phone based smoking cessation pilot trial in the UK showed over a two-fold increase in self-reported quit rates at 6 weeks. The MRC Txt2stop trial is a randomised controlled trial of the effect of the Txt2stop intervention on smoking cessation at six months (ISRCTN 80978588).

Methods: A single blind randomised controlled trial with allocation concealment. Participants in the UK were recruited from Oct 2007 to June 2009 via adverts placed in the media or from their General Practitioner. Potential participants sent a text message registering their interest to a short code number or registered online.

Participants: 5,800 daily smokers aged 16 or over and interested in quitting.

Intervention: Participants in the intervention arm (n= 2911) received the Txt2stop intervention. Participants (n= 2881) in the control group received text messages unrelated to quitting.

Main outcome measures: The primary outcome measure is bio-chemically verified self-reported smoking abstinence at 6 months.

Analyses: All analyses were based on the intention-to-treat principle. We estimated the relative risk with a 95% confidence interval for biochemically validated continuous abstinence at six months. Our primary analysis uses multiple imputation by chained equations (MICE) to impute missing data. Secondary analyses count those lost to follow up as smokers.

Results: Complete follow up data for biochemically verified continuous abstinence were obtained for 5336 (92%) participants. Biochemically validated continuous abstinence at six months was higher in the intervention group than in the control group in the primary analysis (MICE) (relative risk 2.20 (95% CI 1.77- 2.73)) and secondary analysis (losses to follow up are treated as smokers) (226 (7.8%) vs. 105 (3.6%); relative risk 2.13 (95% CI 1.70, 2.67).

Conclusions: The Txt2stop mobile phone based smoking cessation support intervention increases smoking cessation at six months. Txt2stop would be a useful addition to existing smoking cessation services.

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POS3-1

THE EFFECT OF NICOTINE ON RESPIRATORY SINUS ARRHYTHMIA IN NONSMOKERS

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Respiratory Sinus Arrhythmia (RSA) is a component of heart rate variability indexing parasympathetic influence on the heart. RSA has received increasing attention as an indicator of psychological processes, with chronically low RSA associated with depression and anxiety (Appelhans & Luecken, 2006), whereas acute RSA decreases relate to better performance on attentional tasks (Duschek et al., 2009). Smokers have lower RSA than nonsmokers (Alyan et al., 2008), and acute administration of nicotine in smokers further decreases RSA (Karakaya et al., 2007). However, it is difficult to determine the precise effect of nicotine on RSA, due to potential confounding of nicotine dependence and withdrawal. Additionally, the relationship between nicotine's effects on RSA, mood, and cognitive performance is unknown. To examine these questions, we studied the effects of 7mg of transdermal nicotine on RSA, mood, subjective drug effects and cognitive performance (attention and executive functioning) in 29 healthy adult nonsmokers. In a two-session, within-subject, double-blind, counterbalanced design, RSA was measured using a Minimitter cardiac monitor, with artifact correction and RSA quantification by CardioEdit/CardioBatch software (Porges, 2007). We found nicotine acutely suppressed RSA compared to placebo, while increasing heart rate (HR). However, the increase in HR produced by nicotine was partly independent of alterations in RSA, suggesting that nicotine's effects on HR are not solely produced by changes in parasympathetic activity. Nicotine-induced changes in RSA were not correlated with subjective effects. Further, nicotine either did not improve, or was detrimental to, cognitive performance, and changes in RSA were not associated with nicotine's effects on cognitive performance. In conclusion, nicotine acutely decreases RSA (in common with other drugs of abuse, such as alcohol; Reed et al., 1999), but these physiological changes did not related to mood or cognitive functioning in this non-smoking population.

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POS3-2

RELATIONS OF FUNCTIONAL AND DYSFUNCTIONAL IMPULSIVITY TO INDICATORS OF TOBACCO DEPENDENCE MOTIVATION

Stephanie R. Pitts* and Adam M. Leventhal

The relation between impulsivity and smoking behavior is robust, yet poorly understood. One means to elucidating the impulsivity-smoking relationship is to explore whether different facets of impulsivity evidence disparate relations to smoking behavior. One model parses this construct into separate dimensions of impulsivity: functional (FI; tendency to make quick and effective decisions when adaptive) and dysfunctional (DFI; tendency to make quick rash decisions that result in negative consequences). It is unclear whether FI and DFI exhibit different patterns of association to smoking characteristics. This study examined relations of FI and DFI to multiple indicators of tobacco dependence motivation in 212 daily smokers (M = 15 cig/day, M = age 24 years, 53% female). FI and DFI were correlated at trend levels ($r = .13$, $p = .06$), but evidenced disparate relations to indicators of tobacco dependence in regression models controlling for age, ethnicity, and gender. DFI was positively associated with difficulty refraining from smoking in places where it is forbidden, smoking when ill, craving to smoke, and smoking without awareness or attention (betas .15 -.28, ps < .05). By contrast, FI was inversely associated with craving, prioritizing smoking over other reinforcers, and smoking to modulate negative affect (betas > -.14, ps < .05). Neither dimension of impulsivity was significantly associated with smoking heaviness, cessation history, age of onset, nor other domains of smoking motivation. These findings suggest that DFI and FI may play differential roles in smoking behavior. People high in DFI may have a particularly strong urge to smoke across various settings and a tendency to smoke without awareness, whereas high-FI individuals may actually have lower drive to smoke in certain circumstances. These findings are relevant to understanding mechanisms linking impulsivity and smoking behavior and suggest that High-DFI smokers may perhaps require more intensive interventions to dampen motivation to smoke.

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POS3-3

EFFECTS OF NICOTINE CONTENT ON SMOKING TOPOGRAPHY ACROSS MULTIPLE CIGARETTES

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It has been proposed that reducing the nicotine content in cigarettes may be an effective approach to smoking reduction and cessation (Benowitz & Henningfield, 1994). However, there is evidence that smokers switching to low nicotine cigarettes may compensate for reduced nicotine content by smoking cigarettes more intensely and are at greater risk of negative health effects from toxin exposure. In one study, Strasser and colleagues (2007) showed that smokers asked to smoke cigarettes varying in nicotine content (Quest®) provided higher total puff volumes and carbon monoxide boost when smoking a .05 mg nicotine cigarette as compared to cigarettes with higher nicotine levels (.3 mg and .6 mg). However, no differences in average puff volume were evidenced between participants who smoked exclusively .05 mg cigarettes when compared with individuals smoking higher yield cigarettes (.6 mg) across 11 days. In addition, participants given .05 mg cigarettes smoked significantly fewer cigarettes per day (Donny et al., 2007). The time course of compensatory smoking has yet to be characterized across an intermediate interval of time (i.e., several cigarettes within a single session). The present study assessed the effect of nicotine content on measures of smoking topography within subject (N=26), across four cigarettes at two nicotine levels (.05 and .6 mg). When smoking .05 mg nicotine cigarettes, subjects demonstrated significant elevations in total puff volume, average puff volume, and average puff duration. Average inter-puff interval was significantly longer when subjects smoked cigarettes with higher nicotine content. Furthermore, there were significant interactions between nicotine content and cigarette number in average puff volume and average puff duration. Post-hoc analysis revealed that elevations on these variables resulting from lowered nicotine content disappear across the course of 4 cigarettes. Overall, these findings suggest that compensatory smoking may be a relatively short-lived phenomenon. As such, very low nicotine content cigarettes may be useful for reducing dependence on nicotine and aiding in harm reduction and/or smoking cessation.

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POS3-4

PROCESSING BIAS TO SMOKING RELATED STIMULI AFTER ACUTE ALCOHOL ADMINISTRATION: COMPARING DAILY AND WEEKLY SMOKERS

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When trying to achieve nicotine abstinence, lapses back to smoking often involve the consumption of alcohol. Alcohol may therefore increase the incentive value of cigarettes and related stimuli. This study attempts to elucidate the underlying mechanisms by which this may occur. Daily (n=32) and social (n=32) smokers (50% male) were required to abstain from smoking overnight for 12 hours. Participants were randomized to receive either an alcoholic beverage or placebo equivalent. Alcoholic drinks contained 0.4 g/kg as vodka with chilled tonic water and lime cordial; drink volumes were reduced by 8% for women. After drink consumption, participants completed a cognitive battery comprising the visual probe and Stroop task. Reaction time data, with stimulus type (smoking, neutral) as the within-subject factor and smoking status (daily, social) and challenge condition (alcohol, placebo) as the between-subject factors, revealed for the visual probe task a significant main effect of picture type ($F[1, 58]=5.09$, $p=0.028$), reflecting faster reaction times to probes replacing smoking pictures compared to neutral pictures, qualified by a marginal picture type x challenge x smoking status interaction ($F[1, 58]=3.45$, $p=0.068$). Stratification by challenge and smoking status indicated faster reaction times to probes replacing smoking pictures for daily smokers receiving alcohol only ($p=0.070$). For the Stroop task, a significant main effect of word type was revealed ($F[1, 59]=19.13$, $p<0.001$), reflecting slower reaction times to colour name smoking words compared to neutral words, qualified by a trend towards a word type x smoking status x challenge interaction ($F[1, 59]=2.69$, $p=0.106$). Stratification by challenge and smoking status indicated slower reaction times to colour name smoking words for daily smokers receiving alcohol only ($p=0.005$). Although marginally significant, these data suggest a processing bias for smoking cues can be induced by alcohol consumption in abstinent daily smokers, but not in abstinent weekly smokers. These findings provide a possible mechanism of action underlying smoking relapse episodes frequently associated with alcohol consumption.

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POS3-5

LABORATORY SMOKING OF MAKE YOUR OWN (MYO) CIGARETTES

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In countries where there is intense tobacco regulation and higher cigarette prices there has been a notable increase in the prevalence of smokers making their own cigarettes. Generally, self-produced cigarettes are made by rolling shredded tobacco in paper leaves (Roll Your Own, RYO) or a machine is used that injects the tobacco into a preformed cigarette paper tube (Personal Machine Made, PMM) cigarettes. In an on-going series of studies smoking behavior and toxin exposure from RYO and PMM cigarettes produced by exclusive MYO smokers is characterized. Participants (N = 9) smoked cigarettes that they have prepared in the laboratory in a previous visit on three occasions separated by at least 24 hr– (1) ad lib smoking, (2) after overnight verified tobacco abstinence, and (3) an intense smoking condition, defined as smoking 3 cigarettes in a 2-hr period. These conditions were selected to determine if the compensation and elasticity evident in commercially made cigarettes are evident in the RYO and PMM cigarettes. The results reported below are from the ad lib smoking condition only (RYO, n = 7; PMM, n = 2). Like commercial cigarettes MYO cigarettes increase CO boost (RYO = 4 ppm; PMM = 5 ppm). Smoking topography variables for the RYO group were: total puff volume = 734 mL, puff velocity = 39 mL/sec and puff duration = 1.6 sec; whereas, topography variables for the PMM group were total puff volume = 1164 mL, puff velocity = 41 mL/sec and puff duration = 2.6 sec ($p < .10$). Time to smoke the cigarettes was 4 min for RYO and 6 min for PMM, and puffs/cigarette was 15 for RYO and 14 for PMM. Examination of preliminary data across all conditions suggests that the PMM cigarette smokers responded to the elasticity and compensation induced by the conditions like smokers of factory made cigarettes, while puffing behavior did not change, as a function of condition in the RYO group. The data suggest that smokers of both types of MYO cigarettes expose themselves to significant toxin exposure and that regulation of self-produced cigarettes is an impending domestic public health challenge.

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POS3-6

ANALYTIC TECHNIQUE TO MODEL SMOKING PUFF AND INHALATION DATA FOR COMPARISON WITH TOXIN EXPOSURE

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The Federal Drug Administration (FDA) is charged with the regulation of tobacco products. This regulatory effort will involve characterizing tobacco products from the level of the product content, use and effects on health; subsequently, creating a need to characterize products with varying chemical content in terms of how they are used by smokers and how the product and use behavior impact toxin exposure. The current study used existing data (N = 26) on puff (i.e., time to smoke; number of puffs; and puff volume, duration and velocity) and inhalation (i.e., volume, duration and velocity) behaviors and markers of toxin exposure (i.e., nicotine and CO boost) from cigarette smokers who used cigarette products with varied tar levels and under conditions of abstinence and intense smoking. The data on puff and inhalation behaviors were obtained using the CReSS topography and LifeShirt systems, respectively. The nicotine and CO boost were derived from samples obtained before and after smoking. Data on tidal and inhalation breaths was extracted from a subset of the participant records to inform the development of an automated analytic technique to characterize typical tidal breaths and to distinguish tidal inhalation from puff-associated inhalations. Least square fit and chi-square pattern recognition strategies to identify puff associated inhalations were evaluated. The measure development process and measure development characteristics (e.g., internal consistency and validity) will be discussed. This automated approach will allow for quantification of differences in smoking behavior, which can then be used in regression models with type of tobacco product to predict toxin exposure. Availability of a methodologically rigorous technique to quantify smoking behavior data will provide the opportunity to create a continuous model that incorporates product characteristics, behavioral use patterns and toxin exposure. Such models may inform current tobacco product regulation by identifying behavioral and toxin exposure differences across tobacco products.

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POS3-7

DISENTANGLING RELATIONS BETWEEN DEPRESSIVE SYMPTOMATOLOGY AND SMOKING MOTIVATION BY PARSING DEPRESSION INTO SYMPTOM SUBDIMENSIONS

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The depression-smoking relationship is complex and poorly understood. One barrier to understanding this link is depression's symptomatic heterogeneity. Different depressive symptoms have evidenced disparate relations to smoking behavior; however, past research has used depression measures that yield symptom dimensions, which may not be sufficiently comprehensive or distinct. The Inventory of Depression and Anxiety Symptoms (IDAS) produces 7 specific and distinguishable depressive symptom dimensions: Dysphoria (anhedonia, sadness, psychomotor disturbance, self-esteem loss, cognitive difficulty), Lassitude (anergia), Sucidality (thoughts/behaviors of self-harm), Ill Temper (irritability), Well-Being (happiness), Appetite Loss, Appetite Gain, and Insomnia. This study examined common and unique relations of IDAS dimensions to: (1) smoking heaviness (cig/day); and (2) domains of smoking motivation. Subjects were 338 smokers entering a cessation program (M = 36 yrs old, 44% Female, 86% Caucasian, M = 17 cig/day). Results indicated that Dysphoria, Lassitude, Insomnia, Ill Temper, and Well-Being each univariately associated with heavier smoking. In multivariate models including all of the dimensions as simultaneous predictors, only Dysphoria uniquely associated with smoking heaviness (ß = .28, $p < .01$). All dimensions univariately predicted multiple domains of smoking motivation (e.g., subjective addiction to cigarettes, habit, appetite control, affect modulation). For most facets of smoking motivation, Dysphoria was the only dimension to retain a unique relation in multivariate models (ßs .20 - .41). These results suggest that relations of depressive symptoms to smoking heaviness and motivation may be explained by: (a) variance specific to Dysphoria symptoms; and (b) common variance across symptom dimensions. Dysphoria symptoms, which contain core DSM-IV depression criteria, may be central to depression-smoking comorbidity, whereas other symptoms may play a peripheral role.

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POS3-8

THE ACUTE EFFECTS SNUS VS. QUICK RELEASE NICOTINE LOZENGE IN MALE AND FEMALE SMOKERS

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Objective: Swedish snus (SS) has garnered controversy for its proposed use as a smoking cessation aid and/or as a harm reduction tool. To date, however, little work has been done to directly compare SS with non-tobacco products that deliver comparable doses of nicotine.

Methods: During two double-blind randomized sessions, 23 dependent smokers (12 male) administered either SS containing 4 mg of nicotine or a quick-release 4 mg nicotine lozenge (NL) for 30 minutes. Subjective effects were assessed using Visual Analogue Scales and the Brief Questionnaire of Smoking Urges 10 and 40 minutes after completion of product administration.

Results: While both SS and NL were found to acutely reduce tobacco craving and several symptoms of withdrawal, NL effects on craving appeared to persist longer than those of SS ($p<0.01$) and NL also appeared to be preferred to SS ($p<0.01$).

Conclusions: Findings suggest that when given in comparable doses, NL may be superior to SS for the acute management of smoking abstinence symptoms.

CAN ADDAPT.

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POS3-9

DEVELOPMENT OF A METHOD TO ESTIMATE MOUTH-LEVEL BENZO[A]PYRENE EXPOSURE BY FILTER ANALYSIS

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Cigarette filters trap a significant portion of the mainstream smoke particulate matter during smoking. Differences in particulate deposition as readily evidenced by the visible appearance of staining patterns reflect natural variations in smoking behavior. The

quantitative analysis of total particulate matter or a specific smoke constituent deposited in a cigarette filter butt is a viable approach for estimating the mouth-level exposure to nicotine, tar, or other constituents in tobacco smoke. One previous approach used deposited solanesol measured in the filter as a proxy to predict mouth-level exposure to nicotine and other toxic and carcinogenic compounds such as tobacco-specific nitrosamines. However, cigarette filters have compound specific trapping efficiencies. Previous experiment indicated that solanesol did not yield a linear correlation with benzo[a]pyrene levels in mainstream smoke. We developed a new method for estimate mouth-level benzo[a]pyrene exposure by filter analysis. Under a variety of machine smoking condition to yield a range of total smoke volumes, benzo[a]pyrene was extracted from both spent cigarette filter and mainstream smoke collected on standard Cambridge filter pad, purified by solid phase extraction, and quantified by high performance liquid chromatography coupled with fluorescence detector. Measurements were made using 2R4F research cigarette and other commercial cigarettes having a range of machine smoke tar and nicotine deliveries. In all cases, result indicates linear relationship of benzo[a]pyrene between spent cigarette filter and Cambridge filter pad. This method not only estimates mouth-level benzo[a]pyrene exposure, but also provides a better understanding of how smokers actually use their products in their daily environment.

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POS3-10

EFFECT OF SMOKING TOPOGRAPHY AND RESPIRATORY FUNCTIONS ON EXPOSURE TO TOBACCO DERIVED CARCINOGENS AMONG POLISH SMOKERS

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Introduction: There are few studies concerning the relationship between smoking topography and exposure to tobacco derived carcinogens. We tested the hypothesis that smoking topography is a determinant of urine levels of polycyclic aromatic hydrocarbons (PAHs) and 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL), commonly used biomarkers of tobacco carcinogen exposure.

Methods: 185 regular smokers (80 male and 105 female; age: 35±13 and 38±14; FTND: 4.1±2.6 and 3.6±2.5, respectively) participated in the study. Each volunteer smoked five cigarettes of their own brand during single day. Puffing behavior was measured with the CressMicro pocket device (Borgwaldt GmbH, Germany). Mean values of various puffing parameters from five measurements were calculated. Respiratory function tests (FEV1 and VC) were also performed. Urine was sampled to measure levels of NNAL, a metabolite of the carcinogen 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK), and the PAH metabolites: 1-hydroxyfluorene (1-HFl), 2-hydroxyfluorene (2-HFl), 1-hydroxyphenanthrene (1-HPhe), 3+4-hydroxyphenanthrene (3+4-HPhe) and 1-hydroxypyrene (1-OHP). Then multiple regression analysis was performed (Statistica 9, Statsoft, USA). Analyses were controlled for age, sex, BMI, CPD, and type cigarettes (regular vs. low tar).

Results: Multiple regression analysis showed a significant relationship between average single puff volume and urine NNAL ($p<0.05$) and 1-HFl ($p<0.01$) concentrations. The type of cigarettes (regular vs. low tar) was significantly associated with urine levels of 1-HPhe and 3+4-HPhe ($p<0.05$). There was no effect of respiratory function on tobacco-derived carcinogens.

Conclusions: Puff volume appears to influence smokers' exposure to tobacco derived carcinogens among smokers independently from the number of cigarettes smoked per day.

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POS3-11

ACUTE EFFECTS OF ELECTRONIC NICOTINE DELIVERY SYSTEMS (ENDS) ON ARTERIAL STIFFNESS IN HEALTHY CIGARETTE SMOKERS

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Significance: The electronic nicotine delivery systems (ENDS), commonly called electronic cigarettes or e-cigarettes, are cigarette-like plastic devices that generate vapor when inhaled by a user, by means of heating a nicotine solution in a mixture of propylene glycol and water. Little is known about their safety, quality, and potential health effects. Aim: The aim of the study was to investigate the acute effect of electronic (ENDS) and conventional cigarettes on arterial stiffness.

Materials and Methods: The study was performed using a randomized placebo-controlled double blind cross-over design. Sixteen healthy smokers, 6 men and 10 women, aged 37±13 years, were recruited and studied in the morning on two different days. All subjects were regular smokers who smoked >10 cigarettes per day. In each session, participants were randomly provided with an ENDS with a 16 mg nicotine cartridge or ENDS containing a cartridge without nicotine (placebo). Subjects were also asked to smoke their regular cigarette one hour after the use of ENDS. Stiffness Index (SI) and Refection Index (RI) were measured using Pulse Track monitor at the beginning of the experiment, 15 and 60 minutes after the use of the ENDS, and 15 and 60 minutes after smoking a conventional cigarette. The effect of nicotine or placebo from e-cigarette on arterial stiffness was described as the relative change from baseline values. A two-way ANOVA for repeated measures was used to detect changes in arterial stiffness over time.

Results: Single use of ENDS was not associated with changes in arterial stiffness. We did not observe any significant differences in SI and RI after single use of ENDS with nicotine when compared with placebo (4.0±4.8 vs. –3.2±5.0% and 8.9±6.0 vs. 11.0±9.9%, respectively; $p>0.05$). No significant differences in SI and RI were detected after single use of ENDS with nicotine when compared to conventional cigarettes (4.0±4.8 vs. 7.0±7.3% and 8.9±6.0 vs. 3.2±5.8%, respectively; $p>0.05$).

Conclusions: We did not observe acute effects of ENDS on arterial stiffness in healthy cigarette smokers.

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POS3-12

NICOTINE PHARMACOKINETICS: COMPARISON OF A CIGARETTE, LOOSE SNUS, POUCHED SNUS, AND MEDICINAL NICOTINE GUM

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In a consumption survey of Swedish snus users, we found that users of loose snus (where a consumer takes an amount of loose tobacco from a tin and forms a ball of it before placing it in the mouth) consumed a far greater weight of tobacco each day than users of pouched snus (where a portion of snus tobacco is contained in a fleece). To investigate whether there were differences in the nicotine absorption kinetics following use of loose snus as compared to pouched snus, we have conducted a randomised cross-over pharmacokinetic study in Sweden. Six products were included in the study: 2 pouched snus products (approximately 9mg and 14mg of nicotine per portion), 2 different portion sizes of loose snus (approximately 9mg and 23mg of nicotine per portion), a cigarette (1mg ISO nicotine yield) and a medicinal nicotine gum (an over-the-counter oral nicotine replacement therapy with 4mg of nicotine per piece). All of the products were commercially available in Sweden at the time of study initiation (January 2010). The 20 volunteers who completed the 6 product visits were daily snus users who were also occasional smokers. They attended a Clinical Research Unit in Sweden on 6 occasions to test 1 product per visit. The concentration of plasma nicotine was determined at intervals for two hours during and after product use. All of the snus products were used for a period of 1 hour, which corresponded with the median tmax. The median tmax for the nicotine gum was 45 minutes (usage time: 30 minutes) and 7 minutes for the cigarette (usage time: approximately 5 minutes). Systemic nicotine exposure, based on AUC(0-tlast) and Cmax increased with increasing nicotine content for both types of snus, although increases in exposure were sub-proportional to the increases in nicotine content. All of the tobacco products gave higher systemic nicotine exposure than the nicotine gum. The nicotine exposure was similar for both of the 9mg nicotine pouched and loose snus portions with no statistically significant difference seen between these two products, suggesting that product form had no effect on the absorption kinetics of nicotine.

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POS3-13

MOTIVATION AND CONFIDENCE TO QUIT SMOKING IN FEMALE SMOKERS: WHAT IS THE ROLE OF COPING MECHANISMS?

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Stress is often cited as one of the main barriers to quitting smoking among women. Research suggests that the use of multiple coping mechanisms may help smokers resist the urge to smoke during attempted cessation. However, it is unknown how the use of coping mechanisms may impact the motivation to quit smoking and confidence to resist urges to smoke prior to a quit attempt. Therefore, the purpose of this study is to identify the association between motivation to quit smoking and confidence in ability to resist urges to smoke with a variety of coping mechanisms among female smokers during ad libitum smoking. Women between the ages of 18-40 who smoked at least 5 cigarettes/day were recruited to participate in an ongoing study. To be eligible participants had to be in stable physical/mental health, not be on any psychotropic or hormonal medications and be willing to quit smoking for four days. At screening, participants self-reported their motivation to quit smoking using a 10-point likert-type scale and confidence to resist urges to smoke (a single 4-point item from the Minnesota Nicotine Withdrawal Symptoms). They also completed the 'Revised Ways of Coping Checklist' (RWCC). Analyses were completed using SAS 9.2 to compute descriptive statistics, Spearman Correlations and ANOVAs. Participants (n=126) were, on average, 30.1 ± 6.5 years old and smoked an average of 13.3 ± 5.7 cigarettes/day. Most had at least a high school education (67%), were White (57%) and smoked within 30 minutes of waking (70%). Motivation was significantly correlated with the RWCC subscales of Avoidance (r=0.2, p=0.04) and Wishful Thinking (r=0.2, p=0.01). The RWCC subscales of Problem Focused, Seeks Social Support, and Blamed Self were not significantly correlated with motivation. There were no significant associations between confidence and the coping mechanisms. The results of this study indicate that the use of different coping mechanisms may be associated with one's motivation to quit smoking, but not confidence to resist urges to smoke. Additional research is needed to validate this observation and investigate how it may be used in cessation treatment planning.

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POS3-14

BRAIN RESPONSES TO MONETARY VS. TIME INCENTIVES: WHAT'S MORE REWARDING MONEY OR THE OPPORTUNITY TO SMOKE SOONER?

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Neuroimaging studies show increased brain responses in regions associated with reward processing when smokers view smoking cues. Few studies have examined smokers' brain responses to non-cigarette incentives. The current study examined smokers' responses to both monetary and time incentives that gave participants the opportunity to complete the study earlier and smoke sooner. Functional magnetic resonance imaging (fMRI) was used to examine the neural systems of reward in smokers during the anticipation and delivery of incentives.

Method: The task consisted of cues predicting the delivery of a monetary or time incentive followed by feedback displaying how much was won on the trial and block of trials. Following the fMRI scan participants were paid and allowed to leave the research center early based on how much money and how many time incentives they earned during the fMRI. Sixteen smokers who smoke at least half a pack a day participated in the study.

Results: During reward anticipation the orbitofrontal cortex (OFC) responded more to monetary compared to time incentives. During reward delivery the dorsolateral prefrontal cortex (dlPFC) responded more to monetary incentives, whereas the medial prefrontal cortex (MPFC) responded more to time incentives.

Discussion: The results demonstrate that reward type impacts the degree to which the neural systems of reward respond in smokers. Specifically, brain regions associated with reward representation (OFC and dlPFC) responded more to monetary rewards whereas regions associated with performance monitoring (MPFC) responded more to time rewards. In the current study performance during the time incentive trials led to the opportunity to leave the experiment early and smoke sooner. Therefore, the current results indicate that the time incentive trials may require extra performance monitoring among smokers because the opportunity to smoke may be a more salient reward than money. Further research is needed to confirm this interpretation of the results; however, these results indicate that smokers may value rewards differently based on their personal goals.

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POS3-15

THE INFLUENCE OF NICOTINE ON SLEEP IN HEALTHY NON-SMOKERS AND IN SMOKERS DURING CONSUMPTION AND WITHDRAWAL

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Nicotine may affect sleep by influencing sleep-regulating neurotransmitters. Sleep disorders can increase the risk for depression and substance dependency. To detect the impact of pure nicotine we examined polysomnographically (PSG) recorded sleep in non-smokers. To compare the influence of nicotine with those of tobacco smoke we investigated PSG of smoking subjects during a period of smoking, during withdrawal and after a period of abstinence from nicotine. 66 healthy non-smokers (33 males, 33 females aged 20-25 years), matched for age and gender, were randomized to receive in a double-blind, parallel group design placebo or either 8 or 16 mg nicotine patch (daytime or night-time application). All subjects had an adaptation night followed by the PSG night. In a second study, 41 smokers (27 male, 14 female, median age 29 years, FTND 6.3) were examined during smoking, 24-36 hours after smoke stop and 3 months after cessation. PSG data of smokers were compared with those of non-smoking individuals matched by age and sex. Nicotine administration in non-smokers caused in increased sleep onset latency, decreased slow wave sleep and less sleep efficiency. Furthermore it decreased the frequency of leg movements in sleep. Compared to non-smokers smokers had longer sleep latency, lower sleep efficiency, less slow wave sleep but more leg movements. Compared to the smoking state sleep was only slightly disturbed during nicotine withdrawal. Compared to abstainers relapsed smokers presented initial more depressive symptoms (though on a subclinical level), a higher degree of nicotine dependence and more withdrawal symptoms including more subjectively sleep impairment. The preliminary data analysis shows a reduced sleep quality caused by nicotine consumption both in healthy non-smoking subjects and in smokers and resulted in an affection of leg movements during sleep. Ex-smokers who relapsed after initial abstinence were characterized by increased depressive symptoms and higher nicotine dependency. Withdrawal associated sleep impairment may contribute to earlier relapse into smoking behaviours.

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POS3-16

USING ECOLOGICAL MOMENTARY ASSESSMENT TO STUDY COLLEGE STUDENTS' EXPOSURE TO CIGARETTE ADVERTISING

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The studies that have examined the effect of exposure to cigarette ads on smoking have been methodologically varied, ranging from experimental studies of small select samples (strong internal validity, weaker external validity) to naturalistic field studies of large representative samples (strong external validity, weaker internal validity). The trade-offs in choosing between different methods and designs make it difficult to draw precise conclusions about cigarette advertising effects. Moreover, the tobacco industry has increasingly targeted college students so the extent to which the available literature, which has mostly focused younger adolescents, can be generalized to older adolescents is not known. This study adapts ecological momentary assessment (EMA) to address these methodological and substantive issues by asking college students to monitor in vivo their exposures to cigarette ads. EMA affords the measurement precision of experiments and the external validity of naturalistic field studies; as such, it provides more precise information on how cigarette ads affect this understudied population. College students, ages 18-24 (n=47; 57% female; 60% Caucasian), carried palmtop computers with them for three weeks to record their exposures to cigarette ads, including exposure to smoking in movies. Participants answered questions about their thoughts and feelings about smoking immediately after each ad exposure and also in response to random prompts during the measurement period. This incredibly rich data set allows us to answer a number of important questions. For example, how frequently are college students exposed to cigarette ads? (Answer: about 2.2 times/week.) Where do college students encounter cigarette ads (answer: 39% in convenience/grocery stores; 24% outside of gas stations; 12% in movies)? Is exposure to cigarette ads associated with smoking-related cognitions? (Answer: yes, future smoking intentions are higher following exposure to cigarette advertisements compared to intentions measured at random times.) This study provides new information for the field about how to assess and model the effects of cigarette advertising on smoking.

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POS3-17

DOES SMOKING RESTORE SELF-CONTROL RESOURCES?

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The Self-Control Strength Model (e.g., Baumeister et al., 1994) views self-control (SC) as a limited resource, and has been increasingly applied to the study of addictive behaviors. Depletion of SC resources via experimental manipulation has been found to increase alcohol and cigarette consumption. This increase in substance use has typically been conceptualized as a form of SC failure called underregulation, or the failure to exert control over oneself (i.e., inability to resist urges). However, SC failure may also be the result of employing a SC strategy that exhibits beneficial effects acutely, while leading to detrimental long term consequences (i.e., misregulation). That is, smoking may serve to temporarily restore depleted SC resources. The present study tested the hypothesis that smoking restores depleted SC resources, and therefore could be viewed as a form of misregulation, using a randomized, 2 x 2 crossed-factorial, between-subjects design. To manipulate SC depletion, half of the 132 dependent smokers were instructed to suppress their emotional reaction to a brief video depicting environmental damage (i.e., Depletion), whereas the other half were instructed to "act natural" (i.e., No Depletion) during viewing. Half of the participants in each condition then smoked a cigarette, whereas the other half sat patiently, without smoking (i.e., Smoke vs. No Smoke). All participants then completed a behavioral measure of SC (Mirror Tracing Performance Task: MTPT). As hypothesized, an ordinal interaction occurred between the Depletion and Smoking manipulations for duration of time spent on the MTPT. That is, participants in the depletion condition showed less persistence on the MTPT, unless they were permitted to smoke. There was no evidence that this effect was mediated by affect and/or urge. Thus, smoking appeared to restore depleted SC resources, independent of putative mood or craving effects. These findings suggest that restoration of SC resources (i.e., misregulation) may represent another type of negative reinforcement from smoking that may play a role in nicotine dependence, and could inform the development of novel treatment modalities.

This study was conducted at, and funded by, the University of South Florida.

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POS3-18

ENHANCING INTRINSIC MOTIVATION FOR SUSTAINED ABSTINENCE AMONG COLLEGE SMOKERS ENROLLED IN A QUIT AND WIN CONTEST

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Background: Many features of Quit and Win smoking cessation contests are well suited for implementation on college campuses, but their short-term benefit is limited by relapse to smoking after the brief contest period. Findings confirm the need for interventions designed to increase intrinsic motivation to maintain abstinence after the external reinforcement has been removed (i.e., contest ends).

Methods: In Fall 2010, a randomized clinical trial (pilot) was implemented at a 2-year college (N=101). Participants were required to abstain from smoking for the one-month contest period for the chance to win a $3,000 prize. Participants were assigned to either 5 sessions of Motivation and Problem Solving counseling (n=20, MAPS), General College Health counseling (n=20, HE), or a no counseling condition (n=61, NO). MAPS combines motivational interviewing and CBT strategies to create a wellness plan focused on increasing intrinsic motivation and skills for living smoke-free. An online survey was completed at end-of-contest and one-month post-contest.

Results: At baseline, participants smoked 11.8±7.9 cpd on 28.7±3.7 days/month, their mean age was 27±7.7, 66.3% were female and 79.2% were Caucasian. At end-of-contest, 69% of respondents reported continuous 30-day abstinence (ITT abstinence, 48.5%). Participants in MAPS had higher abstinence rates (80%) than HE (70%) or NO (67%). At one-month post-contest, 27% of respondents reported sustained abstinence since enrollment (13.9% ITT). MAPS reported higher rates of sustained abstinence (50%) as compared to HE (27%) or NO (18%). Further, the increase in self-efficacy (SEQ-12-I) from baseline to end-of-contest was greater among MAPS (mean 7.56[SD 7.10]) than HE (6.14[7.26]) or NO (4.46[6.14]). A similar pattern was seen for changes in importance of quitting over time (0.25[0.68] vs. 0.07[1.38] vs. -0.34 [2.29], respectively). Because of the small size of this pilot trial, none of these differences is statistically significant (p>0.05).

Conclusion: Results suggest that MAPS may increase self-efficacy and importance in quitting and may increase the likelihood of end-of-contest cessation and sustained abstinence post contest.

This study was conducted at the University Of Minnesota, supported by NIH grant #R01HL093114-01.

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POS3-19

RELATIONSHIPS BETWEEN IMPULSIVITY, DECISION-MAKING AND EXECUTIVE FUNCTION IN SCHIZOPHRENIA AND CONTROLS: EFFECTS OF CO-MORBID CIGARETTE SMOKING

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Background: Cigarette smoking improves certain cognitive deficits in schizophrenia such as attention and working memory. The effect of co-morbid tobacco dependence on impulsivity, decision-making and executive function, however, is less clear. Moreover, the relationships between these different aspects of cognitive function in patients with schizophrenia and the effects of cigarette smoking are unknown.

Methods: 66 patients with schizophrenia (32 current, 12 former and 22 never smokers) and 61 non-psychiatric controls (23 current, 11 former and 27 never smokers) were assessed on the Kirby Delayed Discounting Task (KDDT), Iowa Gambling Task (IGT) and Wisconsin Card Sorting Task (WCST). Smokers were studied under satiated conditions.

Results: Participants with schizophrenia performed significantly worse compared to controls on the IGT and WCST (P's <0.001), measures of decision-making and executive function respectively, but performance was not modulated by smoking status in either group. There was a significant effect of smoking status on delay discounting, a form of impulsivity, in schizophrenia but not in controls; participants with schizophrenia who had never smoked were less impulsive than current (p=0.01) and former (p=0.04) smokers. In controls, performances across all the three tasks were significantly correlated: IGT total money and WCST perseverative errors (p=0.02) were positively correlated, whereas delay discounting was negatively correlated with IGT (p=0.04) and WCST (p<0.01) performance. No correlations were identified in the schizophrenia group.

Conclusions: Decision-making and executive function were poorer in persons with schizophrenia but unlike other aspects of cognitive function these deficits were not remediated by cigarette smoking. In controls performance on decision-making and executive function tasks were correlated and performance on both these tasks was reduced in persons with higher impulsivity as assessed by the KDDT. The relationship between these measures appears to be more complex in schizophrenia, which is likely due to the differential effects of smoking on impulsivity, decision-making and executive function in this population.

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POS3-20

FUNCTIONAL UNDERPINNINGS OF SAZETIDINE-A AND VARENICLINE AS SMOKING CESSATION AIDS

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Smoking is the largest preventable cause of death and disease in the United States, with about 46 million U.S. adults currently smoking (CDC, 2007). Furthermore, repeated quit attempts are common in smoking individuals and a recent study found that less than 10% of quit attempts resulted in continuous abstinence for one year (Gonzales, et al., 2006). Reasons cited for this impaired ability to remain abstinent include prolonged withdrawal symptoms comprised of both attentional (Rukstalis, Jepson, Patterson, & Lerman, 2005) and affective (Cook, Spring, McChargue, & Hedeker, 2004; Pomerleau, et al., 2005) elements. With the advent of newer pharmacotherapies like Chantix™ (varenicline), successful quit attempts have significantly increased. Therefore, subtype-specific nicotinic drugs present a rich area for investigation of their therapeutic potential in smoking cessation. However, a dearth of ideal animal models and subtype-selective ligands that easily cross the blood-brain barrier has hampered inquiry into this area. Equipped with automated behavioral models and the novel application of circuitry-level functional analysis, the current studies examine the effects of nicotinic partial agonists, varenicline and sazetidine-A, during withdrawal from chronically administered nicotine. Our studies indicate that varenicline and sazetidine-A have differential effects in

behavioral paradigms modeling nicotine withdrawal. Additionally, differences between varenicline and sazetidine-A are reflected in the functional effects of these drugs on CA1 reactivity in the hippocampus. Voltage-sensitive dye imaging (VSDi) has the capacity to evaluate circuit-level effects of both chronic and acute drug exposure. Using VSDi, we observed drug-specific effects on hippocampal circuitry changes following cessation of nicotine treatment, which could then be correlated to behavioral effects. These findings indicate the potential use of sazetidine-A as a smoking cessation aid in individuals co-morbid for anxiety and depression, where varenicline treatment may not be as useful.

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POS3-21

IDENTIFICATION OF GENES AND BIOLOGICAL PATHWAYS SIGNIFICANTLY MODULATED BY CIGARETTE SMOKING IN HUMAN PERIPHERAL WHOLE BLOOD CELLS OF METHAMPHETAMINE-DEPENDENT SUBJECTS

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Cigarette smoking has been associated with many disorders and diseases. Although it is known that cigarette smoking can modulate the function of many genes/proteins and biological processes in multiple tissues, including the peripheral blood, our knowledge of gene expression patterns in the peripheral blood of smokers is limited. The goal of this study was to identify the genes and pathways differentially regulated in blood cells from smokers compared with non-smokers, as well as to investigate the genes and pathways whose changes in expression correlate with smoking quantity. All participants included in the current study were derived from a clinical trial study for the treatment of methamphetamine dependence. Based on daily smoking quantity, each participant was classified as non-smokers (cigarette per day [CPD] = 0; N = 10), light smokers (CPD ≤ 10; N = 22), moderate smokers (CPD ≤ 20; N = 36), and heavy smokers (CPD ≥ 21; N = 10). Total RNA was extracted from the peripheral whole blood cells. Following comparison of genome-wide expression profiles of each smoking group with that of the non-smoking group for the more than 40,000 genes, we identified 660, 516, and 686 differentially expressed genes in the corresponding light, moderate, and heavy smoker groups, respectively, at $p \leq 0.05$. Among them, 126 genes were regulated in all three groups. Furthermore, the expression of 213 genes correlated significantly with smoking quantity, among which were biomarkers of smoking-related diseases, such as lactotransferrin, lipocalin 2, and alpha synuclein. We also identified a series of differentially enriched pathways in the smoking groups that are involved in immune function, metabolism, and neuronal function; e.g., T-cell receptor signaling pathway, apoptosis pathway, ubiquitin-mediated proteolysis, and axon guidance. In summary, we have identified a number of marker genes whose expression correlates with smoking quantity, as well as a series of biological pathways modulated by smoking.

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POS3-22

THE LOCALIZATION OF BRDU POSITIVE CELLS IN A ZEBRA FINCH BRAIN FOLLOWING IN VIVO NICOTINE ADMINISTRATION

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The mammalian and avian hippocampus play a crucial role in memory formation and spatial memory processing. Hippocampal damage induces impaired memory functioning, observed in neurodegenerative disorders, such as schizophrenia and Alzheimer's disease. Research suggested that the hippocampal release of immediate early genes (IEGs) together with plastic changes is important for proper functioning, but the identity of these plastic changes was never defined. Our preliminary studies indicate that nicotine increases the expression of the IEG transcription factor Egr-1, implying that DNA synthesis is increased. Our hypothesis is that nicotine affects the proliferation and survival of new neurons in the finch brain and more particularly in the hippocampus. Adult male zebra finches (n=16) were housed individually in recording chambers. After a 15-day baseline recording, animals received a 5 day-saline treatment (0.03 ml/10 gr BW). The animals were then randomly divided in two equal groups and were treated for 7-days twice a day with nicotine (0.18 mg/kg, s.c.) or saline. During the first five days of this treatment, all animals received an injection of the DNA synthesis marker BrdU (50 mg/kg, i.m.). After the 7-day treatment with nicotine or saline, the animals were observed for 21 days. Animals were sacrificed, brain tissue was quickly removed and flash-frozen. Tissue was cut on a cryostat (14 um) and sections were qualitatively examined for labeled profiles of BrdU. We found that in the nicotine-exposed animals BrdU positive cells are present in the lamina frontalis superior, which is the rostralmost extension of the hippocampal formation in birds, linked with memory formation and spatial memory. Another prominent finding was the presence of positive cells in the hyperpallium apicale, which is located directly beneath the HVC, a song nucleus involved in song acquisition and production. Currently, we do not know if these new neurons are incorporated in this structure or are en route to the HVC. Therefore, the precise role of the song system and the hippocampus in directing memory formation and spatial memory must be examined in further studies.

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POS3-23

THE LONG-TERM EFFECT OF NICOTINE ON CRYSTALLIZED SONG IN THE ADULT MALE ZEBRA FINCH

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The zebra finch (Taeniopygia guttata) is a well-known animal model to study cognitive processes using the natural occurring song pattern as a parameter for synaptic plasticity. The song pattern of the male zebra finch crystallizes 90-120 days after hatching, and remains constant for the entirety of the animal's life. In addition, the acquisition and composition of song is considered to be highly analogous to human speech. The presence of nicotinic acetylcholine receptors was recently demonstrated in two song nuclei that are involved in learning and memory of vocalizations and thus implies a role for these receptors in the vocalization process. This study was undertaken to investigate the potential effect of nicotine on the quality of the crystallized song of adult male zebra finches. Sixteen mature (>120 days old) male birds were selected at random, and housed individually in recording cages to monitor song production. After baseline recording and control injections were made (7 days each), nicotine (n=8, 0.18 mg/kg, s.c., 7 days, twice a day) or saline (n=8, 0.03 ml/10 g BW) was given. Songs were recorded for three months before being analyzed using Song Analysis Pro (SAP). Our results show that the crystallized song pattern in nicotine-exposed animals is significantly degraded, in which the overall structure of the song remains constant, but the finer features vanish from the spectrogram beginning approximately three weeks following the cessation of the nicotine treatment, and continuing for two months until the end of the experiment. Age matching controls did not show this effect. These results indicate a long-term change in the crystallized song, which is caused by the 7-day administration of nicotine. Two possible hypotheses are proposed: First, there may be damage caused by nicotine injection to other organs such as the lung or the heart, leading to a decrease in energy committed to the vocalization process, in which case re-administration of nicotine would have no effect. A second possibility could be that there is a genetic change in the song nuclei, in which case injection of nicotine after a latency period would reverse the songs deterioration.

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POS3-24

D-CYCLOSERINE SELECTIVELY DECREASES NICOTINE SELF-ADMINISTRATION IN RATS WITH LOW BASELINE LEVELS OF RESPONSE

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Greater diversity of treatments to aid smoking cessation will provide greater opportunity for adapting treatment to best suit particular types of smokers, in order to maximize the chance for successful cessation. Nicotine indirectly affects many noncholinergic transmitter systems by its stimulating the efflux of a variety of neurotransmitters. Drugs acting on some of these non-nicotinic receptor systems may be useful in promoting smoking cessation. The current study evaluated in young adult female Sprague-Dawley rats the efficacy of D-cycloserine, which is a partial agonist at NMDA glutamate receptors. The rats were trained to self-administer nicotine (0.03 mg/kg/infusion, IV) via operant lever response (FR1) with a visual secondary reinforcer. An acute dose-effect study of D-cycloserine (0, 10, 20 and 40 mg/kg, sc, N=16) effects on nicotine self-administration showed that there was a significant ($p<0.025$) interaction of D-cycloserine x low or high

pretreatment baseline level of nicotine self-administration (below or above the median response). In the low baseline group the 10 mg/kg D-cycloserine dose significantly ($p<0.05$) decreased nicotine self-administration. With the high nicotine self-administration group 40 mg/kg dose significantly ($p<0.05$) increased nicotine self-administration. In a follow-up study, repeated injections of 40 mg/kg of D-cycloserine were given for two weeks to evaluate chronic effects on nicotine self-administration (N=14 controls, N=16 D-cycloserine treated). As with the acute study, there was a significant ($p<0.05$) interaction of D-cyloserine x baseline levels of nicotine self-administration. Chronic D-cycloserine significantly ($p<0.025$) reduced nicotine self-administration selectively in rats with low baseline levels of response. It was ineffective with the rats with higher levels of baseline nicotine self-administration, which showed signs of increased response for nicotine. These results suggest that NMDA glutamate treatments may be useful in helping people successfully quit smoking. In particular, lighter smokers may benefit, highlighting the need for diverse treatments for different types of smokers.

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POS3-25

IS ALL RISK BAD? ADOLESCENT CIGARETTE SMOKERS FAIL TO TAKE ADAPTIVE RISK IN A LABORATORY DECISION-MAKING TEST

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Cigarette smoking has been linked to real-world risky behavior, but this association has been based largely on retrospective self-reports. Limitations of self-report data can be avoided by using laboratory, performance-based measures, such as the Balloon Analogue Risk Task (BART; Lejuez et al., 2002; Journal of Experimental Psychology: Applied). Initial studies have suggested that smokers display greater risk-taking on this task than nonsmokers, but these studies did not account for drug abuse and psychiatric comorbidities, which are commonplace among smokers. We therefore conducted a study of late adolescent/young adult (age 18 to 21) smokers (n = 26) and nonsmokers (n = 38) performing the BART, and excluded individuals with positive drug or alcohol toxicology screens, substance abuse or dependence diagnoses, and/or current psychiatric conditions. Contrary to previous findings, smokers did not display greater risk-taking on the BART than nonsmokers. In fact, when performance was examined trial-by-trial, compared to the smokers, the pattern of responses exhibited by nonsmokers showed increasing risk-taking over the course of the task ($p < .001$), earning them a nonsignificantly greater amount of money than the smokers. Controlling for smoking status, additional analyses revealed that risk-taking was positively associated with years of education, nonverbal IQ, and employment. A subgroup of participants with high scores on a delay discounting task also exhibited low levels of risk on the BART. The results suggest that in late adolescents, smoking is associated with a failure to take risks in situations where risk-taking is adaptive.

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POS3-26

MULTIPLE-DOSE PHARMACOKINETICS OF NICOTINE WITH A NOVEL MOUTH SPRAY FORM OF NICOTINE REPLACEMENT THERAPY

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As the efficacy of nicotine replacement therapy might be improved by faster systemic nicotine uptake, a new nicotine mouth spray has been developed. To evaluate the multiple-dose pharmacokinetics of nicotine with the mouth spray, and to compare the extent of nicotine uptake from the spray versus that from nicotine lozenge (NiQuitin® Lozenge) and nicotine gum (Nicorette® Gum), a randomized crossover study was conducted in 40 healthy adult smokers. Each subject received four separate treatments, with repeated doses administered over 11 hours. The treatments comprised: two consecutive sprays of mouth spray, 1 mg/spray, given either every 30 minutes or every hour, respectively, nicotine gum 4 mg given every hour, and nicotine lozenge 4 mg given every hour. For all treatments plasma nicotine concentrations increased during the first 8 - 9 hours after the first administration but then steady state was reached. The maximum and average plasma nicotine concentrations (Cmax and Cav, respectively) within the last dosing interval of mouth spray 2 mg every hour were lower (17.1 and 14.6 ng/mL, respectively) than those for nicotine lozenge 4 mg every hour (29.0 and 25.5 ng/mL, respectively) and nicotine gum 4 mg every hour (27.3 and 23.3 ng/mL, respectively), whereas they were somewhat higher with mouth spray 2 mg every 30 minutes (31.4 and 28.8 ng/mL, respectively). At steady state, plasma nicotine levels within one dosing interval seemed to fluctuate slightly more with mouth spray 2 mg/h than with lozenge 4 mg/h (peak-trough fluctuation 38% vs 29%). The peak plasma nicotine concentration at steady state was reached faster after the last administration of mouth spray (1 mg/h and 2 mg/h) than with lozenge or gum (median tmax 10 vs. 25 and 30 minutes, respectively) indicating more rapid absorption of nicotine from the mouth spray. In summary, nicotine delivered via the mouth spray results in steady-state plasma levels similar to or lower than those for gum or lozenge, but the fluctuation in plasma levels within one dosing interval is greater. This is due to a more rapid increase in plasma nicotine levels when nicotine is administered via the mouth spray.

The study was performed by McNeil AB.

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POS3-27

THE EFFECTS OF ACUTE ABSTINENCE AND REWARDS ON ERROR-MONITORING IN CIGARETTE SMOKERS

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Error-monitoring is a component of self-regulation that may be influenced by acute abstinence from smoking. The error-related negativity (ERN) is a neurophysiological index of error-processing. The ERN may be an endophenotype for externalizing behaviors, including substance use. Although a recent study found ERN amplitude to be similar among smokers and nonsmokers, participants were minimally deprived and light smokers. The present study examined the effects of acute abstinence on error-processing among heavy smokers (15 or more CPD). Participants completed two sessions: smoking as usual and abstinent (>12 hrs; CO-verified; order counterbalanced). Psychophysiological and behavioral data were collected while participants completed a modified version of the Eriksen flanker task. To determine whether motivation played a role in abstinence effects, the task was completed in alternating blocks in which performance was rewarded (maximum of $8) and immediate feedback was provided or not. Preliminary analyses focus on n=16, about half of the anticipated sample size. As expected, accuracy on the flanker task was greater on congruent than incongruent trials, $p<.001$, and for reward blocks relative to non-reward blocks, $p < .005$. However, abstinence had no reliable effect on accuracy, $ps > .12$. The ERN (error – correct, 0-100 ms post-response) was robust frontocentrally. Although the Abstinence x Reward x Accuracy interaction was not reliable in this preliminary sample, $p = .14$, unprotected follow-up tests were consistent with our hypotheses. In the absence of reward, the ERN was diminished during abstinence, $p = .10$. Reward improved the ERN during abstinence, $p<.03$, to a level comparable to that observed during smoking with reward, $F<1$. Overall, these preliminary analyses suggest that abstinence impairs error-monitoring and point to the role of motivation in the effects of abstinence on cognition and self-regulation.

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POS3-28

ASSOCIATION BETWEEN EMOTIONAL DISTRESS, AFFECT MODERATION, AND NICOTINE DEPENDENCE

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Both smokers' reports and theory suggest that smokers who are emotionally distressed will smoke more and be more nicotine-dependent. These effects are expected to be mediated by emotional distress, which suggests that individuals' ability to regulate affect should exercise a moderating influence. Daily smokers (N = 147, smoking rate=16.5 ±6.3) who were not planning to quit reported their average cigarette consumption and completed measures of dependence: the Wisconsin Inventory of Smoking Dependence Motives (WISDM), and the Nicotine Dependence Syndrome Scale (NDSS). The Global Severity Index (GSI) was used to assess emotional distress. The Emotion Regulation

Questionnaire assessed emotional regulation. Separate linear regression models were constructed to examine the association between GSI, emotion regulation, smoking rate, NDSS and WISDM (summary scores). Increasing GSI scores were associated with increased cigarette consumption (beta=2.22; p<0.004), NDSS (beta=0.39; p<0.003) and WISDM (beta=5.91; p<0.0003). After adjustment for average cigarette consumption, the relationship of emotional distress to NDSS was reduced to marginal significance (beta=0.23; p<0.06), however persisted for WISDM (beta=4.61; p<0.005). Emotion Regulation did not moderate the relationships between GSI and dependence. Questionnaire-assessed emotional distress was associated with increased smoking and nicotine dependence. Some, but not, all effects on dependence were mediated by increased smoking. The observed associations could reflect the contribution of emotional distress to the development of dependence, or could reflect some overlap between the constructs (for example, distress due to withdrawal symptoms.) Contrary to our hypothesis, it does not appear that emotion regulation, as assessed here, moderates this relationship. The distress expressed in the GSI may already take into account the success of the smoker's efforts to regulate response to stressors. Further analysis of the relationships among emotional distress, emotion regulation, cigarette consumption, and dependence is warranted.

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POS3-29

EFFECTS OF ACUTE NICOTINE ADMINISTRATION ON ELECTROPHYSIOLOGICAL AROUSAL IN NON-SMOKERS

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Tobacco smokers, while being aware of the long-term hazards of their habit, continue to smoke. This is believed to be due in part to the short-term effects of nicotine on mood, arousal and cognition. Acute administration of nicotine and nicotine withdrawal have been shown to exert opposing effects on arousal in smokers, as there has been a positive relationship shown between amount of smoking and cortical excitability. However, it is unclear as to whether nicotine acts directly to modulate arousal, or whether it acts indirectly through the relief of withdrawal symptoms. The purpose of this study was to investigate the effects of acute nicotine administration on electrophysiological cortical activity in nicotine-naïve non-smokers, as this group does not experience the physiological effects associated with nicotine withdrawal. As previous studies have shown a positive relationship between the amount of smoking and cortical excitability, it was hypothesized that, compared to placebo, acute nicotine administration would induce a decrease in slow-wave activity and an increase in fast-wave activity in nicotine-naïve non-smokers. 11 healthy non-smokers were administered nicotine gum (6 mg) in a placebo-controlled (2 sessions), double-blind, randomized crossover design. Electroencephalographic (EEG) activity was recorded from the scalp with a 40-channel system. Artifact free activity was submitted to spectral analysis for computation of amplitudes (in the delta, theta, alpha, beta1, beta2, beta3, and gamma bands), which were plotted across the scalp. There were no significant differences in fast-wave activity (beta1, beta2, beta 3 and gamma bands) between nicotine and placebo. There was greater left (vs. right) hemisphere activity in both the delta and theta bands. The lack of drug effects could be due to the small sample size. Increased left vs. right hemisphere activation could be in part the anxiolytic effects of nicotine, which appear to be mediated by the right hemisphere.

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POS3-30

"QUITTING IS EASY; I'VE DONE IT MANY TIMES": EXAMINATION OF GENDER AND ETHNICITY ON QUIT ATTEMPTS AMONG HEAVY DRINKING SMOKERS

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Recent research has identified ethnic and gender differences in nicotine dependence severity and quit attempts. Specifically, greater nicotine dependence severity and desire to quit smoking has been reported for African Americans relative to Caucasians while females are generally more likely to make quit attempts. The goal of this study is to examine gender and ethnicity effects on quit attempts, controlling for nicotine dependence severity, in a diverse sample of heavy drinking daily smokers (n = 105, 74% male, 54% African American). Participants smoked ≥ 10 cigarettes per day and reported an average of 3.13 (SD = 3.67) quit attempts lasting 24-hours or more over the past year. Analyses of the effects of ethnicity (African American versus Caucasian) on past year quit attempts revealed a significant main effect of dependence severity (p< .05) on quit attempts such that higher levels of nicotine dependence predicted fewer quit attempts. In addition, there was a significant Ethnicity × Severity interaction (p < .05) such that while higher severity of dependence was associated with fewer quit attempts in Caucasians (p < .05), it was unrelated to quit attempts in African Americans. There was also a trend towards a main effect of gender such that females reported more quit attempts than males (p = .06), however, there was no Gender × Severity interaction (p = .10). African Americans also scored higher on the Alcohol Use Questionnaire (ADS) compared to their Caucasian counterparts. These results help elucidate ethnic and gender differences in quit attempts in a unique population of heavy drinking smokers. This is highly relevant as heavy drinking represents a significant risk factor for failed smoking cessation attempts. Further analyses of the role of alcohol use in smoking cessation patterns will be examined in this growing diverse sample of daily smokers.

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POS3-31

ENHANCING NICOTINE VACCINE EFFICACY: GENERATING NON-OVERLAPPING CLONAL B CELL RESPONSES TO NICOTINE VACCINES THROUGH THE USE OF 3 STRUCTURALLY DISTINCT IMMUNOGENS

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Nicotine conjugate vaccine efficacy is limited by the concentration of nicotine-specific antibodies that can be reliably generated in serum. Previous data show that the concurrent use of 2 structurally distinct nicotine immunogens in rats can generate additive antibody responses by stimulating distinct B cell populations. The current study evaluated the antibody response in rats to these two previously-characterized nicotine haptens, 3'-aminomethyl nicotine conjugated to recombinant Pseudomonas exoprotein A (3'-AmNic-rEPA) and 6-carboxymethylureido nicotine conjugated to bovine serum albumin (6-CMUNic-BSA) as well as a third structurally distinct hapten, 1'-(2-mercaptoethyl)butanamide (S)-nicotine conjugated to keyhole limpet hemocyanin (1'-SNic-KLH). These haptens differ in the site of linker attachment to nicotine, the structure of the linker, and the carrier protein to which they were conjugated. All three immunogens generated high titers of nicotine-specific antibodies in rats as measured by ELISA. For each of the immunogens, there was no ELISA cross-reactivity with either of the other 2 immunogens, indicating that each immunogen stimulated distinct and non-overlapping populations of B cells. Antibodies generated to each of these immunogens also did not cross react with the unconjugated proteins used as carriers for the other 2 immunogens. These data show that it is possible to design multiple immunogens, which provide distinct epitopes for immune presentation from a small molecule such as nicotine (MW 162 Da), with each eliciting a clonally distinct antibody response. This approach may be of interest as a strategy for generating high levels of nicotine-specific antibodies, or antibodies to other small molecules.

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POS3-32

NICOTINE WITHDRAWAL EFFECTS ON AN ATTENTIONAL CONTROL/WORKING MEMORY TASK

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Nicotine withdrawal has been found to disrupt various cognitive processes, including attentional control and working memory. These cognitive reductions can lead to increased negative affect via impaired ability to shift focus from distressing thoughts, as well as decreased capacity to efficiently complete daily activities. Thus, smoking may be negatively reinforced through alleviation of nicotine withdrawal induced deficits in cognitive control. Although it is well established that nicotine withdrawal results in cognitive control decrements, the precise processes and measures that best mark these effects is not as well established. Previous nicotine withdrawal effects on the attentional control/working memory N-back task have produced mixed findings, and studies have

not always been blinded to nicotine administration. We further examined the effects of nicotine on the N-back task among 32 heavy smokers who each attended two laboratory sessions. In a double-blind and counterbalanced fashion, participants smoked four nicotinized cigarettes (.6 mg nicotine) during one session and four placebo cigarettes (.05 mg nicotine) during the other. Participants completed 0-, 1-, 2-, and 3-back versions of the N-back during both sessions. The N-back requires participants to recall whether or not a stimulus was presented N trials previously. Analyses indicated that nicotine, relative to placebo, resulted in faster reaction time and increased accuracy on the 1-back condition. In contrast, there were no significant effects of nicotine on the more difficult N-back conditions. These results suggest that nicotine may have observable behavioral effects that can be detected using simpler RT tasks (e.g., 1-back). More sensitive neurophysiological indices (e.g., event-related brain potentials) may be necessary to detect nicotine effects on higher-level cognitive processes (2- and 3-back). We discuss these findings in the context of other N-back studies and other research examining nicotine withdrawal effects on cognition.

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POS3-33

CHRONIC INTRAVENOUS NICOTINE SELF-ADMINISTRATION IN C57BL/6J MICE WITH NO PRIOR TRAINING

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Rationale: The ability to evaluate genetically engineered mice in a chronic intravenous (IV) nicotine self-administration paradigm will be a powerful tool for investigating the contribution of specific molecules to nicotine reinforcement. The present research describes a reliable model of chronic intravenous nicotine self-administration in 57Bl/6J mice.

Methods: Male C57Bl/6J mice were allowed to self-administer either nicotine (0.03 mg/kg) or saline in 2 hr daily sessions under fixed ratio 1 (FR1) and FR2 schedules of reinforcement using an active vs. passive lever setup. Responding was then extinguished by withholding of nicotine/saline and infusion delivery-associated cues after which animals were subjected to reinstatement by infusion delivery-associated cues, nicotine priming injection (0.15 mg/kg, s.c.), and electric footshock.

Results: Only mice trained to self-administer nicotine showed reliably greater responding on the active vs. the passive lever by the end of FR2 training ($p<0.01$). Nicotine trained mice also reinstated responding on the active lever after presentation of infusion-delivery-associated cues ($p<0.01$) or electric footshock ($p<0.05$); however, a priming injection of nicotine had no effect on responding.

Conclusion: C57Bl/6J mice will self-administer nicotine under appropriate conditions and can be reinstated after extinction through the use of nicotine-associated cues and stress; however, nicotine priming injections are not effective in this mouse model.

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POS3-34

ASSOCIATION OF AGE AT MENARCHE AND THE ONSET OF DAILY SMOKING

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Approximately 440,000 Americans die each year from diseases related to smoking and about 90% of all smokers start during adolescence. Early menarche has been shown to be related to early daily smoking habits in young women. Although the mechanism of this observation is unknown, one hypothesis is that perceptions of maturity relative to peers may play a role. The current study aims to investigate (1) an association between the reported age at menarche (AAM) and the age of becoming a daily smoker, and (2) the perceived timing of menarche (PTOM) and the age of becoming a daily smoker. Female smokers (18-40 years of age) with regular menstrual cycles, who smoke at least 5 cigarettes per day, not taking exogenous hormones or psychotropic medications, and in stable physical/mental health, were enrolled into a study investigating the role of mood and sex hormones on short-term quitting. Participants completed the CIDI, which provided information regarding AAM and PTOM (earlier, later, or about the same time as peers). Participants also self-reported information regarding demographics and smoking behavior. Linear regression investigated the association of actual AAM and PTOM on age of becoming a daily smoker. Study subjects (n=54) were, on average, 29.10 (± 7.22 SD) years of age and smoked 14.09 (± 5.78 SD) cigarettes per day. The average AAM was 12.50 years of age (± 1.55 SD) with most subjects perceiving timing of menarche to be about the same as peers (n=27; 50%), followed by later than peers (n=14; 26%), and earlier than peers (n=13; 24%). The average age of onset of daily smoking across all subjects was 15.87 years of age (± 3.45 SD). AAM was found to be a significant predictor of age of becoming a daily smoker (f-value=5.60, p-value=0.022) while PTOM was not (f-value=0.41, p-value=0.53). The results of this study support previous findings that early maturation in females represents a risk factor for early onset of daily smoking, however, the perception of early maturation does not. Further studies replicating this design with larger samples and investigations of other possible risk factors are warranted.

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POS3-35

EFFECT OF TRAUMA REMINDER ON CUE REACTIVITY TO SMOKING AND NEUTRAL CUES IN SMOKERS WITH PTSD

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Smoking prevalence rates are higher among groups diagnosed with psychiatric disorders compared to the general population. Posttraumatic Stress Disorder (PTSD) is associated with higher smoking prevalence rate (45% vs. 24%) and lower quit rates (32% vs. 43%) than the general population. Given the impact of smoking on health, its high comorbidity with PTSD, and the reduced quit rates among PTSD diagnosed smokers, knowing the factors that maintain smoking in this population is important. One possible factor that may play a role in the maintenance of smoking among PTSD patients is the association between PTSD symptoms and nicotine craving. This study assessed how trauma reminders impacted craving during a cue exposure paradigm. Sixteen non-abstaining smokers meeting criteria for PTSD listened to audio-taped narratives, one trauma related script and one script describing a neutral scene, while presented with a smoking and neutral cue. Scripts and cues were counterbalanced across 2 blocks of 4 trials. Self-reported craving measures and heart rate and skin conductance responses were collected. Analyses indicated a significant Block × Script interaction, $F(1,15) = 4.8$, $p < .05$, with craving rated significantly greater during trauma scripts compared to neutral scripts during the first block and with craving reports increasing for the neutral script during the second block. Craving ratings did not reliably change between smoking and neutral cues. Heart rate and skin conductance responses did not reliably differ between script or cue conditions. Results suggest that in non-abstaining smokers with PTSD, trauma reminders increase craving and the presence of a physical smoking cue did not have an additive effect. Implications for smoking cessation treatment will be discussed.

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POS3-36

EFFECTS OF ACUTE NICOTINE ADMINISTRATION ON BEHAVIOURAL AND NEURAL CORRELATES OF WORKING MEMORY IN NON-SMOKERS

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Nicotine, the primary psychoactive agent in cigarettes, is notoriously addictive. The addictive properties of nicotine may be due in part to its purported enhancement of cognitive processes, particularly those pertaining to sustained attention and working memory. Nicotine has previously been shown to enhance measures of working memory in smokers following acute administration. It is unclear, however, whether these previously reported results are due to absolute improvements in cognitive performance or due to alleviation of withdrawal symptoms. The present study aimed to elucidate the absolute effects of acute nicotine administration on working memory by assessing non-smokers on multiple versions of the n-back task within a randomized, double-blind, placebo controlled, crossover design. Methods: Participants were 20 right-handed, healthy non-smokers between 18-40 years old who attended two test sessions, receiving nicotine polacrilex (6 mg) one day and a placebo gum the other day. All participants performed an n-back task with four randomized conditions (0, 1, 2 & 3-back) while EEG was recorded concurrently from 26 tin electrodes placed on the

scalp. Artifact-free EEG epochs were submitted for Fast Fourier Transform and analyzed for delta, theta, alpha and beta frequency power. Secondary measures included behavioural indices, mood & physical symptoms questionnaires and vital signs. Results: Nicotine (vs. placebo) increased alpha1 power at right frontal overall and increased alpha1 power at left frontal sites during the highest load (3-back) condition. Nicotine (vs. placebo) also increased alpha2 power during the 0-back condition in the right hemisphere and in the 2-back condition at frontal sites. Nicotine (vs. placebo) further increased overall right hemisphere theta activity during 0- and 1-back task conditions. Nicotine had no effect on mood, physical symptoms, vital signs or behavioural measures (hits, false alarms, reaction time) across any of the n-back conditions. Summary: Although nicotine had no impact on task performance, it did modulate working-memory related neural networks in non-smokers, albeit in a working memory load dependent manner.

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POS3-37

DOES NICOTINE USE ALTER THE "HIGH" OR "DESIRE" FOR COCAINE AMONG COCAINE-DEPENDENT SMOKERS?

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Aims: The primary aim of this study was to evaluate whether nicotine use alters the "High" or "Desire" for cocaine among cocaine-dependent smokers.

Methods: Participants answered questionnaires, including Fagerstrom Test for Nicotine Dependence (FTND), Tiffany's Craving Questionnaire (TCQ), and a Multiple Drug Use Questionnaire (MDUQ).

Results: Participants (N=199) were primarily African American males (61%), 44.8+7.0 (mean+S.D.) years of age, who reported using cocaine for 17.5+7.9 years and used cocaine 19.8+8.7 days out of the last 30 days. As expected, the majority of cocaine users were also nicotine-dependent (N=171; 86%), had smoked cigarettes for 23.3+9.4 years and 27.7+6.1 days out of the last 30 days, and smoked 13.7+10.6 cigarettes/day. Mean FTND score was 4.5+2.6. The two questions on the MDUQ scale (-5: reduces, 0: no change, +5: increases) included "Does nicotine affect the high that you experience from cocaine?" and "Does nicotine affect your desire for cocaine?" The scores were 1.2+2.8 and 0.7+2.3, respectively. Eleven questions on the TCQ evaluated interactive effects of nicotine and cocaine on a scale of 0 to 100 (0: not at all, 100: most ever). In response to "When using cocaine, I crave cigarettes more than usual"; and "When using, I smoke out of habit," participants rated these as 78.9+29 and 73.5+28.9, respectively. Additional analyses were performed by separating participants into HighCD vs. LowCD groups using a median split based on the number of cigarettes smoked each day. The HighCD group smoked 22.3+9.6 cigs/day while the LowCD group smoked 6.2+2.9 cigs/day. Full data outcomes for the MDUQ and TCQ for these groups will be presented.

Conclusions: Overall, the results indicate that nicotine use does not substantially increase the "High" or "Desire" produced by cocaine, but these individuals use nicotine due to nicotine craving and out of habit. Of interest, after performing a median split, those in the HighCD group reported a significant increase in several parameters of the TCQ when compared to those in the LowCD group.

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POS3-38

NICOTINE METABOLITE RATIO PREDICTS SMOKING TOPOGRAPHY AND CARCINOGEN BIOMARKER LEVEL

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Variability in smoking behavior is partly attributable to heritable individual differences in nicotine clearance rates. This can be assessed as the ratio of the metabolites cotinine (COT) and 3'-hydroxycotinine (3HC) (referred to as the nicotine metabolism ratio, NMR). Faster metabolizers of nicotine have higher smoking rates, and therefore may have increased risk for lung cancer. We hypothesized that faster NMR would be associated with greater cigarette puff volume and higher levels of total 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL), a carcinogen biomarker. Current smokers (n=109) smoked one of their preferred brand cigarettes through a smoking topography device and provided specimens for NMR and total NNAL assays. NMR quartiles were created based on previous research. The participant sample was 59% male, 96% Caucasian with an average age of 45.4 (SD=10.8) years old. On average, they had been smoking for 29.3 years (SD=11.2), smoked an average of 20.5 cigarettes per day (SD=8.4), with an average nicotine dependence score of 4.9 (SD=2.1). There was an overall association of NMR quartiles with total puff volume (F=2.62, p=.05); smokers in the third quartile (p=.042) and fourth quartile (p=.016) exhibited significantly higher total puff volumes than those in the first quartile. There was a significant main effect of the NMR with NNAL (F=3.59, p=.02); smokers in the third quartile (p=.001) and fourth quartile (p=.033) had higher total NNAL levels than those in the first quartile. Linear regression analysis indicated that the total puff volume by daily cigarette consumption interaction was positively associated with total NNAL level (beta=2.538x10-5, t=2.94, p=.004), controlling for sex (p=.02), years smoking (p=.04), and menthol (p=.16); the overall model was significant [F(4,104)=4.85, p=.001, R2 =.16). Compared to the slowest metabolizers (first quartile), smokers in the third and fourth quartiles exhibited 23% and 28% increases in total puff volume, and total NNAL levels that are 61% and 53% higher, respectively. A heritable biomarker of nicotine clearance predicts total cigarette puff volume and total NNAL.

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POS3-39

RISK TAKING, TOBACCO USE, AND PEER INFLUENCE

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Adolescence is a sensitive period in the augment of a variety of risk-taking behaviors, including tobacco use. Peer pressure has been shown to play a major role in adolescent risk-taking behaviors. We modified the Balloon Analogue Risk Task (BART) to include a peer component to empirically investigate whether peer influences alter risk-taking behavior among adolescents. Furthermore, we also examined whether adolescents who engage in a particular kind of risk-taking behavior such as cigarette smoking were more susceptible to peer influences. 39 adolescents (22 smokers, 17 nonsmokers) recruited from high schools in CT completed one experimental session during which the regular- and peer-BART were presented in counterbalanced order. Smokers reported smoking 15.1 cigs/day (SD = 4.9) and had mFTQ scores of 5.6 (SD =1.8). Results from a repeated measures ANOVA showed significant increases in the number of explosions in response to the peer BART when compared with the regular BART ($F(1, 39) = 6.96$, $p = .01$) with no significant changes in adjusted average pumps (p=0.09). The changes in risk-taking in response to the peer BART differed by smoking status ($F(1, 39) = 4.14$, $p = .05$); specifically smokers had greater increase in the number of explosions by 2.27 (SD = 3.12) compared to an increase of .29 (SD = 2.87) by non-smokers. While no correlations were found between peer-influenced changes in risk-taking on the BART and resistance to peer influence (RPI, Steinberg and Monahan, 2007), positive correlations were observed with trait impulsivity measures (BIS-11, Barratt, 1959) for total scores ($r=0.45$, $p<0.05$) as well as the subscales of non-planning impulsivity ($r=0.35$, $p<0.05$) and cognitive impulsivity ($r=0.50$, $p<0.01$). These results suggest that smokers may be more susceptible to peer influences on risk-taking behavior. Additionally, the enhancement of risk taking behaviors in the presence of peers appears to be positively correlated with an impulsive personality. Despite this being a preliminary investigation, the current findings have important implications for the development of optimal prevention and cessation programs for risky behaviors among adolescents.

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POS3-40

ROLE OF NICOTINE RECEPTOR SUBTYPES IN SENSORY GATING

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The ability to filter sensory information and suppress unimportant input is crucial for many cognitive functions. People that suffer from schizophrenia show deficiencies in sensory filtering, which is associated to other cognitive dysfunctions. Many schizophrenia patients smoke and enhance sensory filtering and cognition by the consumption of nicotine. Prepulse inhibition (PPI) of startle is an operational measure for sensory

gating and it is disrupted in schizophrenic patients. We explore the nicotine receptors that mediate the enhancement of PPI in rats, using stereotaxic injections of nicotine, TMPH and MLA and behavioral experiments as well as electrophysiological recordings in brain slices. Our results show that nicotine activates receptors directly in the startle pathway, and that these receptors in the pontine reticular formation modulate startle and PPI of startle. Both, in vivo and vitro experiments indicate that these nicotine receptors are mainly non-alpha 7 receptors.

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POS3-41

COMBINING ACTIVE AND PASSIVE IMMUNIZATION USING A TARGET ANTIBODY CONCENTRATION STRATEGY TO ENHANCE THE EFFICACY OF NICOTINE IMMUNOTHERAPY

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Nicotine vaccines reduce nicotine-induced behaviors in rats and are undergoing clinical trials. Efficacy for smoking cessation is limited because current vaccines do not uniformly produce the high nicotine-specific antibody (NicAb) concentrations necessary to consistently reduce smoking behavior. Passive immunization with a nicotine-specific monoclonal antibody may allow more control over NicAb concentrations than vaccination but its use is limited by cost and a shorter duration of action. Combining these two immunotherapies is an alternative approach that exploits the advantages of each approach. The goal of this study was to explore combination immunotherapy using a target concentration strategy. Vaccinated animals were supplemented with individualized doses of the monoclonal antibody Nic311 as necessary to achieve a total serum NicAb concentration (0.2 mg/mL), previously determined to be effective for blocking locomotor sensitization to nicotine. Rats received vaccine alone, Nic311 alone, both, or neither, followed by 0.3 mg/kg nicotine s.c. for ten consecutive days. Non-immunized animals receiving nicotine showed significant locomotor sensitization and higher activity levels on days 7-10 than non-immunized animals receiving saline. The combination of vaccination and Nic311 achieved the targeted total serum NicAb concentration and blocked locomotor sensitization to nicotine to a greater extent than vaccination or Nic311 alone. Only the combination immunotherapy and vaccine-only groups had significantly lower brain nicotine levels than the non-immunized group. The mean Nic311 dose necessary to supplement vaccination (30 mg/kg) was considerably lower than the dose of Nic311 previously shown to reduce locomotor sensitization (>80 mg/kg) when used alone. These data show that small, individualized doses of Nic311 can enhance the ability of a nicotine vaccine to block locomotor sensitization to nicotine in rats. A target antibody concentration strategy may be useful in addressing the highly variable serum NicAb levels produced by nicotine vaccines, or other addiction vaccines, in humans.

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POS3-42

LACK OF EVIDENCE SUPPORTING A FUNCTIONAL ROLE OF CB2 RECEPTORS IN NICOTINE REWARD

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Introduction: Cigarette smoking is responsible for 5 million deaths worldwide every year. The mechanisms underlying tobacco smoking are of wide interest and clearly there is still a need for more effective medications to help in smoking cessation and prevent relapse. Over the last decade there have been significant advances in the discovery and understanding of the cannabinoid system along with the development of pharmacologic tools that modulate its function. Characterization of the crosstalk between nicotine addiction and the cannabinoid system may have significant implications on our understanding of the neurobiological basis for the co-abuse of cannabis and tobacco. Currently there are 2 types of cannabinoid receptors identified and cloned in the human body CB 1 and CB2 receptors. CB1 receptors were found to be primarily located in the brain and are involved in the rewarding properties of cannabinoids. Cb2 receptors were thought to be located peripherally and are involved in the modulation of the immune response of the body. Van sickle et al., 2005 was able to identify a functional role of CB2 receptors in the brain. Onaivi et al., 2008 proposed that CB2 receptors play a functional role in depression and alcohol abuse. Aim of the work our main objective was to study the potential role of CB2 receptors blockade on nicotine self administration using fixed ratio and progressive ratio schedules of reinforcement, as well as the effect of CB2 receptor blockade on reinstatement of nicotine seeking behaviour induced by nicotine priming and visual cues.

Methodology: Male Long Evans rats were trained to lever press for nicotine. After stabilization of behaviour, AM630, 1.25, 2.5, 5mg and vehicle were administered to the animals in a counterbalanced within subject design (IP, 30 minutes before the start of the session).

Results: blockade of Cb2 receptors did not produce any significant effect on nicotine self-administration under fixed and progressive ratio schedules of reinforcement. Furthermore AM630 had not effect on reinstatement of nicotine seeking behaviour induced by visual cues and nicotine priming.

Canadian Tobacco Research Initiative.

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POS3-43

REPEATED EXPOSURE TO CHRONIC NICOTINE AND WITHDRAWAL INCREASES SENSITIVITY TO REWARD

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Nicotine reward is an integral part of the addictive nature of nicotine, However, it is not clear if relapse to smoking is motivated by rewarding properties of nicotine or by the desire to alleviate withdrawal symptoms. To characterize the early period of nicotine deprivation and to evaluate how multiple withdrawal periods alter reward threshold in the absence of nicotine, we used intracranial self-stimulation (ICSS) to measure alterations in brain stimulation reward (BSR). In separate cohorts of mice we used conditioned place preference (CPP) to evaluate positive context conditioning. Following one 14-day exposure to nicotine (Osmotic minipumps; 24mg/kg/day), acute administration of nicotine reduced sensitivity to reward. However, after multiple chronic nicotine exposures and withdrawal periods, mice showed a gradual increase in reward sensitivity in response to acute doses of nicotine. In addition, basal reward threshold in the absence of nicotine is also increased. Exposure to repeated chronic nicotine and withdrawals may reduce the aversive effects produced by acute doses of nicotine. Alternatively, repeated exposure and withdrawal may increase the rewarding value of nicotine. To distinguish these possibilities we exposed animals to repeated nicotine and withdrawal and evaluated reward in a conditioned place preference paradigm. Following a single exposure to 14 days of nicotine, mice did not demonstrate a place preference for nicotine in the period of withdrawal. However, following multiple exposures to nicotine and withdrawal, mice do demonstrate enhanced nicotine CPP when compared to animals that were never chronically exposed to nicotine. Together, these results indicate that multiple chronic exposures to nicotine and withdrawals, not only reduce the aversive effects of acute nicotine administration, but also increase the sensitivity to its rewarding effects.

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POS3-44

SOURCE LOCALIZATION OF ENHANCED EARLY VISUAL PROCESSING BY NICOTINE IN RESPONSIVE NON-SMOKERS: AN EVENT-RELATED (ERP) AND SLORETTA STUDY

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Nicotine has been shown in previous studies to have an enhancing effect on cognition, specifically on attentional processing. However, the nature of these processes modulated by nicotine and whether they occur at early or late stages of information processing is unclear. This study utilized event-related potentials (ERPs) and sLoretta (standardized low resolution electromagnetic tomography) to examine the acute effects of nicotine on selective attention in non-smokers performing a Posner-type visuo-spatial task of attentional orienting. The attentional processing of visual-spatial locations is reflected in the P1 ERP component, which represents earlier stages of visual analysis. Twenty-four non-smokers (14 females) received nicotine gum (6 mg) in a randomized, double-blind, placebo-controlled, repeated measures design. Using change in heart rate (HR), a measure of nicotine absorption, participants were grouped into responsive and non-responsive groups by median split. Behavioural performance and ERPs were assessed in response to target locations preceded by valid, invalid and neutral cues. Source

localization for these indices was indexed by sLoretta. Nicotine did not alter behavioural performance but it increased HR relative to placebo. In general, electrophysiological changes seen in P1 did not support the hypothesis that nicotine enhances visual spatial selective attention. However, individuals who indicated greater nicotine absorption (i.e., increased HR) demonstrated a larger P1 ERP component during valid cue trials with nicotine versus placebo. With source analysis, it expected that these responder group differences will also be exhibited by greater activation (in the responder group) of the extrastriate cortex generating P1. The study concludes that nicotine enhanced selective attention with regards to the early visual encoding and analysis, as indexed by P1. These results demonstrate support for nicotine-related cognitive enhancement and could explain, in part, tobacco dependence. Results will also be discussed in the context of source localization for the effects of nicotine on early cortical processing during visuo-spatial attention.

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POS3-45

CRAVING RELIEF WITH A NOVEL NICOTINE MOUTH SPRAY FORM OF NICOTINE REPLACEMENT THERAPY

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As the efficacy of nicotine replacement therapy might be improved by faster systemic nicotine uptake, a new nicotine mouth spray has been developed. Pharmacokinetic studies have demonstrated that absorption of nicotine from the mouth spray is fast. To evaluate the speed of onset of effect of nicotine mouth spray, a randomized crossover study was conducted in 200 healthy adult smokers. The study compared urges to smoke over time following administration of either nicotine mouth spray 2 mg or nicotine lozenge (NiQuitin® Lozenge) 2 mg and 4 mg. Following 5 hours of witnessed abstinence from smoking, study treatment was administered and urge to smoke was measured frequently for two hours on a 100 unit visual analogue scale. The areas under the urge to smoke-vs.-time curves during the first 10 minutes were then compared between treatments. The results indicate that onset of relief of urges to smoke was faster following use of mouth spray 2 mg than either nicotine lozenge 2 mg or nicotine lozenge 4 mg. During the first 5 minutes after administration statistically significant differences were observed between mouth spray 2 mg and lozenge 2 mg (13.9 units on average) and between mouth spray 2 mg and lozenge 4 mg (12.2 units on average). Statistically significant differences were also demonstrated between mouth spray versus lozenge over the first 1, 3 and 10 minutes following treatment administration. In summary, the rapid absorption of nicotine from nicotine mouth spray observed in pharmacokinetic studies translates into fast onset of relief of urges to smoke.

The study was performed by McNeil AB.

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POS3-46

TONIC BUT NOT PHASIC VENTRAL TEGMENTAL AREA DOPAMINERGIC ACTIVITY THROUGH D2 RECEPTORS MEDIATES THE AVERSIVE MOTIVATIONAL RESPONSE TO WITHDRAWAL FROM CHRONIC NICOTINE

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The neurobiological mechanisms underlying the negative motivational symptoms of nicotine withdrawal remain poorly understood. We previously demonstrated that signaling at dopamine receptors is necessary for the aversive motivational response to nicotine withdrawal in dependent rodents. We next hypothesized that the specific pattern of signaling (tonic vs phasic firing) at dopamine receptors mediates aversions to nicotine withdrawal. Using electrophysiological, genetic, pharmacological and behavioral methods, we demonstrate that tonic but not phasic activity in ventral tegmental area dopaminergic neurons is critical for the motivational effects of nicotine withdrawal in nicotine dependent animals. Conversely, the selective blockade of phasic dopamine activity prevents the expression of conditioned place aversions to acute aversive nicotine (1.75 mg/kg) but not to withdrawal from chronic nicotine (7 mg/kg/d). Either increasing or decreasing signaling at dopamine D2 receptors (and genetic knockout of the D2 but not D1 receptors) prevents the aversive motivational response to nicotine withdrawal. These results demonstrate that a specific pattern of tonic dopaminergic signaling through D2 receptors mediates the aversive motivational response to nicotine withdrawal, and suggest that disruption of tonic dopamine activity may represent a novel target for therapeutic treatments for nicotine addiction.

CIHR.

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POS3-47

SMOKING INITIATION DURING COLLEGE PREDICTS FUTURE ALCOHOL INVOLVEMENT: A MATCHED-SAMPLES STUDY

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Recent studies have indicated that substantial initiation to cigarette smoking occurs during the college years: 25% or more of students who enter college as never smokers will have used cigarettes by graduation. Smoking in college is closely associated with alcohol use. For example, freshman year alcohol use has been found predictive of subsequent smoking initiation. However, little is known regarding the relationship of smoking initiation with subsequent alcohol involvement. To address this question, the present study compared senior year alcohol use between students who initiated smoking during college and a matched sample of never smoking students. We hypothesized greater alcohol involvement among smoking initiators. Included in the present study were 104 Chinese- and Korean-American undergraduates who at baseline (freshman year) reported never having smoked a cigarette. Subjects were drawn from 433 participants in a longitudinal study of tobacco use who were assessed annually each year in college. Never-smokers were matched with initiators on gender, ethnicity, baseline alcohol use, as well as parental smoking status and behavioral undercontrol (variables predictive of college smoking initiation). One-to-one matching was performed using procedures described by Abadie & Imbens (2006), yielding a final sample of 52 matched pairs with a minimum p =.32 for comparisons on the matching variables. To assess our hypothesis, the matched groups were compared on change scores for number of drinks reported in the prior 30 days at senior and freshman year assessments. As predicted, participants who had initiated smoking during college reported significantly greater increases in total drinks consumed ($t=5.40$, $SE=2.67$, $p < .001$). The present findings provide prospective evidence that smoking initiation during college increases risk for future alcohol involvement. Thus, students who initiate during college appear at increased risk for alcohol-related negative consequences in addition to health risks from smoking. These data add to growing evidence for the need to implement prevention programming targeting college cigarette smoking.

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POS3-48

THE EFFECT OF NICOTINE AND ETHANOL ON CYP2E1, AN ETHANOL, DRUG AND TOXIN METABOLIZING ENZYME, IN MONKEY BRAIN AND LIVER

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CYP2E1 is an enzyme, which contributes to the metabolism of ethanol as well as many clinical drugs and toxins. Smoking and alcohol consumption induce CYP2E1 in human liver and may also induce CYP2E1 in human brain. Increases in CYP2E1 could have consequences such as altered susceptibility to toxicity, metabolic tolerance and changes in drug efficacy. We hypothesize that nicotine and ethanol are inducers of CYP2E1 in the human liver and brain. We investigated the effects of ethanol and nicotine, alone and in combination, on hepatic and brain CYP2E1 levels in monkeys. We also assessed brain CYP2E1 levels in smokers and alcoholics. 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. In addition, monkeys in the nicotine and ethanol + nicotine groups were also injected with 0.5 mg/kg nicotine twice daily whereas the other groups were injected with saline on the same schedule. Tissue from monkeys and human smokers and alcoholics were assessed for CYP2E1 protein through immunoblotting. Monkey liver microsomes were used to perform in vitro CYP2E1 activity assays. Monkeys treated with nicotine had induced CYP2E1 in the liver and in

the putamen frontal cortex and cerebellum. Monkeys allowed to self-administer ethanol showed induction of CYP2E1 in the liver but no significant induction of CYP2E1 in any of the brain regions assessed. There was no interaction between nicotine and ethanol on the induction of CYP2E1 protein/activity. Preliminary results reveal that smokers, but not alcoholics, have higher CYP2E1 levels in the cerebellum compared to non-smoking non-alcoholics. Both nicotine and ethanol self administration induce CYP2E1 in monkey liver, whereas only nicotine had an inductive effect in monkey brain. We also confirm that CYP2E1 is higher in the brains of human smokers, offering strong support that nicotine is an inducer of CYP2E1 in the human brain.

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POS3-49

NICOTINE EFFECTS ON VIGILANT ATTENTION AND WORKING MEMORY AMONG NONSMOKERS

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Human and animal studies suggest that nicotine may enhance a wide range of cognitive processes relevant to performing daily activities, including attentional control and working memory. Nicotine induced enhancement of cognition may provide additional reinforcement during the progressive development of nicotine dependence. As dependence progresses, the cognitive enhancing effects of nicotine may exacerbate the intractable nature of tobacco use above and beyond nicotine withdrawal induced cognitive deficits. Utilizing a nonsmoker population allows us to differentiate absolute nicotine enhancement of cognition from the well-established nicotine withdrawal induced cognitive deficits that occurs among smokers. Studies examining the effects of nicotine among nonsmokers on working memory and attentional control have produced mixed results. We further examined the effects of nicotine on the attentional control/working memory N-back task among 36 nonsmokers who attended two laboratory sessions. In a double-blind and counterbalanced fashion, participants were given a 7 mg nicotine patch throughout one session, and a placebo patch during the other. During both sessions, participants completed the 0-, 1-, 2-, and 3-back versions of the N-back. The N-back requires participants to recall whether or not a stimulus was presented N trials previously, with increased levels of N representing greater difficulty and more complex cognitive operations. Analyses indicated that nicotine relative to placebo resulted in reduced reaction time on the 0-back condition ($p < .01$). This version of the N-back is essentially a target detection task that relies on vigilant attention. In contrast, nicotine did not have an effect on reaction time on 1-, 2-, and 3-back versions of the task. These results suggest that nicotine may have observable behavioral effects that can be detected using simple RT tasks, whereas more sensitive neurophysiological indices (e.g., event-related brain potentials) may be necessary to detect nicotine effects on higher-level cognitive processes. We discuss these findings in the context of ongoing research examining nicotine effects on cognition.

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POS3-50

SINGLE-DOSE PHARMACOKINETICS OF NICOTINE WITH A NOVEL MOUTH SPRAY FORM OF NICOTINE REPLACEMENT THERAPY

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As the efficacy of nicotine replacement therapy might be improved by faster systemic nicotine uptake, a new nicotine mouth spray has been developed. To evaluate the single-dose pharmacokinetics of nicotine at three doses of the mouth spray, and to compare the speed of nicotine uptake from the spray versus that from nicotine lozenge (NiQuitin® Lozenge) and gum (Nicorette® Gum), a randomized crossover study was conducted in 45 healthy adult smokers. Each subject received single doses of nicotine mouth spray 1 mg, 2 mg, 4 mg, nicotine lozenge 4 mg, and nicotine gum 4 mg on separate occasions. Blood samples were collected for 12 hours to determine pharmacokinetic variables. Mean plasma nicotine concentrations during the first 10 minutes, measured using area under the curve (AUC10min), were three times as high with spray 4 mg as with lozenge or gum. The AUC10min with 2 mg and 1 mg doses of spray, respectively, were twice and 1.5 times as high as the AUC10min with lozenge or gum. The maximum baseline-corrected plasma nicotine concentration (cCmax) with 4 mg spray exceeded that for lozenge and gum by 34% and 20%, respectively; the median time to reach Cmax was 10-12.5 minutes for the three doses of spray, 45 minutes for lozenge, and 30 minutes for gum. The mean baseline-corrected area under the plasma nicotine concentration-vs.-time curve (cAUC∞) with 4 mg spray was 15% higher than that with gum but did not differ significantly from that with lozenge. In summary, nicotine delivered via the mouth spray is absorbed considerably faster than nicotine given via gum or lozenge.

The study was performed by McNeil AB.

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POS3-51

EFFECTS OF NICOTINE-SPECIFIC ANTIBODIES AND A NICOTINIC RECEPTOR ANTAGONIST ALONE AND IN COMBINATION ON NICOTINE DISCRIMINATION IN RATS

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Vaccines against nicotine are currently in clinical trials and show some efficacy for increasing smoking cessation. Vaccine efficacy is strongly correlated with the serum antibody concentrations that are elicited. Primary limitations to vaccination are the limits on how much antibody can be elicited by a vaccine and the dramatic variability in antibody levels between individuals. Antibodies attenuate nicotine's effects by reducing nicotine distribution to brain and it's subsequent binding to nicotinic acetylcholine receptors. Combining nicotine specific antibodies with other medications that attenuate nicotine binding through other mechanisms may improve antibody efficacy. The purpose of this study was to address this issue by examining the separate and combined effects of the monoclonal nicotine-specific antibody Nic311 and the nicotinic receptor antagonist mecamylamine (MEC) on nicotine's discriminative stimulus effects. Four groups of rats were trained to discriminate 0.4 mg/kg nicotine from saline using a two-lever operant discrimination procedure. Antagonism of nicotine discrimination by Nic311 (160 mg/kg i.v.) and ascending doses of MEC (0.03, 0.1, 0.3, and 1.0 mg/kg s.c.) was then assessed across four daily 2-min extinction test sessions using a 2 x 2 design (Group 1: control antibody + saline; Group 2: Nic311 + saline; Group 3: control antibody + MEC; Group 4: Nic311 + MEC). Nic311 alone produced a 24-48% reduction in % nicotine-lever responding (%NLR) across all four test sessions, but the effect was only statistically significant on day 2. MEC produced a dose-dependent decrease in %NLR, with no effect at the two lowest doses and an 80-93% attenuation at the two highest doses. Nic311 combined with MEC significantly suppressed %NLR at every MEC dose (85-92% reduction across all four sessions). Thus, very low doses of MEC that were ineffective alone completely blocked nicotine discrimination when combined with Nic311. These data demonstrate that nicotine-specific antibodies and MEC can work synergistically to suppress the subjective effects of nicotine and suggest that low doses of MEC may significantly enhance the efficacy of immunotherapy.

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POS3-53

THE INFLUENCE OF CYP2B-MEDIATED NICOTINE METABOLISM IN THE BRAIN ON NICOTINE SELF-ADMINISTRATION

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The goal of this initial study was to determine whether nicotine metabolism in rat brain alters nicotine self-administration (NSA) in an established model of smoking. Genetic variation in the human CYP2B6 enzyme can influence smoking behaviours, which cannot be accounted for by differences in peripheral nicotine metabolism. As CYP2B is expressed in the brains of multiple species including human, monkey and rat, and can metabolize nicotine, it is possible that some of the differences in smoking behaviours are due to variable metabolism within the brain. Brain CYP2B6 levels vary greatly between people, which may contribute to interindividual differences in smoking phenotypes. To investigate a role for brain CYP2B-mediated nicotine metabolism in NSA we used a mechanism-based inhibitor. C8-xanthate (C8X) is a selective substrate that CYP2B metabolizes into a reactive intermediate, which irreversibly binds to the enzyme inactivating it. Male Wistar rats self-administered nicotine under a fixed ratio (FR) schedule at three nicotine doses: 7.5, 15, and 30 microg/kg/infusion. After NSA

was acquired rats were switched to a progressive ratio (PR) schedule. Rats were given artificial cerebrospinal fluid (ACSF) intracerebroventricularly (ICV) into the right lateral ventricle and PR NSA was tested for 3 sessions. Rats were then given C8X ICV and PR NSA was tested for 3 sessions, which was then repeated. C8X injections resulted in higher numbers of infusions and median breakpoints at all nicotine doses tested. To confirm that C8X did not affect peripheral nicotine metabolism, a potential confound, rats were given either ACSF or C8X followed by an intravenous (0.2 mg/kg) or subcutaneous (0.6 mg/kg) nicotine injection, and blood was sampled over 180 minutes. There were no differences in nicotine or cotinine plasma levels between ACSF and C8X-injected rats indicating that C8X had not altered systemic nicotine levels. Together these results suggest that inhibiting CYP2B-mediated nicotine inactivation in the brain results in each dose of nicotine being more reinforcing. This supports the possibility that differences between people in CYP2B6 brain levels may alter smoking behaviours.

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POS3-54

SS2 SUBUNIT CONTRIBUTIONS TO NICOTINE EFFECTS ON ANXIETY-LIKE BEHAVIOR

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Smokers report that they smoke to relieve anxiety, while studies reveal that smokers have higher incidences of generalized anxiety and panic disorders. Nicotine, the primary psychoactive agent in tobacco, is also thought to regulate anxiety in a dose-dependent fashion. Nicotine binds to nicotinic acetylcholine receptors (nAchRs). nAchRs composed of the ß2 subunit have the highest binding affinity for nicotine and are implicated in depression-like behavior. The purpose of this study was to assess targets of nicotine that regulate anxiety-like behavior in wild type (WT) and ß2 subunit knockout mice (ß2KO) using the light-dark assay, a test that evaluates the conflicting drives in rodents to avoid predation (e.g., prefer an enclosed dark chamber) and to explore their environment (e.g., venture into a brightly lit novel environment). Previous research suggests that the lateral septum (LS) regulates anxiety-like behavior and other studies show that nicotine regulates phosphorylation of extracellular regulated kinase (pERK) in this region at 20 min following nicotine injection. We therefore studied genotype- and nicotine-associated changes in levels of pERK. C57BL6 WT and ß2KO male mice received 0, 0.01, 0.05, 0.1 or 0.5 mg/kg of nicotine immediately before placement in the dark chamber of a light-dark box for a period of 10 minutes. Subsequently, brains were harvested and prepared for pERK immunohistochemistry. 0.5mg/kg of nicotine significantly increased latency to leave the dark chamber ($P<0.001$) and decreased movement/second (MS) in the light chamber ($P<0.005$) compared to saline in WT mice but not in ß2KO subjects. Independent of genotype, there was a non-significant trend ($P=0.07$) for animals receiving 0.05 mg/kg nicotine to spend more time in the light chamber than saline controls. Behavioral changes were not associated with changes in number of pERK positive cells or levels of pERK intensity at the 10 min timepoint. The above data suggest that activation of ß2*nAchRs promotes anxiogenic-like effects of nicotine. Alternatively inactivation of ß2*nAchRs may promote anxiolysis. Further study is required to determine nicotine's regulation of pERK in the LS.

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POS3-55

MECHANISMS OF NICOTINE-INDUCED EXCITATORY SYNAPTIC PLASTICITY IN THE VTA

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Nicotine, the major addictive substance in tobacco, activates nicotinic receptors (nAChRs) to initiate a series of adaptive changes including long-term potentiation (LTP) in the brain. LTP of excitatory synaptic transmission has been proposed to contribute to development of addiction. Our lab has previously shown that nicotine facilitates induction of LTP in dopamine (DA) neurons by increasing glutamate release via activation of alpha7 nAChRs on the glutamate terminals. Recently, we developed an in vitro exposure paradigm to study nicotine's effect on the excitatory synaptic strength. A brief exposure of nicotine to brain slices from drug naïve adult rats followed by a period of recovery in normal aCSF induced an NMDA receptor (NMDAR)-dependent increase of AMPA/NMDAR ratio in VTA DA neurons, similar to that induced by a single in vivo administration of nicotine (i.p. injection). To explore the underlying mechanisms, we tested the effects of nicotine on DA neuron firing rate in the presence of various receptor blockers and found that activation of somatodendritic beta2 nAChRs depolarizes DA neurons, independent from a heightened excitatory presynaptic input. Similar pharmacological tests showed that direct activation of somatodendritic beta2 nAChRs in DA neurons provides sufficient postsynaptic depolarization for the induction of synaptic plasticity. In addition, both D1/D5 dopamine and NMDA receptors were required for the induction of synaptic plasticity. The D1/D5 receptors apparently influence NMDAR expression, as nicotine enhancement of NMDAR EPSC is D1/D5-dependent. Therefore, we propose a mechanism of synaptic potentiation initiated by nicotine-induced depolarization of DA neurons via somatodendritic alpha4beta2 nAChRs. Activation of D1/D5 receptors by increased somatodendritic release of DA then potentiates NMDAR function, which eventually leads to AMPA-mediated synaptic plasticity in the DA neurons. Our observations highlight remarkable mechanistic overlap between the effects of nicotine and cocaine within this circuitry, providing potential insight into the phenomenon of cross sensitization.

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POS3-56

BLOCKADE OF DOPAMINE RECEPTOR D4 ATTENUATES REINSTATMENT OF NICOTINE-SEEKING BEHAVIOR INDUCED BY NICOTINE CUES OR NICOTINE PRIMING IN RATS

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Background: Currently available medications for smoking cessation, including nicotine replacement therapy, bupropion, and varenicline, are only effective for a minority of smokers while many individuals relapse after transient cessation. There is a need to develop new or better therapies specifically preventing relapse. Nicotine is commonly considered as a major component of tobacco contributing to smoking addiction, and it has been reported that dopamine receptor D4 (DRD4) polymorphism in humans is associated with tobacco smoking-associated cue-reactivity. Therefore, we studied pharmacological effects of DRD4 antagonist on nicotine self-administration and reinstatement of nicotine-seeking behavior in rats.

Methods: Long-evans rats were trained to self-administer nicotine at 0.03 mg/kg/infusion under fixed ratio (FR) increment schedules of reinforcement during daily 1-h sessions. After the rats demonstrated stable nicotine self-administration under an FR5 schedule, we examined pharmacological effects of a selective DRD4 antagonist (L-745,870) on nicotine self-administration and reinstatement of nicotine-seeking behavior induced by either nicotine-associated cues or priming injection of nicotine.

Results: The selective DRD4 antagonist (L-745,870), at the dose range of 0.1-3.0 mg/kg (i.p.), significantly attenuated reinstatement of nicotine-seeking behavior induced by either nicotine-associated cues ($p<0.05$) or a priming injection of nicotine (0.15 mg/kg, s.c.; $p<0.05$). However, the same dose range of DRD4 antagonist did not affect nicotine (0.03 mg/kg/infusion) self-administration. In addition, there was no effect of the DRD4 antagonist on reinstatement of food-seeking behavior induced by either food-associated cues or food-priming.

Conclusions: The selective DRD4 antagonist (L-745,870) specifically attenuated both cue-induced and nicotine-primed reinstatement of nicotine-seeking behavior, suggesting a clinical potential of selective DRD4 antagonist as a therapeutic agent against tobacco smoking relapse.

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POS3-57

EFFECTS OF NICOTINE ON THE GATING OF THE AUDITORY P50 AND ITS INFLUENCE BY DOPAMINE TRANSPORTER GENE POLYMORPHISM

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Objectives: Auditory sensory gating deficits are a core feature of schizophrenia and are transiently normalized with nicotine, but the role of dopamine in this response is unclear. This study compared the effect of nicotine on sensory gating of the auditory P50 in normal subjects and the influence of differing variable number tandem repeats (VNTRs) of the dopamine transporter (DAT) gene.

Materials & Methods: 23 healthy non-smokers were administered a standard auditory gating paradigm in which 32 pairs of clicks (S1, S2) were presented binaurally through headphones during recordings of electroencephalographic (EEG) activity. Subjects underwent 2 separate randomized sessions, one immediately following the administration of a 6 mg dose of nicotine gum and one session following administration of placebo gum. Genotyping was accomplished via polymerase chain reaction using DNA derived from saliva.

Results: In the placebo session, subjects with the 10/10 homozygous repeat DAT allele exhibited a trend for greater P50 suppression compared to those with the 9/10 DAT genotype. Relative to placebo, nicotine administration increased P50 gating in subjects with 9-repeate allele to a level comparable to that of subjects with the 10/10 DAT genotype. Futherm the S2 latency of the 9/10 DAT was shorter than the S2 latency of the 10/10 DAT genotype.

Discussion: These results are consistent with the current literature demonstrating an association between the 10/10 allele genotype and reduced DAT density. Variations in tonic intrasynaptic dopamine levels associated with the DAT gene appears to moderate sensory gating and this may play a role in gating impairments and their correction by smoking in schizophrenia.

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POS3-58

RAPID SMOKING MAY NOT BE AVERSIVE IN SCHIZOPHRENIA

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Aversive smoking has been investigated as a smoking cessation technique that involves rapid smoking in the laboratory. Rapid smoking is defined as (1) Puffing every 6-10 sec, and/or (2) Smoking >3 cigarettes sequentially in 10-30 min. Rapid smoking usually results in dizziness, sore throat, nausea, burning eyes, and other unpleasant feelings. Studies have documented higher nicotine intake in smokers with schizophrenia (SCZ), suggesting rapid smoking in this population. To explore rapid smoking, 198 smokers (61 schizophrenia; SCZ; 58 bipolar, BPD and 79 controls; CON) were assessed in a single day (24 + 2 h), ad libitum smoking topography session using the CReSSmicro device to measure smoking behavior. Mean values of repeatedly measured topography variables were estimated and compared using a mixed model analysis to model the differences in SCZ, BPD and CON subjects. Smokers were not different in baseline characteristics including cigarettes per day, expired carbon monoxide, or total FTND score. A total of 3712 cigarettes were smoked by subjects, comprised of 47202 puffs and 44072 IPI. Smokers with SCZ had significantly more puffs per cigarette than CON (15.7 vs. 12.5 puffs, p<0.001). IPI was also significantly shorter in SCZ vs. CON (15.7 vs. 22.3, p<0.001) and BPD (15.7 vs. 20.0, p<0.01) with no difference between IPI in BPD and CON. The median IPI was 9.5 sec in SCZ and 16.2 in CON. SCZ and BPD were more likely to have IPIs <=6 sec than CON (OR 2.39, p<0.001 for SCZ vs. CON; OR 1.25, p<0.001 for BPD vs. CON, based on random effects logistic regression analysis). We also determined the frequency between groups of smoking >3 cigarettes in any 30 minute interval. More SCZ met this definition of rapid smoking (51% SCZ vs. 19% CON; p<0.001) and the maximum number of cigarettes smoked during a 30-minute period was 7 for SCZ. Using either definition, SCZ exhibit patterns of rapid smoking. Smokers with SCZ seemingly do not experience this smoking pattern as aversive since it reflects their naturalistic pattern of smoking, outside of the laboratory. The implications of rapid smoking on craving, levels of dependence and cognition in SCZ warrant further study.

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POS3-59

CIGARETTE SMOKE TOXICANT EXPOSURE ESTIMATES IN SMOKERS SWITCHED TO REDUCED TOXICANT PROTOTYPE CIGARETTES

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We have conducted a study that addresses the first part of the US Institute of Medicine's definition of a potential reduced-exposure product by analysing biomarkers of exposure in smokers switched to prototype cigarettes which, when measured on smoking machines, produced lower levels of some toxicants compared to conventional cigarettes. The six-week study, undertaken in Germany, involved short periods of clinical confinement. One hundred smokers of 6mg ISO tar cigarettes were recruited. After two weeks smoking a commercial 6mg ISO tar yield product, 50 were switched to a 6mg ISO tar Reduced Toxicant Prototype (RTP) cigarette containing diluent sheet in the blend. In addition, 150 smokers of 1mg ISO tar commercial cigarettes were recruited, 50 of whom were switched to an RTP containing the diluent sheet and 50 to an RTP containing tobacco treated to reduce polyphenols and proteins. All RTP cigarettes included filters containing adsorbant additives. Biomarkers of exposure, mouth level exposure to tar and nicotine were measured, and the sensory response to the product scored. Reductions in toxicant levels found in smoke chemistry correlated well with reductions in biomarkers of exposure. For example, the calculated average acrolein intake for the 6mg ISO tar conventional product, based on cigarette yield under an intense regime and measured daily cigarette consumption was 2298 µg/day. This corresponded to an average level of 1803 µg/day of 3-hydroxypropylmercapturic acid (3-HPMA), a biomarker of exposure for acrolein. Similarly, the 6mg ISO RTP was associated with a calculated acrolein intake of 871 µg/day and a 3-HPMA level of 751 µg/day. This equates to an approximately 40% reduction in both the estimated intake and the biomarker of exposure level. Overall, the study also found that the groups switched to RTPs at both tar yields showed reduced levels of biomarkers of exposure for several smoke toxicants compared to those that continued to smoke conventional cigarettes.

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POS3-60

EFFECTS OF PLAIN PACKAGING ON EYE MOVEMENTS TOWARDS HEALTH WARNINGS AND BRAND INFORMATION IN NON-SMOKERS, WEEKLY SMOKERS AND DAILY SMOKERS

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There is considerable current interest in the potential of plain packaging, whereby cigarettes are sold in generic packs with minimal brand information, as a tobacco control strategy. This may take the form of uncoloured packs containing health warnings and the brand name only, in a standard format and without imagery or colouring. However, there has been little research into the behavioural effects of plain packaging. We investigated eye movements towards brand and health warning information, on plain and branded packs, in non-smokers (n = 15), weekly smokers (n = 14) and daily smokers (n = 14). Participants were presented with pack images, half comprising common branded packs, and half plain packs, which included a health warning in the bottom half, and brand information in the top half. A 3 (smoking status) × 2 (pack type) × 2 (location) ANOVA of number of saccades (eye movements) indicated a main effect of pack type ($F [1, 39] = 5.51$, $p = 0.024$), with more eye movements when branded packs were presented compared with plan packs. However, this was qualified by a pack type × location interaction ($F [1, 39] = 30.98$, $p < 0.001$), indicating equal eye movements towards brand and health warning locations for the branded packs ($p = 0.49$), but more eye movements towards the health warning location than the brand information for plain packs ($p = 0.023$). This was further qualified by a smoking status × pack type × location interaction ($F [2, 39] = 3.52$, $p = 0.039$), indicating that this effect was present in non-smokers and weekly smokers, but not in daily smokers. These findings indicate that eye movements to health warnings are greater than to brand information when presented on plain packs, but not on branded packs, and that this effect is present only among non-smokers and weekly smokers. This latter finding argues against the tobacco industry assertion that plain packaging will prevent existing customers from identifying brand information. Plain packaging may therefore serve to selectively highlight the salience of health warnings in non-smokers and weekly smokers, and therefore be particularly effective as a tobacco control strategy to reduce uptake.

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POS3-61

CUE-REACTIVITY IN LOW-LEVEL SMOKERS: RELIABILITY AND STABILITY OF EFFECTS ACROSS PHOTOGRAPHIC AND IN VIVO CUES

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The cue-reactivity paradigm elicits robust craving effects in heavy smokers, but research on the strength of cue-specific craving in low-level smokers is less well developed. Moreover, the stability of cue-reactivity over time in this population has yet to be examined. The current research is part of larger project validating hair analysis as a biomarker of nicotine exposure in low-level smokers. Participants were non-daily smokers who reported smoking between one and twenty-nine days out of the past thirty days, no more than fifteen cigarettes on an average smoking day, and who were not planning to cut down or quit smoking at the time of recruitment. Participants attended six study visits over the course of three months. Cue –reactivity sessions were conducted on Day 1, Day 8, Day 15, Day 22, and Day 85 of the study. During each cue-reactivity session, a total of 12 trials were delivered consisting of counterbalanced cues of two types (smoking and neutral) and two presentation modalities (photographic and in vivo). Photographic cues depicted smoking related or neutral scenarios. In vivo trials required participants to hold a cigarette or a neutral object. Self-reported craving was assessed at baseline and after each cue presentation. Data from the first twenty-five smokers who have completed the study to date demonstrate robust cue-specific craving across all five sessions ($F= 32.91$, $p< .0001$, partial $\eta 2= .58$), which was more pronounced for in vivo cues than for photographic cues (interaction $F= 7.96$, $p< .01$, partial $\eta 2= .25$). No session effects were present, suggesting stability of cue-reactivity over the course of the five laboratory sessions. Further analyses will be presented with a larger sample (we anticipate a sample size of at least 100) and with additional variables, including distraction, focus, and mood ratings. Part of these analyses will involve a systematic evaluation of the correlational structure of cue-reactivity over repeated sessions. In addition, potential moderators of cue-reactivity in this sample, such as nicotine dependence and number of cigarettes smoked, will be explored.

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POS3-62

NICOTINE DEPENDENCE AND REACTIVITY TO SMOKING AND ALCOHOL CUES FOLLOWING PHARMACOLOGIC MANIPULATION

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Prior research has examined reactivity to salient cues, as well as direct drug effects on craving to smoke and drink. Few studies have examined how individual differences in smoking related variables moderate cue and drug effects on craving. In the present study, we examined the relationships between nicotine dependence and reactivity to smoking and alcohol cues following standardized administration of nicotine and alcohol. The sample consisted of 87 smokers, ages 21-55 with a wide range of smoking and drinking patterns. Nicotine dependence was measured using the Wisconsin Inventory of Smoking Dependence Motives (WISDM) during an initial session. Two WISDM scores were utilized, the global score and the craving subscale. During four subsequent laboratory sessions, a fully crossed 2x2 within-subject design was utilized, in which participants consumed two drinks containing alcohol or placebo and smoked one nicotinized or denicotinized cigarette. Following substance administration, participants viewed 3 types of pictures: smoking, alcohol, and neutral. Pictures were rated on the following dimensions: craving to smoke, craving to drink, valence, arousal, and interest. Analysis indicated that, among those high on the WIDSM Craving subscale, administration of nicotine was associated with reduced craving to smoke in response to smoking pictures. This suggests that reactivity is suppressed during periods of acute nicotine satiation. In addition, nicotine primed valence ratings to alcohol pictures among individuals with low WISDM Global scores. This finding provides some evidence for cross-drug priming of cue-reactivity. Findings related to other subscales and ratings will also be discussed. Overall, findings suggest that nicotine dependence moderates the effects of nicotine on cue-reactivity (to both alcohol and smoking cues). Implications for further research on nicotine-alcohol interactions, as well as treatment, will be discussed.

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POS3-63

THE RELATIONSHIP BETWEEN NICOTINE DEPENDENCE AND CUE-INDUCED CIGARETTE CRAVING

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Background: Most models of dependence posit that dependence is related to background craving – a tonic state of craving when deprived. Theory and research are conflicted about how dependence relates to cue-induced craving – phasic increases in response to cues. Some models consider cue-induced craving part of dependence, and others imply that cue-responsivity disappears with dependence. These associations are further complicated by the a variety of measures of nicotine dependence, which take different theoretical approaches to the conceptualization of dependence.

Method: Participants (n=198, 57% men) were daily smokers averaging 16.01 (6.71) cigarettes per day. Participants were not trying to quit smoking. We examined data from 4 cue-reactivity sessions, with cue sets (smoking, negative affect, positive affect, neutral) counterbalanced across sessions. In each session, after a 30-minute deprivation period, participants viewed 30 cue-relevant photos validated for content and shown over 3 minutes (6 seconds each). Participants rated their craving before and after cues (QSU-Brief, scaled as 1-49). Participants completed measures of nicotine dependence (FTND, NDSS, WISDM-68), which were used to predict craving. Multivariate and univariate regression models were used to predict background craving (pre-cue) and cue-induced craving (pre-post cue change scores) for QSU Factors 1 and 2.

Results: Dependence measures predicted background craving, both factors 1 and 2. They did not predict cue response (controlling for session number and change in response to the neutral cue) for any cue.

Conclusion: Cue-induced craving is unrelated to nicotine dependence, as traditionally assessed. Models and measures of dependence must take into account cue-induced craving. Future studies should examine the relationship between reactivity to cues and actual smoking behavior, in order to better understand how reactivity to cues and nicotine dependence may function independently or synergistically to influence smoking behavior.

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POS3-64

SELF-REPORT AND BEHAVIORAL REACTIVITY TO PICTORIAL SMOKING CUES

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Dozens of cue reactivity studies have shown increased self-reported craving in response to smoking-related stimuli. In contrast, few cue studies have focused on behavioral reactivity (e.g., number of puffs) or on the relationship between cue-induced craving and actual smoking. The degree to which greater craving in response to cues predicts greater smoking behavior remains uncertain. The present study examined subjective and behavioral reactivity as a function of exposure to pictorial smoking and neutral cues and assessed correlations between craving and smoking measures. Sixty non-deprived smokers completed two sessions, each involving exposure to either smoking-related or neutral cues. Craving via QSU was assessed at initial baseline (CraveB) and after initial exposure to the cues (Crave1). Cues continued for 6 mins while subjects smoked as much as they wanted using the Cress puff topography device. As expected, smokers reported much greater craving to smoking compared to neutral cues ($t(58) = 7.26$, $p < .001$). Additionally, smokers showed greater increases in puff volume ($t(58) = 4.91$, $p< .001$) and number of puffs($t(58) = 4.71$, $p< .001$), and faster latency to first puff ($t(58) = -4.56$. $p< .001$) in response to smoking versus neutral cues. For both cue types, craving was positively associated with puff volume ($r = .502$, $p < .001$ for smoking cues, $r=.434$, $p=.001$ for neutral cues) and number of puffs ($r =.511$, $p< .001$, and $r =.522$, $p< .001$) and negatively associated with latency to puff ($r = -.467$, $p< .001$ and $r = -.482$, $p< .001$). Specific to smoking cues, craving change from baseline to post-exposure (CraveB-Crave 1) was positively associated with puff volume($r =.302$, $p =.02$) and negatively associated with smoking latency ($r = -.292$, $p =.025$). These associations were not found for neutral cues. Overall, absolute craving levels were associated with smoking behavior. However, only craving in response to smoking cues, and not neutral cues, was associated with subsequent smoking behavior. Implications for the utility of cue reactivity to understand nicotine dependence will be discussed.

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POS3-65

INFLUENCE OF E-CIGARETTE SWITCHING ON SMOKING URGES, BEHAVIOR, AND EXPOSURE

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Electronic cigarettes (e-cigarettes) have been promoted as a safe alternative for delivering nicotine to smokers. The present study assessed short-term influence of electronic cigarettes on urge to smoke, smoking behavior and short term exposure. Subjects (N= 60) were 21-65 years old, used non-menthol cigarettes, not contemplating quitting, and were naïve to e-cigarette use. After a 72-hour baseline of usual cigarette brand use, subjects were switched to the NJOY NPRO e-cigarette where nicotine strength was matched to the subject's preferred cigarette brand (i.e. low tar cigarette users received Light cartridges). Phone interviews were conducted 4 days post switching and follow-up lab sessions at 11 and 14 days. In separate lab sessions, puff topography, smoking urges, nicotine withdrawal, and carbon monoxide boost were measured pre-and post-smoking either the conventional, or e-cigarette. Cigarette and e-cigarette use were measured in the field using a smoking diary and phone interview. After 4 days, 44% of self-reported cigarette use (cigs/day) was replaced by e-cigarettes, and increased to 51.7% after 14 days. Cigarette consumption declined from 14.57 cigarettes per day to 7.25 ($p<.001$) after switching. Subjects took larger ($p=.045$) and longer ($p=.008$) puffs when using the e-cigarette. E-cigarette use reduced negative urge motivations to smoke after initial use ($p=.029$), after 11 days ($p=.04$) and after 14 days ($p=.046$) post switching. Depressed affect ($p=.035$), difficulty concentrating ($p=.034$), and craving ($p=.046$) were reduced only at 14 days post switching. No significant increase in exhaled carbon monoxide, was detected after e-cigarette use at any time point. Data suggest that e-cigarettes may have a role in the reduction of smoking urges and subjective withdrawal symptoms, although an acclimation period may be necessary. Analysis of salivary cotinine will be used to determine e-cigarette nicotine exposure. Potential toxicant exposure will be determined by urinalysis (ongoing).

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POS3-66

IN VITRO MODELS OF SMOKING-RELATED DISEASES: AN EXAMINATION OF THE BIOLOGICAL EFFECTS OF REDUCED TOXICANT PROTOTYPE CIGARETTES

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INTRODUCTION: A potential approach to reduce the harm associated with cigarette smoking is to reduce smoke toxicant levels, creating 'Potential Reduced-Exposure Products' with a reasonable expectation to lower consumer health risks (US Institute of Medicine, 2001). In vitro models of smoking-related diseases may provide screening tools for novel cigarettes with altered smoke toxicant levels and data from such models may be used as part of a weight-of-evidence approach, alongside clinical data, to provide support for the reduced harm potential of novel cigarettes. Here, we describe in vitro models of cardiovascular disease, chronic obstructive pulmonary disease (COPD) and oxidative stress in which we have examined the effects of smoke extracts from conventional and novel reduced toxicant prototype (RTP) cigarettes.

METHODS: In all models, cells were exposed to cigarette smoke total particulate matter (TPM) derived either from relevant commercial controls or from RTP cigarettes which have a number of reductions in smoke toxicant levels. The migration of cultured endothelial cells was used as a vascular damage repair assay with relevance to cardiovascular disease development. In the bronchial epithelial H292 cell line, we monitored cellular antioxidant (GSH) levels as a secondary measurement of oxidative stress. We further measured the levels of COPD-related inflammatory mediators secreted by H292 cells.

RESULTS: TPM caused a dose-dependent inhibition of migration by the endothelial cells, an effect, which was reduced in magnitude when using TPM derived from an RTP. Similarly, in H292 cells TPM from conventional cigarettes caused depletion of cellular GSH levels and the secretion of various inflammatory mediators such as the vascular endothelial growth factor (VEGF). Both of these responses were mitigated when using TPM derived from RTP cigarettes.

CONCLUSIONS: Cigarette smoke extracts induce changes in in vitro models of smoking-related diseases and these effects can be mitigated by altering the smoke chemistry. Further studies are required to investigate the clinical implications of reducing cigarette smoke toxicants.

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POS3-67

THE EFFECTS OF REWARD CONTINGENCY ON RESPONSE INHIBITION IN ADULT ABSTINENT SMOKERS AND NONSMOKERS

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Nicotine pharmacologically activates brain areas involved in reward processing. Prolonged smoking and chronic stimulation of reward pathways may lead to compensatory neuroadaptations, including reduced sensitivity to non-drug rewards (anhedonia), particularly during abstinence. This latter effect may contribute to continued smoking after a quit attempt (relapse), perhaps by biasing decision making (smoking is relatively more appealing). Relatedly, when non-drug rewards are used to support an alternative response, like choosing not to smoke (e.g., contingency management), maintaining abstinence might be more challenging. Despite its relevance for understanding relapse, our understanding of the effects of smoking on non-drug reward processing during abstinence remains limited. Our aim in this study is to characterize the influence of monetary (non-drug) reward on brain activity in (12-hour) abstinent daily smokers (n=22) and non-smoker controls (n=7). Participants underwent fast, event-related functional magnetic resonance imaging (fMRI) as they simultaneously performed an antisaccade (AS) task modified to include trial-by-trial reward and neutral contingencies. The inclusion of partial 'catch' trials and jittered inter-trial fixation periods allowed us to deconvolve activity specifically related to the cue, preparatory, and response period of rewarded and neutral AS trials. Behaviorally, both groups generated significantly fewer response suppression errors on rewarded compared to neutral AS trials. fMRI results indicate that daily smokers, compared to nonsmokers, showed attenuated brain activation across time during reward trials in reward- and oculomotor control-related circuitry. These areas include the caudate ($F(12, 324)=3.031$, $p<0.001$) and, across a more restricted time period, the frontal eye field (FEF) ($F(6, 162)=2.261$, $p<0.05$). In sum, abstinent daily smokers appear to show attenuated responses in widely distributed areas during reward vs. neutral trials and in comparison with non-smokers. These data suggest specific, brain-based vulnerabilities in non-drug reward processing during abstinence that may be related to chronic smoking.

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POS3-68

ANXIETY SENSITIVITY AND ASTHMA-RELATED QUALITY OF LIFE AMONG SMOKERS WITH ASTHMA

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Despite the known compromising effects of smoking on lung functioning and health, individuals with asthma are more likely to be current smokers than those without asthma (Frank et el., 2006). Furthermore, although a large body of work has established statistically significant and practically meaningful associations between cigarette smoking and anxiety disorders (Feldner et al., 2007; Morissette et al., 2007), there has been relatively little exploration of anxiety-related vulnerability factors among smokers with asthma. One promising factor in this regard is anxiety sensitivity (AS), defined as the fear of arousal-related physical and psychological sensations (McNally, 2002; Reiss & McNally, 1985). Extant research indicates that elevated levels of AS make smoking cessation more difficult (Zvolensky et al., 2009), and that AS moderates the association between smoking and panic-relevant variables (McLeish et al., 2007). Furthermore, AS is predictive of poorer asthma control (McLeish et al., in press). However, no research to date has examined how AS relates to other facets of asthma management, particularly among smokers with asthma. Thus, the purpose of the current study was to evaluate the unique predictive ability of AS in terms of asthma-related quality of life among adult smokers with asthma. It was expected that after controlling for smoking rate, asthma control, and negative affect that AS would predict a lower quality of life in terms of activity limitations, symptoms, and emotional functioning. Participants were 117 smokers (51.7% male) with self-reported physician-diagnosed asthma (Mage = 38, SD = 12.04). As predicted, results indicated that after controlling for smoking rate, asthma control, and negative affect, AS was a significant predictor of activity limitations, symptoms, emotional functioning, accounting for 2.2% to 5.5% of unique variance. Contrary to prediction AS was also a significant predictor of environmental stimuli. These results suggest that smokers with asthma who are also high in AS may require specialized interventions to manage their asthma and improve their quality of life.

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POS3-69

GENERATION AND CHARACTERIZATION OF A MENTHOL CIGARETTE FOR BIOLOGICAL AND PUBLIC HEALTH RESEARCH

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Mentholated tobacco has been suspected to play a role in smoking initiation and addiction among youth, and may affect the biotransformation of other smoke constituents. Previously, direct comparisons between two cigarettes based solely on the absence or presence of menthol were not possible due to a lack of cigarettes that are identical except for variations of menthol level. We have produced cigarettes with various levels of menthol using a commercially available cigarette, and assessed the effects of menthol level on attributes such as smoke particle size, aerosol fraction, and constituent transfer, etc. Cigarettes with menthol levels of 0.2%, 0.4%, and 1.5% (w/w with respect to tobacco) were generated by direct vapor deposition using temporal control. Cigarette filters and tobacco filler were independently extracted and analyzed to determine the relative location and extent of menthol deposition by GC/FID. Mainstream cigarette smoke (CS) was generated from these mentholated and non-mentholated cigarettes using a Borgwaldt-KC SM85 30-port rotary cigarette smoking machine under ISO conditions. Smoke particle size from mentholated and non-mentholated cigarettes was determined using a Mercer-style cascade impactor. Isopropanol extracts of the glass fiber filters followed by XAD-4 sorbent tubes were used to determine the amount of menthol and nicotine in the CS. Results indicate that menthol transfer efficiencies in CS were between 12% and 21% based on the theoretical value from the unburned cigarettes. Menthol levels did not affect smoke stability and aerosol particle size. Interestingly, menthol in cigarettes appeared to cause a small concentration-related increase of nicotine level in smoke. In summary, we have produced and characterized a menthol cigarette suitable for studying the biological and public health effects of menthol in tobacco, and the preliminary results indicate that menthol levels may alter the delivery efficiencies of tobacco constituents.

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POS3-70

COMPARISON OF MOUTH LEVEL EXPOSURE TO TAR AND NICOTINE IN ROMANIAN SMOKERS OF NORMAL AND SLIM KING SIZE CIGARETTES

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Most 'King Size' (KS) cigarettes have a circumference of about 25mm and are 83-84mm long, with filters 20-27mm in length. Recently, a slimmer format, described as a 'King Size Super Slim' (KSSS), with a circumference of 17mm, has become popular in several countries. Although several studies have estimated the Mouth Level Exposure (MLE) to tar and nicotine of smokers of KS cigarettes, there have been no studies of KSSS reported to date. Romanian KSSS cigarettes with 1, 4 and 7mg machine-smoked ISO tar yields were chosen for this study. Since these products have filters containing activated carbon, comparisons were made with KS cigarettes both with activated carbon filters (KSC, at 1mg, 4mg and 7mg ISO tar yield) and without the carbon filters (KSNC, at 4mg and 7mg ISO tar yield) in order to assess the effect of activated carbon in the filter on MLE. Fifty to 70 male and female Romanian smokers of each product were recruited, aged 21-50 years, with self-reported consumption of 15-25 cigarettes per day. The subjects gave written informed consent before commencing the study. The smokers were provided with sufficient cigarettes for two days, based on their self-reported consumption, and asked to smoke them as normal and collect a minimum of 15 spent filters over the two days using a filter collector provided. There were no significant differences between tar MLEs for the KSC, KSNC, and KSSS products within the 1, 4 and 7mg machine-smoked ISO tar yield groups but there were significant differences between the yield groups: 1mg tar MLE < 4mg < 7mg. The KSNC smokers obtained lower MLE to nicotine than the KSSS and KSC smokers in the same ISO tar group. There were no differences between the MLE to tar or nicotine for smokers of KSSS and KSC. There were also no differences between the tar MLE obtained by smokers of KSC and KSNC. The MLE to nicotine for the KSNC smokers was significantly less than the KSC smokers at both 4mg and 7mg ISO pack tar. This may be due to the lower blend nicotine content of the KSNC products.

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POS3-71

NICOTINE ANALYSIS OF DISSOLVABLE TOBACCO PROMOTED TO REDUCE HARM

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In 2009, R.J. Reynolds Tobacco Company released a line of dissolvable tobacco products that are marketed as an alternative to smoking in places where smoking is prohibited. These products are currently available in Indianapolis, IN, Columbus, OH, and Portland, OR. Camel has four varieties of the dissolvables - Mellow Orb, Fresh Orb, Mellow Stick, and Fresh Strip. Currently, little to nothing is known about the chemical composition or health effects of the dissolvable tobacco products. Chemical characterization of the dissolvables has identified the following compounds: nicotine, ethyl citrate, palmitic acid, stearic acid, sorbitol, glycerol, xylitol, cinnamaldehyde, coumarin, vanillin, and carvone. With the exception of nicotine, the components identified thus far in the dissolvables are either flavoring compounds or binders. Nicotine absorption by the user largely depends on the pH of the product. With increasing pH, more nicotine is in the free-base form and absorbed by the user. From measurement of pH, the percentage of un-ionized (free) nicotine can be determined using the Henderson-Hasselbalch equation. pH was measured for all four of the dissolvables and found to be 7.78 for Mellow Orb, 7.57 for Fresh Orb, 7.52 for Mellow Stick, and 8.03 for Fresh Strip. At these pH values the percentage of free un-ionized nicotine is between 24.0-50.5%. Finally, product literature states the total amount of nicotine is 0.6-3.1mg per dissolvable.

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POS3-72

ENVIRONMENTAL INFLUENCES ON GENETIC ASSOCIATIONS WITH NICOTINE DEPENDENCE

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Multiple genome-wide association studies suggest a link between variants in nicotinic receptor genes and nicotine dependence. To investigate the relationship of environmental factors to these reported genetic associations, we performed a large meta-analysis of data from the Gene-Environment Meta-Analysis of Nicotine Dependence (GEMINI) Consortium to assess the environmental modification of genetic effects in several regions associated with nicotine dependence. Environmental factors evaluated include birth cohort, socioeconomic status, age of smoking onset, and education. By using a large sample size and focusing specifically on regions previously associated with nicotine dependence, we had adequate power to detect variation in the relationship between nicotinic receptor genes and nicotine dependence by environmental conditions.

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POS3-73

EFFECTS OF VARENICLINE AND BUPROPION ON NEUROCOGNITIVE PROCESSES DURING NICOTINE DEPRIVATION

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Nicotine deprivation is associated with craving, negative affect, and difficulty concentrating, which may contribute to subsequent relapse. Bupropion and varenicline are both effective treatments for smoking cessation and evidence from clinical trials suggests that these treatments increase abstinence rates and reduce craving and withdrawal during abstinence. However, the mechanism by which these medications reduce relapse is not clear. Recent research has focused on neurocognitive processes, such as response inhibition and attention, which may be important predictors of relapse. In the current study, 62 (22 female) daily smokers (at least 10 cigarettes per day) were randomized to receive bupropion (300 mg/day), varenicline (2 mg/day), or placebo in a Nicotine Deprivation Model. After a one-week run-up phase, participants completed a 9.5-hr laboratory session following overnight abstinence (CO verified). Participants

completed measures of response inhibition (Cued Go-No-Go [CGNG]), attention (Conners' Continuous Performance Task [CPT]), working memory (digits backwards), and delay discounting (Kirby). Measures of craving, withdrawal, and mood were also collected. Preliminary findings suggest that measures of reaction time were sensitive to medication. Specifically, those who received varenicline had shorter reaction times on both the CPT and the CGNG, compared to those who received bupropion or placebo. Shorter reaction time and higher levels of cue dependency (i.e., greater reliance on cues to inhibit a response during the CGNG) were related to increased craving and lower levels of attention (e.g., d`) were associated with increased withdrawal, independent of medication condition. Additional analyses will examine sex differences and whether they moderate medication effects on task performance. These findings add to evidence that varenicline reverses multiple abstinence-induced cognitive deficits, which may be an important mechanism in the clinical effects of varenicline.

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POS3-74

SMOKING ABSTINENCE MODULATES DACC FUNCTION DURING AFFECTIVE COGNITION

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Dependent smokers experience increased negative affect and exhibit impaired cognitive function shortly after quitting. However, the neurobiological underpinnings of abstinence-induced changes on affective cognition remain uncharacterized. Eighteen generally healthy adults smokers (50% female; mean age = 31.6, SD = 8; mean cigarettes/day = 14, SD= 5) and an age and sex-matched sample of 18 non-smokers (50% female; mean age= 30.1, SD =8.1) participated in the study. Participants underwent functional magnentic resonance imaging (fMRI) while performing an event-related affective Stroop task (aST). The aST measures affective cognition. Smoking participants completed two sessions: once following 24 hr abstinence, and once following smoking as usual. Control subjects completed one imaging session. Statistical threshold for brain data was set at .05 FWE corrected. Measures of mood and smoking-related behaviors were collected. Consistent with previous studies, smoking abstinence resulted in increased self-reported negative affect and worse task-related performance on the AST (lower accuracy and increased RT). However, contrary to hypotheses, smoking abstinence did not increase distraction from negatively valenced stimuli. With regard to fMRI data, smoking abstinence, as compared to satiety, was associated with increased BOLD signal in dorsal anterior cingulate cortex (dACC; BA31, BA32). The dACC is commonly activated during attentional processes involving regulating cognition and resolving conflict. As such, greater activation in dACC during abstinence suggests recruitment of this region in order to maintain task performance. These data will be further discussed in the context of smoking abstinence effects on affective cognition.

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POS3-75

THE EFFECTS OF STEADY-STATE VARENICLINE ON INHIBITORY CONTROL AND DELAY DISCOUNTING IN TREATMENT-SEEKING SMOKERS

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Varenicline is currently the most efficacious pharmacotherapy for smoking cessation. However, the psychobiological processes by which varenicline facilitates cessation are not well understood. Building on preliminary evidence that varenicline improves aspects of neurocognitive functioning, we tested the hypothesis that steady-state varenicline improves two key domains of impulsivity (i.e., inhibitory control and delay-discounting). Participants were treatment-seeking smokers enrolled in a double-blind RCT examining the impact of longer pre-quit varenicline duration. Session 1 was a pre-drug baseline, and Session 2 occurred after 3 weeks of either placebo (n=27) or varenicline (n=31), one week before the target quit date. Testing took place under minimal deprivation (approximately 45 minutes). Inhibitory control, the ability to inhibit a pre-potent response, was measured using the stop task. In each of 3 task blocks, participants responded by indicating the direction target arrows faced but inhibited responding to a dynamically adjusting auditory stop signal presented on 25% of trials. Delay-discounting, a preference for immediate, small over delayed (7, 30, 90, and 180 days) but larger amounts of money, was measured using a computerized hypothetical discounting measure (Mitchell, 1999). Preliminary Group (varenicline v. placebo) x Session (pre v. post) analyses revealed comparable inhibitory control with varenicline (SSRT M[SD] pre = 230[54], post = 215[47]) and placebo (SSRT M[SD]; pre = 256[85], post = 235[62]); F<1. Similarly, there was no reliable difference between treatment conditions in the area under the discounting curve; varenicline AUC M[SD] pre = 0.30[0.12], post = 0.29[0.13], placebo AUC M[SD] pre = 0.32[0.14], post = 0.29[0.14]; F =1.05, p=0.31. Thus, there was no evidence that steady-state varenicline reduces impulsivity among minimally withdrawn treatment-seeking smokers. It remains possible that varenicline-induced changes in impulsivity predict relapse in the present study and that varenicline affects impulsivity more robustly during longer periods of abstinence.

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POS3-76

NICOTINIC INVOLVEMENT WITH COGNITIVE FUNCTION AND ITS RELEVANCE TO TOBACCO ADDICTION

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Nicotinic receptors are found throughout the brain and are involved in a variety of behavioral functions. Nicotine plays an essential role in tobacco addiction. Nicotinic systems have also been conclusively proven to play key roles in cognitive function. Nicotine has been shown to improve attention, learning and memory. Cognitive improvement with nicotine has been found in a broad range of species including, zebrafish, mice, rats, monkeys, and humans. This is independent of the alleviation of nicotine withdrawal-induced cognitive impairment. Nicotine significantly reduces cognitive impairment of Alzheimer's disease, schizophrenia and attention deficit hyperactivity disorder (ADHD). A variety of nicotinic agonists are being developed for the treatment of these cognitive disorders. People with developmentally expressed cognitive impairments such as ADHD and schizophrenia show double to triple the general rate of smoking. There is evidence that people with these conditions may be self-medicating with tobacco, albeit in a particularly deadly fashion. We have found that nicotinic innervation of the hippocampus and amygdala is key for memory function. Both alpha7 and alpha4beta2 antagonists in these areas impair memory. Interestingly, we recently found that blockade of alpha4beta2 nicotinic receptors in the mediodorsal thalamic nucleus has the opposite effect of improving memory. Nicotinic actions on cognitive function may be related in key ways to nicotine involvement in tobacco addiction. Not only might some people smoke for self-medication to alleviate cognitive impairment and people may relapse to smoking to alleviate the cognitive impairment of nicotine withdrawal, it is clear that learning and memory of conditioned sensory cues are key parts of tobacco addiction. With its cognitive enhancing effects nicotine may facilitate its own addiction and the cognitive impairment of withdrawal may make it more difficult to extinguish the conditioned cues of tobacco addiction. For a variety of reasons investigating the cognitive enhancing effects of nicotine is important for a fuller understanding of nicotinic actions and the complex bases of tobacco addiction.

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POS3-77

CLINICAL LABORATORY EVALUATION OF THE EFFECTS OF ELECTRONIC "CIGARETTES"

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Electronic "cigarettes" (ECIGs) use a battery-powered heater to vaporize a solution of nicotine, propylene glycol, and other chemicals housed within a cartridge. These unregulated products are lauded by manufacturers for their ability to deliver nicotine in the absence of harmful smoke constituents and by consumers as an effective smoking cessation aid. Importantly, these claims have yet to be supported by objective empirical work, including the use of clinical laboratory methods for evaluating ECIGs at the individual level. Clinical laboratory work reveals valuable information about the effects of product use: toxicant delivery, withdrawal-suppression ability, cardiovascular response, product acceptability, abuse liability, and behavioral adaptations. As such, a review of published and ongoing work, which includes such measures sheds light on these product

considerations and might be used to predict the safety and efficacy of ECIGs. For example, the few available studies suggest that acute administration of ECIGs does not result in significant CO or nicotine delivery, relative to smokers' own brand of cigarette. In fact, the nicotine delivery profile for the ECIG brands tested was no different than that for an unlit cigarette or the Nicorette inhaler. These ECIGs were also observed to decrease some symptoms of nicotine/tobacco abstinence (e.g., "craving") and increase product acceptability ratings (e.g., "pleasant," "satisfaction"), at least temporarily. Interestingly, these subjective effects parallel those observed when regular smokers use denicotinized cigarettes. If reliable, this early work suggests that, although ECIGs may reduce exposure to toxicants such as CO, they may also fail to deliver nicotine effectively and suppress withdrawal completely. Other cigarette-like products that present a similar effect profile have been observed to supplement rather than replace tobacco cigarette smoking. Thus, a combination of relevant outcome measures and appropriate control conditions used within the clinical laboratory model is essential for understanding a product's relative risks and gauging its long-term success.

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POS3-78

NICOTINIC RECEPTOR ALPHA5 AND BETA2 SUBUNITS, CHOLINERGIC EXCITABILITY, AND COMPENSATION IN LAYER VI NEURONS OF PREFRONTAL CORTEX

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Layer VI corticothalamic neurons in the prefrontal cortex play an important role in attention. Acetylcholine (ACh) elicits excitatory currents in these neurons which are likely mediated by alpha4beta2* nicotinic receptors with the accessory alpha5 subunit. This study examines the differences in cholinergic excitation of layer VI pyramidal neurons with genetic deletion of either the accessory alpha5 subunit or the ligand-binding beta2 subunit. Whole cell recordings of layer VI neurons in acute prefrontal slices from adult male mice were made to contrast the cholinergic responses in alpha5-/- mice and beta2-/- mice with their wildtype (WT) controls. Stimulation of nicotinic receptors by application of ACh in the presence of atropine (an antagonist of muscarinic ACh receptors) induced changes in membrane potential and rate of action potential firing that were significantly smaller in alpha5-/- and beta2-/- neurons compared to WT. Nicotinic stimulation was able to depolarize the majority of WT neurons to threshold, but only a minority of alpha5-/- neurons, and none of the beta2-/- neurons. Since nicotinic excitation of layer VI prefrontal neurons is important in attention, we examined whether compensation for its loss in alpha5-/- and beta2-/- mice occurred through upregulation of muscarinic ACh effects. Following isolation of the muscarinic effect by nicotinic and glutamatergic blockers, ACh induced significantly larger changes in membrane potential and rate of action potential firing in alpha5-/- and beta2-/- neurons compared to WT. To assess the degree of compensation, the effects of ACh on layer VI neurons in the presence and absence of atropine were compared. There were no differences in the WT responses between these conditions, but the response to ACh without atropine was increased in the alpha5-/- and beta2-/- neurons. The latter responses were also prolonged compared to WT. These results suggest that upregulation of the effects of muscarinic receptors in prefrontal layer VI neurons of alpha5-/- and beta2-/- mice compensate partially, and with altered timing, for decreased functionality of nicotinic acetylcholine receptors.

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POS3-79

ETHANOL INTERACTIONS WITH NICOTINIC RECEPTORS IN BRAINSTEM CHOLINERGIC CENTERS

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Nicotine and ethanol are two of the most widely co-abused drugs. Ethanol impairs motor activity along with its rewarding effects, and one theory is that the stimulant effects of nicotine may offset the some of the ethanol induced motor impairment. Alternate hypotheses suggest that nicotine enhances the value of drug-associated cues, but the mechanisms underlying these interactions remain unclear. A major challenge in understanding the effects of ethanol is the identification of molecular targets that mediate the behavioral effects. Ethanol has been shown to modulate nicotinic acetylcholine receptors (nAChRs) in cell culture, but no such studies have been carried out in brain slices. To investigate this interaction, we tested the effect of bath applied ethanol on nAChR-mediated currents using whole cell patch clamp recording in tissue slices including a brainstem cholinergic center, the lateral dorsal tegmental nucleus (LDTg) from adult rats. The LDTg contributes to motor control and motor learning, as well as reward related circuitry. The majority of nAChR responses in LDTg were completely blocked by the selective α7* antagonist, MLA (10 nM). Bath application of ethanol at low, physiologically relevant levels (1-10mM) caused profound reduction to the α7* nAChR responses. Interestingly, the inhibitory effect of ethanol on α7* nAChRs was blocked by either the PKA inhibitor H89 or the adenylate cyclase inhibitor SQ22536 (introduced via the recording electrode solution). Bath application of activators and inhibitors of the PKA pathway potentiated and inhibited LDTg α7* nAChR currents, respectively. Thus, ethanol may inhibit α7 nAChRs via inhibition of the PKA pathway. Nicotine increased the frequency of miniature EPSC's in the mediodorsal thalamus, a brain region involved in motor control, which receives extensive cholinergic inputs from the LDTg. Nicotine potentiation of thalamic EPSC's was significantly reduced either by MLA or 10mM ethanol. These findings suggest that some of the sedative effects of ethanol may be mediated by a reduction in α7* nAChR effects on glutamatergic synaptic transmission.

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POS3-80

ADOLESCENT EXPOSURE TO NICOTINE INFLUENCES ADULT NICOTINE CONSUMPTION

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Among adolescents, heavy smokers are more likely to continue to smoke later in life compared to light smokers (Jefferis et al., 2003). A number of environmental factors contribute to the continued use of tobacco (Gilpin et al 2007); however, nicotine is thought to be the major pharmacologic factor that influences tobacco use and dependence (CDC, 1988). Few studies have causally examined how the amount of nicotine exposure during adolescence affects onset of nicotine consumption in adulthood. Animal models of nicotine exposure have been used to investigate the biobehavioral factors involved in smoking cigarettes (Klein et al., 2004). We examined the effect of low and high nicotine exposure during adolescence on nicotine consumption in adulthood. Forty-two male and 42 female C57BL/6J adolescent mice were placed into either a HIGH- or LOW-NIC exposure group. LOW-NIC mice (n=42) had free access to 50 ug/ml freebase nicotine solution or water via a 2-bottle choice paradigm; HIGH-NIC mice (n=42) had free access to two 50 ug/ml nicotine bottles; these conditions were maintained for 30 days (PN32-67). Both groups then were exposed to a 2-bottle choice paradigm for 24 hrs during initial adulthood (PN68). During adolescence, HIGH-NIC mice drank more nicotine (ml) than did LOW-NIC mice ($p<0.05$). When provided a choice in adulthood, HIGH-NIC mice consumed more nicotine (ml) than did LOW-NIC mice ($p<0.05$), even when nicotine consumption was adjusted for body weight (mg/kg) ($p<0.05$). In adulthood, females consumed more nicotine per unit body weight (mg/kg) than did males, regardless of adolescent NIC exposure ($p<0.05$). These findings suggest a pharmacologic pathway through which tobacco use during adolescence sustains heavy tobacco use in adulthood. Additional animal studies that extend nicotine consumption testing further into adulthood are needed to test this hypothesis.

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POS3-81

PREVIOUS CHRONIC EXPOSURE ELIMINATES THE CONDITIONING EFFECT OF NICOTINE IN RATS

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Individual differences in nicotine/tobacco addiction is a major factor that underlies limited success rates in smoking cessation interventions. We have demonstrated that rats show significant individual variation in their preference when nicotine is administered orally in a two-bottle free choice design. In this study, Sprague Dawley rats were preselected based on their nicotine preference and then subjected to conditioned place preference (CPP). Here, we report data obtained from three different sets of animals in three different experiments. Adolescent continuous (nicotine choice starting at 1 month

and continued for 23 weeks), Adolescent interrupted (nicotine choice starting at 1 month for 6 weeks, and continued for another 6 weeks after an interval of 9 weeks), Adult exposure (nicotine choice starting at 3.5 months, for six weeks). Rats with minimum and maximum nicotine preference, selected according to nicotine consumption, underwent CPP testing, pairing nicotine with the initially non-preferred compartment. Control animals received only water from both bottles under identical conditions. Control animals in all three groups, that received nicotine only during CPP testing confirmed our previous findings: male, but not female rats showed nicotine-induced CPP. On the other hand, the conditioning effect of nicotine was diminished in rats, which were given a free choice of oral nicotine at adolescence or adulthood. Despite differences in nicotine preference and subsequently nicotine intake prior to CPP testing, nicotine did not induce CPP in any experiment. However, in the "adult exposure" group, in male rats there was a trend in maximum nicotine preferring rats to show conditioning and minimum preferring rats show aversion to the nicotine paired compartment; an interaction which did not reach significant levels. There was no correlation between nicotine consumption and CPP score, suggesting that the amount of nicotine consumed for at least 6 weeks prior to CPP testing does not affect conditioning. These results suggest that the conditioning effect of nicotine in rats is diminished following chronic exposure, especially when exposure starts at adolescence.

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POS3-82

FATTY ACID AMIDE HYDROLASE (FAAH) INHIBITION MODULATES NICOTINE SELF-ADMINISTRATION IN MONKEYS

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Endogenous cannabinoid signaling is known to be involved in nicotine addiction, but the functions of specific endocannabinoid transmitters in the abuse-associated effects of nicotine have long remained unclear. We recently found that nicotine's rewarding effects 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). We also showed that peroxisome proliferator-activated receptors alpha (PPAR-alpha) were involved in these effects in rats, since OEA and PEA are endogenous ligands for these receptors. Here we studied the effects of FAAH inhibition by URB597 on reinforcing effects of nicotine in squirrel monkeys using fixed-ratio intravenous nicotine self-administration procedure. We found that pretreatment with URB597 attenuated reinforcing effects of nicotine, which was demonstrated by the rightward shift of the nicotine dose-response curve. Also, pretreatment with URB597 prevented nicotine-induced reinstatement, a model of relapse into nicotine use. The URB597 effects on self-administration, as well as reinstatement, were reversed by pretreatment with PPAR-alpha antagonist MK886. These findings suggest that FAAH inhibition counteracts the addictive properties of nicotine, and point to FAAH and PPAR-alpha as novel molecular targets for tobacco dependence.

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POS3-83

MODULATION OF NICOTINE-INDUCED ELEVATIONS IN DOPAMINE NEURON ACTIVITY IN THE VENTRAL TEGMENTAL AREA AND NUCLEUS ACCUMBENS SHELL BY THE PPAR-ALPHA AGONIST CLOFIBRATE IN RATS

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Recent research suggests that a receptor related to the endogenous cannabinoid system, the peroxisome proliferator-activated alpha nuclear receptor (PPAR-apha), which regulates genes involved in lipid metabolism and inflammatory responses, is a viable target for treating nicotine dependence. We previously reported that systemic administration of the synthetic PPAR-alpha agonists WY14643 and methOEA block nicotine-induced activation of isolated dopamine neurons in the ventral tegmental area (VTA) of anesthetized rats and nicotine-induced elevations in dopamine in the nucleus accumbens shell in freely-moving rats, effects considered essential for nicotine's addictive actions and, as well, block nicotine- self-administration behavior and relapse to drug-seeking behavior in abstinent rats or monkeys. There is a class of widely used, approved medications that target this nuclear receptor. These PPAR-alpha agonist drugs, the fibrates, are well tolerated in humans for treatment of hypercholesterolemia and hyperlipidemia. Here we investigated whether the PPAR-alpha agonist clofibrate can modulate dopamine neuron firing in the VTA and nicotine-induced dopamine elevations in the nucleus accumbens shell in Sprague Dawley rats. We found that clofibrate decreased nicotine-induced activation of dopamine neurons in the VTA of anesthetized rats and decreased nicotine-induced elevations in extracellular dopamine levels in the nucleus accumbens shell of freely moving rats. These results provide further evidence that PPAR-alpha nuclear receptor activity modulates the addictive effects of nicotine and suggest that clinically used fibrates are potential medications for the treatment of nicotine dependence.

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POS3-84

NON-QUITTING AND QUITTING CIGARETTE SMOKERS EXHIBIT DIFFERENT PATTERNS OF CUE-ELICITED BRAIN ACTIVATION WHEN ANTICIPATING AN OPPORTUNITY TO SMOKE

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The authors examined the effects of smoking status and smoking expectancy on cue-reactivity using functional magnetic resonance imaging. The main objective of the study was to compare cue-elicited brain activation in non-quitting and quitting smokers who were anticipating an opportunity to smoke. Cue-elicited activation was observed in the rostral prefrontal cortex (PFC) in both non-quitting and quitting smokers who expected to smoke within seconds, but not in those who expected to have to wait hours before having the chance to smoke. For non-quitting smokers expecting to smoke, rostral PFC activation was positively correlated with the activation of several areas previously linked to cue-reactivity, including the orbitofrontal cortex (OFC) and anterior cingulate cortex (ACC). In contrast, rostral PFC activation was negatively correlated with activation of the OFC and rostral ACC in quitting smokers expecting to smoke. Results extend previous work examining the effects of smoking expectancy and highlight the utility of examining interregional covariation during cue exposure.

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POS3-85

EFFECTS OF SMOKING AND OPRM1 A118G ON BRAIN MU OPIOID RECEPTOR BINDING POTENTIAL

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Evidence points to the endogenous opioid system, and the mu-opioid receptor (MOR) in particular, in mediating the rewarding effects of drugs of abuse, including nicotine. A single nucleotide polymorphism (SNP) in the human MOR gene (OPRM1 A118G) has been shown to alter receptor protein level in preclinical models and smoking behavior in humans. To clarify the underlying mechanisms for these associations, we conducted the first in-vivo investigation of the effects of smoking and OPRM1 A118G genotype on MOR binding potential (BPND or receptor availability). Twenty-two smokers prescreened for genotype (12 A/A, 10 */G) completed two [11C]Carfentanil positron emission tomography (PET) imaging sessions following overnight abstinence and exposure to a nicotine-containing cigarette and a de-nicotinized (placebo) cigarette. Compared to non-smokers (10 A/A, 10 */G), abstinent smokers (placebo session) exhibited elevated MOR BPND in the five regions of interest (ROIs): anterior cingulate cortex, amygdala, caudate, ventral

striatum/nucleus accumbens, and thalamus. Among the smokers, nicotine exposure reduced MOR BPND in all regions, supporting nicotine-induced endogenous opioid neurotransmission. Consistent with preclinical data, smokers homozygous for the wildtype OPRM1 A allele exhibited higher levels of MOR BPND than smokers carrying the G allele in anterior cingulate cortex, amygdala, and thalamus. Across genotype groups, the extent of subjective reward difference across sessions was associated with MOR BPND difference in caudate. Future translational investigations will permit further elucidation of the role of MORs in nicotine addiction and smoking relapse.

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POS4-1

SUSTAINABILITY OF A HOSPITAL CESSATION PROGRAM

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Background: The Ottawa Model of Smoking Cessation (OMSC) is a hospital-based smoking cessation program being implemented in hospitals across Canada. Hospital-based cessation programs are effective and recommended as best practice. Attention needs to focus on factors influencing long-term sustainability within acute care hospital systems.

Objectives: This presentation will describe a theoretical model of sustainability and results from an initial evaluation study of sustainability and recommendations to enhance likelihood of sustainability.

Methods: Twelve key informants from six hospitals, selected to represent higher and lower OMSC activity level, were interviewed about the implementation of OMSC and plans for ongoing operation using a semi-structured interview format. Qualitative analysis examined themes related to sustainability and Gruen et al.'s sustainability model was applied to interpret our findings.

Results: Factors influencing sustainability include perceptions of smoking cessation (the health problem) as a hospital responsibility, characteristics of the OMSC and "fit" with hospital systems and actions by key program drivers/stakeholders. We did not find major differences in implementation and sustainability factors between hospitals with higher and lower levels of OMSC activity, even though hospitals were intentionally selected to capture the extremes of program activity level. However interactions between the three factors differed which suggests that how a new program is implemented has as much if not more influence on sustainability as any specific factor.

Significance: Applying a sustainability model to a hospital smoking cessation program allowed examination of how implementation decisions can impact sustainability. Evaluating the interaction between these three factors part way through the implementation of a program may identify factors and interactions that if dealt with, enhance likelihood of long term sustainability. Knowledge of sustainability influencers provides an opportunity to create a sustainability plan to address these factors during program implementation and not after the possibility of long term sustainability has diminished.

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POS4-3

THE NEED FOR TOBACCO CESSATION IN A FREE CLINIC POPULATION

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National guidelines recommend tobacco screening at every medical visit. The uninsured are more likely than the insured to use tobacco and less likely to receive cessation advice from a provider. The goal of this study is to test the dissemination of evidence-based tobacco cessation strategies to free clinics serving the uninsured. This abstract reports baseline data on prevalence and correlates of tobacco use and provider cessation advice among a sample of uninsured patients at six free clinics in North Carolina. Tobacco use was defined as past 30-day use of cigarettes or smokeless tobacco. Logistic regression analysis was used to assess correlates including demographics, education, employment status, and receipt of provider screening. Quit behavior, readiness to change, and receipt of provider quit advice are described. Of the 158 patients interviewed after a visit with a health care provider, 83 (53%) were tobacco users. Use was less likely among Hispanics (AOR=0.12; CI 0.03-0.57) and high school graduates (AOR=0.21; CI 0.08-0.54). Employment status was not significantly associated with use. Among users, 64% made at least one quit attempt in the past year and the majority were in the Contemplation (33%) or Preparation (39%) stage of readiness. 70% of all patients were screened for use in the past 3 months, although screening was more likely among tobacco users than non-users (AOR=3.83 [95% CI 1.63-8.98]). In the past 3 months, 55% of users were advised to quit, 45% were asked if they were willing to quit, 2% were assisted with setting a quit date, 7% were advised to seek assistance through a quit line or counseling, and 14% were given a cessation brochure. The prevalence of tobacco use among a sample of uninsured free clinic patients was more than twice the national average and higher than most publically available literature that describes tobacco use among the uninsured. Based on patient reports of provider behavior, there is substantial opportunity to increase tobacco screening among all patients and cessation advice and assistance among tobacco users. Free clinics may serve an untapped, high risk population for tobacco morbidity and mortality.

National Cancer Institute (R21DA024631).

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POS4-4

REDUCING CURRENT SMOKING: MODELING INITIATION AND CESSATION RATES TO ACHIEVE TARGETS

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Objective: Use a simulation model to develop scenarios for changes in smoking initiation and cessation rates needed to reach a target reduction of five percentage points in prevalence of tobacco smoking in Ontario over a five-year period.

Method: Change in smoking prevalence was modeled as a function of death rates, cessation, and initiation. Tobacco-attributable deaths among Ontario's current smokers were estimated from the Cost of Substance Abuse in Canada 2002. Deaths due to other causes were estimated from the Canadian Human Mortality Database. Cessation rate and initiation rate were obtained from the 2008 Canadian Community Health Survey. Cessation rate was calculated as quitting smoking for at least 30 days and it was later adjusted for first-year relapse using a coefficient derived from previous Ontario data. Initiation rate was defined as uptake of current smoking (defined as having smoked 100+ cigarettes and having smoked in the last month) in the last year. The Ontario Ministry of Finance's population projections were used to forecast the number of smokers based on the desired smoking prevalence target.

Results: Approximately 1% of Ontario's current smokers, aged 12 years and older, die every year. After accounting for relapse, 1.6% of current year smokers successfully abstain from smoking for at least 12 months. New smokers, who smoke their first cigarette within past year, make up 1% of current smokers. Several scenarios to reach targeted reduction in prevalence were developed, including: (1) keep uptake rate constant at 1% and increase cessation rate from 1.6% to 3.5% (2) decrease uptake rate by half to 0.5% and increase cessation rate from 1.6% to 3.1% (3) increase cessation rate by two fold and decrease uptake rate from 1% to 0.6%.

Conclusion: This study demonstrates innovations in calculating uptake and cessation rates from population surveys and provides a simple model to examine alternative paths for reaching a target smoking rate. Target setting is a vital public health practice and this study assists future policy and program planning around cessation and uptake of smoking.

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

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POS4-5

EVIDENCE TO GUIDE ACTION: RENEWAL OF THE SMOKE-FREE ONTARIO STRATEGY

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INTRODUCTION: In 2009, the (Ontario) Ministry of Health Promotion and Sport undertook a process to renew the "Smoke-Free Ontario" strategy for tobacco control.

METHODS: The government asked the Ontario Agency for Health Protection and Promotion (OAHPP) to convene a scientific advisory committee to review the scientific evidence and provide recommendations. The committee was composed of tobacco control researchers and practitioners from Ontario. Scientific and practice-based evidence informed the committee's deliberations and recommendations. A previously prepared stakeholder report provided contextual information for Ontario. Input from government and policymakers was managed separately from the scientific process. Peer review of the science-based recommendations was provided by an international expert panel of tobacco control scientists. OAHPP provided technical and secretarial support for the 6-month project.

RESULTS: The committee's 55 recommendations build upon the current evidence and represent innovative approaches to many aspects of comprehensive tobacco

control. In addition to addressing the traditional pillars of tobacco control (i.e., prevention, protection, and cessation), these recommendations explicitly address the tobacco industry as the disease vector, tobacco-related disparities and health inequity, and key system enablers. Newly developed program logic models are expected to aid in the deployment of tobacco control resources.

DISCUSSION: The scientific advisory committee's recommendations are a strong foundation for the next generation of tobacco control program, policy, and media interventions in Ontario. Significant insight was gained in managing stakeholder and policymaker input into scientific research and deliberations as a means to enhance utility and uptake of the recommendations. Lessons learned could inform the work of other jurisdictions as they renew their comprehensive tobacco control strategies. (Note: a synopsis of the report will be available with the presentation).

This project was funded by the (Ontario) Ministry of Health Promotion and Sport. The Ontario Agency for Health Protection and Promotion provided technical and secretarial support.

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POS4-6

DO HISPANIC SMOKERS PREFER HISPANIC CESSATION MEDIA?: COMPARING ENGLISH LANGUAGE AND SPANISH LANGUAGE MEDIA CAMPAIGNS IN FLORIDA

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Introduction: Among all ethnicities in Florida, Hispanics are the least likely to make a quit attempt. In an effort to reach Hispanic smokers, the Florida Department of Health developed and implemented a cessation media campaign specifically for Spanish-speaking tobacco users. In this abstract we present the results from a study of Hispanic tobacco users comparing the effectiveness of the Hispanic campaign to English language youth prevention and tobacco cessation campaigns on ad awareness, ad appeal, and the impact of the campaigns on outcomes.

Methods: Three cross-sectional telephone surveys were conducted using random digit dial, listed, and cell phone samples. Data was collected at three time points: following English youth prevention, English cessation, and Hispanic cessation campaigns. 204 Hispanic smokers/recent quitters were interviewed at time 1, 201 at time 2, and 100 at time 3.

Results: Using logistic regression, ANCOVA, and MANCOVA modeling, the English youth prevention campaign was found to be more powerful in generating ad awareness. As compared to after the youth prevention campaign, Hispanics were 1.6 times less likely to exhibit campaign awareness after the English cessation campaign and 1.3 times less likely to be aware of ads following the Hispanic cessation campaign ($p=.007$ and $p<.001$, respectively). The campaigns were not found to be effective in motivating Hispanics to achieve key outcomes, such as quitting behaviors ($p>.05$). However, the Hispanic ads performed well in terms of receptivity. Three receptivity items were combined into a single factor defined as the likelihood of the ad to influence taking some action. Two Hispanic ads had the two highest scores on the factor.

Discussion: Overall, the Hispanic campaign was found to neither generate higher ad awareness as compared to English campaigns, nor to motivate Hispanics to achieve key outcomes. However, receptivity of ads was higher for the Hispanic campaign, especially regarding taking action based on the ads. Allowing the Hispanic campaign to run for a longer period of time and increasing TRPs would likely enhance its effectiveness.

Evaluation contract from the Florida Department of Health.

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POS4-7

COPING STYLES AND IMPULSIVITY DIFFERENTIATE ADOLESCENTS WHO USE TOBACCO, MARIJUANA OR BOTH SUBSTANCES

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The use of tobacco and marijuana by adolescents is associated with negative consequences, including increased levels of marijuana use and binge alcohol use. This work attempted to extend that finding by examining trait impulsivity and coping behaviors among adolescents in four groups: non-marijuana or tobacco users, past month users of tobacco only, past month users of marijuana only or past month users of both substances. We hypothesized that combined users would be the most impulsive and use higher levels of maladaptive coping, followed by users or either tobacco or marijuana, then by non-users. Data from 925 high school-aged adolescents participating in a survey to assess interest in a marijuana treatment program was used. ANCOVA was used to evaluate levels of coping (as assessed by the RCBI) and impulsivity (as assessed by the BIS-11) in the four groups; logistic regression evaluated differences between substance use groups. In general, the hypotheses were supported: combined users were more impulsive than marijuana only users and non-users ($p< .01$), but not different from tobacco only users. Non-users were least impulsive ($p\leq .015$). Similarly, combined users were most likely to express anger in response to stress ($p< .01$), with non-users less likely to express anger than combined or marijuana only users ($p< .01$). Tobacco only and marijuana only users were differentiated by impulsivity (higher in tobacco users; $p= .029$) and stress-related anger (higher in marijuana users; $p= .021$). Angry coping differentiated tobacco only from combined users ($p= .012$), while impulsivity differentiated marijuana only from combined users ($p= .011$). These results indicate that trait impulsivity and maladaptive coping in response to stress may be important in the progression of adolescent tobacco and/or marijuana use.

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POS4-8

THE CHANGING MARKETING OF SMOKELESS TOBACCO IN MAGAZINE ADVERTISEMENTS

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Objective: To systematically document the changing advertising strategies and themes of the smokeless tobacco (ST) industry.

Methods: Using descriptive content analysis, this study analyzed 17 nationally circulated magazines for ST advertisements (ads) from two time periods, 1998-1999 and 2005-2006, and recorded both magazine and advertisement characteristics (e.g., themes, selling proposition, people portrayed, and setting/surroundings.) Ninety-five unique ads were found during the two time periods – occurring with total frequency of 290 ad placements in 816 issues.

Results: Significant differences in ST ads were identified between time periods and magazine types. Overall, not only were a greater percentage of ads found in the latter time period, but the average number of ads per issue increased as well. While more recent magazines contained a greater proportion of "alternative to cigarette" messages, individuality themes, flavored products, indoor settings, web addresses, references to taste, comparison to other brands, and presence of financial incentives, earlier magazines contained greater percentages of ads with masculinity themes, wilderness settings, and references to cost or value. General adult magazines contained a greater concentration of ads with flavored products, "alternative to cigarette" messages, individuality themes, indoor settings, and a psychosocial needs-focus.

Conclusions: While keeping their base of customers by advertising in men's magazines with themes appealing to men and "traditional" ST users, the ST industry appears to be simultaneously changing its message strategy in order to expand its target audience to include readers of general adult magazines who may not currently use ST.

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POS4-9

A PORTRAIT OF WOMEN WHO SMOKE DURING AND AFTER PREGNANCY IN ONTARIO

Chelsea Kirkby, Nadia Minian, and Shelley Cleverly, Echo: Improving Women's Health in Ontario

In 2007/2008, fifteen percent of pregnant women aged 15-49 years in Ontario were current smokers. A number of women will quit during pregnancy, however, between 70-80% relapse one year after giving birth. Smoking during and after pregnancy has a harmful effect on both the health of the pregnant woman and the fetus. The impact of smoking women's health is great and is a leading cause of death and disability, including stroke, lung cancer, and osteoporosis. The impacts of smoking during pregnancy on the fetus and newborn are also significant and can include preterm birth, low-birth weight, sudden infant death syndrome (SIDS) and future behavioural problems in children. It is important to know more about women who are smoking during and after pregnancy to best assist these women in their cessation efforts. Best practices for smoking cessation

interventions for women who smoke during and after pregnancy are shifting from those that focused on fetal health as motivation for cessation to those that focus more on women's health and the broader social and biological issues that affect cessation. In order to better understand the context of women's lives and to tailor services and policy that address smoking cessation during and after pregnancy, Echo: Improving Women's Health in Ontario has created a profile of this population using data from the Better Outcomes Registry & Network Ontario (BORN Ontario - previously the Ontario Perinatal Surveillance System - OPSS). In this presentation we will highlight both social and health characteristics of women who smoke during or after pregnancy in Ontario. This information will be valuable for service providers and policy makers that work to support women in their smoking cessation efforts during and after pregnancy.

Ontario's Ministry of Health and Long Term Care.

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POS4-10

CORRELATES OF SMOKING IN TEXAS: SMOKING STATUS, PHYSICIAN INTERACTION, AND DAILY CIGARETTE CONSUMPTION

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Introduction: Despite decreases in smoking in the United States, continuing efforts are needed to examine factors associated with tobacco use and cessation.

Purpose: To identify the demographics, perceived health status, and health-related behaviors associated with smoking status; (2) contrast these factors between current and previous smokers; and (3) assess factors associated with current smokers' tobacco-related discussions with physicians & daily cigarette consumption.

Methods: Data from 3,964 adults were analyzed from a random sample of households a seven-county region of Texas. Multinomial logistic regression, binary logistic regression, and linear regression were performed.

Findings: Compared to never smokers, past and current smokers were more likely to be older, less educated, consume more alcohol weekly, and have a tobacco-related discussion with a physician in the previous 2 years. Current smokers were less likely to visit a physician in the past 2 years, consumed fewer fruits and vegetables, and consumed more sugar-sweetened beverages. Compared to past smokers, current smokers were more likely to be female, overweight, consume more alcohol and sugar-sweetened beverages, and have a tobacco-related discussion with a physician. Among current smokers (12.4% of the sample), having tobacco-related discussions was associated with having more physician visits, consuming more alcohol, and smoking more cigarettes per day. Smoking more cigarettes per day was associated with being male, visiting a physician less often, consuming more alcohol, and fewer fruits and vegetables.

Conclusions: Tobacco cessation will be more effective when integrating physicians and healthcare settings in intervention designs.

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POS4-11

THE INFLUENCE OF SECONDHAND SMOKE EXPOSURE ON SEVERITY OF INFLUENZA AMONG A PEDIATRIC INPATIENT POPULATION

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Background: Secondhand smoke exposure (SHSE) has been associated with morbidity and mortality in pediatric patients. It is estimated that 50% of children are exposed, which increases the risk for respiratory and other illnesses. However, little is known about the relationship between SHSE and influenza.

Objective: The objective was to determine whether hospitalized children with influenza who have SHSE are more likely to show markers of increased severity.

Methods: We analyzed charts from 2007-2009 obtained from inpatient hospital records at the University of Rochester Medical Center. Demographic and health information, such as premature birth, medications, and other diagnoses were collected. SHSE assessment data was obtained from provider notes. The severity indicators were: length of hospital stay (LOS), hours on oxygen, need for intensive care, need for intubation, and development of pneumonia. Chi-square, Mann-Whitney U tests, and t-tests were completed using SPSS 18.0.

Results: Of the 50 charts reviewed, 30% indicated SHSE. There were no significant differences in race, age, or ethnicity in relation to SHSE. Children who had SHSE were more likely to require intensive care (43% vs. 6%; $p < 0.01$) or intubation (20% vs. 0%; $p < 0.01$) when hospitalized for influenza. No other significant differences emerged related to illness severity and SHSE; however, there was a trend towards an association with SHSE and LOS. Asthma and prior medical conditions were not associated with SHSE and the other severity indicators; however, there was a significant relationship between having another pre-existing medical condition and LOS ($p < 0.05$).

Conclusion: Children with SHSE required intensive care and intubation more often than those not exposed when hospitalized for influenza. Future studies with larger sample sizes and measurements of biomarkers for SHSE are needed. These results suggest, however, that children with SHSE are more vulnerable, and that greater efforts are needed to immunize this population against influenza, as well as to reduce SHSE among all children.

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POS4-12

PSYCHOSOCIAL CORRELATES OF SMOKELESS TOBACCO USE AMONG INDIANA ADOLESCENTS

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Introduction: Adolescent tobacco use is influenced by intrapersonal (e.g., impulse control) and external factors, such as behaviors of friends and peers. The relationships of these factors to smokeless tobacco (ST) use are not yet fully understood.

Purpose: To investigate the relationship of selected psychological and normative variables to adolescent lifetime ST use. Methods: Data from 1,354 Indiana middle and high school students were analyzed. Binary sequential logistic regression was performed to examine the relationship of personal characteristics and psychosocial measures to adolescent lifetime ST use.

Findings: Just over 9% reported having ever used ST, among which 79.7% were male. Females and younger students (compared to high school seniors) were less likely to have used ST in their lifetime, whereas participants with a sibling smoker and those who compare their life to the lives of others were more likely to report lifetime ST usage. In the presence of psychological and normative variables, sex, grades 7 & 9, and comparing one's life to others remained significant. Perceived friend approval of substance use and belief that friends engage in risky behaviors were significantly more likely to report lifetime ST use. High perceived risk of substance use and low conformity to the influence of friends were less likely to have ever used ST.

Conclusions: Understanding the normative perceptions of adolescents, and interactions between friend and peer groups, may enable community and school officials to tailor interventions to prevent ST initiation and promote cessation.

No funding.

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POS4-13

SMOKELESS TOBACCO MARKETING APPROACHES TO OHIO APPALACHIAN SMOKELESS TOBACCO USERS

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Compared to the general U.S. population, smokeless tobacco (ST) consumption is higher among young males residing in the Appalachian region of the U.S. Recent tobacco control initiatives, such as clean indoor air legislation and higher taxes on cigarettes may be partially responsible for increased ST consumption in Ohio Appalachia. The purpose of this study was to describe current ST marketing approaches to young adult males who consume ST products and reside in three Ohio Appalachian counties. Qualitative interviews were conducted with 38 adult male self-reported ST users. Participants were recruited from local community sites such as agricultural and health care agencies, and community colleges. The mean age of participants was 29 (SD=12.9) and their mean age of initiation of tobacco use was 15 (SD= 3.9). Approximately 77% of users consumed ST on a daily basis and the average total years of consumption was 12.7 (SD=13.6). One-third of the sample

reported an annual household income of < $25,000, with 84.6% working either full- or part-time. The majority of participants were single (53.9%) and 66.7% had some college education. All participants were white. Qualitative data analysis is underway. Specifically, interview information will be analyzed to describe: (1) familiarity with types of ST products; (2) venues and events that market ST products; (3) personal experiences with ST marketing; (4) perceptions and feelings about ST marketing; (5) knowledge about the health effects of ST; and (6) use of ST as a method of harm reduction.

National Cancer Institute: R21 CA129907, "Smokeless tobacco marketing approaches to Ohio Appalachian populations."

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POS4-14

PREDICTORS OF LONG-TERM QUITTING AMONG CHINESE SMOKERS FOLLOWING TREATMENT: THE ROLE OF PERSONALITY TRAITS

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Objectives: Research suggests some personality traits may be relevant to engagement in smoking but few studies examined the association between personality traits and smoking cessation. This study aims to determine whether personality traits correlate with cessation behaviours of smokers who had received cessation counselling in a Chinese population.

Methods: A cross-sectional telephone follow-up (average 7 years) survey was conducted from Feb to Aug 2008 with 1173 Chinese smokers who had attended the first smoking cessation clinic in Hong Kong from Aug 2000 to Jan 2002 and received stage-matched individualized cessation counseling. We used logistic regression analysis with backward elimination to identify factors associated with quitting. Factors studied included five personality traits (Neuroticism, Extraversion, Openness to Experience, Conscientiousness, Agreeableness) at the follow-up survey and seven factors at baseline: stage of readiness to quit, Fagerstrom score of nicotine dependency (FTND), intensity of counseling received, gender, age, marital status, and daily cigarette consumption.

Results: A total of 480 participants completed the survey (41%). More completers were male (83.8% vs. 76.0%; p=0.002) and fewer were married (33.5% vs. 47.5%; p<0.001). Completers were older at baseline (40.6 years vs. 37.3 years; p=0.001) and older when starting smoking (18.2 years vs. 17.6 years; p=0.02). Among the 480 completers, 207 (43%) reported no smoking in the past 30 days. Logistic regression showed that conscientiousness was positively (Odds Ratio (OR)=1.61, 95%CI=1.07-2.41) and openness to experience was negatively (OR=0.63, 95%CI=0.45-0.89) associated with quitting after controlling FTND and stage of readiness at baseline.

Conclusions: Our results showed conscientiousness was associated with a greater likelihood of quitting among the smokers. But extraversion was not associated with smoking cessation in our study which might be due to subjects who were dominant and self-confident were likely to be less responsive to a cessation intervention as they might think they have the power to control their own situation.

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POS4-15

IMPLEMENTATION OF IVR TECHNOLOGIES TO IMPROVE QUITLINE EFFICIENCIES

S. G. Seshadri, Ph.D.

Quitlines are effective at delivering cessation support to large numbers of smokers. Most smokers make a quit attempt, but many initially successful quitters relapse over time. Smoking treatment researchers and providers have increasingly recognized that smoking cessation is followed by a high rate of relapse, and that prevention of relapse is a key to reduce the overall rate of smoking. New York State Quitline has implemented automated callback procedure based on IVR (interactive voice response) to track shipments to more than 26,000 clients who were sent a 2 week starter pack of NRT at a daily rate of over 3000 attempts and over 13,000 clients responding to IVR session and many more returning calls to Quitline in response to voice mail. This technology is also to be adapted for relapse prevention among the large number of clients in NYSQL database. The response rates and cost of using IVR and telephone contacts are discussed. Response rates will also be analyzed to identify Caller Characteristics and demographics that are amenable to automated services. It is planned to optimize the calling patterns and to evaluate the effectiveness of IVR based calling to support smoking cessation in clients periodically as well as to provide automated counseling services as requested. In addition, the cost and resource usage of developing customized applications and their effectiveness will be discussed.

New York State Department of Health.

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POS4-16

PSYCHOLOGICAL, PEER, AND FAMILY RISK FACTORS FOR ADOLESCENT TOBACCO USE IN A CLINICAL SAMPLE

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Nearly 90% of adult smokers begin during adolescence, and nearly 2/3 become daily smokers by the time they reach age 19 (Sims, 2009; DHHS, 1994). Risk factors for adolescent tobacco use include psychological factors, such as depression; peer influences such as number of close friends who smoke; and family factors, including poor parental supervision and monitoring of behavior (Hawkins & Catalano, 1992; Tyas & Patton et al. 1998; Pederson,1998; Scal, Ireland, & Borawsky, 2003). This present study seeks to examine how demographic, psychological, peer and family factors explain adolescent tobacco use in a clinical sample of adolescents. It is hypothesized that (1) higher rates of depression and suicidal ideation at baseline will be associated with higher rates of tobacco use within the sample, and (2) after controlling for psychological variables, high rates of peer smoking and poor parental monitoring and family relationship quality will also be associated with adolescent tobacco use. Data was collected from 146 adolescents aged 12 to 15 (M = 13.50; SD = .72) recruited from a psychiatric inpatient facility in the US Northeast. Approximately 41% of the sample had a diagnosis of major depression at baseline. Participants completed self-report surveys at baseline, 9 and 18 months. A hierarchical logistic regression will be conducted to assess two dependent variables: lifetime smoking and past 30-day tobacco use at 18-month follow-up. Predictors will be entered into the model in 4 blocks. Block one will include demographic variables (i.e., age and gender). Block two will include mood variables including baseline level of depression and suicidal ideation (Children's Depression Inventory score, Kazdin, 1981; Suicide Ideation Questionnaire Score, Reynolds, 1988). Block three will include a measure peers tobacco use, (items taken from the Deviant Peer Group Affiliation measure, Dishion, 1991). Block four includes a measure of parental monitoring and parent-child relationship quality (scales takes from Parental Monitoring Questionnaire, Kerr & Stattin, 2000 and the Inventory of Parent and Peer Attachment, IPPA Armsden & Greenberg, 1987).

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POS4-17

SMOKING CUES AND ARGUMENT STRENGTH OF ANTI SMOKING PUBLIC SERVICE ANNOUNCEMENTS AFFECT FORMER SMOKERS' PERCEIVED MESSAGE EFFECTIVENESS AND THEIR SMOKING URGE, INTENTION, AND ATTITUDE TOWARD SMOKING BEHAVIORS

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The current study examined whether presence of smoking cues and argument strength (AS) of antismoking public service announcements (PSAs) affect former smokers' responses to PSAs and their efficacy and intention of refraining from smoking. Participants (n=94) were randomized to one of 4 conditions, manipulating the presence of smoking cues and the presentation order of message' AS level. They attended a single, laboratory-based session where demographic and smoking history preceded viewing two sets of six PSAs. Each set differed in terms of AS level as rated by a different group of former smokers. After viewing, participants completed measures of smoking urge and attitude, self-efficacy, and intention toward refraining from smoking. The perceived effectiveness and recognition about the PSAs were also obtained. The participant sample was on average 36 (SD=11.9) years old; 43 were male. They have been non-smokers for 6.9 (SD=7.98) years and were slightly nicotine dependent (FTND mean=3.61, SD=2.05). Results indicate that smoking urges are higher in low AS condition compared to high AS condition (F=3.77, p=.055). PSAs with high AS were perceived more effective compared to those with low AS (F=12.61, p < .01). Participants reported higher self efficacy and intent in refraining from smoking after exposure to PSAs with no smoking cues compared to those with smoking cues (P=3.11, p=.081 and F=4.52, p < .05). The interaction of AS and smoking cue on perceived effectiveness was significant such that as AS increases

perceived message effectiveness increases. However, PSAs low in AS and with no smoking cue have higher perceived effectiveness compared to those with smoking cue present ($F=5.65$, $p < .05$). That is, smoking cues undermine perceived effectiveness of PSAs whose AS is at low level. Results suggest that inclusion of smoking cues should be carefully weighed along with AS of PSAs by message designers. Smoking cues are frequently used visual feature in antismoking PSAs and their presence can influence former smokers' self-efficacy and intent to remain as ex-smokers and can undermine message effectiveness.

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POS4-18

ITC UNITED STATES SUPPLEMENTAL CIGARETTE PACK COLLECTION: ASSESSING CHANGES TO CIGARETTE DESCRIPTIVE TERMS PRIOR TO FDA REGULATIONS

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On June 22, 2009, the US FDA was granted the authority to regulate tobacco products through the Family Smoking Prevention and Tobacco Control Act. The intent is to reduce tobacco-related morbidity and mortality through product regulation such as eliminating misleading descriptive terms, placing restrictions on advertising, and regulating the characteristics of tobacco products. During a supplementary study among International Tobacco Control (ITC) Survey respondents residing in the US, changes in cigarette packaging were observed prior to the implementation of this legislation. Between November 2009 and January 2010, a supplementary data collection effort was conducted in the form of a telephone survey among smokers in the ITC Survey residing in the US. N=678 of the 912 (74%) eligible smokers participated. In addition, eligible smokers were invited to mail a pack of their cigarettes to us (n=320 packs received out of n=401 eligible smokers [80%]). The characteristics of these packs were examined in detail. Many (71%) of the smokers surveyed were unaware of FDA tobacco legislation. Changes to the descriptive terms printed on cigarette packs were observed in advance of the FDA ban on terms such as "light" and "mild." Of the 320 packs received, 46 (14%) used a color rather than a standard flavor descriptor to designate a particular variety. Despite this change, 56% of smokers who sent us a pack with a color descriptor printed on it still used terms such as "light" and "mild" when asked to name the variety of cigarettes that they were sending. In an additional observation, 24% of packs included a safety warning printed on the tear tape. As cigarette packaging continues to change in the US because of FDA regulations, it is important to continue active surveillance to track changes in descriptive terms, warnings, and packaging. Additionally, it is important to measure smokers' perceptions of tobacco product safety as an important step in monitoring the effectiveness of FDA legislation.

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POS4-20

AN ENVIRONMENTAL SCAN OF TOBACCO-FREE POLICIES OF YMCA AND YWCA LOCATIONS IN ONTARIO, CANADA

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Introduction: Sport and recreation organizations play a vital role in the health and wellness of communities. There is a movement across Canada to incorporate tobacco-free policies within different organizations involved with physical recreation. In many communities across Ontario, the local 'Y' is a centerpiece of physical activity. Tobacco-free policies are consistent with the YMCA and YWCA's health and well being focused mandate, however there was no inventory of which Y locations in Ontario had comprehensive tobacco-free policies. This study was undertaken to understand to what extent YMCA and YWCA locations in Ontario are enacting similar policies. The work was conducted to support the Tobacco-free Sports and Recreation (TFSR) Community of Practice (CoP).

Methods: A list of all Y locations in Ontario was created using the national YMCA and YWCA websites (n=104). Each location was contacted by telephone in August 2010, and asked to participate in a survey about their tobacco use policies. Only YMCA and YWCA locations with fitness and recreation facilities were included in the policy scan (n=64); staff at these facilities were asked ten questions about smoke-free spaces, set-back distances, signage, and smokeless tobacco restrictions.

Results: Surveys were completed by 63 of the locations. In Ontario, 71% (n=45) of the YMCA and YWCA locations reported their location had a 100% smoke-free premises policy, including outdoor spaces such as parking lots, basketball courts and soccer fields. Approximately 17% of locations (n=11) reported that their Y facility had a 100% tobacco-free policy including smokeless tobacco.

Tobacco Free Sports and Recreation Community of Practice.

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POS4-21

SMOKE-FREE OUTDOOR SPACES BYLAWS: LESSONS LEARNED FROM FOUR ONTARIO HEALTH UNIT DISTRICTS

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There is a global movement towards the provision of smoke-free outdoor spaces to protect the health of the population. With the assistance of local public health professionals, a small number of Ontario municipalities have amended their bylaws to declare specific outdoor spaces smoke-free. However, many health units have yet become fully engaged in this process. This study identifies trends and lessons learned from health units that have played a key role in developing and implementing smoke-free outdoor spaces bylaws. Health units identified by the 'Play Live Be Tobacco-free – Ontario Collaborative' policy scan were sorted into Statistics Canada's socio-demographic 'Peer Group' categories. Health units were ranked according to the number of municipalities with smoke-free outdoor spaces bylaws as well as the number of outdoor areas covered by the bylaws. A total of eight key informants from the four highest ranked health unit districts were recruited to participate in semi-structured interviews from May to September 2010. The interviews were structured according to John Kingdon's policy change theory. In order to bring the issue to the political agenda and garner support, health professionals 'framed' smoke-free outdoor spaces in multiple ways. Typical frames were protecting the health of children by preventing exposure to second-hand smoke, positive role-modeling for children to denormalize smoking and the environmental impact of cigarette litter. Key informants approached external stakeholders to assist with proposing smoke-free bylaws. Often, advisory committees or sub-committees of municipal council were contacted. Parks and Recreation departments were also commonly approached. In one instance, the transit authority took a leadership role and approached the health unit for assistance in developing a bylaw. The policy change process for developing and implementing smoke-free outdoor spaces bylaws is complex and can be pursued through numerous pathways. Public health professionals must be adept at working with limited resources, utilize professional and personal contacts, and take into account the current political climate.

This study was conducted while the first author was enrolled in the M.P.H. program at the University of Toronto, and supported by the Ontario Tobacco Research Unit and a CIHR Strategic Training Program in Public Health Policy fellowship.

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POS4-22

ADHD SYMPTOM DIMENSIONS AND TOBACCO WITHDRAWAL SYMPTOMS: ASSOCIATIONS IN A POPULATION-BASED SAMPLE OF AMERICAN ADULTS

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Extant research indicates that Attention Deficit/Hyperactivity Disorder (ADHD) may be associated with increased prevalence of tobacco withdrawal symptoms. However, prior studies on this topic have not distinguished ADHD symptom clusters—inattention (IN) and hyperactivity-impulsivity (HI)—which is important because they may evidence disparate relations to withdrawal. This study examined associations between lifetime number of total, IN, and HI ADHD symptoms and lifetime retrospective reports of DSM-IV tobacco withdrawal symptoms (depression, sleep difficulties, poor concentration, increased eating, irritation, anxiety, slower heartbeat, restlessness) in a population-based sample of American adult lifetime ever smokers (N = 15,215). Separate logistic regression models were tested, each after adjusting for demographics, comorbid psychiatric and substance use disorders, and smoking characteristics. Results indicated that the total number of ADHD symptoms was related to presence of each withdrawal symptom (ORs >/= 1.03, ps < .001). Number of IN symptoms univarately associated with each withdrawal symptom (ORs >/= 1.05, ps < .001). Similarly, HI showed positive univariate relations with each withdrawal symptom (ORs >/= 1.03, ps < .01), with the exception

of withdrawal-related depressed mood (p > .05). When IN and HI were entered simultaneously in multiple predictor adjusted models, all HI-withdrawal symptom relations were reduced below significance, whereas IN remained uniquely associated with each withdrawal symptom (ORs >/= 1.06, ps < .01), excluding sleep difficulties and increased eating. These findings suggest that number of ADHD symptoms may be associated with greater likelihood of experiencing tobacco withdrawal symptoms in the US population of adults. IN symptoms may have a unique relation with certain withdrawal symptoms. If replicated and extended in prospective and experimental studies, these findings may be relevant for understanding mechanisms of ADHD-smoking comorbidity and developing treatments for smokers with ADHD.

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POS4-23

A FEASIBILITY STUDY OF SECOND HAND SMOKE IN MUMBAI RESTAURANTS 20 MONTHS AFTER ANTI-SMOKING LEGISLATION IN INDIA

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Objectives: We performed a study to monitor indoor second-hand smoke (SHS) exposure in Mumbai, India following the Government of India's recent legislature banning smoking in all public places. Using a diverse group of restaurants, we assessed indoor PM2.5 levels as indicators of the ban enforcement according to restaurant type, socioeconomic status, and education status of patrons. We aimed to gauge the feasibility of using PM2.5 monitoring and passive air nicotine methods in obtaining accurate readings in an urban Indian center.

Methods: Twenty restaurants within Mumbai were selected by convenience sampling. The sample included many different types of restaurants, covering a broad range of socioeconomic class patronage. The owner or manager on duty completed an interviewer-administered questionnaire describing basic characteristics of the restaurant and the estimated education level of patrons. PM2.5 monitoring was performed for 30 minutes inside each location in addition to a total of ten minutes outside for the purpose of ascertaining the baseline air quality. PM2.5 data are presented as the difference between indoor and outdoor readings.

Results: In this study, 62.5% of restaurant owners approached agreed to participate. We found that the median indoor PM 2.5 level was [median (high, low)] 0.012 (-0.04, 1.43) mg/m3. Seven out of the 20 restaurants had PM 2.5 readings that were below the corresponding outdoor measurement, pointing to the high level of environmental PM2.5 present in Mumbai.

Conclusion: This study suggests that presently the enforcement of the smoking ban is inadequate. Further research is needed to identify the locations that present the greatest risk for SHS exposure in Mumbai and in other regions in India. This study demonstrates that while it is feasible to perform the PM2.5 monitoring in an urban Indian center like Mumbai, the environmental PM2.5 pollution presents difficulty for interpreting the results. Using this methodology, we are not able to discern PM2.5 elevations as being nicotine-specific or environmentally derived, which is a complication for monitoring in high density, high pollution settings.

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POS4-24

CHANGING METHODOLOGIES: INITIAL IMPACTS OF THE FDA REGULATION ON EXISTING RESEARCH STUDIES

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The enactment of the FSPTCA, giving the FDA the authority to regulate tobacco products, has already significantly changed the ways in which tobacco products can be marketed. Section 911 of the act bans product labels such as light and mild because they imply risk reduction. Historically, these labels have been used to describe FTC machine smoking results of tar. As a result of the ban, studies examining different tar level products as the basis for their design and methods must accommodate this new lack of cigarette labels. An ongoing clinical study examines differences in smoke exposure and smoking behavior between cigarette smokers of different tar levels. Cigarette pack labels were used to classify smokers into one of the three groups (Full Flavor, Light and Ultralight); however, given these restrictions on labeling, a new approach to standardize a methodology that would allow for the continuation of data collection and the reclassification of the existing participant cases was required. First, the usual cigarette brand, type and UPC code for each participant was located in the 2005 FTC TNCO guide to determine tar level. If no FTC data was available, tar levels were obtained from the following sources in preferential order: CDC cigarette testing of tar levels, tobacco companies published tar levels, internet literature searches. If no tar level was found, the case was not reclassified (n = 1). Finally, tar level cut points for the three groups (FF = >15mg; L = 15mg or <; UL = 6mg or <; FTC, 2007) were used as a benchmark to reclassify completes. Results indicate that of the 250 completes, 37% of cases were reclassified into groups other than those dictated by the pack labels. These findings were consistent with an analysis of the FTC 2005 data, comparing cigarette labels to their associated tar levels. Of the 1306 cigarettes with reported tar, 31% fell outside their labeled group. Given these findings, the ban to eliminate marketing terms such as light and ultralight was an important move in tobacco control by FDA and may make it easier to examine the role of tar in future exposure studies.

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POS4-25

DIFFERENCES IN DRINKING PATTERNS AMONG FIREFIGHTERS WHO REPORT CIGARETTE SMOKING DURING THEIR FIRST YEAR OF FIRE SERVICE

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INTRODUCTION: Previous research links job-related distress among rescue workers and the development of risky drinking behaviors (McFarlane, 1998). Firefighters, in particular, have been shown to use drinking as a means of coping with job stressors (Bacharach et al., 2008). For approximately 20% of firefighters, a traumatic exposure leads to PTSD, a condition with high rates of comorbid substance use disorders (Corneil et al., 1999). Despite these drinking patterns as well as the well-established high rates of comorbidity between drinking and cigarette smoking (Jensen et al., 2003), no published research has examined the effect of comorbid smoking and drinking among this high-risk group. The goal of this study was to assess for potential differences in drinking patterns among firefighters who report daily smoking, and to examine whether smoking status would predict higher levels of problematic drinking.

METHODS: Participants were 60 firefighters selected from a sample of 162 (n = 28 cigarette smokers; n = 32 randomly selected non-smoking comparison group) from five cities across the United States who were asked to provide continuous drinking data during their first year of fire service. Smoking data included the FTND and drinking data was collected via the Timeline Follow-Back calendar and the Drinking Motives Questionnaire.

RESULTS: To investigate potential drinking differences between smokers and nonsmokers, four ANOVAs were conducted. Smokers endorsed a significantly greater number of drinking episodes [F (1, 59) = 6.00, p<.05] and heavy drinking episodes [F (1, 59) = 5.93, p<.05] across the one year period. Additionally, firefighters in the smoking group reported greater drinking motives related to positive reinforcement [F (1, 59) = 4.44, p<.05] and social enhancement [F (1, 59) = 4.77, p<.05]. Taken together, these findings suggest that when compared to their non-smoking peers, firefighters who smoke have higher drinking frequencies and different drinking motives. A better understanding of these differences could lead to improved smoking and alcohol cessation interventions.

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POS4-26

SMOKING TRANSITIONS: ILLICIT DRUG USE PREDICTS NICOTINE DEPENDENCE BUT NOT CESSATION IN A DESIGN THAT CONTROLS FOR FAMILIAL RISKS

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Background: Drug dependence has been associated with smoking and nicotine dependence (ND). Little is known about drug use and transitions to ND and to cessation. We examined whether a variety of specific illicit drug use contributed to

smoking transitions from regular smoking to ND and from ND to quitting smoking before and after controlling for familial vulnerability.

Methods: Data come from 1,919 biological offspring (age 12-32 years), 1,107 twin fathers, and 1,023 mothers. Cox proportional hazard survival models were computed separately for each illicit drug to test if the drug use contributed to risk for smoking transitions while controlling for offspring age, paternal ND and maternal ND. Age onset of each drug use was defined and the drug variables were treated as time dependent variables in the survival models.

Results: Marijuana (HR=2.38), cocaine (HR=1.55), stimulants (HR=1.77), opiate (HR=1.35) and phencyclidine (HR=2.43) use significantly predicted transition from regular smoking to ND while hallucinogens, sedatives, solvents and inhalants were not significant. No drug was significantly associated with transition from ND to quitting smoking.

Conclusions: Illicit drug use is an important predictor of transitions from regular smoking to ND even after controlling for familial risk but is not associated with the transition to quitting smoking.

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POS4-27

IMPACT OF WEIGHT AND EMOTIONAL CONCERNS ON QUIT OUTCOMES AMONG QUITLINE USERS

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Weight gain concern may hinder tobacco quit outcomes. We examined weight concerns (WC) when quitting among a sample of 4,670 Maine Tobacco Helpline users registered between 1/1/09-6/1/09. Of 1,335 randomly selected, 738 (55.3%) completed a 7-month follow-up (FU) survey. Three models were assessed: (1) WC vs. no WC, (2) WC-counseled vs. not, among those with WC, and (3) those with 30-day continuous abstinence vs. not abstinent at FU. Models controlled for age, education, health insurance, medication use, time to first cigarette after waking, and cigarettes/day (CPD) at registration. Model 3 also controlled for counseling duration, number of quit attempts, and the interactive effect of emotional concerns/stress (EC) on the association between WC and abstinence. We used a nine-category variable to estimate the interaction. The sample was first grouped by (1) no EC, (2) EC & not EC-counseled, and (3) EC & EC-counseled. Each group was further divided by (a) no WC, (b) WC, no WC-counseling, and (c) WC & WC-counseled. Subgroup 1a (no-EC & no-WC) was the referent category. Participants with weight concerns (n=365, 49.6%) were more likely to be female (OR=2.48, 95% CI: 1.78-3.44), use a combination of cessation medication (OR=1.86 vs. no medication; 1.01-3.43), and have EC (OR=1.40; 1.01-1.94). Among weight concerned, those provided WC-counseling received more total counseling, were older, more educated, had commercial insurance, and had EC. Those abstinent at FU (n=109, 29.9%) used fewer CPD, had more total counseling time, and used NRT exclusively. Relative to having no EC and no WC, WC-only participants were 2.23 (1.07-4.68) times more likely to be quit with WC-counseling and 1.76 (1.04-2.96) without WC-counseling. In contrast, EC-only participants without EC-counseling were 3 times less likely (0.33, 0.14-0.75) to be abstinent than those with no EC and no WC. The remaining EC/WC/specific-counseling groups had quit rates similar to those with no EC and no WC. In the absence of emotional concerns, results suggest those with WC benefit from weight-specific counseling. But when EC is present, counseling about handling emotions appears more important for improving quit outcomes.

Partnership for A Tobacco-Free Maine, Maine CDC, Department of Health and Human Services, Maine Medical Center Research Institute, Tufts University School of Medicine – Department of Public Health and Family Medicine.

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POS4-28

PSYCHOLOGICAL FUNCTIONING AMONG LOW-INCOME PREGNANT SMOKERS

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BACKGROUND: While several studies have reported significant levels of comorbidity of smoking and depression or stress among pregnant smokers, fewer have examined other aspects of psychological functioning such as maternal anger, hostility, and aggression. This study examined differences in maternal psychiatric symptoms and stress between pregnant smokers and non-smokers during pregnancy and at 2 months postpartum. We also examined if potential changes in psychological functioning from pregnancy to the postnatal period varied as a function of maternal smoking status.

METHODS: Pregnant women presenting for prenatal care were interviewed during pregnancy about their daily smoking and other substance use patterns. Saliva samples were collected at each time point. Women with illicit substance use other than marijuana were excluded from the study. The sample consisted of 149 pregnant smokers and 67 non-smokers from mostly low-income, minority backgrounds. Maternal reports of psychological functioning were obtained during pregnancy and at 2 months postpartum. Repeated measures ANOVAs were used to examine group differences and group by time interactions.

RESULTS: Pregnant and post-partum smokers had higher levels of physical and verbal aggression, anger, and hostility during pregnancy and at 2 months postpartum. Pregnant smokers had higher levels of perceived stress during pregnancy, but not postpartum, and higher levels of depression in the postpartum period, but not during pregnancy. There were no group by time interactions, although there were main effects of time on all variables, with women reporting declines in psychiatric symptoms and stress from pregnancy to the postpartum period.

CONCLUSIONS: Comorbid psychiatric symptoms other than depression may be a significant barrier to treatment among low-income pregnant smokers. While recently developed treatments for low-income pregnant smokers have focused on comorbidity between smoking and depression, other aspects such as stress and anger/hostility variables have been largely ignored in the treatment literature.

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POS4-29

COMPARING THE EFFECTIVENESS OF FACE-TO-FACE VERSUS TELEPHONE CESSATION COUNSELING IN HELPING FEMALE SMOKERS TO QUIT IN HONG KONG

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Background: While the smoking prevalence of male reached the peak, that of female remained 4% for decades in Hong Kong. Previous studies had shown that female smokers perceived higher difficulty and lower confidence in quitting smoking and achieved lower quit rate than male smokers. Objectives: To compare the effectiveness between face-to-face and telephone counseling in assisting female smokers to quit.

Methods: In November 2006, HKU launched a smoking cessation hotline recruiting female smokers. Experienced nurse counselors delivered a stage-matched smoking cessation counseling via either face-to-face or telephone interview according to participant's preference. Except simple body check in face-to-face group, all participants were asked about history on smoking, given advice on quitting and delegated individualized quit plans. Counselors contacted participants in 1-week and 1-month to reinforce quitting behaviors. Participant's smoking status was assessed at 3- and 6-month telephone follow-up.

Results: Up to Jan 2010, we recruited 357 female smokers and 180 (50.4%) chose to receive counseling via face-to-face format. The participants in two counseling groups were similar, except those in face-to-face group were older (36.3 ± 10.0 vs. 33.6 ± 9.7, $p<0.001$), attained higher education (territory or above: 21.1% vs. 10.2%, $p<0.001$) and were in higher stage of readiness to quit (action stage: 21.1% vs. 11.3%, $p<0.001$). At 6-month, we achieved a follow-up rate of 83.5% (face-to-face: 83.3% vs. telephone: 83.6%). By intention-to-treat, 7-day point prevalence quit rate in face-to-face group (33.3%) was significantly higher than telephone (20.3%, $p<0.01$).

Conclusions: The flexibility of our counseling attracted a large number of female smokers. Face-to-face counseling achieved higher quit rate than telephone and also local smoking cessation clinic (21.9%). Participants in face-to-face group were more motivated and actively engaged in quitting may be the reasons for the good result. Tobacco industry recognizes women as their new target. It's about time for policy

maker to plan for gender-specific cessation service and our experience provides considerable evidences.

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POS4-30

CIGARETTE SMOKING AND OUTCOMES AFTER ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANT

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BACKGROUND: There are limited data on the effect of cigarette smoking on treatment outcomes in the allogeneic hematopoietic stem cell transplant (HSCT) population. Abnormal lung function is a known risk factor for respiratory failure and other morbidity and mortality, although the specific causes of these abnormalities have not been well explored.

METHODS: We conducted a retrospective observational cohort study of 845 consecutive patients aged > 18 years who underwent allogeneic HSCT at the Seattle Cancer Care Alliance/Fred Hutchinson Cancer Research Center. Smoking exposure was defined by quit time, smoking status (never, former, and current) and log2-transformed pack-years. The main outcomes were time to respiratory failure within 100 days of transplant, relapse, and non-relapse mortality.

RESULTS: In multivariate analyses, a two-fold increase in pack-years smoked was associated with an increased risk of early respiratory failure (HR 1.33, 95% CI 1.09 to 1.64, p = 0.006). This association was observed independent of pre-transplant lung function. While a two-fold increase in pack-years smoked was also associated with an increased risk of relapse within 100 days of transplant (HR 1.27, 95% CI 1.01 to 1.59, p = 0.04), this finding did not hold with overall relapse (HR 1.16, 95% CI 0.92 to 1.46, p = 0.21). An association was not observed between cigarette smoking and non-relapse mortality.

CONCLUSIONS: Cigarette smoking is associated with an increased risk of respiratory failure and disease relapse within 100 days of allogeneic HSCT. The association with respiratory failure is mediated in part by abnormal lung function prior to transplant and likely through other mechanisms as well. Given the adverse effects associated with cigarette smoking prior to transplant, future studies should focus on obtaining accurate smoking histories, tracking prospective changes in smoking status, and assessing the impact of tobacco cessation on outcomes in this population.

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POS4-31

THE EFFECT OF RIO DE JANEIRO´S SMOKE-FREE LEGISLATION ON CARBON MONOXIDE CONCENTRATION IN HOSPITALITY VENUES

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Background: Several recent studies have clearly shown that no level of exposure to secondhand smoke (SHS) is safe, and a close link exists between SHS and the risk of coronary heart disease and stroke. Carbon monoxide (CO) is one of the most important components present in SHS.

Objective: To evaluate the impact of the smoking ban law in Rio de Janeiro city, Brazil, on the CO concentration in restaurants, bars, nightclubs, and similar venues.

Methods: In the present study we measured the CO concentration in 146 hospitality venues by using portable CO monitors to measure CO concentration in different environments (indoor, outdoors areas). These measurements were performed twice, before and 12 weeks after the law was implemented. We verified the quality of the air in the city during the same period of our study through the air quality databank from the Environmental Agency of Rio de Janeiro (INEA).

Results: The CO concentration pre- and post-ban in hospitality venues was indoor area 2.60 (1.77) vs. 1.12 (1.01) ppm (p<0.0001); outdoor area 2.61(1.27) vs. 1.14(1.09) ppm (p<0.0001). The average CO concentration measured by INEA in 2 automatic stations in the city was lower than 1 ppm during both the pre- and post-ban periods.

Conclusion: Rio de Janeiro´s smoke-free legislation significantly reduced the CO concentration in hospitality venues. The quality of the air in the city during the study did not influence the results.

No funding.

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POS4-32

MACHINE SMOKING REGIMES AS INDICATORS OF HUMAN EXPOSURE TO SMOKE TOXICANTS

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Historically cigarette emissions have been measured using smoking machines operating under ISO/FTC parameters, a regime which underestimates puff volumes and frequencies for most smokers. Other regimes have been developed to represent more “intensive” smoking patterns, or mimic differences in human smoking across different cigarettes. Recent studies examining smokers’ exposure to nicotine have provided mixed conclusions as to whether any smoking regime can predict human exposure. There is also limited data available examining the effectiveness of machine smoke yields as predictors of exposure to smoke toxicants. We have therefore undertaken a study to compare a range of toxicant yields, obtained under different machine smoking regimes, with biomarkers of exposure (BoE) in smokers. The study was undertaken in Germany, involving occasional clinical confinement of two groups of 6mg ISO tar cigarette smokers, three groups of 1mg ISO tar cigarette smokers, and one non-smoker group; each group contained fifty subjects. BoE for nicotine, CO, four TSNAs, acrolein, crotonaldehyde, three PAHs, 1,3- butadiene, and three aromatic amines were measured for each of the subjects. Cigarettes were machine smoked to determine the yields of nicotine and smoke toxicants under ISO, HCI, ISO/TC126 WG9 Option B (WG9B) regimes, and the HCI regime without ventilation blocking; ratios of toxicants to nicotine were also calculated. Stronger correlations were obtained between BoE levels and machine yields than between BoE levels and ratios of yields to nicotine. For the involatile aromatic amines, pyrene and TSNAs very good correlations were obtained with both HCI and WG9B yields, although WG9B yields gave stronger correlations with the TSNA BoE. With the volatile smoke constituents the WG9 smoke data gave very strong correlations with the BoE. These data show that the exposure of 1 and 6 mg product smokers to toxicants were well predicted by machine smoking data obtained under the WG 9B regime. Smoke data obtained under other regimes was less able to predict exposure to a range of volatile and involatile toxicants.

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POS4-34

CORRELATES OF CIGARETTE ACCESS BEHAVIOURS AMONG CANADIAN YOUTH SMOKERS: FINDINGS FROM THE 2006-2007 CANADIAN YOUTH SMOKING SURVEY

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Background: Point-of-sale restrictions aim to prevent youth from acquiring cigarettes; however, often these restrictions do not work as youth still access cigarettes from both tobacco retailers and social sources, such as family members, friends or strangers.

Purpose: The purpose of this study was to explore the between-school variability in cigarette access behaviour and the characteristics associated with whether youth smokers access cigarettes from social sources or if they purchase directly from retailers.

Methods: Nationally representative data collected from 41,886 Grade 9 to 12 students attending 143 secondary schools who participated in the 2006-07 Canadian Youth Smoking Survey (YSS) were examined for descriptive analyses. Multi-level logistic regression models were used to determine between-school variation in youth cigarette access and to examine student-level characteristics associated with the odds of a student reporting that they usually buy their own cigarettes versus usually getting their cigarettes from a social source.

Results: Daily smokers are more likely to buy their own cigarettes from a store compared to occasional smokers (chi square=390.5, degrees of freedom=2, p<.0001).

School-level differences accounted for 29.4% of the variability in the odds of a student reporting that they usually buy their own cigarettes from a store versus usually getting their cigarettes from a social source. Males were more likely than females to buy their own cigarettes (OR=2.15). Youth who have ever binge drank were more likely to buy their own cigarettes compared to youth who have never binge drank (OR=3.42). Youth who were asked for age when purchasing cigarettes were more likely to buy their own cigarettes compared to youth were not asked for age (OR=1.55), and youth who were asked for ID when buying cigarettes more likely to buy their own cigarettes compared to youth who were not asked for ID (OR=1.27).

Conclusion: Future studies should continue exploring factors that impact youth cigarette access within the school environment to inform the development of new school-level tobacco control initiatives aimed at impeding youth from obtaining cigarettes.

The Propel Centre for Population Health Impact provided support for this project. Mary Vu received funding from the Ontario Tobacco Research Unit (OTRU) through an Ashley Studentship for Research in Tobacco Control and the Canadian Institutes of Health Research (CIHR) Training Grant in Population Intervention for Chronic Disease Prevention: A Pan-Canadian Program.

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POS4-35

UTILIZING EMAIL TO RE-ENGAGE SMOKERS IN THE QUITTING PROCESS

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As smoking is a chronic addiction, The New York State Smokers' Quitline (Quitline) employs various communication methods including e-mail, Interactive Voice Response (IVR) and phone calls to reengage smokers in the quitting process and to support the client in making an additional quit attempt. E-mail is a common and cost effective method to reach and to communicate with clients who provide a valid e-mail address. E-mail campaign objectives include clients opening the message and clicking back to obtain Quitline services including coaching, free nicotine replacement therapy, and the Quitline's online quit plan and online smoke-free community. The Quitline has developed e-mail campaigns using various messaging and images in blast sizes ranging from 47,000 to over 70,000 individual e-mails. E-mail campaign messages have been developed to complement topical events that may support making a quit attempt, for example, New Years Day resolutions, Father's Day, Mothers Day and Valentines Day, as well as current tobacco cessation media campaigns. E-mail is also been used to bring attention to policy changes like tax increases in order to offer a smokefree alternative. Email messages have also been created with emotive gain and loss-frame messaging, graphic messaging, and basic service messaging. Campaign success ranges from 1%-6% click-through based on total blast sizes, dates, images and events. As part of this presentation we will present data on the characteristics of responders and non-responders as well as the quantity of responders based on messaging, events, and e-mail format.

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POS4-36

SOCIAL NETWORK INFLUENCES ON SMOKING DURING PREGNANCY

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BACKGROUND: Maternal cigarette smoking during pregnancy is a significant public health issue that has profound effects on maternal and fetal health. Although many women stop smoking upon pregnancy recognition, a large number continue to smoke. This is especially true among younger, low-income women. In community samples of adults, there is increasing evidence that social network factors (such as a partner's smoking or other network members' smoking) are associated with an increased likelihood of smoking. The objective of this work was to examine social network predictors of smoking in the first trimester, controlling for women's own smoking prior to conception.

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 (ETS) including partner, peer, and family smoking. Saliva samples were collected at each time point. A GLM model was estimated to examine the relation between ETS and the risk for smoking during the first trimester.

RESULTS: After controlling for the average number of cigarettes smoked in the 3 months before conception, women whose partners smoked were at increased risk for smoking during the first trimester. This finding persisted even after considering other smokers in the house. A greater number of smokers in the peer network was also associated with an increased risk for smoking in the first trimester. In terms of exposure to smoking, women who reported being in a room with a smoker or outside with a smoker in the past 7 days were also more likely to smoke during the first trimester.

CONCLUSIONS: Environmental tobacco exposure during pregnancy consists of influences from a variety of sources including intimate partners and peers and these social network influences impart considerable risk of smoking among women in their first trimester. These findings highlight the importance of targeting sources of ETS exposure during pregnancy as well as women's own smoking in treatment plans.

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POS4-37

ASSOCIATION OF THE CHRNA5-A3-B4 GENE CLUSTER WITH HEAVINESS OF SMOKING: A META-ANALYSIS

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Variation in the 15q24 nicotinic receptor cluster CHRNA5-A3-B4 has recently shown promise as a candidate region for smoking behaviour. Polymorphisms in this cluster have been linked to multiple smoking-related phenotypes (e.g., nicotine dependence) and smoking related diseases (e.g., lung cancer). Two SNPs, rs16969968 in CHRNA5 and rs1051730 in CHRNA3, have generated particular interest. We sought to evaluate the strength of evidence for the association between the rs16969968 (k = 44 samples) and rs1051730 (k = 27 samples) SNPs and heaviness of smoking, as measured by daily cigarette consumption, including k = 15 samples which reported data on both SNPs. We used meta-analytic techniques to evaluate existing published data, and contacted study authors where necessary for additional data. We tested both dominant and recessive models of genetic action, and explored which SNP provided a stronger genetic signal. In addition, we also sought to investigate study-level characteristics (i.e., ancestry, disease state) to establish whether the strength of association differed across populations. We also tested for publication bias and explored the impact of year of publication. Meta-analysis indicated compelling evidence of association between the rs1051730/rs16966968 variants and daily cigarette consumption under both recessive (d = -0.15, 95% CI -0.17, -0.12, p < 0.0001) and dominant (d = -0.10, 95% CI -0.12, -0.08, p < 0.0001) models of genetic action, equivalent to a genotype effect of 1-2 cigarettes per day. These effects appear to act recessively, and rs1051730 may provide a stronger signal than rs16966968 (pdiff = 0.025). A stronger genetic signal was also noted in the non-European ancestral group compared to the European group in stratified analyses (pdiff = 0.025). Strong evidence for an association between rs16969968/rs1051730 variants and daily cigarette consumption were however observed irrespective of stratification by study level characteristics. Whilst the functional relevance of rs1051730 in CHRNA3 is unknown, it is possible that this is a strong tagging SNP for functional haplotypes in this region. Further research is called for to identify these.

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POS4-39

USE OF QUIT SMOKING MEDICATIONS BY PATIENTS WITH MEDICAL CONTRAINDICATIONS AND DRUG-DRUG INTERACTIONS

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Objective: Quit-smoking medication double quit rates. However, medications can interact with other drugs or be contraindicated by preexisting conditions. We identified drug interactions and medication interactions of participants in an ongoing RCT on telemedicine for smoking cessation. All participants receive screening for medication eligibility and guidance in selecting medications, which they obtain through their own means or through a pharmaceutical assistance program.

Methods: We describe medical eligibility and pharmacotherapy usage among participants to date (158). At study baseline, all participants' medical conditions and medication use were collected and sent to a pharmacist. The pharmacist generated a report on drug-drug interactions, contraindications, and cautions which study counselors used to guide a discussion on quit-smoking medication preferences with participants. Data on cautions, contraindications, and participant preferences were sent to patients' primary

care physicians, who made the final medication decision and wrote scripts for patients where necessary. To describe procedures, we extracted baseline and 3-month follow-up data from study records.

Results: Most participants (67%) had at least one caution and/or contraindication for Bupropion, 54% for Varenicline, and 37% for NRT. Contraindications were most often caused by preexisting medical conditions. Medical conditions were the most common cause of cautions for Varenicline (97%) and NRT (50%). Cautions for Bupropion were evenly split between drug-drug interaction and medical condition. The majority of participants cautioned or contraindicated for a quit smoking medication chose to not use that medication, opting for another medication or no medication at all.

Conclusion: By knowing patients' medical conditions and drug-drug interactions, counselors are better equipped to guide patients in the selection of quit smoking medications. Physicians are also better able to evaluate the appropriateness of medications for patients. In addition, by providing this information, we look to increase medication use and consequently in quitting rates.

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POS4-40

CHANGES IN CUE RESPONSE AMONG NICOTINE DEPENDENT COLLEGE STUDENTS WHO REPORT FREQUENT BINGE DRINKING

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INTRODUCTION: Estimates suggest that approximately 90% of individuals who engage in problematic alcohol use also regularly smoke cigarettes (Jensen et al., 2003). Among heavy episodic drinkers, quantity of alcohol use has been linked with an increased quantity of cigarette use (Batel et al., 1995) as well as an increased likelihood of remaining a smoker (Murray et al., 1995). For adults and adolescents alike, comorbid alcohol use stands as a well-established risk factor for relapse during a smoking cessation attempt (Humfleet et al., 1999; Jaszyne-Gasier et al., 2007). Reasons for this may include both environmental influence factors (Cooney et al., 2003) and cross-substance cue reactivity (Cooney et al., 2007). Despite this previous research, little is known about the potential impact of binge drinking on smoking relapse among nicotine dependent college students. Thus, the goal of this study was to examine the influence of binge drinking on cue response during a 24-hour period of smoking abstinence.

METHODS: Participants (N = 34) were college students who reported smoking 16 or more cigarettes per day for at least the past 6 months. Variations in cue response to environmental alcohol and smoking images were assessed among smokers who characterized themselves as frequent binge drinkers (n = 19) or non-binge drinkers (n = 15). Tobacco withdrawal data was collected using the Tobacco Withdrawal Symptoms Checklist and changes in cigarette craving were collected with the Questionnaire of Smoking Urges.

RESULTS: A repeated measures ANOVA yielded a significant group by withdrawal interaction [$F(1, 32) = 4.55$, $p < .05$], along with a significant group by urges interaction [$F(1, 32) = 4.35$, $p < .05$]. These findings reveal the detrimental additive effect of binge drinking among college-aged smokers. When compared to their non-binge drinking peers, smokers who regularly binge drink experience disproportionate levels of tobacco withdrawal and cigarette craving during a period of smoking abstinence when they are confronted with both alcohol and smoking-related cues. A better understanding of these differences may lead to improved cessation rates among this population.

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POS4-41

THE SUBTLE MARKETING OF NICOTINE CONTENT IN SMOKELESS TOBACCO

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Introduction: One marketing strategy for smokeless tobacco, referred to as the "graduation process," was designed to attract new users to low nicotine brands, subsequently leading to their preference for higher nicotine brands. Marketers conveyed this message in the 1970s and 1980s with little equivocation, an approach unlikely in this era of anti-tobacco legislation. The objective of this study was to test the hypothesis that nicotine content continues to be marketed to varying levels of tobacco users, although with more subtlety than in the past.

Methods: A comprehensive search of over 350 consumer magazines, via a proprietary database compiled by TNS Media Intelligence, yielded 862 advertisements (90 distinct) of moist snuff published from January 2005 through December 2009. The 90 distinct advertisements were then evaluated in a content analysis to determine the intended audience, novice or experienced users of moist snuff.

Results: Highly significant associations were observed between the intended audience and nicotine content, tobacco leaf cut and brand of the advertised tobacco. Products with the lowest (0-1.9 mg/g) and highest (≥5 mg/g) concentrations of unionized nicotine were marketed to the novice and experienced users, respectively. However, magazines with a high youth readership were unexpectedly more likely to publish advertisements intended for experienced users.

Conclusions: The continued use of nicotine content as a marketing tool highlights the importance of educating youths about the seductive dangers of tobacco advertising.

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POS4-42

CHILDHOOD TRAUMA PREDICTS A TELESCOPED COURSE OF NICOTINE DEPENDENCE IN ALCOHOL DEPENDENT WOMEN, BUT NOT IN MEN

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Background: A more rapid progression from smoking initiation to the development of nicotine dependence ("telescoping") has been associated with a greater difficulty quitting smoking. We have reported that childhood adversity is associated with an increased risk of nicotine dependence (ND) in alcohol dependent (AD) adults, but the relationship between early life stress and the progression from smoking initiation to ND is unknown in this population. Thus, we examined the relationship between exposure to childhood trauma and the speed of progression to ND. Because prior research has shown gender differences in the relationship between childhood trauma and development of substance use disorders, we conducted separate analyses for men and women.

Method: Participants were 86 smokers (n=41 men; 48%) who met lifetime criteria for ND and were in early or sustained full remission from alcohol dependence and illicit drug use disorders. Current, independent mood, anxiety, or psychotic disorders were exclusionary. The Childhood Trauma Questionnaire-Short Form (CTQ-SF) was administered to assess severity of childhood trauma. Tobacco history (i.e., age of first tobacco use and age-at-onset of ND) was obtained from the Semi-Structured Assessment for the Genetics of Alcoholism-II (SSAGA-II).

Results: AD men and women were similar on the average number of years between their first cigarette and onset of ND. Greater overall severity of childhood trauma (i.e., CTQ-SF total scores) predicted a faster progression from first tobacco use to ND in women ($p=.02$), but not in men ($p=.78$). When each of the five CTQ-SF subscales were examined separately as predictors of ND progression, only the emotional neglect subscale predicted a more rapid progression in women ($p=.04$).

Conclusions: These results demonstrate a relationship between childhood trauma and speed of progression to nicotine dependence in AD women but not in men, extending previous findings of gender differences in the relationship between early life stress and development of substance use disorders.

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POS4-43

CARBON MONOXIDE EXPOSURE ASSOCIATED WITH WATERPIPE TOBACCO SMOKING: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Waterpipe tobacco smoking is a prevalent alternative tobacco use method that many believe to be less harmful than cigarette smoking. The empirical evidence available contradicts this belief and indicates that waterpipe use may produce heightened exposure to some toxicants like carbon monoxide (CO). CO exposure has been linked to health risks including cardiovascular disease-associated hospitalizations and adverse pregnancy outcomes. This systematic review and meta-analysis identified all waterpipe tobacco smoking studies that incorporated the measurement of CO measured in expired air CO (parts per million [ppm]) and/or carboxyhemoglobin (COHb %) in blood to summarize the CO exposure associated with waterpipe tobacco smoking. Eligible

studies for meta-analysis were clinical examinations that measured expired air CO or COHb in response to one waterpipe tobacco smoking episode using a pre-post design among regular (≥1 waterpipe tobacco smoking episode per month) smokers. Eight studies (combined N=378) were eligible for the expired air CO meta-analysis and two (combined N=90) for the COHb meta-analysis. Random-effects modeling resulted in a mean (SD) increase for expired air CO of 31.5 (4.5) ppm and for COHb of 3.7 (0.3) %. Due to inconsistent reporting and the few studies available, moderator analyses were limited in both meta-analyses. The magnitude of CO increase observed for one episode of waterpipe tobacco smoking greatly exceeded that of a single cigarette (approximately 6-10 ppm). Together with numerous case reports of CO poisoning associated with waterpipe tobacco smoking, these data suggest a potential for CO toxicity as well as adverse CO-related health effects among waterpipe users. These results, although restricted, provide the most comprehensive report to date concerning CO exposure associated with waterpipe tobacco smoking and should be used to inform public health administrators, physicians, and the general population.

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POS4-44

TOBACCO SMOKE EXPOSURE AND BLOOD LEVELS OF CADMIUM, LEAD, AND MERCURY IN THE U.S. YOUTH AND ADULT POPULATION

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Cigarette smoke and secondhand smoke (SHS) contain thousands of chemicals including metals that are potentially toxic and carcinogenic. In 2009, we reported levels of 12 urine metals in a nationally representative sample of tobacco smoke-exposed and not exposed National Health and Nutrition Examination Survey (NHANES) participants. We determined that smokers had higher urine levels of cadmium, lead, and some other metals than nonsmokers. Children had the highest lead levels and SHS-exposed adult nonsmokers' lead levels equaled smokers. To further characterize uptake of heavy metals we examined 5 waves of NHANES data (1999-2008) for relationships between tobacco smoke exposure and blood levels of cadmium, lead, and mercury. Male and female participants include 5,072 cotinine-validated self-reported cigarette smoker's ages 12 and older and 29,110 cotinine-validated nonsmokers ages 3 and older with varying levels of SHS exposure. Nonsmokers include participants' ages 20 and older that were self-reported never (10,317) or former (5,030) smokers. Users of other nicotine sources (pipes, cigars, chewing tobacco, snuff, nicotine patches, nicotine gum) were excluded from the analytical sample. Preliminary analyses not controlling for known confounders suggest that tobacco smoke exposure results in elevated blood levels of some metals and for the youngest participants (ages 3-6), there is an apparent dose-response relationship between exposure to SHS and blood lead. Additional analyses will address lead, cadmium, and total mercury blood levels overall and by age, sex, race/ethnicity, and poverty status versus cotinine-based exposure to tobacco smoke in youth and adult smokers and nonsmokers controlling for known confounding variables. This analysis will complement our previous finding that SHS-exposed children, a population particularly vulnerable to the toxic effects of low level lead exposure, have higher urine lead levels than children without SHS exposure and strengthen our understanding of the public health impact of the youth-adult disparity in SHS exposure.

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POS4-45

USAGE PATTERNS OF STOP SMOKING MEDICATIONS IN AUSTRALIA, CANADA, THE UNITED KINGDOM, AND THE UNITED STATES: FINDINGS FROM THE 2006-2008 INTERNATIONAL TOBACCO CONTROL (ITC) FOUR COUNTRY SURVEY

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Varenicline is a prescription stop smoking medication that has been available in the US since August 1, 2006, in the UK and other European Union countries since December 5, 2006, in Canada since April 12, 2007, and in Australia since January 1, 2008. There are few population-based studies that have examined use rates of varenicline and other stop smoking medications. We report data from the ITC Four Country Survey conducted with smokers in the US, UK, Canada, and Australia who reported an attempt to quit smoking in the past year on the 2006 survey (n=4,022), 2007 survey (n=3,790), and/or the 2008 survey (n=2,735) Respondents reported use of various stop smoking medications to quit smoking at each survey wave, along with demographic and smoker characteristics. The self-reported use of any stop smoking medication has increased significantly over the 3-year period in all 4 countries, with the sharpest increase occurring in the United States. Varenicline has become the second most used stop smoking medication, behind NRT, in all 4 countries since being introduced into each of these markets. Between 2006 and 2008, varenicline use rates increased from 0.4% to 21.7 % in the US, 0.0% to 14.8% in Canada, 0.0% to 14.5% in Australia, and 0.0% to 4.4% in the UK. In contrast, use of NRT and bupropion remained constant in each country. Following its introduction in all 4 countries, varenicline has become the second-most widely used stop smoking medication, although uptake has been slower in the UK relative to the other 3 countries. Overall stop smoking medication use rates increased in each country between 2006 and 2008. This increase was driven by sharp increases in varenicline while NRT and bupropion use remained relatively stable. Given the clinical trial evidence demonstrating the effectiveness of varenicline, our findings suggest that the introduction of varenicline led to an increase in the number of smokers who used evidence-based treatment during their quit attempts, rather than simply gaining market share at the expense of previously available stop smoking medications.

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POS4-46

SCREENING FOR SECONDHAND TOBACCO SMOKE EXPOSURE OF CHILDREN IN THE INPATIENT SETTING

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Background: Secondhand smoke exposure (SHSE) is associated with poor outcomes for many children's illnesses. Hospital admission is an opportunity to identify SHSE and encourage parental smoking cessation. Little is known about SHSE screening of children in this setting. Objective: To determine prevalence and sensitivity of SHSE assessments of pediatric inpatients by emergency department (ED) providers, admitting residents and floor nurses. Methods: Participants were recruited within 24 hours of admission. A detailed parent interview administered by a study team member assessed SHSE. Saliva was collected using cotton tipped Salivettes (Salimetrics, Inc). Salivary cotinine was measured using immunoassays (detection limit 1 ng/mL) at the Children's National Medical Center in Washington, D.C. SHSE assessments by ED providers, admitting residents and nurses were determined by chart review. Having SHSE as a dichotomous exposure variable was defined as: living with someone who smoked in the home, or exposure to SHS anywhere within 7 days, or cotinine >1 ng/mL. Sensitivities and Kappas measured agreement between ED, resident and nursing reports, and SHSE. SPSS was used for analyses. Results: 432 families were approached; 140 participated. Patient mean age was 3.9 years (range 0-17); 56% were male, 75% white, 10% African-American, 7% multiracial, and 6% Hispanic. 32% were admitted with respiratory illnesses (RI). Median cotinine level (N=81) was 0.50 ng/mL (range 0 to 25); 28% had cotinine levels >1. The exposure variable was positive for 46%. ED staff assessed SHSE 46% of the time, residents 42%, and nursing 79%. Of patients screened, ED providers identified 18% as exposed (sensitivity 41%; Kappa 0.420); residents identified 38% (sensitivity 67%; Kappa 0.590), and nurses identified 12% (sensitivity 27%; Kappa 0.276). Sensitivity was higher for RI vs. non-RI admissions. Conclusions: Many children are not screened for SHSE when admitted, and sensitivities for those who are screened tend to be low. Cues to screen may increase screening yield, but may not identify children at risk. Further research to determine the most effective way to identify SHSE is needed.

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POS4-47

IMPACT OF THE TOBACCO PROMOTION AND ADVERTISING BAN IN MÉXICO

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Background: Although tobacco advertising on television and radio had been banned previously, in 2008 Mexican legislation prohibited outdoor tobacco advertising and the distribution of free samples and items with tobacco branding. Advertising and promotions were still allowed through adult magazines, in adult-only establishments, and through personal communications, such as email or mail. Objective: To investigate the impact of the advertising and promotion restrictions, including possible increases in channel that had not been banned.

Method: Population-based, representative data from adult smokers were analyzed from the 2007 (n=941) and 2008 (n=1051) administrations of the International Tobacco Control (ITC) Policy Evaluation Project in 4 Mexican cities (Mexico City, Guadalajara, Tijuana y Cd. Juarez). Logistic regression models were used to assess unadjusted and adjusted changes in self-reported exposure to tobacco advertising and promotions.

Results: Prevalence of self-reported exposure in the previous month to tobacco advertising through banned channels either decreased as advertising on posters, billboards and bus stop (10%) or stayed constituent over time as advertising on bars, pubs and clubs as well as restaurants. Prevalence of receipt of the free samples, clothes and other brand name merchandise increased (AOR = 1.86, AOR = 2.36) and emails with promotional materials increased. Furthermore, use of coupons or other discounts increased.

Conclusions: Our findings suggest that tobacco industry advertising and promotional activities increased through unregulated channels, which is consistent with other studies that have found that partial advertising and promotion bans simply result in rechanneling resources to unregulated channels. Furthermore, banned channels either decreased or remained consistent over time.

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POS4-48

SMOKING CHARACTERISTICS AMONG WOMEN EXPOSED TO INTIMATE PARTNER VIOLENCE: THE ROLE OF SMOKING EXPECTANCIES

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Intimate partner violence (IPV) is a worldwide public health problem that is associated with negative health consequences and higher rates of substance abuse, including alcohol, drugs, and tobacco. IPV-exposed women report higher rates of smoking than non-exposed women and further, greater severity of IPV is associated with higher levels of nicotine dependence. However, little is known regarding IPV-exposed women's beliefs about smoking, or smoking outcome expectancies. It is important to understand smoking expectancies since they have been shown to predict motivation to quit, cessation attempts, and relapse. Within a self-medication framework, IPV-exposed women who experience stress symptoms related to IPV may have expectancies that smoking will help them cope (e.g., that smoking makes them feel better physically or increases energy). The aim of the present study was to examine the relationship among smoking expectancies, IPV type (physical, sexual, and psychological), coping strategies (avoidant, social support, and problem solving), and Post-Traumatic Stress Disorder (PTSD) symptom clusters among IPV-exposed women. Participants were 81 women who reported smoking at least 5 cigarettes per day (cpd mean = 12.4) and were moderately dependent (mean FTND = 4.5). All women completed a baseline interview and a 90-day follow-up interview. Results of hierarchical regression models revealed that PTSD symptoms of re-experiencing and avoidance/numbing were uniquely and positively related to expectancies that smoking would reduce cravings and increase energy, ps < .05. Only current smoking and nicotine dependence were related to expectancies that smoking reduces negative affect. The current data suggest that PTSD symptoms may represent one pathway by which smoking expectancies are maintained among this sample of IPV-exposed women. To the extent that smoking expectancies predict treatment-seeking behavior and cessation, targeting smoking expectancies may be an important treatment component for IPV-exposed women.

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POS4-49

ROLE OF NICOTINE DEPENDENCE IN PREDICTING SMOKING CESSATION AMONG RECENTLY DIAGNOSED CANCER PATIENTS

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Persistent smoking among cancer patients is prevalent and associated with worse prognosis for many cancer types. Despite being one of the most robust predictors of smoking cessation in the general population, nicotine dependence (ND) has not been reported as a consistent predictor of smoking cessation in the medically ill. We investigated associations of several baseline measures of ND, including the Fagerstrom Test for Nicotine Dependence score (FTND), Heaviness of Smoking Index score (HSI), number of cigarettes smoked per day (CPD) and time to first cigarette after waking, with biochemically confirmed smoking cessation at three time-points among 183 smokers recently diagnosed with cancer who participated in a pre-surgical smoking cessation intervention trial. All participants received counseling and cessation pharmacotherapy. The mean age of participants was 55.9 years (standard deviation (sd) 10.2), 87% were white and 53% were female. Baseline ND measures (Mean (sd)) were FTND score (4.9 (1.9)), HSI score (3.3 (1.3)) and CPD (19.5 (10.5)). Eighty-five percent reported smoking their first cigarette within 30 minutes of waking. The prevalence of biochemically verified, smoking cessation was 45%, 35% and 32% at hospitalization, 3 months and 6 months, respectively. In a series of logistic regression models adjusted for age, race and sex, none of the ND measures were associated with smoking cessation at any time point (all p>0.05). Our findings suggest that traditional measures of ND may not be associated with smoking cessation among cancer patients. Potential explanations for null findings are treatment effects that attenuated the relationship between ND and smoking outcomes, the fact that many had reduced their smoking rate prior to assessment of ND, variable adherence to cessation treatment, and the impact of acute, life-threatening illness on motivation and other factors that influence cessation outcomes. These factors warrant examination and will be presented.

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POS4-50

USE OF MENTHOL CIGARETTES AND NICOTINE DEPENDENCE: FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL POLICY EVALUATION SURVEY

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Relatively few population-based epidemiologic studies have been done to examine the association between menthol cigarettes and nicotine dependence. The results are also inconclusive. The objectives of this study are to examine the patterns of menthol use in the US, UK, Canada, and Australia and to assess the effects of menthol cigarettes on indicators of nicotine dependence. The sample size for this study was 4,603 participants in the International Tobacco Control (ITC) Four Country Survey who were smokers at the time of the baseline interview and who reported their usual cigarette brand in each survey or not smoking in two follow-up surveys. Outcomes assessed were: smoking cessation defined as smoking at least weekly at the baseline survey but less than weekly at follow-up; and changes in self-reported cigarettes per day. Overall, 8.4% of respondents reported smoking menthols during the baseline survey with 25% of US respondents reporting smoking menthols. Across all 4 countries, the use of menthols was relatively stable across all 3 surveys. In the US, minority smokers were more likely to smoke menthols; there was no such relationship in any other country. Menthol smokers had similar quit rates to non-menthol smokers, (15.6% vs. 14.6%; RR=0.95, 95% CI: 0.67-1.33) and change of amount smoked during the time between the baseline and third survey. Among the four countries examined, menthol use is largely a US phenomenon. The results observed in this study suggest that there is no association between menthols and indicators of nicotine dependence. From a policy perspective, the findings do not suggest that menthol is harmless. Previous studies have documented how menthol has been used as a tool to promote tobacco use, particularly among underserved populations in the US. Consideration to regulate menthol should be based on all factors that are in the interest of the public's health.

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POS4-51

TOBACCO RETAIL OUTLET DENSITY BY PROXIMITY TO SCHOOLS AND LOW INCOME AREAS IN WESTERN NEW YORK

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Literature suggests that tobacco retail outlets are concentrated in low-income areas. This study assesses the prevalence of tobacco retail outlets in two cities in Western New York, measuring the density in low-income areas and the proximity to schools. A list of tobacco retail outlets for Erie and Niagara counties was obtained from the NYS Department of Tax and Finance for the year 2010. Outlets were geocoded by address in ArcGIS version 9.3.1. Tobacco outlets located in each city limit were included in the analysis (n=350-Buffalo, n=65-Niagara Falls). All schools were geocoded by address (n=104-BUF, n=15-NF) and various distance buffers were created around each school. Census tracts were sorted by the median household income and were categorized into quartiles for each city. "Tobacco retail outlets per 10,000 persons" was calculated for each quartile. In Buffalo, 8.9% (n=31) were located within 500 ft, 31.4% (n=110) were located within 1,000 ft, and 57.4% (n=201) were located within 1,500 ft of a school. In Niagara Falls, only 3.1% (n=2) were within 500 ft, 9.2% (n=6) were within 1,000 ft, and 23.1% (n=15) were within 1,500 ft of a school. In Buffalo, census tracts with the lowest median income had 16.6 tobacco outlets/10,000 people, whereas those with the highest median income had only 6.4 tobacco outlets/10,000 people. Comparing the lowest income to the highest income areas, there are approximately 2.6 times more tobacco retail outlets (per 10,000 people) in the lowest income quartiles. In Niagara Falls, there were 23.9 tobacco outlets/10,000 people in the lowest income tracts vs. only 5.2 outlets/10,000 people in the highest income tracts. Comparing the lowest to the highest income tracts found that over 4.5 times more tobacco outlets (per 10,000 people) were present in the lowest income quartiles. This study found a higher tobacco retail outlet density near schools and in low-income areas although differences existed between the two cities. High availability of tobacco products and concentrated marketing around schools could lead to increased youth smoking initiation and a normalization of tobacco use.

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POS4-52

DEPRESSION AND SMOKING CESSATION: A LONGITUDINAL ANALYSIS USING DATA FROM THE INTERNATIONAL TOBACCO CONTROL (ITC) FOUR COUNTRY SURVEY

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The current study examined the relation between depression and smoking cessation using longitudinal data from adult smokers from Canada, the US, the UK, and Australia. We analyzed data from waves 5 (Oct 06 to Feb 07)), 6 (Sept 07 to Feb 08), and 7(Oct 08 to Dec 08)) of the International Tobacco Control (ITC) Four Country Survey – a cohort survey of a nationally representative samples of adult smokers. Depression was measured using an average of 3 items that measured (1) feeling down, depressed, or hopeless, (2) anhedonia, and (3) diagnosis of depression by doctor or health care provider. Controlling for relevant demographic variables and Heaviness of Smoking Index (a measure of nicotine dependence), weighted logistic regression revealed that those higher in depression scores at W5 were less likely to intend to quit smoking in the same wave (OR = .67, p < .001). When controlling for quitting intentions at W5, there was again a marginally significant lower likelihood of having quitting intentions at W6 (OR = .80, p = .12), and a highly significant lower likelihood of having quitting intentions at W7 (OR = .68, p < .001). Similarly, we found that those higher in depression scores at W5 were also less likely to have made a quit attempt at W6 (OR = .68, p < .001), and when controlling for quitting attempts at W6, a lower likelihood of making a quit attempt at W7 (OR = .60, p < .001). In addition, a increase in depression scores from W6 to W7 was predictive of a lower likelihood of having quitting intentions (OR = .80, p < .001) and quit attempts (OR = .85, p < .001) at W7. Although the relation between depression and our measures of quitting varied in strength across the four countries, in each country, the pattern of results was essentially the same. These results demonstrate a long and consistent relation between depression and continued smoking. This study is the first to use longitudinal data from a representative sample of adult smokers from four Western Countries to examine the relation between depression and smoking. These findings point to the need to identify the role of depression in understanding and predicting smoking among smokers.

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POS4-53

EVALUATING STRATEGIES FOR DISTRIBUTION OF NRT TO LIGHT AND HEAVY SMOKERS WHO CONTACT A QUITLINE

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We have previously demonstrated that the offer of a free 2-week supply of nicotine replacement therapy (NRT) to smokers of 10+ cigarettes per day can be a cost-effective strategy to induce smokers to call a quitline and increase quit rates. Additionally, a recent study we conducted failed to find a favorable cost-effectiveness ratio for giving smokers calling the New York State Smokers' Quitline (NYSSQL) more than a 2-week free supply of NRT. This presentation presents data on two new studies comparing strategies for distribution of free NRT to smokers calling the NYSSQL. The first study presents results from a study evaluating the distribution of NRT to daily smokers of less than 10 cigarettes per day. Prior to April 2010, the NYSSQL limited the offer of free NRT to smokers of >=10 cigarettes per day. Beginning in April 2010, we offered callers who smoked 1-9 cigs/ day the option of receiving a 2-week supply of either nicotine gum or nicotine lozenge. The offer of NRT was made to 720 light smokers, of whom 96% accepted the offer, demonstrating strong interest in the offer of free NRT among light smokers. Of those who accepted the offer of free NRT, 55% chose the lozenge while 45% chose the gum. The second study used a randomized design to evaluate the benefits of providing heavy smokers with access to a free 2-week supply of both the nicotine patch and lozenge versus the patch alone. Accrual into this study was limited to adult smokers, with no contra-indications for using NRT, who scored either a 5 or 6 on the Heaviness of Smoking Index (HSI). Those scoring >= 5 on the HSI represent about 21% of callers to the NYSSQL. So far, 2,691 smokers have been enrolled in the NRT combination study. In both studies, smokers are being followed up by phone and internet to assess smoking status 7-months after enrollment. In the light smoker study, we will examine quit rates in a sample of 400 smokers who called the NYSSQL during the period when the free NRT was offered (i.e., after April 2010) to 400 smokers surveyed historically before the free NRT was offered. Follow-up data for both studies will be available in time of the annual SRNT meeting in February 2011.

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POS4-54

RELATIVE REACH, UTILIZATION, EFFECTIVENESS AND COSTS OF CLEARWAY MINNESOTA'S(SM) QUITPLAN® SERVICES

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Introduction: We examined the relative reach, utilization, effectiveness and costs of four tobacco cessation services funded by ClearWay Minnesota: the QUITPLAN Helpline, quitplan.com, QUITPLAN Centers, and QUITPLAN at Work. These findings can help inform program managers and policymakers as resource allocation decisions are made.

Methods: Data were collected in 2007 and 2008. Reach was calculated using recommended methodology from the North American Quitline Consortium. Program utilization data were obtained from vendor records. Quit outcomes were assessed at 7-months post enrollment by phone or mixed method (phone/web) surveys. Cost data were provided by ClearWay Minnesota.

Results: Survey response rates were: 58.2% (Centers), 66.7% (Worksite), 61.2% (Helpline), and 67.4% (Website). Promotional reach rates, defined as the number of tobacco users who enrolled in a program divided by the number of tobacco users in the state, were 0.06% (Worksite), 0.13% (Centers), 0.39% (Helpline), and 0.91% (Website). Utilization varied, with the Worksite and Helpline reporting the highest rates

of full utilization (42.6% and 38.1%) and the website and Helpline reporting the highest rates of less than minimal utilization (56.5% and 13.4%). The Helpline had the highest abstinence rates at both 7- and 30-days (7-day ITT, 22.4%, 30-day ITT, 19.9%), followed by the Worksite program (7-day ITT 21.3%, 30-day ITT 19.9%), the Website (7-day ITT 21.2%, 30-day ITT 17.5%), and the Centers (7-day ITT 19.8%, 30-day ITT 16.4%). Using 7-day ITT abstinence rates, cost per quit for calendar year 2008 ranged from a low of $222 (website) to $2,001 (Centers); a similar pattern was seen for 30-day ITT abstinence rates. Conclusions: Although population-based programs (Helpline and web) had the largest reach and the lowest cost per quit, these programs also had the largest proportion of enrollees who did not receive minimal levels of intervention. Cessation outcomes were approximately equivalent across programs. These findings suggest that policymakers should consider multiple factors when allocating funds for tobacco cessation services.

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POS4-55

COMPARISON OF CURRENT VERSUS PAST INCIDENCE OF DEPRESSION AS A PREDICTOR OF QUIT SUCCESS IN A MASS MAILOUT OF NICOTINE REPLACEMENT THERAPY

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Depression is a well-established risk factor for decreased quit success among smokers. The objective of the current study was to examine whether quit rates following use of nicotine replacement therapy (NRT) differed by depression status (current vs. past vs. no history). Participants were 13,143 smokers in Ontario, Canada (55% female; mean age = 44 years) enrolled in the Smoking Treatment for Ontario Patients (STOP) study; each received a 5-week supply of NRT (patch or gum) in the mail with self-help materials. A random sample of 4,130 (31%) participants was followed up 6 months after baseline assessment. Participants were divided into three mutually exclusive groups based on self-reported history of depression at baseline: current depression (14.0%, n=1,845), past depression (7.7%, n=1,006), and control (78.3%, n=10,292). Logistic regression models tested the impact of depression status on quit rates at end-of-treatment and 6-months after controlling for age, sex, household income, educational level, level of nicotine dependence, and type of NRT. End-of-treatment quit rate was significantly lower than the control group (56.7%) for both groups with current depression (43.1%, p<.001; OR=0.61) and past depression (49.0%; p=.04; OR=0.78). Higher end-of-treatment quit rate in the past versus current depression group reached the level of a trend but was not significant (p=.09; OR=1.28). 6-month follow-up quit rate for smokers currently depressed at baseline was significantly lower (13.2%) compared to the control group (23.4%; p<.001; OR=0.52). The quit rate in the past depression group did not significantly differ from the control group (19.8%; p=.45), but was significantly higher than the current depression group (p=.02; OR=1.68). Further analyses will be presented indicating that lower quit rates among those with current depression were due to both fewer quit attempts and increased likelihood of relapse. Results of the current study indicate that current but not past incidence of depression significantly decreases the long-term effectiveness of NRT when given through a mass mailout program with limited behavioural intervention.

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POS4-56

SMOKELESS TOBACCO USE AND YOUTH – FINDINGS OF THE YOUTH SMOKING SURVEY, 2004-2009

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Introduction: Smokeless tobacco (SLT) use among Canadian youth is poorly understood. This study used data from the Youth Smoking Survey (YSS), a nationally representative cross-sectional school based survey collected every 2 years. Measures of SLT were first included in 2004-2005, and have remained in the 2006-2007 and 2008-2009 survey waves.

Methods: Cross sectional data from the 2004-2005, 2006-2007, and 2008-2009 Youth Smoking Survey (YSS) were used to examine youth 'ever use' and 'current use' of smokeless tobacco by gender, geographic region, and smoking status. Students surveyed were from grades 7-12. Survey results have been weighted.

Results: In 2008, 4.9% of males and 4.5% of females, grades 7-9, reported they had 'ever tried' smokeless tobacco, which represents more than 58,000 students across Canada. Reported 'current use' of SLT for students in grades 7-9, in 2008, was 3.9% of male and 2.6% of female youth. Ever and current use of SLT among female youth has increased since 2004, while usage among males has decreased slightly. There are significant regional differences in the proportion of youth using SLT; in 2008, BC (6.0%) and Atlantic Canada (5.7%) had the highest proportion of youth currently using SLT, while Ontario (2.1%) and Quebec (2.4%) had the lowest reported usage. The Prairies experienced the greatest reduction in current chew users between 2006 (5.6%) and 2008 (3.6%). The majority of chew users in 2008 were current smokers (67.1%).

Discussion: While the proportion of current male SLT users dropped between 2006 and 2008, the proportion of female SLT users has jumped significantly during the same time period. In 2006 13% of SLT youth users were female; in 2008 the proportion had tripled to 39%. The Atlantic region, and Quebec have experienced a doubling of the proportion of their youth reporting current use of SLT. Although the overall prevalence of use among Canadian youth is relatively low, these trends indicate a need for prevention and comprehensive tobacco-free policies that will discourage SLT initiation and use.

Propel Centre for Population Health Impact, Dr. Leatherdale is a Cancer Care Ontario Research Chair in Population Studies, the 2008-2009 Youth Smoking Survey is a product of a pan-Canadian capacity building project that includes Canadian researchers from all provinces and provides training opportunities for university students at all levels. Production of this paper has been made possible through a financial contribution from Health Canada.

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POS4-57

CHATTER BOX: CIGARETTE PACKAGE DESIGN ELEMENTS AS A VEHICLE FOR COMMUNICATING MEANING ABOUT LIFESTYLE AND STRENGTH

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This research provides an in-depth study of how Canadian tobacco companies are using specific design elements on cigarette packages—including color, descriptors, imagery, and pack shape—to communicate messages about lifestyle and strength. These messages push the boundaries of current regulatory policies, which prohibit lifestyle-oriented advertising and false, misleading or deceptive promotion. Study materials included over 100 uniquely branded cigarette packages, representing brands from each of Canada's three major companies. Brands were selected based on market share or recent release. Using the pack as the unit of analysis, we conducted a semiotic analysis—the study of signs, symbols and how meaning is constructed and culturally grounded. The semiotic analysis examined the social function of particular design elements, with resulting analytically finding further defined through analysis of tobacco industry documents (Legacy Tobacco Documents Library) and an examination of 228 cigarette-brand print advertisements from business (Your Convenience Manager) and consumer (Toronto Life, Eye Weekly) magazines. Results underscore intricate ways in which design elements work on their own and in combination to convey meaning. The production of meaning from these elements contributed to the overall thematic orientation of a package. The social function of these themes were shown to convey: luxury (e.g., the brand Benson and Hedges de Luxe uses metallic colours, foil embossing, monograms, lexical choices), femininity (e.g., Vogue lilas uses pastel colour, cursive font, lexical choice related to fashion), tradition (Macdonald Special and Canadian Classics use Canadian graphics/symbols, lexical choice related to Canada, historic dates, slide pack), and strength (du Maurier uses bold colour, gradient lexical choices, and typography). This research provides a critical test of the cigarette package as a communication vehicle. It provides evidence for future tobacco control policies directed toward regulating package design elements including the option of plain and standardized packaging.

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POS4-58

REMOVAL OF MISLEADING PACK DESCRIPTORS IS NOT ENOUGH: FINDINGS FROM THE ITC FOUR-COUNTRY SURVEY

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In an effort to address the problem of smokers' incorrect beliefs about Light cigarettes, many countries have begun to implement provisions from Article 11 of the WHO FCTC with most focussing on banning the use of misleading brand descriptors on cigarette packs. This paper examines how smokers' beliefs about cigarettes in Australia and Canada were affected by the removal of misleading "light/mild" terms from packs, and extends follow-up in the United Kingdom. The data come from the first 7 waves (2002-2009) of the International Tobacco Control Policy Evaluation (ITC) Four-Country Survey, an annual cohort telephone survey of adult smokers in Canada, US, UK, and Australia (21,613 individual cases). The descriptors "light" and "mild" were removed in 2003 in the UK (during the 2nd survey wave), in 2006 in Australia (during the 4th wave), and in 2007 in Canada (mainly after the 5th wave). The labeling change in Australia also included the removal of the ISO emission yield figures from packs and like the UK, was also accompanied by a mass media campaign to educate the public. We compare beliefs about light cigarettes both before and after the bans, with smokers in the US, in which no ban was implemented, serving as the control condition. The results revealed that misperceptions about light cigarettes declined between 2002 and 2009 in all four countries. There was a significantly larger reduction in misperceptions about lights in Australian smokers relative to the other countries, compared with only a temporary reduction in the UK, and no apparent effect in Canada. We conclude that brand descriptors, which imply that cigarettes deliver less tar and nicotine, are inherently misleading and should be banned. However, the policy of banning such descriptors is insufficient by itself to effectively reduce consumer misperceptions about so-called light low yield cigarettes. This finding underscores the need for a more comprehensive approach to be taken to debunk the Light myth, which includes sustained public education campaign to correct misconceptions, removal of misleading pack design via plain packaging and ban on filter ventilation that distorts risk perception.

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POS4-59

CURRENT AND FORMER SMOKERS' OPINIONS OF POTENTIAL TOBACCO REGULATORY ACTIONS BY THE FDA

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The Surgeon General acknowledged the health risks associated with smoking in 1964; however, it was not until 2009 that the government claimed regulatory power over tobacco products with the Family Smoking Prevention and Tobacco Control Act. While the intent of the Tobacco Control Act is to reduce tobacco's negative impact on the public's health, the effect of this legislation on smokers' attitudes, intentions, and behaviors is unclear. This study reports on characteristics of smokers endorsing the following three FDA-related items: (1) Government regulation of cigarettes will make cigarettes safer; (2) The government should reduce the amount of nicotine in cigarettes to help smokers quit; and (3) Menthol cigarettes should be banned. A total of 3638 current and former smokers in 8 cities were surveyed, of which 432 were African American, 256 were Hispanic, and 249 were of another racial/ethnic background. Results indicate that 30% of current and former smokers believe that regulation with yield a safer cigarette. White and African American vary considerably when asked if menthol should be banned (22% v. 34% p<0.001) and if nicotine should be reduced (53% vs. 67%, p<0.001). In all cases, former smokers were more supportive of FDA regulation than current smokers. Multivariate results demonstrated that smokers who agreed that regulation would yield a safer cigarette were more likely to have graduated high school, feel social pressure to quit, and have a desire to quit. In comparison to smokers who disagreed that the government should decrease nicotine, smokers who agreed were more likely to be female, African American, intend to quit in the next 6 months, believe that smoking is a serious health risk, have a desire to quit, and feel social pressure to quit. Smokers who agreed that menthol should be banned were less likely to have graduated high school, and more likely to be African American, older, intend to quit in the next 6 months, want to quit smoking, and recently tried to quit. Findings suggest that smokers who are interested in quitting are open to government regulation of cigarettes.

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POS4-60

SMOKE-FREE LEGISLATION: LESSONS LEARNT FROM THE ENGLISH EXAMPLE

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England implemented a comprehensive smoke-free legislation (SF) on July 1st 2007, prohibiting smoking in enclosed public places and work places, with the intention of protecting workers and the public from exposure to second hand smoke. It was anticipated that the legislation could result in changes in smoking and quitting behaviours. This paper will explore the relationship between SF and smoking and quitting behaviours in England. Research explored changes in number of quit attempts and the impact of SF upon smoking cessation services. National household surveys were conducted in England between January 2007 and December 2008. The sample (10,560 adults) 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 smoking cessation service 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. There was an increase in the number of smokers making a quit attempt around the time that SF was implemented, compared with the same time the following year (8.6%, n=82 and 5.7%, n=48 respectively) (Fisher's Exact=0.022). Almost a fifth of smokers making a quit attempt around this time cited SF as the reason for doing so. Additionally, there was an increase in the number of smokers accessing the smoking cessation services around this time, however this was a significantly lower increase than had been anticipated by the services (16.2% and 42.5& increase respectively) (Chi squared=73.35, p<0.0001) Lessons can be learned from the English experience and the knowledge employed internationally. Early preparation by health care professionals, Government and other organisations, increase in the availability of cessation support services and nationwide advertising campaigns can maximise the number of quit attempts following introduction of SF. Lessons learnt will be discussed in further detail.

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POS4-61

TOBACCO OUTLET DENSITY AND LOCAL TOBACCO POLICY: RELATIONS WITH YOUTH SMOKING

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This study investigates the relations between tobacco outlet density, comprehensiveness of local tobacco policy, and youth smoking in 50 non-contiguous California cities. 1,491 youth (51.9% male, M age = 14.7 years, SD =1.05) were surveyed through a computer-aid telephone interview about their smoking behaviors and beliefs. A three-level measure of comprehensiveness of local tobacco policy was created based on a review of local tobacco policies in these communities. Both clean air laws and youth access laws were considered. Outlet density in each city was calculated as the number of retail tobacco outlets per 10,000 persons and city characteristics were obtained from 2000 U.S. Census data. Using multilevel logistic and linear regression analyses, interaction effects and main effects were examined. The simple slopes method and related graphical techniques were used to evaluate the nature of the interactions in multilevel analyses. Statistically significant interactions were found between comprehensiveness of local tobacco policy and tobacco outlet density for all youth smoking outcomes (i.e., ever smoked cigarette, past-12-month cigarette smoking and past-30-day cigarette smoking). Also, in the presence of these interaction terms and individual and city-level covariates, significant main effects of outlet density on ever smoked cigarette and past-12-months cigarette smoking were in the expected directions. Specifically, tobacco outlet density was positively associated with youth smoking. No significant main effects were found

for comprehensiveness of local tobacco policy on any of the smoking outcomes after controlling for interactions and covariates. Comparisons of simple slopes indicate that the positive associations between tobacco outlet density and youth smoking behaviors were stronger at the lowest level of tobacco policy comprehensiveness compared to the moderate and high levels. Our results suggest that comprehensiveness of local tobacco policy may act as a moderator of relationship between outlet density and youth smoking, such that density is less important at moderate and high levels of tobacco policy comprehensiveness.

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POS4-62

MENTHOLS COST LESS NEAR SCHOOLS WITH A HIGHER PROPORTION OF AFRICAN AMERICAN STUDENTS

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The U.S. Food and Drug Administration (FDA) is deliberating a ban on menthol cigarettes, which comprise one third of the nation's $70 billion cigarette market. The systematic targeting of African Americans by menthol advertising is well documented, but less is known about menthol promotions at the point of sale. A previous study observed no relationship between the price for menthols and the proportion of non-white residents in store neighborhoods. However, the study purchased single packs, which would miss any impact of multi-pack discounts. This study compared promotions and prices for the leading brands of menthol (Newport) and non-menthol (Marlboro) cigarettes in stores (n=407) near a random sample of California high schools (n=91). A promotion was defined as any ad that featured a special price, multi-pack discount or gift with purchase. Multi-level models estimated the proportion of menthol advertising, the presence of promotion, and the lowest pack prices (before sales tax) in relation to the proportion of African American students at the nearby high school, adjusting for store type and other school/neighborhood demographics. More stores featured a promotion for Marlboro (78%) than for Newport (31%), and menthol promotions varied with school/neighborhood demographics. For each 10% increase in the proportion of African American students, the proportion of menthol advertising increased by 5.9% (e.g., from an average of 25.7% to 31.6%), the odds of a Newport promotion were 42% higher (95% CI= 1.02;1.98) and the cost of Newport was 12 cents lower (95% CI=-0.18, -0.06). For Marlboro, the odds of a promotion and the price were unrelated to any school/neighborhood demographics. These results suggest that selectively targeted advertising near high schools with more African American students translates into lower prices for menthol cigarettes. Such evidence about the environmental (in)justice of menthol marketing should inform the FDA's policy decision.

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POS4-63

SENSORY BELIEFS ABOUT YOUR BRAND ARE ASSOCIATED WITH THE BELIEF THAT YOUR BRAND IS LESS HARMFUL: CONVERGENT EVIDENCE FROM ITC SURVEYS IN CANADA AND CHINA

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Background: In recent years, a number of countries have banned brand descriptors such as "light" and "low tar" to prevent misperceptions that these cigarettes are less harmful, in accordance with Article 11 of the WHO FCTC. Other non-linguistic features (e.g., lighter colors) have been shown also to create the same misperceptions. In this study, we present findings from ITC Surveys in Canada and China demonstrating that the sensory experience of smoking a cigarette appears to be very strongly related to perceptions of that brand's harmfulness.

Objective: To measure the relation between the belief that a smoker's brand of cigarettes is "smoother" or less harsh and his/her perception that the brand is less harmful in two diverse countries: Canada and China.

Methods: Canadian data are from Wave 6 of the International Tobacco Control Four Country Survey (ITC-4). ITC-4 is a random digit dialed nationally representative telephone survey of adult smokers (n=1,088). Chinese data are from Wave 2 of the International Tobacco Control China Survey, a face-to-face survey of adult smokers and non-smokers in 6 cities in China (n=2904). Binary logistic regression analyses were used to estimate the predictive association between the belief that one's cigarette brand was "smoother" and the belief that "the brand of cigarettes you smoke is less harmful," controlling for standard demographic variables and type of cigarettes smoked.

Results: Smokers in Canada (OR=2.23 95% CI 1.29-3.86, p=0.004) and China (p<0.001, OR=5.10 95% CI 3.69-7.03, p<0.001) who reported that their cigarette brand is "smoother" were significantly more likely to also believe that their cigarette brand is less harmful than other brands.

Conclusions: The findings from this study demonstrate the importance of implementing tobacco control policies that address the impact that cigarette design and marketing can have in capitalizing on people's natural associations between smoother/less harsh sensations and lowered perceptions of harmfulness. Implications of these findings for Articles 9, 10, and 11 of the Framework Convention on Tobacco Control will be discussed.

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POS4-64

BEYOND LIGHT AND MILD: CIGARETTE BRAND DESCRIPTORS AND PERCEPTIONS OF RISK IN THE INTERNATIONAL TOBACCO CONTROL (ITC) FOUR COUNTRY SURVEY

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Virtually all of the evidence on false beliefs about the relative risks of cigarette brands has been focused upon "light" and "mild" brand descriptors, which are now banned in more than 50 countries. As these terms are rapidly becoming obsolete, evidence is needed on consumer perceptions of the broader set of brand descriptors now appearing on packaging. Survey data were taken from Wave 5 (2006) of the International Tobacco Control (ITC) Four Country Survey, a longitudinal cohort study. Participants included 8,242 current and former adult smokers from Canada (n=2,022), US (n=2,034), UK (n=2,019), and Australia (n=2,168). Overall, one-fifth of smokers incorrectly believed that "some cigarette brands could be less harmful" than others, with false beliefs highest among US smokers. Smokers of "light," "mild," "slim," and 100mm/120mm cigarettes were more likely to believe that some cigarettes could be less harmful (OR=1.29, p=.001) and that their own brand might be a little less harmful (OR=2.61, p<.001). Smokers of "gold," "silver," "blue," "purple" brands were more likely to believe their "own brand might be a little less harmful" compared to smokers of "red" or "black" brands (OR=11.82, p=.025). The findings suggest that, despite current prohibitions on the words "light" and "mild," smokers in Western countries continue to falsely believe that some cigarette brands may be less harmful than others. The names of colours and descriptors such as "slim" are associated with false beliefs about the reduced harm in the same manner as the prohibited terms "light" and "mild." Consumer perceptions of certain colours as indicators of lower harm also highlight the importance of plain packaging regulations.

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POS4-65

HELPING ONTARIO PREGNANT WOMEN COPE WITH SMOKING CESSATION: SHARING LOCAL KNOWLEDGE PROVINCIALLY

Nadia Minian*, Chelsea Kirkby, Shelley Cleverly, and Pat Campbell, Echo: Improving Women's Health in Ontario

In 2007/2008 there were over 100,000 pregnant Ontarian women who smoked tobacco and wanted to quit smoking. Unfortunately, despite the availability of "best practices" to help pregnant women quit smoking, there are few targeted resources

available for them. Smoking among women has devastating health consequences to their health, including cardiovascular disease, lung cancer, COPD, osteoporosis, among many others. In addition, pregnant women who smoke are almost twice as likely to have a low-birth weight baby as women who never smoked. Also, smoking cigarettes increases a woman's risk of having complications during pregnancy. The good news is that if a woman stops smoking even by the end of her second trimester of pregnancy, she is no more likely to have a low-birth weight baby than a woman who never smoked. In addition her overall health will improve as well. Given these findings, Echo: Improving Women's Health in Ontario (Echo) is partnering with a diverse group of stakeholders in a multi-pronged approach to increase smoking cessation for Ontario pregnant women. Echo is working with several organizations across the province to champion pilot demonstration projects designed to increase availability and access to smoking cessation services for marginalized women. Each of these demonstration projects will be evaluated to show the effectiveness and appropriateness of practice models for diverse marginalized populations. Echo is also partnering with a community-based organization to organize events that will generate cross-site learning, engage policy makers and support the spread of innovation across the province. In this presentation, we will share our model, which aims to: enhance knowledge exchange among practitioners, policy makers and researchers, and facilitate the uptake and application of the knowledge in the practice setting/ community.

Ontario Ministry of Health and Long Term Care.

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POS4-66

TOBACCO DEPENDENCE EDUCATION - TRAINING FUTURE PHARMACISTS AS TOBACCO TREATMENT SPECIALISTS

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Introduction: Pharmacists are uniquely positioned to promote tobacco-dependence treatment (TD Rx) programs. Published studies revealed the need to enhance didactic and clinical training in TD education in the Pharm.D. curriculum. To bridge this gap, Loma Linda University School of Pharmacy (LLUSP) included 9 hours of Yr-1 didactic teaching in 2006 from "Rx for Change" curriculum as a first step.

Methods: Prompted by a LLU tobacco curriculum initiative in April 2008, the LLUSP Dean identified the Department Chair and 3 faculty members to redesign TD education. The selected faculty received specific training with 1-on-1 mentorship sessions with key experts in the TD field, attended SRNT meetings, and 2 faculty members received extensive clinical tobacco training at 4 US TD treatment centers. In December 2009, the LLUSP Dean implemented broad curricular mapping for all 4 Pharm.D. years to identify the gap and enhance TD content and clinical experience.

Results: Based on this planning, TD curriculum was changed from 9 to 26 didactic hours and 0 to 4 clinical training hours. Didactic hours focused on nicotine biochemistry, pharmacology, principles of addiction, behavior modification, motivational interviewing, therapeutic options, and combination pharmacotherapy. Pre and post-tests in Yr-1 (after the implementation of increased TD training) showed significant improvement in their knowledge, clinical skills and self-confidence to intervene with tobacco users and to negotiate TD treatment options with physicians more confidently.

Conclusions: The results indicate that administrative support, targeted TD curricular enhancements, and intensive faculty development can improve the overall Pharm.D. curriculum and prepare Pharm.D. students to better serve the needs of tobacco users in addressing their addiction.

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POS4-67

TRENDS IN TOBACCO CESSATION CURRICULA IN US OSTEOPATHIC MEDICAL SCHOOLS

Brian N. Griffith, Ph.D.*, Helen Baker, Ph.D., and Norman Montalto, D.O.

Background: Tobacco use is the primary cause of premature deaths and disability in the United States. A 1998 survey of US osteopathic medical schools identified deficiencies in teaching of smoking cessation. This study updates these findings for the 2009-2010 academic year.

Design: A 26-item survey was sent electronically to deans of the US osteopathic medical schools, which had students enrolled in 2009-2010. Up to three follow-up reminders were sent by email. Results from 2010 are reported and compared to findings in 1998.

Results: By August 28, 2010, 24 of 28 osteopathic medical school sites (85.7%) had responded. Compared to data reported ten years ago, significant improvements were found in the proportion of schools covering all seven basic science content areas, 47.4% in earlier study compared to 91.7% in 2009-2010 (p=.001); the proportion of schools that offer clinical smoking cessation, 63.2% vs. 95.8% (p=.003); in the proportion of schools that offer clinical tobacco intervention in any part of the four-year curriculum, 57.1% vs. 95.8% (p=.001); and in the proportion of schools that cover pharmacologic agents for nicotine replacement or antidepressant therapy in detail (rather than briefly or not at all, p=.0001): in the 1998 survey, no schools covered pharmacologic agents in detail, 94.7% covered them briefly, and 5.3% did not cover them, while in 2009-2010, 54.2% of schools covered pharmacologic agents in detail, 45.8% covered them briefly, and none did not cover them. No significant changes were found in the proportion of schools covering all 13 of 13 content areas (15.7% vs. 29.1%, NS); proportion covering motivational interviewing in detail (26.3% vs. 33.3%, NS); proportion requiring curricula on smokeless tobacco (57.9% vs. 62.5%, NS), or proportion of schools covering all four clinical skills identified by the authors to be critical (36.8% vs. 45.8%, NS).

Conclusions: In the past decade, US osteopathic medical schools have become more likely to provide instruction on tobacco cessation, but some important areas are still not taught by all.

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POS4-68

OLDER SMOKERS: AN UNDERSTUDIED AND RAPIDLY GROWING SUBSET OF THE POPULATION

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Smoking cessation at any age, including old age (> 65), can increase life expectancy and improve health. Unfortunately, clinical interventions aimed at assisting older smokers lack an empirical framework – older smokers are rarely included in laboratory-based studies assessing tobacco withdrawal and/or the effects of smoking cessation treatments. For instance, across 15 methodologically rigorous studies selected for a recent comprehensive review of tobacco withdrawal symptoms, the mean age of participants was 37.8 years (SD = 8.1). This age-related gap in the literature is alarming as there is reason to assume that smoking cessation is distinctly different for older smokers relative to younger/middle-aged smokers because of differences in physiology, smoking behavior, and beliefs about smoking. Furthermore, the number of older adults, and most likely older smokers, is predicted to more than double in the next 20 years prompting some to deem smoking a critical "geriatric health issue". This review provides an overview of the issues associated with researching and ultimately treating older smokers. First, variables unique to the older smoker and the impact these variables might have on treatment approaches and outcomes will be explored (e.g., years smoking, dependence level, metabolism, cognitive aging, concomitant health conditions, etc). Second, recommendations for researchers interested in conducting tobacco-related research in geriatric patients, such as recruitment and inclusion/exclusion criteria, will be presented. Lastly, current clinical practices involving older adult smokers will be critiqued and unique opportunities for assisting the elderly smoker with a quit attempt will be proposed (e.g., during an inpatient hospital visit). In sum, this review will educate scientists and clinicians on the importance of the older smoker in our efforts to reduce the negative health consequences associated with tobacco smoking.

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POS4-69

THE PATH TO QUIT: HOW EXPOSURE TO A LARGE-SCALE MASS MEDIA SMOKING CESSATION CAMPAIGN PROMOTES QUIT ATTEMPTS

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BACKGROUND: Although awareness of mass media smoking cessation campaigns are hypothesized to affect quit behavior through primary changes in cessation-related cognitions, this has yet to be formally tested.

METHODS: Structural equation modeling was used to analyze whether changes in cessation-related cognitions mediate the relationship between awareness of a national mass media smoking cessation campaign, EX, and quit attempts in a cohort of 4,067 smokers drawn from eight Designated Market Areas (DMAs) in the U.S. Models were examined in the total population, as well as stratified by race/ethnicity, sex, age, and education.

RESULTS: Data suggest that there is both a statistically significant direct effect of EX awareness on quit attempts (standardized estimate: 0.03) as well as an indirect effect (standardized estimate: 0.01) mediated by changes in cessation-related cognitions. Results are not uniform across sub-populations, as stratified analyses show that awareness of EX is significantly associated with positive changes in cessation-related cognitions and quit attempts only in African-Americans, males, and those with less than a high school education.

CONCLUSIONS: Campaign developers should consider how media messages may get differentially processed across at-risk groups in order to optimize behavior change.

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POS4-70

THE MARKETING AND ADVERTISING STRATEGY OF THE ELECTRONIC CIGARETTE INDUSTRY

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After their introduction into the European market in 2006 and the U.S. market in 2007, electronic cigarettes (e-cigarettes, e-cigs, or electronic nicotine delivery devices) have received much attention, both as a novel device and for their purported health advantages in comparison to traditional cigarettes. Although e-cigarette health and safety data is still being generated, much vital information on the public health implications of this new product can be gained by examining the marketing and advertising strategies of the e-cigarette industry. In the United States, at least 6 organizations have worked to increase awareness and promote health claims of e-cigarettes. These include industry-member organizations, advocacy organizations and research organizations. E-cigarette marketing and promotion has chiefly occurred online, although advertisements on the radio and on television have been noted. Internet banner advertisements and advertisements have appeared as Sponsored Results on websites such as Google, Yahoo and Bing and are used by e-cigarette companies to increase website traffic. The social networking websites Facebook and MySpace and the user-generated content websites YouTube and Twitter are used by multiple e-cigarette companies to promote the product and as a way to offer discounts on future purchases. Internet forums are used to communicate directly with current and potential consumers, and address issues such as the introduction of new products, and discounts that are available for future transactions. In addition, internet forums offer a venue for peer advice about e-cigarette product choice and use techniques to novice users. In summary, e-cigarette marketing and advertising occurs mainly online, with both organizations and individual companies using a wide range of internet media to promote e-cigarette use.

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POS4-71

CONSUMER RESPONSES OF SMOKERS TO E-CIGARETTES

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E-cigarettes recently generated attention among smokers as a novel device with purported health advantages over conventional cigarettes. Research has focused on nicotine delivery and acute exposure, with limited information available on smokers' responses to e-cigarettes. To fully inform regulation of e-cigarettes, a science base that includes measures of consumer response must be developed which includes two interacting domains: (i) perceptions of product messaging and ii) response to product use. Data from two studies are presented which describe smokers' consumer responses to e-cigarettes. Using an online survey, 180 regular smokers' perceptions of NJOY e-cigarettes were assessed: (i) perception of product descriptors (e.g., appeal); (ii) expectations (sensory and nicotine effects); (iii) beliefs (risk, dependence); and (iv) future use intentions. Additionally, in a 2-week outpatient study, 56 regular cigarette smokers were switched to NJOY and asked to rate product sensory characteristics (e.g., flavor, odor) and subjective effects (e.g., withdrawal relief, personal and social acceptability). Smokers reported favorable perceptions of e-cigarette marketing, including lowered risk perception and high interest in use. However, the sensory responses suggest lower appeal than conventional cigarettes. A majority of subjects reported that, relative to conventional cigarettes, the e-cigarette was less harmful (62.5%), had fewer carcinogens (75.0%), and presented less risk of respiratory illness (67.5%), heart disease (75.0%) and lung cancer (62.5%). After 14 days of use, few subjects reported liking e-cigarette effects (25%), social acceptability (37.5%), or ease of use (12.5%). E-cigarette puffs were less satisfying (p=.002) and were perceived to have a lower nicotine content (p=.001) than subjects' preferred cigarettes. Further research is needed to understand consumer responses of other subgroups targeted by e-cigarette marketing, including non-smokers, ex-smokers and health conscious tobacco users. These findings emphasize the need for regulation of e-cigarette marketing, and product design characteristics that influence nicotine delivery and sensory response.

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POS4-72

CHILDHOOD MALTREATMENT AND SMOKING CESSATION

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Childhood maltreatment has been associated in cross-sectional and retrospective cohort designs with increased smoking prevalence, earlier age of initiation, and an increased number of cigarettes smoked/day (CPD). We expanded research in this area by studying the relationships between childhood experience of emotional abuse (EA), physical abuse (PA), and sexual abuse (SA) and (1) indicators of nicotine dependence, (2) motivation to quit, (3) functional utility, (4) co-morbidities, and (5) cessation behaviors. Data were used from the Assessing Hard Core Smoking Survey (AHCSS), a random-digit-dialed telephone survey of 1,000 U.S smokers (not just hard-core smokers) aged 25 years and older. Re-contact was made with 757 baseline respondents at 14-month follow-up. Results reported below are from regression analyses (linear or logistic as appropriate) that controlled for age, sex, race/ethnicity, education and CPD. PA was associated with higher scores on a subset of questions from the Nicotine Dependence Syndrome Scale. None of the three forms of abuse was associated with time to first cigarette after waking. PA and SA were associated with increased motivation to quit. Total abuse was associated with regulation of negative affect, but not with pleasurable aspects of smoking. Abuse scores were directly associated with Serious Psychological Distress score, but not with binge drinking or street drug use. EA was associated with increased probability of making a quit attempt. Among those who attempted to quit, EA and PA, and to a lesser extent SA were associated with increased severity of withdrawal symptoms; including irritability, restlessness, depression and difficulty concentrating, but not with hunger or cigarette cravings. EA was associated with increased use of NRT, but not Zyban. None of the abuse scores was associated with 30+ day abstinence from cigarettes among attempters or overall abstinence. Adults who have experienced childhood maltreatment seem to experience more challenges with quitting than adults who haven't been abused. These challenges may be overcome by increased motivation to quit and possibly by increased use of NRT.

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POS4-73

THE RELATIONSHIP BETWEEN CIGARETTE SMOKING AND WEIGHT: ANALYSIS OF THE NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY

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To date, most research examining the link between smoking and weight status has relied on body mass index (BMI) while few studies have examined waist circumference (WC). This is an important area for research as central adiposity may be a better predictor of negative health outcomes and mortality than BMI. The current study aims to examine the link between smoking status and weight using both BMI and WC. Data were from the National Health and Nutrition Examination Survey (NHANES) 1999-2008. Smoking status was characterized as being a current, former or never smoker. Former smokers were categorized by time since they had quit (<1 year; 1-4 years; 5-14 years;

≥15 years). Body measurements were obtained through a physical exam. Individuals under 20 years of age or pregnant were excluded. Data from 2007-2008 revealed that 52% of never smokers and 43% of current smokers had a large WC. Among never smokers, approximately 34% were obese compared to about 28% of current smokers. When WC was regressed onto smoking status, never smokers had a 13% reduced odds of having a large WC compared to current smokers ($p < .05$) controlling for sex, age, education, and race. Former smokers who had been smoke-free longer, 5-14 years and 15 years or more, had 37% and 42% reduced odds, respectively, of having a large WC compared to current smokers. A similar pattern emerged predicting BMI. This study confirms a relationship between smoking and weight, as measured by both BMI and WC, in a nationally representative sample. While the bivariate analyses were consistent with previous findings indicating a negative association between current smoking and weight status, the multivariate findings were unexpected. These models revealed that current smokers are larger than never smokers or longer-term former smokers, and the relationship between smoking and WC appeared to be stronger than that of BMI. Major changes in both smoking and overweight/obesity prevalence have occurred in the last ten years in the U.S. Awareness that these health statuses are related should be taken into account in research in either domain or when examining other health outcomes.

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POS4-74

TRENDS IN PATTERNS OF TOBACCO USE AND WEIGHT STATUS AMONG U.S. HISPANICS: THE ROLE OF ACCULTURATION

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In the U.S., Hispanics experience high rates of obesity and greater tobacco use among those of high versus low acculturation. Understanding and preventing negative changes in health behaviors and energy balance associated with acculturation is a key public health challenge associated with continued growth of immigrant populations. The purpose of this research was to (1) examine differences in weight and smoking status between U.S. Hispanics and Non-Hispanics and (2) compare weight and smoking status between US Non-Hispanics and Hispanics by level of acculturation (low, medium, high). Data are from a sample of nationally representative U.S. Hispanics and Non-Hispanics from the 2000 National Health Interview Survey (NHIS). The 2000 NHIS provided data for this study as recent surveys do not include a comprehensive measure of language acculturation. Respondents were classified as never, current, or former smokers. Body weight was categorized as normal, overweight, or obese, based on BMI. Hispanics with high acculturation were relatively similar to Non-Hispanics on smoking status (23.5%, and 23.6% current smokers, respectively). In contrast, Hispanics with low acculturation had lower current smoking rates (15.5 %), ($\chi 2 = 43.6$, $p<0.01$). Independent of smoking status, chi-square tests found Hispanics were consistently more overweight and obese than Non-Hispanics ($p<0.01$). Analysis of current and former smokers found Hispanics of high acculturation had the highest rates of obesity compared to Hispanics of low acculturation and Non-Hispanics ($p<0.01$) but not among former smokers ($p=0.21$). Together these results support the hypothesis that health behaviors in Hispanic immigrants account for at least some of the 'Hispanic Paradox' (despite low SES, relatively lower rates of morbidity and mortality). Attention to preventing the uptake of multiple unhealthy behaviors, particularly smoking and weight gain, as well as other obesogentic behaviors could have a significant public health impact in this population.

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POS4-77

RISK PERCEPTIONS AND SMOKING BEHAVIORS AMONG PARTICIPANTS OF THE ACRIN NATIONAL LUNG CANCER SCREENING TRIAL: ONE-YEAR FOLLOW-UP

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The National Lung Cancer Screening Trial (NLST) will determine whether screening current and former smokers, with a minimum 30-pk/yr history, for lung cancer with spiral CT scans produces a reduction in lung cancer mortality relative to screening with chest x-rays. If CT scans prove effective, they will likely become widely adopted and provide an important opportunity for promoting smoking cessation and relapse prevention. The objective of this study is to examine how the process of undergoing screening modifies perceived risk and smoking behavior. Data were collected from 430 participants at 8 American College of Radiology Imaging Network (ACRIN) sites, prior to their initial and one-year follow-up screens. The Smoking Risk Perceptions Scale assessed perceived lifetime risk of lung cancer and other smoking-related diseases (10=low-50=high). Baseline screening results were categorized as Negative with no/minor abnormalities not suspicious for lung cancer, Negative with significant abnormalities not suspicious for lung cancer, or Positive, demonstrates a nodule or other abnormality that may be due to lung cancer. In this subset of NLST participants (M age=61.0, 55.8% male, 91.9% white), half were current smokers at baseline. From baseline to follow-up, 9.7% of current smokers quit smoking, and 5.6% of former smokers relapsed to smoking. Overall, risk perceptions did not change from baseline to follow-up (means = 37.0 vs. 37.5 for current smokers, 33.2 versus 33.4 for former smokers) and were not differentially affected by test results ($p>.05$). At 12-month follow-up, only 2 participants had been referred to a smoking cessation program and <3% of current smokers attended a smoking cessation program. Rates of smoking behavior changes among participants undergoing screening are similar to population-based rates. Overall, the lung cancer screening experience did not appear to heighten participants' perceived risk or promote cessation behavior. If we are to optimize lung screening as a change agent, risk reduction messages and direct resource referrals are needed.

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POS4-78

HOW BROADCAST, EARNED, AND INTERNET MEDIA AND TAX INCREASES IMPACTED QUITLINE CALL VOLUME IN FLORIDA

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Background: The Florida Department of Health developed a comprehensive cessation media campaign designed to motivate tobacco users to call its Quitline. At the same time, a federal tobacco tax went into effect and the Florida Legislature increased its cigarette tax. This abstract presents results of a study designed to understand the impact of broadcast, earned, and web-based media on quitline call volume, controlling for potentially confounding environmental factors, such as legislative action.

Methods: Data on call volume and caller characteristics were combined with data describing broadcast, earned, and internet media presence and analyzed for four key target audiences. Media data were represented as weekly Targeted Rating Points, impressions, and web clicks. The number of impressions for TV coverage of stories about stopping smoking and tax increases was also included in the model, along with the availability of free nicotine replacement therapy (NRT). This analysis reports on all tobacco users in targeted groups who called the Quitline themselves to quit from July 2008 through June 2009, N = 20,663.

Results: Overall, the models were very successful in describing the relationship between media and call volume. The R2 statistics ranged from .67 to .87 depending on the model. Among targeted groups, the two variables accounting for the largest amount of variance were broadcast media (between 4.6 % and 12.8% variance explained) and visits to the quitline website (between 5.2% to 8.5% variance explained). The free NRT offer, clicks on online advertising, and stories about tax increases had significant but small impacts. Earned media was not associated with call volume.

Discussion: Call volume was most strongly impacted by broadcast media and visits to the quitline website, suggesting increased funding in these areas for future media campaigns. Environmental factors such media coverage of tobacco taxes had a smaller but significant impacts on call volume. Coordinating media efforts with environmental factors may be especially effective in increasing call volume.

Evaluation contract from the Florida Department of Health.

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POS4-79

SECONDHAND SMOKE RECOMMENDATIONS AND REFERRAL TO CESSATION SERVICES IN CLINICAL PRACTICES

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Objectives: Secondhand smoke (SHS) causes premature death and disease, and eliminating smoking in indoor spaces is the only way to fully protect nonsmokers from SHS exposure, and also helps smokers quit smoking. Primary health care providers can play an important role in expanding smoke-free environments by advising patients to avoid SHS exposure.

Methods: The purpose of this paper is to examine primary care provider (ob/gyns, pediatricians, internists, and general practitioners) advice regarding SHS exposure and referral to cessation programs. Using data from the 2008 DocStyles survey (n=1,454), we calculated the prevalence and adjusted odds ratios for offering patients advice regarding SHS exposure and referral of adults who smoke or use tobacco products to a cessation program, including a telephone quitline, a group class, or one-on-one counseling.

Results: This study found that over three-fourths of primary care providers encouraged parents to take steps to protect children from SHS exposure, to make their homes and cars smoke-free, or to avoid SHS exposure. Primary care providers who work in hospitals and clinics were more likely than those working in individual practices (adjusted odds ratio (AOR), 0.44; 95% confidence interval (CI), 0.25-0.78) or group practices (AOR, 0.48; 95% CI, 0.32-0.71) to consistently refer patients who smoked or used tobacco to cessation programs.

Conclusion: Primary care providers are advising patients to reduce exposure to SHS; however, further monitoring is required to promote compliance. Health care providers should advise all nonsmoking patients to avoid SHS exposure and should refer all patients who use tobacco products to cessation services.

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POS4-80

IS PHYSICAL ACTIVITY ASSOCIATED WITH IMPROVED SHORT-TERM SMOKING CESSATION?

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PURPOSE: The purpose of this study was to determine if a correlation exists between the number of cigarettes smoked and the amount of exercise leisure-time activity performed in heavy adult smokers who were motivated to quit smoking.

METHODS: Twenty-seven adult smokers (smoking ≥ 15 cigarettes per day for a minimum of 5 years) participated in the study. The subjects enrolled were motivated (scored ≥ 120 on motivation/confidence 0—200 scale) to quit smoking. Participants received a brief behavioral stop-smoking intervention at baseline, and were instructed to quit smoking within the next 48 hours. Subjects were followed for a total of two weeks during which time smoking behavior and exercise habits were recorded. The Godin Leisure-Time Exercise Questionnaire was administered at baseline and again at the end of weeks I and II (once a week for three weeks) to capture leisure time exercise habits. Smoking behavior was recorded (number of cigarettes smoked) daily.

RESULTS: It was hypothesized that individuals who smoke fewer cigarettes during a cessation attempt may tend to exercise more in their leisure time. It was also hypothesized that gender could play a role in the relationship between physical activity performed and number of cigarettes smoked. Baseline vigorous physical activity was not found to be statistically significant, but there was a trend towards decreased smoking rates at this intensity. Similarly, there was a trend at the vigorous intensity for weeks one and week two, but not at the mild or moderate intensity levels. When analyzed by gender, males contributed to this trend more.

FUTURE DIRECTIONS: The trends noted in the current study may indicate that vigorous level intensity could play an important role in assisting smokers in cessation attempts, while mild and moderate intensity level exercise may be less effective at doing so. Future studies with a longer follow up period and larger sample sizes should be conducted as current smoking cessation programs may greatly benefit from the inclusion of promoting healthy life style choices such as increasing physical activity levels.

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POS4-81

AGE, RACE/ETHNIC DISPARITIES IN PRE-PREGNANCY SMOKING AMONG WOMEN WHO DELIVERED LIVE BIRTHS, 2004-2008

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Introduction: Prenatal smoking prevalence remains high in the US. To reduce prenatal smoking, efforts should focus on delivering evidence-based cessation interventions to high-risk women before pregnancy. Our objective was to identify groups with the highest pre-pregnancy smoking prevalence.

Methods: We analyzed data from 186,064 women with a recent live birth from 32 states and New York City from the 2004-2008 Pregnancy Risk Assessment and Monitoring System (PRAMS), a population-based survey of postpartum women. We calculated self-reported smoking prevalence during the 3 months before pregnancy and 95% CIs for 6 maternal race/ethnic groups (non-Hispanic White, non-Hispanic Black, Hispanic, American Indian, Alaska Native, Asian/Pacific Islander) by maternal age (18-24 years=younger, ≥25 years=older). For each race/ethnic group, we modeled the probability of smoking before pregnancy by age adjusting for education, Medicaid enrollment, parity, pregnancy intention, state of residence, and year of infant birth.

Results: Younger women had higher pre-pregnancy smoking prevalence than older women overall (33.2%, 95% CI: 32.6-33.8 and 17.6%, 95% CI: 17.2-17.9, respectively) and in all race/ethnic groups. The highest smoking prevalence estimates were found in younger non-Hispanic Whites (46.4%, 95% CI: 45.5-47.4), younger Alaska Natives (55.6%, 95% CI: 52.8-58.4), and younger American Indians (46.9%, 95% CI: 42.8-51.2). After adjusting for confounders, younger non-Hispanic Whites, Hispanics, Alaska Natives, and Asian-Pacific Islanders were 1.12-1.50 times more likely to have smoked before pregnancy than their older counterparts.

Conclusion: Age-appropriate and culturally specific tobacco control interventions are needed to reach younger non-Hispanic White, Alaska Native, and American Indian women at risk for pregnancy.

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POS4-82

PART ART AND PART SCIENCE: DISSEMINATING TEEN SMOKING INTERVENTION INTO PRACTICE

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Achieving national health goals requires the availability of effective, adoptable interventions that enhance health and reduce disease risks. Currently, there is a major "translation gap" between teen smoking intervention research and practice. This gap reduces the speed at which effective interventions become widespread public health practice, especially among populations with the greatest disparities (Green, L. 2008). To that end, we describe the process of developing and testing a teen cessation intervention, Not On Tobacco (N-O-T), that was designed and evaluation research conducted with national dissemination in mind. Using N-O-T as a case example, we illustrate the utility of the RE-AIM (Glasgow, R. E., Lichenstein, E., & Marcus, A. C., 2003) framework for enhancing dissemination. Multiple N-O-T investigations, spanning a decade of research, are highlighted to demonstrate and support how the essential tenants of RE-AIM (i.e., Reach, Effectiveness, Implementation, Adoption, and Maintenance) contributed to N-O-T's impact nationally. Throughout the dissemination process, we observed that an intervention's potential for dissemination (e.g., "translatability") also includes factors such as relevance, feasibility, and acceptability to the target population, adaptability, and economic cost. Ultimately, widespread practice hinges on effective reach. Although N-O-T is touted as the most widely used teen cessation program in the US (Curry et al., 2007), the overall reach remains low relative to prevalence of teen smoking. For example, in WV, using the RE-AIM reach calculators, we determined that N-O-T reaches <1% of teen smokers; <5 % of trained facilitators are implementing routinely. In closing, we review our most salient lessons learned about the art and science of dissemination.

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POS4-83

THE PRIORITY GROUP INDEX: A NEW METHOD TO IDENTIFY TARGET POPULATIONS FOR SMOKING INTERVENTIONS

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Objectives: In determining how public resources are to be distributed in smoking interventions, priority groups need to be identified. Priority groups are often identified as those with high prevalence of smoking (a "high risk" lens). This approach can be problematic, however, as the majority of smokers belong to sub-populations other than those with high prevalence (a population lens). An evidence-driven approach to select priority groups is currently lacking. This presentation describes a new quantitative method to support the process of selecting priority groups for smoking

interventions, taking into account both "high risk" and population lenses.

Methods: The 2007 Canadian Community Health Survey was used to identify priority groups for smoking. The prevalence and population counts were calculated for each sub-population by socio-demographic characteristics, chronic disease risk factors and province. Logistic regression was used to estimate adjusted odds ratios (ORs) for each sub-population. A standard score was calculated for the prevalence and population counts for each sub-population as [prevalence (or population) estimate] minus [mean of the prevalence (or population) estimates] and divided by its standard deviation. A Priority Group Index for each sub-population was calculated by multiplying the adjusted OR by the sum of the standard scores of the prevalence and population estimates.

Results: The top 10 priority groups for smoking identified by the Priority Group Index corresponded with two groups identified by Prevalence (mood disorder and no regular doctor), four by Population Count (less fruit and vegetable intake, middle income, physical inactivity and male), one by OR (good general-health), and three by combinations of these other measures (high risk drinking, middle aged and living in a territory).

Conclusions: The "Priority Group Index" identified priority groups based both on high prevalence and large numbers of smoking population. By quantifying the process of selecting priority groups, this method has the potential to enhance the effective use of limited public health resources to identify sub-populations in need of attention.

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POS4-84

SNUS PERCEPTIONS: A QUALITATIVE STUDY AMONG SMOKERS

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Since 2006, the leading US cigarette companies have been investing in promotion and advertisement of "Snus" products marketed as line extensions of the popular Marlboro and Camel cigarette brands. These promotional efforts include direct mail marketing to smokers on cigarette company mailing lists, a channel of communication that is largely kept out of sight of the public health community. No studies have examined the reaction to this direct mail advertising and smokers' perceptions of the new Snus products. Focus groups were conducted in San Francisco and Los Angeles with mostly current smokers who were recipients of direct mail from the tobacco industry. Open-ended discussions assessed the perceptions of smokers about the new "Snus" products. Analyses were performed using a qualitative software tool, Transana, where the data was coded and discussed by the research team. Most participants were aware of snus advertising and many had tried free samples, although not all had tried smokeless tobacco products. Most participants reported a sense of uncertainty about the characteristics of Snus: they were aware that it was "different" from traditional chewing tobacco, but unclear about exactly why. Smokeless tobacco was perceived as a product used by "cowboys" and not urban smokers. Majority of smokers still identified strongly with being a smoker even if they tried the Snus. Major benefit of Snus was its use in smokefree environments. Another benefit was to avoid the social stigma associated with exposing others to secondhand smoke. Smokers failed to discuss harm-reduction aspects of Snus. Free samples were a major motivator to try the Snus. Some of the messages advertised by the industry appear to be reaching smokers, particularly that Snus is "different" from traditional smokeless tobacco, and is a good way to use in smokefree environments. Snus was not seen as an alternative to smoking, and it reinforced smokers' preference for smoking. The unappealing aspects of snus identified may be useful for tobacco control advocates to develop counter messages to discourage the uptake of Snus by new users and smokers who might have otherwise quit.

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POS4-85

RISK FACTORS FOR NICOTINE DEPENDENCE IN ADOLESCENCE

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OBJECTIVE: To identify the role of psychosocial and proximal contextual factors on level of nicotine dependence (ND) in adolescence.

METHODS: The data are from a multiethnic longitudinal cohort of 6th to 10th graders from a large urban school system. Five household interviews were conducted with adolescents and three with mothers over two years. A structural equation model was estimated to predict symptoms of nicotine dependence at Wave 5 among youths who had smoked cigarettes by the first interview (N=669). Covariates included a measure of nicotine dependence at Wave 1.

RESULTS: Pleasant initial sensitivity to tobacco use, parental ND, adolescent ND, extensiveness of smoking, conduct problems, and perceived peer smoking at Wave 1 had the strongest total effects on adolescent ND by Wave 5. Besides its direct effect, parental ND had indirect effects through pleasant initial sensitivity and extensiveness of smoking at Wave 1. The effect of pleasant initial sensitivity was mostly mediated by adolescent Wave 1 dependence and extensiveness of smoking at Waves 1 and 4. Parental monitoring at Wave 1 lowered Wave 3 conduct problems. The latter affected ND through Wave 4 extensiveness of smoking and perceived peer smoking. The model had greater explanatory power for males than females, with the total effect of conduct problems on Wave 5 dependence stronger for males than females.

CONCLUSION: Initial pleasant sensitivity to tobacco is the strongest determinant of ND in adolescence. Other than extensiveness of smoking, parental dependence is next in importance. The intergenerational transmission of ND from parent to child is both direct and indirect. It is mediated by physiological reactions to initial tobacco consumption, as well as parental monitoring of the child and conduct problems. The findings highlight the factors to be the focus of efforts targeted toward preventing ND among adolescents. Adolescent nicotine dependence develops within a matrix of initial subjective responses to cigarettes, and familial, behavioral, and interpersonal factors.

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POS4-86

COTININE IN DRIED BLOOD SPOTS (DBS) AS A BIOMARKER OF TOBACCO EXPOSURE

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Cotinine, a widely used biomarker of tobacco exposure is typically quantified in plasma or urine. DBS are collected routinely from newborns and children for lead screening. Therefore, thousands of samples are available to assess tobacco exposure. In addition, DBS can be collected and stored relatively easily in large epidemiology studies. To test the feasibility of using cotinine in DBS as a biomarker of tobacco exposure we carried out a pilot study of active and passive smokers. DBS and plasma samples were analyzed for cotinine. To analyze DBS, one to three 3.2mm punches were extracted then analyzed for cotinine and its metabolite 3'-hydroxycotinine (HCOT) by solid phase extraction, followed by liquid chromatography tandem mass spectrometry (LC/MS/MS). Plasma cotinine and HCOT levels were determined with a similar protocol. Plasma cotinine values for the active smokers ranged from 11 to 400ng/ml. DBS samples were analyzed in triplicate, these values agreed well with a mean percent standard deviation of 7.1±1.2. The values for active smokers (n=72) ranged from 19 to 797ng/g and correlated with plasma cotinine (r2, 0.91, slope, 1.78). HCOT levels in plasma and DBS were also quantified and the ratio of HCOT to cotinine, as a measure of CYP2A6 activity, was determined. The ratio was 0.38±0.25 in plasma and 0.35±0.24 in DBS (r2, 0.85). These values are comparable to those reported in the literature. Plasma cotinine values in the ETS exposed subjects ranged from not detected (<0.03ng/ml) to 7.8ng/ml. DBS cotinine values were determined on the 36 subjects with plasma cotinine greater than 0.5ng/ml. The correlation coefficient for duplicate analysis of these samples was 0.98. DBS cotinine levels in ETS exposed individuals correlated with plasma cotinine (r2, 0.87). These data confirm the validity of using cotinine levels in DBS as biomarkers of tobacco exposure. The LC/MS/MS method developed is now being applied to the analysis of DBS from newborns. In preliminary analyses of 11 samples, 3 had cotinine values of greater than 1ng/g DBS. The values were 82, 81 and 23ng/g reflecting plasma concentrations of 46, 45 and 13ng/ml, indicating recent smoking of the mother.

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POS4-87

PILOT STUDY OF AN ELECTRONIC DECISION SUPPORT SYSTEM TO ENGAGE SMOKERS WITH SEVERE MENTAL ILLNESSES INTO CESSATION TREATMENT

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Sixty to 90% of people with severe mental illnesses (schizophrenia and severe mood disorders) smoke cigarettes. Although 40% of this group tries to quit each year, these smokers usually attempt cessation without using treatment. Motivational interventions can engage this group into treatment, but they are not typically offered. Computerized interventions, such as electronic decision support systems (EDSS), are a promising strategy to engage smokers into treatment with minimal staff time and low cost. We developed a one-session EDSS that includes motivational exercises and information about cessation treatments tailored for people with severe mental illnesses. We report a second quasi-experimental pilot study of this EDSS. Sixty smokers consented to the study; 40 participants used the EDSS and 20 received a pamphlet (control group). Fifty-two (87%) were interviewed at 2- and 6-month follow-ups for clinician-verified treatment engagement (attended smoking cessation group, initiated cessation medication, or both). Chi-square analyses assessed between-group differences in outcomes; regressions assessed these outcomes while controlling for baseline differences. The participants included thirty-three (63.5%) smokers with schizophrenia, 40 (77.0%) of whom had a lifetime substance use disorder. They smoked 14.3±8.8 cigarettes/day. At 2 months, smokers in the EDSS group were more likely to have initiated treatment than those in the control group: for group, 17 (51.5%) vs. 0 (Chi-square=10.1, p=.001); for medication, 13 (39.4%) vs. 3 (17.7%; ns); for both group and medication, 13 (37.1%) vs. 0 (Chi-square=8.4, p=.004). Likewise, over the 6-month follow-up, more smokers in the EDSS group had initiated treatment than those in the control group: for group, 21 (60.0%) vs. 2 (11.8%; Chi-square=10.08, p=.001); for medication, 21 (60.0%) vs. 6 (35.3%; ns); for both, 18 (51.4%) vs. 2 (11.8%; Chi-square =7.6, p=.006). Regressions that controlled for between-group baseline differences confirmed the significant findings (p<.05) at the 6-month follow-up. These data suggest that computer programs such as this EDSS can engage this hard-to-reach group into smoking cessation treatment.

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POS4-88

UNIQUE DENTAL SCHOOL BARRIERS TO IMPLEMENTING TOBACCO TREATMENT INTO CLINICAL ENCOUNTERS: LOMA LINDA UNIVERSITY

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INTRO: Traditionally, minimal didactic & clinical education to treat tobacco dependence is included in U.S. Dental Schools curricula. The greatest challenge has been to change the culture that surrounds treatment of tobacco dependency; to change the way dental professionals think & feel about the necessity to integrate the care & treatment of this multi-dimensional addiction into the dental practice setting.

METHOD: A Palo Alto Center for Pulmonary Disease Prevention grant (2007-2009) prompted the Loma Linda University School of Dentistry to form a Tobacco Treatment Committee (TTC). Three surveys were conducted in 2008: (1) school-wide curriculum mapping for tobacco; (2) faculty; and 3) students' comfort level, knowledge, willingness, and actual clinical experience in treating tobacco dependent patients.

RESULT: After the surveys, the TTC: (1) increased didactic hours integrated into multiple departments with 8 hours for dental and 4 hours for dental hygiene students; (2) multiple 'tobacco specialists' presented seminars to both faculty and student forums focusing on management of tobacco dependence in the dental practice setting; and (3) modifications were made in the computerized clinical chart system both in health history and treatment sections. Despite these changes, only minimal improvements in patient education and treatment were observed. Based on interviews and current chart evidence, clinical teaching faculty are still hesitant to go beyond advising patients to prescribe medications, & manage tobacco users through dental assessment, treatment and continuing care.

CONCLUSION: Current barriers include: perceived lack of clinical competence, administrative and faculty commitment, and no reimbursement or "clinic credit" given for treating tobacco dependence. The TTC is investigating ways to identify and nurture "tobacco treatment champions." These key faculty would develop expertise and understand the complexities of treatment in the Dental School setting, to act as guides and mentors to students and other faculty. Our goal is to facilitate competent, evidence-based treatment of every patient who presents at the University dental clinics.

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POS4-89

PERSONALITY AND IMPULSIVITY BETWEEN SMOKERS AND NEVER SMOKERS WITHOUT PSYCHOPATHOLOGY

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INTRODUCTION: Cloninger's neuropsychopharmacological theory of personality identifies four temperament traits and three character traits that are largely heritable and are associated with addictions. Several studies had shown that smoking is associated with specific personality traits such as high Harm Avoidance and low Self Directedness. Knowledge about these associations may be useful to clinicians to tailor counseling. The goal of this study was to set the dimensions of a personality and impulsivity scale that best differentiate individuals that have no history of smoking from smokers.

METHODS: Participants: 80 individuals, 50% were men. The average age of subjects was 37.5 years (SD 14.8), from 18 to 65 years. Of the total sample, 42 (52.5%) were never smokers NS and 38 (47.5%) patients were smokers S. We included individuals that had a level of dependency medium to high according to the modified version of the FTND. Patients had an average of 6.4 points (SD 1.5) in the test. All participants signed a letter of informed consent and were interviewed with the SCL-90 to exclude psychopathology. Personality was assessed with the Temperament and Character Inventory (TCI) and Impulsivity with the Plutchik Impulsivity Scale (PIS).

RESULTS AND DISCUSSION: In order to evaluate the differences between the group of smokers and non-smokers in each of the subscales of the TCI and the PIS, we conducted a t test for independent samples. We found statistically significant differences between smokers and nonsmokers in the dimension of self-directedness (t = 3.44, p = 0,001). Furthermore there is a trend toward a personality profile that discriminates between S and NS based on this dimension of character. Statistically significant differences were found between S and NS in the variables of self-control (t = -2.69, p = .009), planning (t = -4.02, p = .000), spontaneous activity (t = -3.25, p = 0.002) and total score of impulsivity (t = -3.88, p = 0.000) being in all constructs the S more impulsive than NS. In general, the trend in this dimension (impulsivity) is clear, even though only two subscales of the PIS showed significant differences.

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POS4-90

A NATIONAL SMOKING CESSATION INITIATIVE: INTEGRATING SMOKING CESSATION BEST PRACTICES INTO DAILY NURSING PRACTICE

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Despite recent advances in tobacco control, approximately 17.9% of Canadians continue to smoke. Evidence suggests that if health care professionals (HCPs) provide even minimal intervention for smoking cessation (SC) with their clients, the impact on smoking rates would be overwhelming. As the largest health care provider group in Canada, Registered Nurses (RNs) working in all sectors in health care throughout the country, are well positioned to play a key role in SC. While HCPs agree smoking cessation interventions are a priority, the challenge remains for RNs to integrate evidence-based SC interventions into their daily practice. The Registered Nurses' Association of Ontario (RNAO) is the professional association representing the nursing profession in Ontario. The RNAO's clinical practice guideline titled, "Integrating Smoking Cessation into Daily Nursing Practice" contains recommendations to support the integration of SC best practice into nursing practice, education and organization/policy. Since 2007, the RNAO has led a successful Ontario-based SC Best Practice Initiative, which aims to build nursing capacity to integrate SC best practices into daily practice through knowledge transfer, mobilization of networks, and integration of current services and programs. In 2010, this program was expanded across Canada, using similar strategies as the Ontario-based project. Public health agencies across Canada, utilizing the expertise of Public Health Nurses, facilitate SC knowledge transfer and activities; targeting local healthcare settings and creating a network of SC Champions, who disseminate and

implement SC best practices within their workplaces. The Ontario and National RNAO SC Best Practice Initiatives educate and support nurses and other HCPs as SC Champions within their organizations, with the belief that if every nurse integrates SC best practices into his/her daily practice with all clients, families, and communities across all health care sectors (acute care, long term care, rehabilitation, home/community and public health), the impact on tobacco use/smoking cessation rates would be significant.

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POS4-91

LEADERSHIP ROLE OF PUBLIC HEALTH NURSES IN SMOKING CESSATION

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A five-year Nursing Best Practice Smoking Cessation government funded Initiative was launched by a major nursing association. This initiative used a multiple pronged approach to increase the capacity of public health nurses in integrating smoking cessation (SC) best practices into daily practice of nurses and others; and to promote uptake of a SC Best Practice Guideline (BPG) at the organizational, team and system levels. An evaluation was conducted using a mixed-method approach. Quantitative data (i.e., web survey) and qualitative data (case studies) were used to measure general progress and practice and policy changes, as well as to better understand the implementation processes to successful adoption of the BPG. This presentation will highlight the findings from the evaluation focusing on; (1) the critical leadership role of Public Health Nurses (PHNs) in promoting systems wide practice and policy changes, (2) the engagement of SC Champions to promote SC BPG uptake, and (3) the successful uptake of the SC BPG amongst nurses, which has resulted in increased perceived levels of comfort and confidence in addressing SC in their practice and impact on clients. Results support the value of a multiple pronged approach related to planning, developing and implementing SC best practices, as well as the impact of policy changes at the organizational and system levels. Overall, the SC Initiative was considered extremely effective in influencing practitioners to incorporate smoking cessation interventions, and, through a major federally funded initiative, its approach is being utilized to implement the SC BPG across the nation.

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POS4-92

PREDICTORS OF WHAT SMOKERS SAY THEY WILL DO IN RESPONSE TO FUTURE PRICE INCREASES: FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL (ITC) FOUR COUNTRY STUDY

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Introduction: Given the impact of higher tobacco prices on smoking cessation, we studied the role of future cigarette prices on forming expectation about smoking behavior.

Methods: Using a random sample of 9,058 adult cigarette smokers from the United States (US), Canada, Australia and the United Kingdom (UK) collected in 2002 we examined predictors of what smokers say they will do in response to a hypothetical 50% increase in the price they paid for their last cigarette purchase. A series of regression analyses examined factors associated with intentions that have a positive impact on health, i.e., intentions to quit and/or to consume fewer cigarettes.

Results: The quit and/or smoke less intentions were more pronounced among those who lived in areas with higher average cigarette prices and who paid higher prices for their brand of choice during the last purchase. The magnitude of the price increase is more important predictor of an intention to quit/smoke less compared to the average cigarette price.

Conclusions: The availability of alternative (cheaper) cigarette sources may reduce, but would not eliminate the impact of higher prices/taxes on smokers' expected behavior that has been linked to actual quit intentions and quitting in follow up surveys.

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POS4-93

THE DECLINING EFFECTIVENESS OF THE CANADIAN WARNING LABELS ON CIGARETTE PACKS: FINDINGS FROM THE ITC CANADA SURVEY, 2002-2009

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BACKGROUND: In December 2000, Canada became the first country to introduce graphic images on health warning labels on tobacco products, inspiring other countries to do the same and for the WHO Framework Convention on Tobacco Control to call for worldwide implementation of "Canadian warning labels." Over the last decade, however, the Canadian labels have remained unchanged, leaving them vulnerable to the well-documented effects of wearout—the declining effectiveness of messages over time. There is thus a need to examine how the effectiveness of the Canadian warnings has changed over time.

METHODS: Key indicators of label effectiveness collected in the International Tobacco Control (ITC) Canada Survey—a longitudinal cohort random digit dialed telephone survey of a nationally representative sample of about 2,000 Canadian adult smokers (with replenishment of respondents lost to attrition at each survey wave), part of the 20-country ITC Project—were analyzed with respect to their time trends over 7 survey waves--from 2002 to 2009.

RESULTS: Between 2002 and 2009, each of the 7 key indicators of label effectiveness declined significantly in Canada. Smokers became less likely to report seeing information about the harms of smoking on cigarette packs (80% to 62%), noticing the warning labels "a lot" (60% to 42%), or reading them closely (32% to 16%). They also were less likely to report avoiding looking at the labels (32% to 14%), and that the labels make them think about the health risks of smoking (17% to 12%), made them more likely to quit (8% to 5%), or made them forgo a cigarette (18% to 13%). All declines were significant ($p<.001$).

DISCUSSION: In the ten years since Canada introduced graphic warning labels, their effectiveness has declined on all indicators of label effectiveness. These findings demonstrate the need for revising/refreshing warning labels in a timely manner and have implications for countries, such as the United States, which are in the process of implementing new health warnings consistent with the FCTC.

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POS4-94

SMOKE-FREE HOUSING POLICIES: STUDENT OPINIONS AT A NORTHEAST PUBLIC UNIVERSITY

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Purpose: The growth in smoke-free housing units has skyrocketed in recent years. In the public housing arena alone, the number of housing authorities adopting smoke-free policies for some or all of their buildings has increased by 6700% in one decade. This vast public interest, together with underlying acknowledgment of the dangers of second-hand smoke and the importance of University students to the local renting economy forged a partnership between a regional Tobacco Control Unit and a public university in the Northeast to conduct research. The purpose of this study was to optimize the understanding of off-campus students' attitude and behaviors towards smoke-free housing.

Design/Methods: The survey contained a total of 46 questions with multiple choice answers, 10 of which were tobacco related. After gaining IRB approval from New York State and the University, email invitations to participate in the survey were sent to 1814 off-campus students. Of the 383 respondents (participation rate of 21%), 352 students

completed the survey (completion rate of 92%). The data were analyzed by both organizations using StudentVoice, Excel, and MatLab.

Results/Outcomes: The study found that 92% of the students surveyed preferred some type of smoke-free policy; 73% preferred that smoking be only allowed outside or not allowed at all where they lived. The study also revealed that if an available house was smoke-free, 89% of the respondents, even those who self-identified as smokers, would rent it immediately and take their smoking outside. Implications: This study found an overwhelming interest in smoke-free housing from a student-tenant's perspective, rejecting the hypothesis that students would value having their freedom more than being restricted with a smoke-free policy. The findings from this study have been utilized to educate landlords about the potential market of smoke-free housing. Future research is needed in other college towns where students make up an important part of the renting population to determine their needs and interest, and for the landlords to "catch-up" with such demand.

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POS4-95

INDOOR AIR QUALITY IN PUBLIC PLACES DURING RAMADAN: AMMAN, JORDAN

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Background: Exposure to secondhand tobacco smoke (SHS) is a major cause of preventable disease and death in the Eastern Mediterranean Region (EMR), yet few countries in the region have enacted smokefree policies to protect the public's health. However, during the period of Ramadan, a number of EMR nations enforce a no smoking policy in public places during daylight hours, when observant Muslims abstain from eating, drinking, and smoking. The purpose of this investigation was to assess how smoking abstinence during Ramadan affects indoor air quality in public places in Amman, Jordan. For comparison purposes, measurements were taken prior to Ramadan in a sample of smoking-permitted venues and venues with a voluntary smokefree policy.

Methods: Particulate matter of 2.5 microns or less (PM2.5), a marker of SHS, was measured among a convenience sample of 16 public venues in Amman, Jordan during Ramadan of 2010. Measurements were taken both before (smoking-prohibited) and after (smoking-permitted) the evening meal (Iftar) for each venue. For comparison, measurements were taken prior to the Ramadan period among an additional sample of 14 public venues, of which four were voluntarily smokefree.

Results: The median PM2.5 level for the 16 venues measured before Iftar was 11 µg/m3, while the median particulate level for the same venues measured after Ifar was 275 µg/m3 (Wilcoxon z=4.827; p<0.001). Prior to Ramadan, the 4 venues with a voluntary smokefree policy had a median PM2.5 level of 50 µg/m3, while venues where smoking occurred had a median level of 305 µg/m3 (Wilcoxon z=2.687; p=0.007).

Conclusions: Indoor particulate pollution dramatically increased in public venues in Amman, Jordan after the religious abstinence from smoking was broken at sundown. Such data may be helpful in educating Jordanians, and possibly citizens of other EMR nations, on the dangers of SHS. The results suggest that a comprehensive smokefree policy covering all days and times, will help to protect the public from SHS exposure in Jordan.

Action on Smoking and Health International.

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POS4-96

SECONDHAND SMOKE (SHS) EXPOSURE LEVELS IN PUBLIC PLACES IN THAILAND TO DEVELOP EVIDENCE FOR SMOKE-FREE POLICY

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Objective: To support smoke-free policy development and implementation by determining levels of SHS exposure in selected public places and to disseminate the findings and analysis to key stakeholders and decision makers.

Results: Data was collected from various public places using air nicotine and PM 2.5. The results of PM2.5 in public places were generally low, except in entertainment venues where the mean PM 2.5 levels exceeded the WHO daily standard. Further, no smoker was observed in any of the 26 buildings sampled for PM 2.5, with signs prohibiting smoking posted in 77 percent of the buildings sampled. Even in buildings with some sign of smoking present (smell or cigarette butts), only entertainment venues had a mean elevation in PM 2.5 above the 25 microgram/cubic meter standard at 46 micrograms/cubic meter. By comparison, India, with lower smoking rates than Thailand, had mean exposure levels both outdoors and indoors that were four times the WHO standard, with observed smoking reported in 80% of government buildings. Similarly, the Philippines, with higher smoking rates, had observed smoking in all building types sampled, but with a lower percent in hospitals and government buildings. PM 2.5 levels were lower indoors than outdoors, but still exceeded the WHO standard slightly in hospitals, by four times in restaurants and by 6 times in entertainment venues.

Conclusion: Despite the need for more education and enforcement of the smoke-free law in entertainment venues, Thailand's incremental expansion to 100% smoke-free coverage has resulted in comparatively lower secondhand smoke exposures for non-smokers through compliance in most public buildings as compared to India and the Philippines.

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POS4-97

COMPLIANCE WITH SMOKE-FREE LAW IN THAI GOVERNMENT SERVICE BUILDINGS

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Survey and environmental measures were used to characterize compliance with smoking bans in government land, municipal and district buildings routinely visited by the public. Both survey data self-reporting level of compliance in 4,534 government offices and monitoring of PM 2.5, small airborne particle levels indicating the presence of smoking in 242 of these offices in 4 regions in Thailand, were used to see if recent actions to improve compliance had resulted in better compliance. Survey data collected by the Tobacco Control Research and Knowledge Management Center showed that 66.1% of offices reported policies prohibiting smoking, while 25.4% reported partial smoke-free policy or practice, with the remaining 8.5% without any policy. Actual exposure measurements in government offices showed that PM 2.5 levels varied by region, though levels were low in most government offices. Factors that increased level of compliance, seen through lower PM 2.5, included the presence of no smoking posters and stickers and the absence of ashtray stands in the buildings. Physical inspection and monitoring of actual exposure levels provided insight into actions that might be taken to improve compliance. Efforts to improve compliance with smoke-free bans through a simple survey to government officials, public signage, and removal of accommodations for smoking do show compliance improvements in Thailand. Both self-report and environmental monitoring was helpful in identifying factors important to compliance.

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POS5-1

ASSESSING ADOLESCENT SMOKING PATTERNS: THE WEEKEND PHENOMENON

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Introduction: Adolescent cigarette smokers may have more daily variability in their smoking patterns than their adult counterparts. To design more effective treatment strategies for teen smokers, it may be important to understand these smoking patterns through use of measures that are able to capture this variability. Methods: Adolescent smokers seeking cessation treatment (N = 366) reported the number of cigarettes smoked on each day of a typical week. A paired t-test was used to examine differences between weekday (Sunday-Thursday) and weekend (Friday-Saturday) smoking. Main effects and interactions for race/ethnicity and gender were assessed using a 2-way ANOVA for the following variables: typical weekly smoking, average weekday cigarettes, average weekend day cigarettes, and difference between weekday and weekend day smoking. Scheffé post hoc tests were used to analyze any statistically significant differences. Results: There was significantly more weekend day smoking compared to weekday smoking, $p < .001$. The difference in weekday versus weekend smoking levels was larger for females than for males, $p < 0.05$. Hispanics reported less typical weekly smoking, $p < .001$, less weekday smoking, $p < .001$, and less weekend day smoking, $p < .01$, compared to Caucasians and multi-racial teens. There was no difference in weekend day versus weekday smoking by race/ethnic background. Conclusions: Using a more detailed assessment of smoking quantity captures patterns of adolescent smoking that may lead to more effective smoking cessation interventions.

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POS5-2

PARENTAL MONITORING AND DELAY DISCOUNTING: ASSOCIATED RISK FACTORS FOR ADOLESCENT CIGARETTE SMOKING

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Parental influence and social peer networks are two of the most consistent predictors of cigarette smoking during adolescence, both indirectly and directly (Flay et al., 1994). For example, having parents who smoke and having peer friends who smoke are both highly predictive of cigarette smoking initiation during adolescence. Additionally, parental monitoring (i.e., the degree to which parents monitor the activities of their children) provides protective effects against initiation of smoking (e.g., Piko & Kovacs, 2009). For the current study we examined the relationship between a novel behavioral characteristic of mothers (i.e., the degree to which they discounted by delay—an index of impulsive decision-making) as related to their children's ratings of parental monitoring. It was hypothesized that greater discounting (i.e., greater impulsivity) would be associated with less monitoring. Additionally, to further explore risk of smoking, we obtained child self-reports about the proportion of their friends who smoked. The study participants were 55 mother/child dyads, with children between 13 and 15 years of age. All participants completed a single laboratory session of approximately 2 hrs. Regression analyses revealed that, as hypothesized, delay discounting by mothers was a significant predictor of parental monitoring ($F = 5.94$, $p = .018$). Moreover, children who reported less monitoring reported that a greater proportion of their friends smoked ($F = 7.97$, $p = .007$), further demonstrating an increased risk of smoking. These findings suggest that delay discounting may be a behavioral characteristic that influences parental monitoring. Future research and efforts to improve monitoring may benefit from a better understanding of how delay discounting by the parents contributes to this important parenting variable.

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POS5-3

TOWARD IMPROVED METHODS FOR ANALYZING COTININE-BIOMARKER HEALTH ASSOCIATION DATA

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Introduction: Serum cotinine, a metabolite of nicotine, is frequently used in public health research as a biomarker of recent exposure to tobacco smoke. Historically, suboptimal statistical methods have been applied when serum cotinine values below the limit of detection (LOD) have been included in secondhand smoke (SHS) research.

Methods: We compared commonly used methods for analyzing serum cotinine data with LOD using parametric and nonparametric techniques using the data from the 1999-2004 National Health and Nutrition Examination Surveys (NHANES). To illustrate the differences in estimates obtained by different analytical methods, serum cotinine with LOD, age, gender, race/ethnicity, and secondhand smoke exposure were regressed on the inflammatory biomarker, homocysteine. The primary objective was to compare the parameter estimates, which quantified the relationship between homocysteine and serum cotinine with LOD, using the different statistical methods.

Results: Parameter estimates and statistical significance for serum cotinine varied according to different statistical methods. Single imputation methods yielded similar estimates and significance; multiple imputation methods yielded smaller estimates than the other methods and without statistical significance.

Conclusions: The multiple imputation method used here did not yield statistically significant parameter estimates. Improved sensitivity in the serum cotinine assay revealed stronger associations with the inflammatory marker homocysteine, suggesting that continued improvements in assay sensitivity may lead to the identification of new and established adverse health effects even at very low levels of secondhand smoke exposure. Additional research is needed into the identification of optimal statistical methods for the analysis of secondhand smoke exposure indicators subject to LOD.

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POS5-4

REDUCTIONS IN CORTISOL DURING SHORT-TERM SMOKING ABSTINENCE VARY BETWEEN NON-MENTHOL AND MENTHOL CIGARETTE SMOKERS

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Although many research studies provide evidence for the association of smoking mentholated cigarettes with greater difficulty in quitting smoking (Pletcher et al., 2006; Gandhi et al., 2009), the reasons for this relationship are unclear. Stress biomarker research has shown that cortisol levels in smokers decrease in response to short-term abstinence (Ussher et al., 2006), and that the magnitude of this initial decrease may be related to relapse rates (al'Absi et al., 2004). Because no research to date has examined the relationship between mentholated cigarettes and cortisol, the present study explored this relationship during both ad lib smoking and short-term abstinence. Participants (N=13) aged 19-34 (M = 22.85±1.28) who smoked >10 menthol (N=5) or non-menthol (N=8) cigarettes/day completed both ad lib smoking and 24 hour abstinence sessions in counter-balanced order. During each session, participants supplied initial CO samples, then provided saliva samples later assayed for cortisol and cotinine. Participants refrained from smoking 24-hrs prior to the abstinence session; abstinence was confirmed via CO<10 ppm. CO and cotinine values were lower during 24-h abstinence sessions for all participants (p's<0.01), though there was no difference in cortisol. CO and cotinine levels were similar among menthol and non-menthol smokers during both sessions. However, there was a session type x cigarette type interaction on cortisol levels ($p<0.01$) such that cortisol levels in non-menthol smokers were lower during abstinence than ad lib smoking cessation ($p<0.01$), yet cortisol levels in menthol smokers were not significantly different between sessions. Thus, although it may be hypothesized that menthol (vs. non-menthol) cigarettes are associated with decreased cortisol levels during short-term abstinence since both measures are associated with poor quit outcomes, this study found an abstinence-induced decrease in cortisol only for non-menthol smokers. Larger, long-term studies are needed to confirm if these relationships persist and to determine if the effects of menthol and non-menthol cigarettes on cortisol are related to relapse.

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POS5-5

DIFFERENTIAL REDUCTION IN ADMISSIONS FOR ACUTE MYOCARDIAL INFARCTION IN PUBLIC AND PRIVATE HOSPITALS AFTER A NATIONAL SMOKING BAN

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Introduction: Several studies in developed countries have shown reduction of acute myocardial infarction (AMI) after the introduction of a smoking ban in public places. We conducted the first study in a developing country showing a 17.1% reduction of admissions in the two years following the ban.

Objective: Analyze the AMI admissions in public and private hospitals in relation to smoking ban. Methods. We analyzed the admissions for AMI two years before and after the smoking ban were introduced on March 2006. All country residents admitted with a primary diagnosis of AMI (code I21, ICD-10) were included. Data collection was performed retrospectively by physicians or nurses at each hospital. Duplicate data from patients admitted to more than one hospital over the same AMI were discarded. Three age groups were considered: <45, 45-64 and ≥65 years. Statistical analysis was performed with chi2 test.

Results: 7,949 patients from 37 hospitals, who accounted for 79% of admissions for AMI in Uruguay, were included (<45=331, 45-64=3111, ≥65=4507). In 24 private hospitals 5311 patients were admitted (2994 before and 2327 after, 22.0% reduction) and 2638 were admitted to 13 public hospitals (1362 before and 1276 after, showing a reduction of 6.3%), $p<0.05$. Within the age groups in private hospitals the reduction was 38.1%, 17.5% and 23.5% respectively ($p>0.05$) while in public hospitals a 39.1% and 10.8% reduction was observed in the first two age ranges and an increase of 3.4% in the third ($p<0.05$).

Conclusion: The smoking ban in public places was associated with smaller reduction in AMI admissions in public hospitals than in privates. In younger patients, the reduction was similar in public and private hospitals, but in public hospitals, which assist lower socioeconomic groups, the reduction was smaller in middle age and there were a small increase in oldest.

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POS5-6

MULTILEVEL ANALYSIS OF THE DETERMINANTS OF SMOKING AND SECONDHAND SMOKE EXPOSURE IN RURAL YUNNAN PROVINCE, CHINA

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Background: This study simultaneously examined contextual and individual level of demographic variables on smoking and exposure to secondhand smoke (SHS) in Tong Hai County, an economically advantaged tobacco cultivating rural area in south-west China.

Methods: The cross-sectional survey was conducted in rural southwest China population aged ≥18 years consisted of 4,070 consenting individuals in 2010. Each participant was interviewed using standard questionnaire. Information on demographic characteristics, status of current tobacco smoking and SHS exposure were obtained. Multilevel logistic regression was used to model the variation in prevalence of smoking and exposure to SHS.

Results: Among the study populations, the prevalence of smoking and exposure to SHS was 63.5% and 74.7% for males, and 0.6% and 71.2% for females, respectively. Both contextual and individual variables were associated with smoking and exposure to SHS. Age was negatively associated with the probability of tobacco use and exposure to SHS, and males were more likely to consume tobacco than females. Individual educational level was negatively associated with smoking, whereas showed no association with exposure to SHS. Adults who grew tobacco were more likely to consume tobacco and to be exposed to SHS. People living in a higher income community were associated with a lower rate of smoking and exposure to SHS.

Conclusions: Future contextual interventions on smoking and exposure to SHS in parallel with those at individual level are needed in China. The inverse association of contextual income level with smoking and exposure to SHS suggests that the poor rural communities rather than the rich ones still have been the target for future intervention programs.

The study was funded by the Bill and Melinda Gates Foundation through a grant to Emory University's Global Health Institute, U.S.A.

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POS5-7

EVALUATING THE IMPLEMENTATION OF CIGARETTE PACKAGE LABELLING POLICY IN 12 COUNTRIES

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Background: With growing restrictions on advertising, the cigarette package has become a primary marketing tool. The Framework Convention on Tobacco Control (FCTC) contains guidelines on health warning and promotional labeling, which have been incorporated into domestic legislation in many countries.

Objective: To assess compliance with FCTC guidelines and domestic legislation of labeling on cigarette packets from 12 countries at different levels of economic development. Methods: Researchers from 12 countries were asked to send packs of at least 5 different types of commonly consumed cigarettes between December 2007 and April 2008 (N=115). The countries from high income regions were - Australia, Germany, Canada; high middle income - Chile, Brazil, Argentina, Malaysia, Colombia, Iran; and low middle income - China, India, and Pakistan. All labels on these packs were counted and evaluated for content, location, and size using a structured data collection instrument.

Results: Health warnings were present on all packs; 68% of boxes had these on the front or back panels (defined collectively as the principal display area [PDA]), while the remainder had them on the side panels. Only in Australia, Germany, Canada, and Chile did health warnings meet or exceed the FCTC recommended size of 30% or more of the packet's PDA. Iran and India had the largest discrepancies between legislated requirements (50% of PDA) and observed label size – 2% and 4% respectively. Boxes from high income countries had an average of 3.0 warnings/pack compared to 1.4 warnings/pack in low income countries. Promotional labels were widespread, found on packets from all countries and more numerous (though not necessarily larger) than health warning labels in all countries except Canada and Chile. The average number ranged from 1.4 labels/pack (Argentina) to 5.4 labels/pack (Iran). Deceptive terms such as "light" and "mild" were observed on 42% of all packets examined.

Conclusions: Legislation on health warning and promotional labeling is poorly enforced, particularly in lower income countries. It is essential to monitor not only the existence of legislation but also to evaluate its implementation.

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POS5-8

PRELIMINARY FINDINGS OF EVIDENCE-BASED AND CULTURALLY TAILORED TOBACCO DEPENDENCE TREATMENTS FOR KOREAN AMERICANS

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This is the first behavioral therapy development study of nicotine dependence that was tailored to Korean culture. The aims of the study were to develop a culturally tailored treatment and to examine its feasibility and effectiveness with Korean American smokers. The design was a two-armed, randomized controlled study and conducted with 30 Korean Americans (23 men and 7 women). Group assignment was stratified by gender and carried out by a computer-generated random number at a one-to-one ratio. The therapy group received eight weekly, 40-minute individual counseling sessions and eight weeks of nicotine replacement therapy with patches, whereas the comparison group received eight weekly, 10-minute brief medication counseling and eight weeks of nicotine patches. By intention-to-treat analysis, abstinence rate (the 7-day point prevalence) at 4-week and 3-month follow-up was 78.6% (11/14) and 71.4% (10/14) in the therapy group and 56.3% (9/16) and 31.3% (5/16) in the comparison group, respectively. The difference between the two groups was significant ($p = 0.028$) at 3-month follow-up. The self-report abstinence at the 3-month follow-up was validated with exhaled breath CO and saliva cotinine levels. Compared to baseline data, significant changes were found in perceived risks of quitting ($t = 4.97$, $p = .000$), and perceived self-efficacy ($Z = 5.23$, $p = .000$) at post-treatment. Findings suggested that the culturally tailored nicotine dependence treatment is effective for Korean American smokers although long-term treatment effect needs to be further investigated.

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POS5-9

SOCIOECONOMIC DIFFERENCES IN THE EFFECTIVENESS OF THE REMOVAL OF "LIGHT" AND "MILD" DESCRIPTORS ON CIGARETTE PACKS: FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL (ITC) THAILAND SURVEY

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Many smokers incorrectly believe that "light" cigarettes are less harmful than regular cigarettes. To address this problem, many countries have banned "light" or "mild" brand descriptors on cigarette packs. Our objective was to assess whether beliefs about "light" and "mild" cigarettes changed following the 2007 removal of these brand descriptors in Thailand and, if a change occurred, the extent to which it differed by socioeconomic position. Data were from waves 2 (2006), 3 (2008), and 4 (2009) of the International Tobacco Control (ITC) Thailand Survey of adult smokers in Thailand. The results showed that, following the introduction of the ban, there was an overall decline in the two beliefs that "light" cigarettes are less harmful and smoother than regular cigarettes. The decline in the "less harmful" belief was considerably steeper in lower income and education groups. However, there was no evidence that the rate of decline in the "smoother" belief varied by income or education. Removing "light" and "mild" brand descriptors from cigarette packs should be viewed not only as a means to address the problem of smokers' incorrect beliefs about "light" or "mild" cigarettes, but as a factor that can potentially reduce socioeconomic disparities in smoking-related misconceptions.

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POS5-10

THE EFFECTIVENESS OF TOBACCO MARKETING REGULATIONS ON REDUCING SMOKERS' EXPOSURE TO ADVERTISING AND PROMOTION: FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL (ITC) FOUR COUNTRY SURVEY

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Introduction: Exposure to tobacco product marketing promotes the initiation, continuation, and reuptake of cigarette smoking, and as a result the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) has called upon member Parties to enact comprehensive bans on tobacco advertising and promotion. This study examines the immediate and long-term effectiveness of advertising restrictions enacted in different countries on exposure to different forms of product marketing, and examines differences in exposure across different socioeconomic status (SES) groups.

Methods: Nationally representative data from the United Kingdom, Canada, Australia, and the United States, collected from adult smokers between 2002 and 2008 using the International Tobacco Control Four Country Survey (ITC-4), were used in this study (N = 21,615). In light of the specific marketing regulation changes that occurred during the course of this study period, changes in awareness of tobacco marketing via various channels were assessed for each country, and for different SES groups within countries.

Results: Tobacco marketing regulations, once implemented, were associated with significant reductions in smokers' reported awareness of pro-smoking cues, and the observed reductions were greatest immediately following the enactment of regulations. Changes in reported awareness were generally the same across different SES groups, although there were some exceptions noted.

Conclusions: While tobacco marketing regulations have been effective in reducing exposure to certain types of product marketing, there still remain gaps, especially with regard to in store marketing and price promotions.

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POS5-11

ASSESSING THE ATTITUDES, BELIEFS, PERCEPTIONS, AND PRACTICES SURROUNDING TOBACCO USE AND EXPOSURE AMONG PREGNANT WOMEN IN THE DOMINICAN REPUBLIC

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Purpose: The purpose of this study is to assess the attitudes, beliefs, perceptions, and practices regarding tobacco use and exposure among pregnant women in the Dominican Republic.

Methods: An exploratory concurrent mixed methods research design was used with the qualitative component (n=28) assessing the attitudes, beliefs, perceptions, and practices surrounding tobacco use and exposure and a quantitative component (n=192) consisting of survey data examined pregnant women's tobacco use, second-hand smoke exposure, knowledge about risks of smoking and benefits of quitting, and attitudes toward women's tobacco use and exposure. All data were collected in the same public health hospitals in Santiago, Dominican Republic between April and August 2009.

Results: Findings from the data suggests that respondents perceived an overall high prevalence of smoking in their respective communities, and a perceived increase in the prevalence of smoking among women. Reference to the mandated general health warning "Fumar es Prejuidicial para la Salud" was common, and knowledge regarding specific health risks related to smoking for both women and their unborn children was limited, with 97% of respondents believing tobacco use is harmful and only 33% believing it can cause illness. Secondhand smoke exposure was frequent among respondents who reported being exposed to secondhand smoke by family members, spouses, friends, and/or neighbors, with 76% allowing smoking in their household. Rates of self-reported secondhand smoke exposure among pregnant women were 31% and over half reported their young children being exposed to secondhand smoke, 57%. Within this sample, 5% reported being an ever regular smoker and among these ever regular smokers, half are current smokers (n=5) and half are ex-smokers (n=5). Among all women, 14% reported experimenting with smoking and 6% stated they will likely resume or begin smoking within the next year.

Conclusions: Using a mixed methods approach for areas in which little or no data are available allows for a deeper understanding of complex public health issues and can assist in the development of effective and comprehensive public health practices.

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POS5-12

INTEGRATING IVR TECHNOLOGY WITH AN EXISTING QUITLINE: EXPERIENCE WITH TWO RCTS

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Interactive voice response (IVR) technology is a feasible and cost-effective method for patient follow-up and disease management in chronic illness, psychological assessment, monitoring drug and alcohol consumption, and has been used to collect data in clinical trials. We have integrated IVR technology into existing quitline services in two randomized tobacco intervention clinical trials. The results will test the use of IVR technology for improving reach and effectiveness of smoking cessation treatment. The purpose of the Technology Enhanced Quitline (TEQ) trial is to test the efficacy of using IVR technology to detect relapse risks among smokers enrolled in quitline services and deliver risk-based counseling at the point of need. The three group trial tests low (10 calls) vs. high (20 calls) intensity IVR monitoring compared to standard care. Of the 4,243 scheduled IVR calls, 1958 assessments were completed (46%); 432 (22%) screened positive for relapse risk. In a second study, Re-engagement in Quitline Treatment for

Low Income Smokers, we are assessing the feasibility and preliminary efficacy of using IVR technology as a tool to re-engage low income smokers into quitline treatment. The IVR technology in this study delivers tailored messages to address barriers to re-enrollment in quitline services among former users. Of the 2,989 participants, 723 (24%) were reached and completed the call by entering information about their perceived barriers to quitline re-enrollment. Preliminary findings indicate that smokers accept and will utilize IVR technology integrated into existing quitline services. Possible limitations of integrating IVR technology include user feelings of intrusiveness of repeated calls and discomfort with responding to computerized assessment. One potential benefit of IVR technology is greater disclosure of relapse and relapse risk, serving as a secure foothold for an individual to seek support for a new quit attempt. Utilization of IVR technology in an existing quitline setting can be successful and scalable due to its relative low cost, high user reach, and good acceptability by smokers seeking cessation support.

NCI - National Cancer Institute.

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POS5-13

EFFECTS OF A COMPLETE SMOKING BAN ON INPATIENTS AT A PSYCHIATRIC FACILITY

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Inpatient psychiatric facilities are concerned about the challenges of implementing inpatient smoking bans. Previous research focused on clinical staff, with relatively few studies on patient reactions. We studied the attitudes and smoking of inpatients at a tobacco-free state psychiatric facility in Buffalo, New York. One hundred patients were surveyed via questionnaire. Sixty percent reported smoking before entering the facility, and approximately 33% of these reported quitting since admission. Those who quit smoked a mean 17.13 (SD=14.83) cigarettes per day (CPD) before entering the facility, compared to 29.37 (SD=24.71) for those who did not quit ($p<0.05$), suggesting lighter smokers were more likely to quit. Smoking off-grounds was available to some patients; however, 59% of inpatients reported smoking occurred in the facility at least sometimes. Current smokers reported reductions in CPD (before: mean=29.37, SD=24.71; after: mean=13.04, SD=12.66; $p<0.01$). Only 4% of non-smokers reported being angry with the smoking ban, compared to 50% of current smokers and 35% of smokers who quit while at the facility ($p<0.01$). Conversely, 67% of non-smokers reported being happy with the ban, compared to 50% of those who quit, and 22% of current smokers ($p<0.001$). All smokers in the survey reported some form of cessation treatment (e.g. NRT, medication, counseling). Counseling, reported by 87%, was reported to be most helpful by those who used it (48%). Among those who quit during the past year, 50% reported that the smoking ban helped. When asked whether patients felt their health improved because of the ban, 63% of those who quit responded affirmatively, compared to 50% of non-smokers and 40% of current smokers ($p=0.02$). Despite somewhat low approval for the tobacco ban among smokers and evidence that some continue to smoke in the facility, inpatients reported benefits of the policy. This suggests that if properly implemented, with ample access to smoking cessation treatment, tobacco bans at inpatient psychiatric facilities can have a positive impact on inpatient smokers despite the challenges of implementation.

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POS5-14

SECONDARY STUDENTS' SOCIAL ENVIRONMENT AND SUSCEPTIBILITY TO SMOKING

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This study aimed to examine the susceptibility of school-age children (aged 11-19) towards smoking, and to explore the predisposing factors such as social environment and family circumstances to smoking susceptibility. A questionnaire was developed to solicit information on students' family circumstances (parental and sibling smoking, parental disapproval), social environment (peer smoking, friends' disapproval), school regulations and enforcement relating to smoking. A total of 643 students (aged 11-19 years old) were recruited from three participating secondary schools in Hong Kong. The results of the study showed that nearly half of them had a father who smoked (44.7%), and 14.0% of their mothers and 13.1% of their siblings were smokers. About one in five (20.6%) reported have at least one friend who smoked. Susceptibility to smoking was determined by the students' answer of 'may accept cigarette offer' instead of 'definitely not.' A total of 185 students (28.8%) indicated their acceptance of a cigarette offered, with male students (31.2%) statistically significantly more likely than female students (19.0%) being susceptible to smoking ($p=0.014$). Family circumstances such as father smoking (53.0% vs. 41.4%, $p=0.008$), sibling smoking (19.5% vs.10.2%, $p=0.002$), and having at least one friend who smoked (43.2% s. 11.5%, $p\leq0.001$) were significant factors contributing to smoking susceptibility. Those who aware of smoking rules in school (90.7% vs.80.5%, $p\leq0.001$), rules reinforcement (89.5% vs. 79.3%, $p=0.001$), parents' disapproval (87.4% vs. 75.7%, $p\leq0.001$) and friends' disapproval (78.9% vs. 44.7%) were considered not susceptible to smoking. It is concluded that students' family circumstances (parental and sibling smoking, parental disapproval), social environment (peer smoking, friends' disapproval), school regulations and enforcement were factors predisposing young people to smoking. Public health professionals should target at breaking the family and environmental predisposing factors and to develop strategies to reduced young peoples' susceptibility to smoking.

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POS5-15

ADOLESCENT SMOKERS SHOW DECREASED BRAIN RESPONSES TO NATURAL REINFORCERS

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INTRODUCTION: Nicotine acts on the mesocorticolimbic circuits of the brain leading to the release of supraphysiologic levels of dopamine. Repeated elevations of dopamine in the brain may cause the addicted individual to become less sensitive to physiologic increases of dopamine associated with natural reinforcers. Some researchers argue that the brains of adolescents are hypersensitive to these effects, displaying responses associated with these brain alterations after much lower exposure to nicotine compared with adults. We looked at the effect of visual cues representing "pleasurable" food on adolescent light smokers compared with non-smokers.

METHODS: Twelve adolescent light smokers and 12 non-smokers aged 13 to 17 years underwent fMRI scanning. During scanning they viewed blocks of photographic images representing "pleasurable" foods and control cues.

RESULTS: Smokers reported smoking a mean of 3.6 cigarettes per day. There was no difference in body mass index between groups (24.1 versus 24.0 respectively, $p=.99$). Food images elicited greater activations in non-smokers in multiple areas including the insula ($T=4.38$, $p<.001$), putamen ($T=4.24$, $p<.001$), rolandic operculum ($T=6.18$, $p<.001$), and inferior frontal cortex ($T= 5.12$, $p<.001$). There were no regions where smokers demonstrated greater BOLD activations compared with non-smokers when viewing food versus neutral images.

CONCLUSION: The finding of decreased sensitivity to natural reinforcers among early adolescent smokers lends further support for the notion that the effects of nicotine on the brain occur early in the trajectory of smoking. As such, adolescents may be particularly vulnerable, experiencing alterations in brain function with very little nicotine exposure.

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POS5-16

LORCASERIN A 5HT2C AGONIST DECREASES NICOTINE SELF-ADMINISTRATION IN FEMALE RATS

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Lorcaserin a 5HT2C agonist was assessed for effectiveness in reducing nicotine self-administration. Young adult female Sprague-Dawley rats were tested for the effect of acute doses (sc) of lorcaserin on nicotine self-administration (0.03 mg/kg/infusion) in 3-hour sessions. The lorcaserin doses (5, 10 and 20 mg/kg) and vehicle (saline) were administered in a counterbalanced order twice (N=7). These lorcaserin doses caused significant ($p<0.005$) decreases in nicotine self-administration with even the lowest dose

of 5 mg/kg reducing nicotine self-administration by two-thirds in the average response over the two test phases. The lorcaserin effect was not seen to diminish from the first to the second phase of testing. However, these doses caused pronounced sedation in a locomotor activity test. Additional rats (N=8) were run to determine the effects of lower doses of lorcaserin (0.3125, 0.625, 1.25 and 2.5 mg/kg). This study showed that lorcaserin also caused a significant reduction in nicotine self-administration at the lower dose range. Averaged across the two phases of the study, the 0.625 mg/kg lorcaserin dose caused a nearly significant ($p<0.06$) reduction in nicotine self-administration relative to performance after vehicle injection. The 1.25 and 2.5 mg/kg doses caused clearly significant ($p<0.005$) reductions in nicotine self-administration relative to control. There was a significant ($p<0.05$) interaction of test phase and lorcaserin effect. Tests of the simple main effects of lorcaserin showed significant effects in the second phase in which each of the lower lorcaserin doses caused significant ($p<0.05$-$p<0.005$) reductions in nicotine self-administration. The lowest dose (0.3125 mg/kg) did not cause any detected reduction in locomotor activity and the next lowest dose (0.625 mg/kg) caused only transient modest locomotor hypoactivity. These studies showed that the 5HT2C agonist lorcaserin significantly reduces nicotine self-administration at doses at and below the threshold for sedative effects. Lorcaserin is a promising drug candidate to test for efficacy in smoking cessation treatment in humans.

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POS5-17

ACUTE EXERCISE, CRAVING REDUCTION AND AFFECT AMONG INDIVIDUALS WITH SERIOUS MENTAL ILLNESS

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The present study examined the acute effects of exercise on cravings, mood and affect in a sample of individuals with severe mental illness (SMI) who were trying to quit smoking. A randomized, within-subject design was used with three components – screening, passive sitting (control condition), and brisk walking (experimental condition). Measures of cravings, mood and affect were completed during the two testing sessions at pre-condition, mid-condition, 0-, 10- and 20- minutes post-condition. A total of 14 participants (mean age = 50.14 ± 9.45 years) completed the three study components. Majority of participants were female (57%), and diagnosed with concurrent types of SMI (43%; e.g., schizophrenia, major depression). All participants reported using NRT. No significant main effects for condition were found for cravings at any of the measurement periods. However, a trend was found for cravings at mid-condition ($p < .09$), with participants reporting less desire for a cigarette during the brisk walking condition than the passive sitting condition. A significant main effect for condition was found at mid-condition for affect ($p = .02$), with participants reporting increased positive affect in the brisk walking condition than the passive sitting condition. Trends were also shown for the mood items relating to depression, anxiety, and irritability, with participants feeling less irritable ($p < .08$), less anxious ($p = .11$), and less depressed ($p = .13$) up to 20-minutes following the brisk walking condition in comparison to the passive sitting condition. Our findings demonstrate that short bouts of exercise can provide immediate benefit for individuals with SMI in terms of increasing affect. Such bouts have minimal impact on cigarette cravings among individuals taking NRT to assist their smoking cessation efforts. However, exercise may remain a beneficial strategy for dealing with cue-elicited cravings. Promoting exercise among individuals with SMI continues to be warranted in reducing the harm associated with physical inactivity and smoking, and in assisting smoking cessation.

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POS5-18

SMOKERS IN PAIN REPORT GREATER DESIRE BUT LESS CONFIDENCE AND MORE DIFFICULTY IN QUITTING

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The prevalence of tobacco smoking among persons with chronic 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 evidence that pain is a potent motivator of smoking (e.g., Ditre & Brandon, 2008, J Abnorm Psych), and that the effect of pain on smoking may be moderated by smoking-related outcome expectancies and mediated by pain coping behaviors (Ditre et al., 2010, J Abnorm Psych). By integrating the extant pain/smoking literature, we have conceptualized a reciprocal relation between pain and smoking that acts as a positive feedback loop, resulting in greater pain and the maintenance of tobacco dependence. Such a model would suggest that persons in pain may have more difficulty quitting smoking. Unfortunately, little is known about cessation-related factors among smokers in pain. The current findings represent a secondary, cross-sectional analysis of data collected during the baseline portion of our most recent experimental study. Smokers (N = 132; > 15cpd) were asked whether they experienced any bodily pain in the past 4 weeks, and completed measures of quitting history, desire to quit smoking, and confidence in quitting. Linear regression analyses revealed that smokers who endorsed pain reported greater difficulty in quitting smoking during their most recent attempt [$b = .20$, $R2 = .04$, $F(1, 130) = 5.59$, $p = .02$], and less confidence that they could go without smoking for one week [$b = -.20$, $R2 = .04$, $F(1, 130) = 5.52$, $p = .02$] or one month [$b = -.19$, $R2 = .04$, $F(1, 130) = 4.98$, $p = .03$]. Despite these negative associations, smokers in pain endorsed higher scores on the contemplation ladder [$b = .18$, $R2 = .03$, $F(1, 130) = 4.17$, $p = .04$], and greater consideration of quitting smoking within the next six months [$b = .19$, $R2 = .04$, $F(1, 130)= 4.86$, $p = .03$]. Results are discussed in the context of social-cognitive theory, and with regard to how the current findings may have implications for the development of targeted smoking cessation interventions for persons in pain.

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POS5-19

MENTHOL VAPOR ATTENUATES THE RESPIRATORY IRRITATION RESPONSES TO ACROLEIN AND ACETIC ACID, TWO CIGARETTE SMOKE IRRITANTS

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Menthol produces a cooling sensation and is widely used in preparations for the treatment of cough, pain and itch and is also a common additive to cigarettes. Its cooling effects are mediated via the transient receptor potential melatonin 8 (TRPM8) receptor. The current study was performed to characterize the effects on menthol on the respiratory tract irritation response induced by two irritants present in cigarette smoke, acrolein and acetic acid that act via differing mechanisms. Acrolein is an electrophilic irritant; acetic acid an acidic irritant. Towards these ends, female C57Bl/6J mice were exposed to menthol vapor, irritant vapor, alone or in combination for 15 minutes during which time respiratory parameters were monitored via plethysmography. Stimulation of trigeminal sensory nerves during exposure causes the sensory irritation response. This response was assessed by measuring the duration of breath-hold (termed braking) at the onset of each expiration. Acrolein vapor (2 ppm) exerted a moderate irritant response that was blocked by concurrent exposure to 16 ppm menthol, a concentration lower than that in mainstream smoke from mentholated cigarettes. Menthol, at this concentration, also partially diminished the irritation response to acetic acid. Eucalyptol, another TRPM8 agonist vapor, also blocked the response to acrolein. These results indicate that menthol vapor is an effective counter-irritant, perhaps acting through the TRPM8 receptor, and furthermore, suggest the menthol in mentholated cigarette smoke may be present in pharmacologically effective concentrations.

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POS5-20

REPORTS AND RATINGS OF EXPERIENCES OF HOSPITALIZED SMOKERS AND NON-SMOKERS IN A TOBACCO-FREE ACADEMIC MEDICAL CENTER

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Introduction: The primary purpose of study was to examine the relationship among current smokers, hospitalized in a tobacco-restricted campus and their perceptions of their hospital experience during the hospitalization compared to non-smokers.

Methods: A cross-sectional survey design conducted within a Midwestern health system among four hospitals: community-based/urban hospital, heart specialty, cancer specialty, and a tertiary Level-I trauma center. The study examined sociodemographic,

disease-related and treatment covariates to investigate effects on overall hospital rating and willingness to recommend.

Results: There were no significant differences in smokers and non-smokers measuring Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) overall positive rating and willingness to recommend; yet, smokers compared to non-smokers were more likely to give a negative overall rating (13.7% vs. 10.5%; p = .014). Six levels of treatment for nicotine dependency were analyzed; 66.4% of smokers who responded to HCAHPS received no evidence of treatment for nicotine dependency in the medical record.

Conclusions: In an era of increasing transparency, the importance of achieving high ratings and reports of patient experiences while hospitalized is gaining momentum; discerning differences in smokers in a tobacco-free hospital setting with or without treatment is worthy of future inquiry.

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POS5-21

AVAILABILITY AND ACCESSIBILITY OF SMOKELESS TOBACCO AND USE NORMS AMONG PREGNANT WOMEN IN A LOW INCOME SLUM AREA OF MUMBAI

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Smokeless tobacco contributes to reproductive health problems including premature birth, low birth weight, stillbirth, and maternal morbidity. In this poster, we address the widespread distribution and use of many. Here we report on the first phase of a pilot study funded by the National Cancer Institute and the Fogarty Center, conducted in a high density slum area of Mumbai showing the distribution of smokeless tobacco outlets, types of tobacco used, and community norms around tobacco use.

Methods: Trained field researchers conducted mapping of the study community, interviews with key informants, and enumeration of different types of smokeless tobacco outlets. They gathered spatial data and estimates of population density within each sub-area, which were used to calculate spatial density of POS and ratio of population to number of POS in each "nagar." Repeat visits tracked the decline and emergence of new POS over a year's period. Samples of all forms of smokeless tobacco products, imitation products and products geared to children were collected, photographed and catalogued. Interview data were collected on community level ST norms the use of ST in 40 pregnant smokeless tobacco users were collected and coded.

Results: Density of ST outlets is very high in the study community. New shops are springing up in the lowest income areas and constitute an important part of the economy of the community. Key informants report widespread use of more than 70 ST products (mishri, gutkha, tobacco chewed, and paan with tobacco) among women and children as well as men, and pregnant women users report a variety of different patterns of use. Some women describe themselves as addicted and express a strong desire to quit use or to reduce their use and have tried to do so unsuccessfully.

Implications for Tobacco Control and Prevention: Prevention of increasing ST use during pregnancy must take place at multiple levels including cessation or reduction programs for users, community norms change, and alternative income generating strategies for very low income ST sellers.

Fogarty Center, NIH/ NCI, NIH.

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POS5-22

SEX DIFFERENCES IN TOBACCO SMOKING-INDUCED UPREGULATION OF BETA2-NICOTINIC ACETYLCHOLINE RECEPTORS: A [123I]5-IA-85380 SPECT IMAGING STUDY

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Sex differences exist in a variety of tobacco-smoking related behaviors. Women are reinforced by the non-nicotine conditioned stimuli that are strongly associated with smoking more than men, while men are more reinforced by the nicotine per se in cigarettes. Women are not as responsive as men to NRTs, which are widely used to help people quit smoking. Nicotine upregulates (i.e., increases) brain nicotinic acetylcholine receptors (nAChRs). Preclinical studies report greater nicotine-induced upregulation of nAChRs in male vs. female rodents compared to same-sex controls. In the present study we examined sex-differences in beta2-nAChR availability between men and women smokers compared to same-sex nonsmokers. Fifty-two men (n=26 nonsmokers, 34+11 y; n=26 smokers, 33+11 y) and fifty-eight women (n=30 nonsmokers, 33+11 y; n=28 smokers, 35+10 y) participated in one [123I]5-IA single photon emission computed tomography (SPECT) scan and one MRI. At intake, men and women tobacco smokers smoked 16+5 cigarettes/day for 14+8 years and 18+6 cigarettes/day for 17+10 years, respectively. Analyses revealed a significant difference between men and women smokers in beta2*-nAChR availability compared to same sex nonsmokers. Specifically, men smokers had significantly higher beta2-nAChR availability in the striatum (16%), cerebellum (16%) and frontal (14%), parietal (13%), anterior cingulate (15%), occipital (17%) and temporal (14%) cortices compared to men nonsmokers; however, women smokers did not differ significantly from women nonsmokers in striatum (2%), cerebellum (1%) or frontal (1%), parietal (3%) anterior cingulate (6%), occipital (8%) or temporal (4%) cortices. Sex differences in the upregulation of beta2-nAChRs may explain why women have a harder time quitting smoking than men. These findings suggest the regulatory effect of nicotine on beta2-nAChRs differs significantly between men and women.

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POS5-23

THE ROLE OF IMPULSIVITY IN NICOTINE REINFORCEMENT VERSUS AUTOMATICITY

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The behavioural route by which impulsivity confers vulnerability to nicotine dependence remains unclear. Impulsivity may increase sensitivity to nicotine reinforcement, thereby increasing the rate of instrumental nicotine-seeking/taking, or may facilitate the transition to automatic control thereby decoupling this behaviour from intentional regulation. To examine these two proposals, Barratt impulsivity (BIS-11) and craving to smoke were measured in 100 smokers prior to an instrumental task for tobacco reward and ad libitum smoking, to measure the rate of tobacco-seeking/taking, respectively. The results showed that impulsivity was not associated with higher rates of tobacco-seeking/taking, but individual differences in smoking uptake and craving were. By contrast, BIS non-planning impulsivity moderated (decreased) the relationship between craving and the number of puffs consumed in the ad libitum test, but not the rate of instrumental tobacco-seeking.

Conclusions: These data suggest that whereas the uptake of drug use is mediated by hypervaluation of the drug as an instrumental goal, trait impulsivity confers a propensity for automatic (non-intentional) control over well-practiced drug-taking behaviour.

UK Medical Research Council.

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POS5-24

ESTABLISHING SMOKE-FREE HOSPITALS IN CHINA: PILOT STUDY IN 41 HOSPITALS

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Background: The Framework Convention on Tobacco Control formally came into effects in China on Jan 9, 2006. On May 21, 2009, four key national stakeholders including Ministry of Health, State Administration of Traditional Chinese Medicine (SATCM), General Logistics Department, and Armed Forces Logistics decided to implement a complete smoking ban in medical and health systems in China from the year 2011. We piloted the new smoke-free standard in 41 hospitals with annual throughput of 37.2 million patients, located in 20 provinces of China.

Methods: Questionnaire surveys were completed in April 2009 and in June 2010, i.e., before and after the pilot implementation.

Results: All 41 hospitals established tobacco control committees involving senior management. All hospitals banned smoking and sales of tobacco products inside the hospitals, and implemented measures designed to enforce the ban. Smoking cessation clinics were set up in 36 hospitals, and 35 hospitals opened smoking cessation hotlines. The implementation of the new standard led to a significant proportion of staff who smoke to stop smoking (a decline from 43% to 35% smoking prevalence in male staff). The main challenges concerned the totality of the ban, its enforcement, and involvement

of doctors in providing smoking cessation advice and referring smokers to specialist treatment.

Conclusions: All the hospitals taking part in the pilot trial were successful in implementing the key elements of the new standard. A number of challenges were identified which need to be addressed when the smoke-free hospitals standard is extended across China.

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POS5-25

MODIFIED RISK SMOKELESS TOBACCO PRODUCTS: THE GOOD, THE BAD, AND NRT

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Passage of the 2009 Family Smoking Prevention and Tobacco Control Act has increased interest in the development of modified-risk tobacco products. A common sense approach to the modification of smokeless tobacco risks is to markedly reduce the level of known toxins in the tobacco. We report that the levels of carcinogenic tobacco-specific nitrosamines (TSNAs) and benzo[a]pyrene (BaP) in smokeless tobacco products can be drastically reduced, to levels comparable to those in nicotine replacement therapy (NRT). Review of the literature and recent analyses of current products shows that total TSNAs in dry snuffs average over 100,000 ng/g, moist snuffs average about 13,000 ng/g, "snus" like products average about 4,000 ng/g and chewing tobaccos average about 2,000 ng/g. A project to reduce TSNAs and BaP in tobacco has resulted in NNN and NNK levels of 72.2 and 49.0 ng/g, respectively, total TSNA levels of 198 ng/g, and BaP levels of 0.7 ng/g. Concentrations of TSNAs (ng) per milligram of nicotine (the desired drug for users) were 3.1, 2.1, and 8.6 ng/mg for NNN, NNK, and total TSNAs, respectively. A dissolvable tobacco product made from this cured tobacco was found to contain non-detectable levels of TSNAs and non-quantifiable levels of BaP, approximating levels reported in the literature for NRT products. In comparison, a modern "snus" product was found to contain 95, 36, 174, and 0.3 ng/mg nicotine for NNN, NNK, total TSNAs, and BaP respectively. A traditional moist snuff product contained 212, 54, 456, and 3 ng/mg nicotine for NNN, NNK, total TSNAs, and BaP. It is possible to produce a tobacco product with carcinogen levels several orders of magnitude lower than those found in currently marketed products, and similar to those in NRT. Although no tobacco-containing product is completely safe, a reasonable first step in reducing harm from tobacco products is to reduce their toxin content and allow adult tobacco users the opportunity to make informed decisions about the comparative advantages of selecting tobacco products with the lowest levels of toxins.

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POS5-26

A PRAGMATIC, RANDOMIZED, CONTROLLED STUDY EVALUATING THE IMPACT OF SMOKING CESSATION TREATMENT REIMBURSEMENT ON SUCCESSFUL QUITTING IN CANADIAN SMOKERS MOTIVATED TO QUIT

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Smoking cessation treatments (SCT) are not reimbursed by most Canadian public and private drug programs despite robust evidence supporting their efficacy and cost-effectiveness.

Objective: Evaluate the effectiveness of medication reimbursement to increase quit rates in Canada in an open label pragmatic randomized trial.

Methods: Subjects were smokers (≥10 cigs/day), motivated to quit within 14 days and without SCT insurance coverage. Participants were randomized (1:1) to receive Full SCT Coverage (FC) eligibility or No SCT Coverage (NC) eligibility for 26 weeks. Eligible SCTs were varenicline, bupropion or nicotine patches/gums. Brief smoking cessation counseling was provided. The primary outcome measure was self-reported 7-day point prevalence of abstinence (PPA) at Week 26.

Results: Of 1,380 randomized subjects [FC: 696; NC: 684], SCT were dispensed for 682 (98.0%) of the FC group vs. 435 (63.6%) of the NC group. In the FC group, varenicline was dispensed at least once for 558 subjects (80.2%) and nicotine patches/gums and bupropion for 201 (28.9%) and 60 (8.6%) subjects, respectively. 297 (43.4%), 126 (18.4%) and 58 (8.5%) subjects in the NC group were dispensed varenicline, nicotine patches/gums and bupropion, respectively. 7-day PPA at Week 26 was 20.8% (n=145) in FC vs. 13.9% (n=95) in NC [OR (95%CI):1.64 (1.23, 2.18); P=0.0007]. Urine cotinine-confirmed 7-day PPA at Week 26 was 15.7% (n=109) in FC vs. 10.1% (n=69) in NC [1.68 (1.21, 2.33); P=0.0018]. 26 weeks after SCT coverage was withdrawn, continuous abstinence between Weeks 26–52 was confirmed for 6.6% (n=46) of subjects in FC vs. 5.6% (n=38) in NC [1.19 (0.76, 1.87); P=0.4388]. All-causality adverse events were reported in 458 (65.8%) FC and 368 (53.8%) NC subjects. Serious adverse events were reported in 35 (5.0%) FC and 25 (3.7%) NC subjects, and were unrelated to SCT or study procedures.

Conclusion: SCT reimbursement drug policy is an effective intervention to improve 26-week quit rates in Canada. Once SCT reimbursement was withdrawn, continuous abstinence rates between Weeks 26 and 52 were no longer different between groups, indicative of the chronic relapsing nature of nicotine dependence.

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POS5-27

PROTECTIVE FACTORS OF ETHNIC IDENTITY AND PARENTAL DISAPPROVAL ON SMOKING IN MINORITY ADOLESCENTS

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Parental influences and positive ethnic identity are postulated to be protective against tobacco use in racial/ethnic minority adolescents. We assessed whether parental disapproval of smoking and positive ethnic identity are protective against a wide range of smoking behaviors such as susceptibility to smoke, smoking initiation, and regular smoking in minority adolescents. A survey assessing attitudes and behaviors related to tobacco use was administered to 9th to 12th grade students in a suburban high school in Connecticut. 816 adolescents (minority: n = 184) completed questions on race/ethnicity, ethnic pride subscale of the Ethnic Identity scale (Marsglia et al., 2001), susceptibility to smoke, ever trying a cigarette, daily smoking in the past 30 days, as well as perceived level of parental disapproval of smoking. Minority status was determined if an adolescent indicated their race/ethnicity as Hispanic, Black, Asian, Native American, or multi-races/ethnicities. Logistic regression analysis indicated that perceived parental disapproval of adolescent smoking was protective against all smoking behaviors from initiation (susceptibility: OR = 2.18, $p < .01$: tried a cigarette: OR = 1.84, $p < .01$) to daily smoking (OR = 2.10, $p < .01$) for all adolescents. Among minority adolescents, those with negative ethnic identity (n = 62) were 2.4 times more likely to be susceptible to smoke ($p = .047$) and 2.8 times more likely to ever try a cigarette ($p = .044$) when compared with minority adolescents with positive ethnic identity (n = 122) and non-minority adolescents (n = 632). Parental disapproval of adolescent smoking is critical in precluding adolescent smoking behaviors for all adolescents. Among ethnic/racial minority adolescents, having negative ethnic identity was associated with intentions and behaviors associated with smoking initiation. Smoking prevention programs targeted at high school students should encourage parents to communicate with their children about smoking, as well as foster positive ethnic identity development in minority adolescents.

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POS5-28

COMPARISON OF SERUM COTININE CONCENTRATION WITHIN AND ACROSS SMOKERS OF MENTHOL AND NONMENTHOL CIGARETTE BRANDS AMONG NON-HISPANIC BLACK AND NON-HISPANIC WHITE U.S. ADULT SMOKERS, 2001–2006

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Background: The Food and Drug Administration (FDA) is examining options for regulating menthol content in cigarettes. There are many pharmacologic properties of menthol that may facilitate exposure to tobacco smoke, and it has been suggested that the preference for menthol cigarettes in black smokers accounts for their higher cotinine levels.

Objective: To assess cigarette per day (cpd)-adjusted cotinine levels in relation to smoking a menthol or nonmenthol cigarette brand among non-Hispanic black and white U.S. adult smokers under natural smoking conditions.

Methods: Serum cotinine concentrations were measured in 1,943 smokers participating in the 2001 to 2006 National Health and Nutrition Examination Surveys (NHANES). The effect of smoking a menthol brand on cpd-adjusted serum cotinine levels in these two populations was modeled by adjusting for sex, age, number of smokers living in the home, body weight, time since last smoked, and FTC-measured nicotine levels. The 8- or 12-digit Universal Product Code (UPC) on the cigarette label was used to determine the cigarette brand and whether it was menthol. Results. Smoking a menthol cigarette brand versus smoking a nonmenthol cigarette brand was not associated ($p \geq 0.05$) with mean serum cotinine concentration in either black or white smokers.

Conclusions: The higher levels of cotinine observed in black smokers compared to white smokers is not explained by their higher preference for menthol cigarette brands.

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POS5-29

SMOKERS' KNOWLEDGE, ATTITUDES, AND PREFERENCES REGARDING GENETIC TESTING FOR SMOKING

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BACKGROUND: Tobacco smoking continues to be the largest preventable cause of premature morbidity and mortality death worldwide. Although most smokers are highly motivated to quit and many smoking cessation therapies are available to help them quit, cessation rates remain very low (15-30%). Recent research strongly suggests that smokers vary in their underlying genetic susceptibility to become addicted to smoking and their ability to stop smoking. Therefore, the use of (pharmaco)genetic testing for smoking cessation in may increase smoking cessation rates. However, at present there is relatively little knowledge about the willingness and attitudes of smokers concerning genetic testing for smoking addiction and cessation, and about individuals' knowledge and beliefs on this subject.

METHODS: In this study we assessed the knowledge and attitudes of smokers' and their willingness to undergo a genetic test using an online survey among 587 smokers.

RESULTS: Knowledge on the influence of genetic factors in smoking addiction and cessation, and possibly also genetics in general, were found to be highly inadequate. Further, smokers seem to considerably underestimate their chances of having a genetic predisposition and the influence of this on smoking addiction and cessation. Furthermore, on average, participants were found to perceive little disadvantages of genetic testing for smoking addiction and cessation, but some advantages and somewhat expected to be able to undergo a genetic test and to deal with the results. Moreover, smokers seem to allocate their GPs a crucial role in the delivery of a genetic test for smoking cessation and information provision on this subject. Finally, in general, smokers seem to be mildly interested in genetic testing, especially when offered by their GP.

CONCLUSIONS: This study provides valuable information about smokers' knowledge, attitudes and preferences regarding genetic testing for smoking addiction and cessation, which can aid decisions on the most appropriate strategies for counseling patients and communicating their test results.

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POS5-30

A COMPARISON OF PREDICTORS OF QUIT ATTEMPTS AND ABSTINENCE

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Smoking cessation is a dynamic process consisting of multiple components. The first step is making a quit attempt, which presumably is driven by motivation. The second step is to ensure success once an attempt has been made, which could be driven by different factors (e.g., dependence). The most common definition of a quit attempt, one lasting 24hrs, seemingly intermixes both motivation and ability to quit. It is unclear if motivation, dependence, or other variables relate to each step in the cessation process differently. We sought to directly examine this question using data from 849 smokers participating in a nationwide, population-based RCT to promote quit attempts and cessation; all participants were at baseline uninterested in cessation. Adjusting for treatment group (data not presented), and using a multivariate logistic approach, baseline stage of change (OR=1.6; 95% CI: 1.3-2.1), readiness to quit in next month (0-10 ladder score) (OR=1.1; 95% CI: 1.0-1.2), and number of previous quit attempts (OR=1.1; 95% CI: 1.0-1.3) were significantly associated with making any self-defined quit attempt during the 6-month post-intervention period. Similarly, stage of change (OR=1.6; 95% CI: 1.3-2.1) and number of prior quit attempts (OR=1.1; 95% CI: 1.0-1.2) were significantly associated with making a 24hr quit attempt. Nicotine dependence (FTND) was unassociated with making any self-defined quit attempt, but was inversely predictive of 24hr quit attempts (OR=0.9; 95% CI: 0.8-1.0). Analysis of abstinence was restricted to participants who made a quit attempt (n=376). Within this sub-sample, only self-efficacy (9-45 scale) (OR=1.1; 95% CI: 1.0-1.1) was predictive of 7-day abstinence at the final follow-up period. Results suggest that factors associated with making a quit attempt differ from those associated with success of that attempt. Defining a quit attempt as one lasting a day or longer (CDC definition) seems to confound motivation and dependence. The findings highlight the importance of building motivation for making a quit attempt; ensuring its success thereafter requires mastery and confidence. Use of evidence-based treatment can strengthen both.

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POS5-31

UNEASY COMPANY? TOBACCO INDUSTRY IN THE UN SYSTEM AND CONFLICT OF INTERESTS

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The World Health Organization's (WHO) Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases 2008-2013 identifies tobacco use as an important risk factor accounting for a significant proportion of the global adult mortality. An evidence based framework for tobacco control is now available through the WHO MPOWER policy package that aligns with the WHO Framework Convention on Tobacco Control (FCTC), a globally binding treaty for countries, which are party to it. Tobacco control and NCD will now receive important international attention through the NCD Summit scheduled in September 2011 by the UN General Assembly resolution calling for a High Level Meeting on the Prevention and Control of NCDs and the Millennium Development Goals (MDGs). While this is a welcome step, it is a revelation that several United Nations organisations have multiple programmes with corporate partners, some of which include tobacco and tobacco-related industry. In this paper, we present results from a survey of global and regional level programmes of seven important United Nations organisations and identify where tobacco industry participation exists and can compromise tobacco control efforts.

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POS5-32

USE OF SUBSTANCE AMONG RESIDENTS OF KARACHI: REASONS AND COST OF USING SUBSTANCES

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Introduction: Use of substances (pan, chaalia, ghutka, niswar) is associated with serious health risks. In Pakistan most people use substances from early years of life, which keeps them on risk of short life span. It is important to understand the cost implication and provide knowledge about the effects of these substances. The aim of this study was to estimate the costs of using these substances and to understand the reasons for using substances.

Methodology: This was a cross-sectional study conducted in two residential colonies in Karachi, Pakistan during 2008 and 2009. Pre-coded structured questionnaire was administered to collect the data on socio demographics, costs, reasons for use of substances and use of substances per day. The data was analyzed on SPSS version 18.0. Possible measures were taken to ensure the confidentiality of all participants.

Results: From 124 randomly selected residents, 107 (86%) agreed to respond. All the selected participants were between the ages 10–71 years (mean±sd age 36.2±16.4). Of the total, about one-fifth of the users were females. Daily use of substances was significantly higher among males (p<0.001). Further, the use was higher among adolescents than adults (p<0.001) and interestingly less educated consumed less than high educated (P=0.06). Males are spending significantly higher on substances; Rs. 37±11.5/ day [Rs.930 or (US$13)/month] compared to females. Overall, 41% of the cost is spent on cigarettes followed by 27% and 23% on local and branded ghutka respectively. The main reasons for using substances were peer pressure, easy availability of substances, stress, liking of taste, and to treat toothache.

Conclusion: This study concluded that use of substances is higher among young males and they are spending a lot on them. To prevent this population, regular awareness campaigns may be held at community and school level so that, continuous re-enforcement make them to quit from using any kind of substances.

This study was part of Project Assignment.

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POS5-33

SMOKING PREVALENCE AND ITS RELATION TO HIGH RISK BEHAVIORS IN YOUNG PEOPLE 15-24 YEARS OLD IN TEHRAN, IRAN

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In a descriptive study, 500 randomly selected youth aged 15-24 in Tehran, were asked about the smoking, alcohol drinking, substance use, and illicit sexual relationships. 50% (250) of respondents were female. Among respondents 59% (295) had experienced smoking while 20% (100) were permanent and 39% (195) occasional tobacco user. 35.2% (92) of girls and 81.2% (203) of boys have experienced smoking. Prevalence of alcohol use 91.5% (150) vs. 8.5% (14), substance use 97.7% (42) vs. 2.3% (1) and illicit sex 94% (109) vs. (7) 6% were respectively higher among smoking boys compared with nonsmoking boys. In all cases the difference was statistically significant. Prevalence of alcohol drinking. 86.2% (50) vs. 13.8% (8), substance use 100% (8) vs. (0) 0 %, and illicit sex 71.4% (20) vs. 28.6% (8) were respectively higher among smoking girls compared with nonsmoking girls. In all cases the difference was statistically significant. Given the high prevalence of smoking among youth and a strong correlation between tobacco use with alcohol, substance and illicit sexual relations, design and implement intervention programs to reduce smoking in adolescents and young adults reduce the possibility of risky behavior among them.

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POS5-34

QUALITATIVE ANALYSIS OF A CULTURALLY TAILORED TOBACCO CESSATION INTERVENTION AMONG THE MENOMINEE

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American Indians (AI) have the highest smoking rate of all ethnicities in the United States, with an overall prevalence rate of 35% compared to 15-25% for other racial/ ethnic groups (CDC, 2006). In Wisconsin, 39% of adult AIs are smokers, compared to 21% for Whites and 29% for African-Americans. The Menominee Indian Tribe of Wisconsin is 1 of 11 federally recognized Tribes in the state with membership of approximately 8,339 and a smoking prevalence rate of 44%. This high smoking rate is a likely contributor to large increases in lung cancer and other smoking-related diseases in Menominee smokers. Abuse of commercial tobacco does not represent a traditional, cultural, or spiritual use of that plant by AIs. In response to its alarming smoking rates and related health outcomes statistics, the Menominee Tribe initiated a partnership with two University of Wisconsin campuses to examine tobacco abuse prevention and treatment possibilities. There is an urgent need for effective cessation treatments for AIs but there are few controlled cessation studies in AI communities. The partners initiated an innovative clinical trial to compare a culturally tailored, culturally relevant intervention (N=75) with an evidence-based, non-culturally-tailored smoking cessation treatment (N=75) similar to the cessation program already in place at the Menominee Tribal Clinic. Semi-structured, audio-taped interviews were conducted prior to quitting to address themes related to abuse of commercial tobacco, resultant health consequences, smoking cessation and difficulties in cessation treatment, and perspectives on traditional use of sacred tobacco. Data were analyzed both deductively and inductively via the Extended Case Method (ECM; Burawoy, 1991). This presentation offers a preliminary analysis of qualitative data from 15 study participants. The results inform future cessation treatment of AI tobacco abuse, mental and behavioral health treatment with AIs, and a Menominee-centric perspective on such. Recommendations for Tribal Participatory Research and multi-institutional partnerships are also addressed.

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POS5-35

THE DEVELOPMENT AND VALIDATION OF A SCALE ASSESSING RIGIDITY IN CLASSIFYING A SMOKER: IMPLICATIONS FOR RESEARCH AND PRACTICE

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Discrepancies exist between current (past 30-day) smoking and self-reported smoking status; the latter is related to intention to quit, controlling for smoking level. Qualitative research has documented several factors (e.g., time since smoking initiation, smoking level, buying vs. “bumming” cigarettes) used by young adults to define a smoker. This analysis was aimed at developing a scale to assess how rigidly or liberally one classifies a smoker. We administered an online survey to six colleges in the Southeast. Overall, we recruited 24,055 college students, yielding 4,840 responses (20.1% response rate), with smoking data from 4,438 students. Current smoking prevalence was 23.7% in this sample. The “classifying a smoker” scale consisted of 10 items derived from qualitative data that assessed factors regarding how young adults define a smoker. We also assessed demographics, smoking status, perceived harm of occasional smoking, readiness to quit, recent quit attempts, and considering oneself a smoker. This scale yielded a Cronbach’s alpha of 0.91. Higher scores indicated a more rigid definition of a smoker (e.g., must smoke often, buy cigarettes, have difficulty quitting). Multivariate logistic regression showed that being younger (Beta=-0.24, p<.001), female (Beta=1.47, p=.009), and black (Beta=0.82, p=.02) were related to greater rigidity in classifying a smoker. Binary logistic regression indicated that, after controlling for age, gender, and ethnicity, higher scores (OR=1.01, p=.005) were associated with current smoking. Among smokers, those with higher scores were more likely to be nondaily vs. daily smokers (p=.009), perceive less harm (p<.001), intend to quit in the next month (p=.04), and not consider oneself a smoker (p<.001). After controlling for demographics and number of smoking days, more rigid definitions predicted not considering oneself a smoker (OR=0.95, p<.001) and less perceived harm (OR=0.98, p<.001). This scale demonstrated good psychometric properties and is associated with smoking status, risk perception, and quitting smoking. This newly developed scale shows promise for identifying intervention targets for prevention and cessation.

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POS5-36

THE INFLUENCE OF PARENTAL SMOKING ON CHILDREN'S ATTENTION TO SMOKING CUES

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Research has shown that children with smoking parents hold more favourable attitudes towards smoking, and are more likely to initiate smoking than children with non-smoking parents. So far, these effects have been explained by the Social Learning Theory, which states that people learn new behaviours through observational learning of social factors in the environment. Nonetheless, it is possible that next to explicit social learning, parental smoking also affects smoking initiation through automatic processes (e.g., attentional biases, implicit positive associations, approach tendencies). Dual process models of addiction explain smoking continuation as the result of an imbalance in the relation between automatic and controlled processes. Possibly, parental smoking affects automatic processes in children who have not experimented with smoking, even before smoking cognitions become more favourable. Therefore, the objective of the present study was to examine whether children with a smoking parent have an attentional bias for smoking cues and fixate more quickly, more often, and for longer periods of time on smoking cues than children with non-smoking parents. To accomplish this, we assessed children's attention while watching two movie clips with smoking cues, using eye-tracking technology. The sample consisted of 11 children with a smoking parent and 19 children with non-smoking parents. Our results showed that children with a smoking parent focused more often ($p = .007$) and for a longer duration ($p = .03$) on smoking cues compared with children with non-smoking parents. The difference in initial fixations did not reach statistical significance, although it constituted a trend ($p = .08$). No correlations between attentional bias measures and explicit smoking cognitions were found. In conclusion, parental smoking affects children's attention to smoking cues. These results may indicate that parental smoking influences automatic processes in children who have not experimented with smoking, and possibly even before explicit smoking cognitions become more favourable. If replicated, prevention and intervention programs need to take this effect into account.

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POS5-37

SOUTH AFRICAN COLLEGE STUDENT ATTITUDES REGARDING SMOKE-FREE POLICIES IN PUBLIC SPACES, PRIVATE SPACES, AND ON CAMPUS

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Tobacco control policies have been increasingly implemented globally. Thus, we examined smoking behavior and attitudes and implementation of private smoking bans among college students in South Africa. An online survey was completed by 130 University of Cape Town students; 4 focus groups among 27 college smokers were also conducted. Among the survey sample, 46.6% were female, 53.4% were White, and 41.5% smoked in the past 30 days (i.e., current smokers). Significant predictors of current smoking included being male (OR=0.34, p=.03), more friends that smoke (OR=1.34, p=.03), more frequently consuming alcohol in the past 30 days (OR=1.09, p=.02), and more days of marijuana use (OR=1.12, p=.15). Focus group data indicated that social factors (i.e., peer or familial) were major influences for smoking initiation and maintenance. While participants reported attempting to quit, common triggers for relapse included stress, social influences, and alcohol consumption. Survey data indicated that 6.8% disapproved of a public ban, 4.9% disapproved of smoke-free workplaces, 17.5% disapproved of restaurant bans, and 37.9% disapproved of smoke-free bars. Less negative attitudes toward smoking were associated with being younger (Coefficient=-0.67, p=.03), more days of smoking in the past 30 days (Coefficient=0.70, p<.001), and having more friends that smoke (Coefficient=1.40, p=.02). In terms of campus policies, 20.4% disapproved of the current smoking policies (i.e., no smoking in university buildings), and 39.8% disapproved of a complete campus-wide ban. While 10.7% stated less likelihood of attending the college if it had a complete ban, 13.6% reported being more likely to attend. Focus group data indicated that enforcement was a barrier to maintaining smoke-free policies. In regard to private restrictions, 73.8% had complete car bans; 67.0% had complete home bans. Despite high levels of support for smoke-free policies, smoking is highly prevalent among South African college students. Thus, further interventions are needed to address this group.

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POS5-38

HOOKAH SMOKING AMONG A COHORT OF ADOLESCENT EVER SMOKERS

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While cigarette smoking has declined among youth in the United States in the past decade, use of other tobacco products, such as hookah, has increased. National prevalence data on hookah smoking among youth are not available, but evidence suggests it is growing in popularity. Hookah smoking is addictive and contains as many carcinogens as cigarette smoking; understanding factors associated with its use is important. We examined if hookah users differed from non-users on demographic, problem behaviors, and smoking-related variables among a cohort of 1263 adolescents (mean age 15 years at baseline) comprising primarily youth who had ever smoked cigarettes (83% ever smokers). Measures assessing demographic characteristics, psychosocial variables, and health behaviors were completed at baseline and at 6, 15, and 24 months. Ever and 30-day hookah use were assessed at 24 months. Of the 1263 participants, 46.1% reported ever use and 25.8% reported smoking hookah at least one day in the past 30 days. 30-day hookah use was associated with gender (OR=0.67, 95% CI=0.48, 0.94) , race (OR=1.22, 95% CI=1.02, 1.47), marijuana (OR=2.12, 95% CI=1.32, 3.43), cigarette (OR=1.16, 95% CI=1.10, 1.22), cigar (OR=1.38, 95% CI=1.18, 1.61), and kretek use (OR=1.69, 95% CI=1.16, 2.45) at 24 months. Students reporting 30-day hookah use were more likely to be male (52.0% versus 48.0% female) and White. Compared to non-users, 30-day hookah users were more likely to report use of cigarettes (72.7% versus 32.5%), cigars (47.3% versus 16.6%), and kreteks (10.2% versus 1.8%). Hookah users and non-users also differed on problem behavior variables. 30-day hookah smokers were more likely to report more alcohol (96.6% versus 89.4%) and marijuana use (89.2% versus 64.8%) than non-users. Hookah users were more likely to attend a hookah bar, lounge, or restaurant at least once at 24 months (OR=7.00, 95% CI=4.93, 9.97) compared to non-users; 78.7% of 30-day hookah users reported attendance compared to 26.3% of non-users. Adolescent hookah users are engaging in other tobacco use and problem behaviors. Evidence-based programs may be needed to reduce use this emerging public health concern.

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POS5-39

FAMILY AND PEERS AS RISK FACTORS FOR MULTI SUBSTANCE USE AMONG ADOLESCENTS

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Purpose: Peer and family factors have emerged in the literature as the most consistent social influences on tobacco and concurrent drug use. Yet, there is a lack of understanding how these environments are associated with multi-drug use among adolescents. The objective of this study is to investigate the association between familial conflict, low family support and family and peer's substance use and the subsequent risk of multi- substance use among adolescents.

Methods: The study used data from a sample of 495 youth participating in the High School Transition Study. Predictors were derived from the 8th grade baseline survey and included data on perceived peer and family substance use, family support and conflicts and individual substance use. The 9th grade follow-up included assessment of substance use outcomes. Multinomial logistic regression was used to test associations between the number of substances used and self-report peer and family measures.

Results: At the 9th grade assessment, 56% of the total participants had used at least one substance and 23% who used substances, met study criteria for multi-substance use (defined as using substances from at least 3 of the 4 categories of substance use: tobacco, marijuana, alcohol, and other drugs). Compared to non-users, multi-substance users were more likely to report having friends who used substances (39% versus 88%), perceived substance use problem in their family (36% versus 66%) and family conflicts (28% versus 58%) (p<0.001). On multivariate analyses, significant predictors of multi-substance use versus no use included reporting having a friend who used substances (RRR 9.21, 95% CI [4.53, 18.73]), parental substance use (RRR 2.39, 95% CI [1.27, 4.48]) and higher level of family conflicts (RRR 2.97, 95% CI [1.52, 5.80]).

Conclusions: These results highlight early adolescence as a critical period for the deleterious effects of exposure to peer and family substance use and parental conflicts, and the need to develop early intervention strategies related to combined use of alcohol, tobacco, marijuana and other drugs targeted at youth.

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POS5-40

PREDICTING SMOKING IN YOUNG ADULTHOOD AMONG ADOLESCENT SMOKERS AND NONSMOKERS

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Little is known about predictors of smoking initiation vs. maintenance from adolescence to young adulthood. Thus, we examined predictors of smoking in young adulthood among (1) adolescent nonsmokers and (2) adolescent smokers using data from a 7-wave longitudinal study of adolescents and their parents entitled Lives Across Time. The initial 4 waves of assessment occurred during adolescence at 6-month intervals from 1988-1992. The fifth wave occurred in young adulthood from 1993-1998. Candidate predictor variables included baseline demographics, adolescent GPA, depressive symptoms per the Centers for Epidemiological Scale – Depression (CESD), family social support, adolescent substance use, peer substance use, and parental smoking. Young adulthood variables included education, marital status, substance use, and CESD. Screening positive for recent smoking was defined by reporting ≥1 cigarette per day in the past 6 months. Of the 776 participants included in this analysis, 29.1% smoked at both time points, 47.7% were nonsmokers at both, 13.7% smoked in adolescence but not as an adult, and 9.5% did not smoke in adolescence but smoked as an adult. Average age of participants in adolescence and adulthood was 15.79 (SD=.70) and 23.8 (SD=1.35) years, respectively, 50.8% were female, and 98.3% were white. Binary logistic regression indicated that predictors of smoking in young adulthood among adolescent nonsmokers included less education (OR=0.77, CI 0.60, 0.99, p=.04), being unmarried in adulthood (OR=0.11, CI 0.20, 0.62, p=.01), less family social support (OR=0.97, CI 0.94, 1.00, p=.03), nonsmoking parents (OR=0.42, CI 0.17, 1.03, p=.06), and increased alcohol use from adolescence to adulthood (OR=1.06, CI 1.03, 1.08, p<.001). Predictors of smoking in young adulthood among adolescent smokers included less family social support (OR=0.97, CI 0.95, 1.00, p=.05) and increased CESD scores from adolescence to adulthood (OR=1.05, CI 1.00, 1.10, p=.04). Distinct factors predict smoking initiation vs. maintenance among young adults. Thus, interventions targeting specific factors (e.g., depressive symptoms vs. alcohol use) might address smoking differently among these groups.

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POS5-41

SIMILARITIES AND DIFFERENCES IN CESSATION-RELATED BEHAVIORS AND ATTITUDES AMONG GAY MALE VS. LESBIAN VS. BISEXUAL ADULT SMOKERS

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Objective: Gay male, lesbian, and bisexual (GLB) adults have higher rates of smoking than heterosexuals. Relatively little is known about cessation-related behaviors and preferences among GLB smokers, including the extent to which behaviors and preferences vary across GLB subgroups. Methods: A large, non-random sample of Colorado GLB smokers (n=1,713) completed a questionnaire about smoking cessation behaviors, attitudes, and resource access in 2007. Respondents were recruited at 129 separate venues or events; 28% of surveys were completed at GLBT events, 19% at GLBT bars or nightclubs, 17% online, and the remainder in GLBT centers, homes, outdoor public spaces or other settings. Logistic regression was used to compare results between gay male, lesbian, and bisexual respondents, controlling for age, education, and race/ethnicity. Results: Preliminary results show that lesbian and bisexual smokers were more likely than gay male smokers to have made a quit attempt in the past year; this difference was only significant for bisexuals (AOR=1.50, 95% CI: 1.09, 2.05). Lesbian and bisexual smokers were less likely than gay males to plan to use NRT in their next quit attempt; this difference was only significant for lesbians (AOR=0.75; 95% CI: 0.58, 0.97). There were no differences in intentions to quit across GLB subgroups. Misperceptions about NRT were common across all GLB smokers but were significantly more prevalent among bisexuals. One-fourth of respondents with doctors were uncomfortable asking their doctor for help quitting; this barrier was more common among lesbians and bisexuals than among gay males. [Note: Results will be finalized and expanded for the conference presentation.] Conclusions: Cessation-related behaviors and attitudes are more similar than different across GLB subgroups. However, important differences may exist, and public health campaigns should focus more on quit attempts among gay male smokers and on use of evidence based cessation treatment among lesbian and bisexual smokers.

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POS5-42

USABILITY TESTING OF A PHYSICIAN TOOL FOR PROVIDING COMPUTER-ASSISTED SMOKING CESSATION COUNSELING

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There is increasing evidence for brief smoking cessation counseling based on Motivational Interviewing (MI). To address low physician smoking cessation counseling rates, we designed a physician tool for providing computer-assisted counseling in office settings based on MI behavioral theory. Our objective was to evaluate physician usability of the web-based counseling tool. Prior to conducting usability testing, three physicians from the content development team piloted the process. The usability sessions were designed to introduce physicians to the tool, use it during a simulated patient interview, measure performance on directed tasks, and solicit physician feedback and first impressions of the tool. Nine physicians who practice in a regional health insurance plan were recruited for usability testing. All nine physicians completed usability testing in one-hour testing sessions observed by 2-3 team members. Content analysis was performed by two study team members to identify functional issues and themes that emerged related to use of the tool. Four major themes emerged from usability testing of the computer-assisted interview tool. Physicians were generally positive about the counseling questions and information but experienced some challenges. Some of the challenges included: discomfort during the simulated patient interview; getting lost in the interview; being overwhelmed by the number of options and text in some sections; and integrating the tool into the simulated patient interview. Physicians highly valued the interview summary captured as an "information prescription" and automatically generated by the counseling tool. The two additional major themes were lack of time to use the tool during a regular office visit and not being able to access resources in the tool while conducting the counseling itself (e.g., medication prescribing information). In-depth evaluations of physician needs and use characteristics suggest specific design elements and training requirements for a computer-assisted counseling tool for improving smoking cessation counseling by physicians. Efficacy of the tool will be tested in a randomized, controlled trial.

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POS5-43

IS SETTING A QUIT DATE A PRIORI ESSENTIAL? A COMPARISON OF STUDIES OF VARENICLINE USING FLEXIBLE VS A PRIORI QUIT DATE PROTOCOLS

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Background: Current smoking cessation guidelines recommend setting a target quit date (TQD) prior to starting pharmacotherapy, as a key factor for success. However, a flexible quit date (FQD) set after starting treatment may be more acceptable to some smokers and allow them to experience the therapeutic effect of a treatment before the quit attempt. To determine the relative effectiveness of the FQD vs. TQD approaches we compared clinical trials of varenicline using the two paradigms.

Method: One double-blind, randomized, placebo-controlled, international study assessed the efficacy of varenicline 1 mg twice daily (BID) for 12 weeks, using a FQD paradigm. This study was compared with 9 varenicline clinical trials using the conventional TQD approach. All studies enrolled adult smokers of ≥10 cigarettes/day who were motivated to quit, used the same dosing regimen, and followed participants through Week 24. At study onset subjects in the TQD studies were instructed to quit on Day 8; those in the FQD study could choose a quit date between Days 8 and 35 after starting medication.

Results: The Odds Ratio (OR) for continuous abstinence from Weeks 9–24 in the FQD study was 4.4 (95% CI: 2.6–7.5) in favor of varenicline (P<0.0001). The 95% CI of the FQD overlapped or exceeded that of the other 9 trials; its OR was the 7th highest of the 10 trials. Continuous abstinence at Week 24 for the FQD (35%) was the 5th highest of the 10 trials. When compared to the two most similar trials, the incidence of 7-day point prevalence of abstinence in the FQD trial increased at a slower rate than in the TQD trials but the abstinence outcomes were similar by Day 35. The incidence of adverse events was similar across the FQD and TQD studies.

Conclusions: Varenicline with a FQD protocol produced similar quit rates, ORs and safety data to varenicline with a TQD paradigm. Although smokers had flexibility in their quit date, they did not postpone quit attempts indefinitely. Our correlational results are not consistent with the assumption that setting a quit date a priori is critical. The FQD study endorses an alternative approach: quitting within a flexible quit window.

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POS5-44

BEHAVIORAL ACTIVATION TREATMENT FOR ADOLESCENT SMOKERS WITH DEPRESSIVE SYMPTOMS - TREATMENT DEVELOPMENT

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Aims: Cigarette smoking in late adolescence is a serious public health concern. Moreover, elevated depression symptoms predict the transition from non-smoking to regular smoking in this group. Although efforts have focused on developing interventions for this group, depressive symptoms are rarely addressed. Thus, the present's study purpose is to develop an integrated treatment for young smokers with elevated depressive symptoms using Behavioral Activation Treatment for Smoking (BATS; MacPherson et al., 2010) as a foundation.

Method: To confirm preliminary acceptability and obtain feedback to determine BATS modifications, we conducted 2 focus groups (n=17) with participants aged 18-21 years, 41% female, who evidenced a Beck Depression Inventory (BDI) score of ≥10. Participants were guided by a group facilitator to review and provide feedback on BATS manual content, format, clarity of components (daily monitoring, activity planning, contracts) and how BATS fits with cessation goals.

Results: Participants (53%) reported a desire to quit at a 6 or above on a 1 to 10 scale. Mean BDI score was 21.4. Participants reported a clear understanding of the BATS' rationale and purpose. In addition, 63.9% agreed BATS could assist adolescents with cessation, and 35% indicated they would recommend it. Based on focus group content, common themes were coded including modifying the daily monitoring to be more portable, placing more emphasis on social networks, providing more strategies to deal with alcohol-related triggers, and providing more examples of activities in line with this age group. In all, participants believed that smoking cessation treatments should "fill voids [caused by smoking] by filling them with positive things, instead of negative things," a goal consistent with BATD.

Conclusions: Based on initial feedback, participants were receptive to BATS' treatment goals and framework. These findings suggest the promise of BATS' efficacy with this group. Additionally, this preliminary evaluation provides evidence that BATS can serve various samples at different ages and education levels. Findings from a third focus group will also be presented within the poster.

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POS5-45

MENTHOL PREFERENCE AMONG SMOKERS IS ASSOCIATED WITH TRPA1 VARIANTS

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Among smokers, there are substantial individual differences in preference for menthol, which acts at sites that include the transient receptor potential (TRP) A1 channel that is expressed by nociceptors in the lung and airways. Menthol preference appears to be stronger in at least some studies of more dependent smokers and in those from African- and Asian ethnicities. We have thus sought association between menthol preference and common variants in the TRPA1 gene in European-American smokers who expressed brand preferences during interviews by experienced staff during participation in smoking cessation clinical trials or non therapeutic addiction genetics research. We have identified SNPs in TRPA1 that display significant association with menthol preference in heavier smokers, providing odds ratios for menthol preference of about 0.6. Menthol preference provides a trend in the same direction in lighter smokers that achieves nominal significance for one SNP. These data are consistent with the idea that common TRPA1 haplotypes may provide novel biological underpinnings for individual differences in menthol preference.

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POS5-46

SMOKING REVEALS SEX-SPECIFIC EFFECTS ON LANGUAGE LATERALIZATION IN SCHIZOPHRENIA

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Background: Studies of schizophrenia show an association with deficits in functional brain lateralization. Schizophrenia is accompanied by a highly elevated prevalence of nicotine-dependency and smoking was recently shown to reduce language asymmetry in men. This questions a common view according to which reduced laterality is associated with or causes the disease. Instead we propose that altered asymmetries could be due to secondary artefacts of smoking. The present study examined auditory language lateralization in schizophrenia and controls.

Methods: We tested sixty-seven patients with schizophrenia (18 male smokers, 17 female smokers, 17 male non-smokers, and 15 female non-smokers) and 72 matched controls in a semantic and an emotional dichotic-listening task.

Results: In the patient group, sex*smoking interaction of semantic language lateralization was significant (p<.05), with non-smoking males exhibiting a higher laterality index (LI) than non-smoking females and with smoking females having a higher LI than non-smoking ones. In the control group, smoking men had a lower LI than non-smoking ones (p<.05). Considering the sex*smoking interaction of the emotional dichotic listening task no significant differences were observed between groups, but comparison within sex revealed that non-smoking males and smoking females exhibited a dissociated LI pattern.

Conclusions: These findings confirm that smoking importantly mediates sex-dependent effects of language lateralization. This could change the perspective according to which schizophrenia may result from altered asymmetries. Previous studies did not control for smoking prevalence between groups in the context of brain lateralization. Further research may sharpen our understanding regarding the role of nicotine in functional brain lateralization.

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POS5-47

SOUTH AFRICAN SMOKERS' INTEREST IN SWITCHING TO SMOKELESS TOBACCO IF INFORMED OF ITS RELATIVE RISK

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CONTEXT: Smokeless tobacco (SLT) products in South Africa carry the mandated warning label 'causes cancer.' Compared to cigarettes smoking, SLT use is considered relatively less harmful, but the role of SLT in tobacco harm reduction will depend on high proportion of smokers completely switching to SLT use. OBJECTIVES: To determine the perception of South African tobacco users of the relative risk of SLT and the level of interest among current smokers in switching to SLT use.

METHODS: This cross-sectional study involved a national sample of South African Smokers (n=688) and SLT users (n=120) aged >=16 years who participated in the

2007 South African Social Attitude Survey (N=2,901). Data on tobacco use, past quit attempts, self-efficacy to quit smoking and smoking restrictions were obtained through an interviewer-administered questionnaire.

OUTCOME MEASURE: Being very/somewhat likely to switch to SLT if told it was 99% safer than cigarettes. Data analysis included logistic regression analysis.

RESULTS: Of the current smokers, only 2.4% were currently using SLT, but 24.5% (n=155) would consider switching to SLT. Of the smokers, 6.6% perceive SLT to be relatively safer, 49.5% perceive SLT to be equally as harmful, 12.6% perceive SLT to be more harmful and 31.3% did not know. The corresponding figures among current SLT users were 66.4%, 22.8%, 8.1%, and 2.8% respectively. Compared to smokers who perceived SLT to be safer than cigarette smoking, those who did not know remained less likely to consider switching even if informed that SLT was 99% safer (OR=0.38; 95% CI = 0.18 - 0.81). Furthermore, compared to those smokers with no smoking restrictions at work, those with strict smoking restriction were more likely to be interested in switching (OR=2.40; 1.42 - 4.06). Those interested were also those less likely to have made any quit attempt.

CONCLUSIONS: Compared to smokers, current SLT users have a more accurate perception of the relative safety of SLT compared to cigarettes. However, the study findings suggest that informing smokers of the relative risk of SLT use compared to cigarette smoking is not likely to significantly increase their motivation to switch.

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POS5-48

KNOWLEDGE OF THE HEALTH EFFECTS OF SMOKING AMONG ADULT SMOKERS IN SOUTH KOREA: FINDINGS FROM THE ITC SOUTH KOREA SURVEY

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In Korea, studies have found high awareness of the overall harms of smoking, but little is known about Koreans' knowledge of the specific diseases caused by smoking and secondhand smoke. This study examined data from the International Tobacco Control (ITC) South Korea Survey, a prospective cohort telephone survey of adults, to determine the level of awareness of the specific health risks of smoking and secondhand smoke. Data was from the first two waves of the survey, conducted in 2005 (N=1002) and 2008 (N=1818). Results demonstrated that smokers at Wave 1 had low knowledge of the health outcomes of smoking: only 35.8% said that smoking causes stroke, 57.5% said it causes impotence, 30.7% said it causes blindness, and 78.9% believed smoking causes lung cancer in non-smokers. By Wave 2, knowledge had improved but was still low for some health effects: less than half (46.7%) of smokers said smoking causes stroke, 63.8% said it causes impotence, and 32.3% believed it causes blindness. Knowledge of secondhand smoke risks was slightly better: 80.7% believed it causes lung cancer in non-smokers and 74.4% said it causes asthma in children. Knowledge significantly improved over time for those smokers who were interviewed at both waves (N=441), with significant differences found for stroke ($t(392)=5.19$, $p<.001$), impotence ($t(380)=5.26$), $p<.001$), blindness ($t(374)=1.98$), $p<.05$), and lung cancer in non-smokers ($t(407)=3.70$, $p<.001$). In addition, differences in knowledge at Wave 2 existed by several demographic variables, such as education and gender. For example, men were more likely than women to say smoking causes impotence (64.6% vs. 47.8%), whereas women were more likely to report that smoking causes premature aging compared to men (81.1% vs. 75.2%). Therefore, while knowledge of the specific health effects of smoking has increased slightly among Korean smokers, there is still room for further improvement, especially for knowledge of blindness and stroke. It is important that South Korea continues to improve its tobacco control efforts in education, such as by implementing graphic warning labels, for smokers to be more aware of the specific outcomes of smoking.

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POS5-49

PREDICTORS OF 1-, 6-, AND 12-MONTH SMOKING RELAPSE AMONG SMOKERS COMPLETING A TOBACCO CESSATION INTERVENTION PROGRAM

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Introduction: Although there are several nicotine replacement therapies that are effective aids for smoking cessation, the abstinence rates reported across clinical trials vary widely. Identifying characteristics that are associated with successful cessation is important; this could facilitate treatment decisions to increase a patient's quitting success. The purpose of the present study was to examine predictors of treatment success and failure among heavy smoking men.

Methods: Participants were 65 men (mean age=39 yrs) who were long-term smokers (mean pack years = 22) and motivated to quit. Participants were administered an 8-week nicotine transdermal patch intervention in a step-down fashion, and were provided 3 individual counseling sessions as well as brief weekly phone counseling. Both pre-treatment (demographic, behavioral, and smoking characteristics) and intra-treatment (patch compliance, tobacco use) measures were used to predict smoking cessation at 1-, 6-, and 12-months post-treatment.

Results: Multivariate logistic regression analyses revealed that, among the pre-treatment variables, younger age and being married were significant predictors of smoking relapse at 6-, and 12-month follow-up, respectively. No other pre-treatment variables were associated with relapse (e.g., demographic factors, BMI, drug and alcohol use, nicotine dependence, smoking history) at any time point. Among intra-treatment variables, any smoking during the first week of treatment predicted smoking relapse at all 3 follow-up time points. Smoking during weeks 3 and 4 was also associated with relapse at 1-month follow-up. Nicotine patch compliance was not associated with cessation success.

Discussion: Smoking any cigarettes during the first week of nicotine patch therapy was the most robust predictor of smoking relapse. Neither nicotine patch compliance, nor any other smoking characteristic, was predictive of cessation success. These results underscore the importance of total abstinence, especially at the outset of treatment, which is paramount to ultimate cessation success.

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POS5-51

THE IMPACT OF CHRNA3 AND BDNF VARIANTS ON THE ASSOCIATION BETWEEN PARENTAL MONITORING AND SMOKING INITIATION

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Smoking initiation is under the influence of both genetic and environmental factors. These factors can act in a synergistic fashion, yet there is a paucity of research examining their interplay with regards to smoking-related phenotypes. Parental monitoring is a well-established environmental risk factor for smoking initiation. We sought to determine the impact of two genetic variants, SNP rs1051730 in CHRNA3 and SNP rs6265 in BDNF, on this relationship. An association between SNP rs6265 (BDNF) and smoking initiation was recently identified in a genome-wide meta-analysis (Furberg et al., 2010). SNP rs1051730 (CHRNA3) was selected given its association with a broad range of smoking-related phenotypes (e.g., nicotine dependence). Utilising data from the Avon Longitudinal Study of Parents and Children, we sought to determine: (1) The association between level of parental monitoring and smoking initiation; (2) The association between rs1051730 (CHRNA3) and rs6265 (BDNF) and smoking initiation; and (3) Whether or not these genetic variants modify the relationship between parental monitoring and smoking initiation. Smoking initiation was defined as having ever smoked a single cigarette, assessed by child self-report at age 15y6m. Level of parental monitoring was determined through child self-report at age 14y. Strong evidence of an association between parental monitoring and smoking initiation was observed ($p < 0.001$). Smoking initiation rates increased as parental monitoring levels decreased. We found evidence of association between rs1051730 (CHRNA3) and smoking initiation (T allele, OR = 0.87, 95% CI 0.79, 0.96, $p = 0.007$), with the 'T' allele appearing to confer a protective effect. No evidence of association was observed for rs6265 (BDNF) (G allele, OR = 1.1, 95% CI 0.97, 1.23, $p = 0.16$). However, our study sample was underpowered to detect an effect equivalent to that noted by Furberg et al. (2010). There was no evidence of an interaction between rs6265 (BDNF) and parental monitoring ($p > 0.5$) and no clear evidence of an interaction between

rs1051730 (CHRNA3) and parental monitoring. These findings and their implications will be discussed in detail.

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POS5-52

CORRELATES OF EXPOSURE TO TOBACCO SMOKE POLLUTION (TSP) AMONG NON-SMOKERS IN BANGLADESH: FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL (ITC) BANGLADESH SURVEY

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Exposure to tobacco smoke pollution (TSP; also known as secondhand smoke) has been estimated by the WHO to cause 1.0% of all deaths and 0.7% of the worldwide burden of disease in disability-adjusted life-years in 2004 (Öberg, 2010). With the growing recognition of the health risks posed by TSP, there has been greater interest in reducing exposure to TSP among children and non-smoking adults in the home. However, the majority of research on household exposure to TSP is from high-income countries, and less is known about the correlates of TSP exposure in developing countries. The present study was designed to identify the correlates of household exposure to TSP among a sample of adult non-smokers (N= 2,594) from Wave 1 (2009) of the International Tobacco Control (ITC) Bangladesh Survey. Non-smokers who were exposed to TSP were those who lived with at least one smoker in their household and who reported having no home smoking ban (N=1,091). Those not exposed to TSP were those who either reported having a complete home smoking ban or who reported no smokers in the household (N=1,503). Exposure to TSP was found to vary by demographic characteristics. Those non-smokers who were female, lived in slum areas, were less educated, had lower income, and whose father smoked were more likely to be exposed to TSP in the home. In addition, of the attitudinal and behavioural measures examined, only concern that tobacco smoke harms children was significantly associated with TSP exposure: non-smokers who reported being concerned about the harms of tobacco smoke were significantly less likely to be exposed to TSP than those who were unconcerned (29.5% vs. 50%, x2=7.70, p=.01). These findings have implications for promoting smoke-free homes and reducing TSP exposure among non-smokers in developing countries such as Bangladesh, highlighting in particular the importance of educating the public on the dangers of TSP and the benefits of smoke-free laws.

This study was conducted while the first author was at the University of Waterloo. Supported by the CIHR Training Grant in Population Intervention for Chronic Disease Prevention: A Pan-Canadian Program (Grant #:53893). The ITC Bangladesh Project was supported by grants from the International Development Research Centre (104831), Canadian Institutes of Health Research (79551), and the Ontario Institute for Cancer Research.

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POS5-53

SMOKERS' PERCEPTIONS OF NICOTINE GUM, BRIEF ADVICE, AND GROUP COUNSELLING FOR SMOKING CESSATION

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Smoking cessation interventions have relatively low long-term success rates. Poor uptake of and adherence to treatments may contribute to poor outcome. We examined smokers' perceptions of the acceptability and effectiveness of common treatment approaches, and related these to smoker characteristics. Method: Smokers were recruited from community and university sources. 81 participants were presented with information regarding cessation using nicotine gum, individual brief advice, and group counselling. For each method, they were given a description and summaries of benefits and risks or side effects. Participants then completed a questionnaire regarding acceptability of each treatment, how the treatment would fit into their lifestyle and which treatment they would prefer. Questions included demographics and questions about self-efficacy for quitting. Smokers were not offered cessation help in the study, but those who requested it were referred to their physician and given a list of resources. Results: Almost all participants were aware of nicotine gum for cessation, but only 44% chose this as their favoured approach. Fewer were previously aware of brief advice and group counselling approaches, but 58% chose group counselling as their favoured approach; 16% chose individual brief advice. Those who favoured each approach were more likely to rate that approach highly on acceptability measures. Preferences were not related to socio-demographic measures. Participants gave reasons for favouring each cessation method. Nicotine gum was preferred because it addresses cravings, is convenient, accessible, and self-administered. Individual brief advice was preferred because a health professional would give personalized advice regarding cessation strategies. Group counselling was preferred because it offers peer support and advice from others dealing with the same issue. Implications: Health professionals should involve smokers in choosing cessation approaches that fit with their preferences, as this may enhance adherence and outcomes.

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POS5-54

SECONDHAND SMOKE EXPOSURE AT DIFFERENT TYPES OF INDOOR WORKPLACES IN PENANG, MALAYSIA

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Prolonged exposure to tobacco smoke pollution is a serious risk to public health. Malaysia have implemented smoke-free workplaces since 1994 particularly at hospitality venues and later expanded to include twenty types of indoor workplaces. The aim of this study is to compare tobacco smoke-derived particulates level in different types of non-smoking workplaces in Penang, Malaysia listed under the Malaysia Control of Tobacco Product Regulation 2004, using a standardized measurement protocol. We included 44 indoor venues using mechanical ventilation air condition system, 8 offices, 7 hospitals, 5 shopping malls, public transport terminals and fitness/sport centre each, 4 restaurants, 3 cinemas and 3 amusement centre, 2 hotel and 2 public transport. These were selected using mix random, convenience and purposive sampling. The TSI SidePak AM510 Personal Aerosol monitor was used to measure the concentration of particulate matter less than 2.5 microns in diameter (PM2.5). Geometric mean PM2.5 level were highest in amusement centre (125.7µg/m3), fitness/sport centre (59.1 µg/m3) and public transport terminal (40.7 µg/m3), while were the lowest in hospital (10 µg/m3). Analysis of variance shows that there was a significant different between workplaces ($p<0.05$) and based on Post-Hoc analysis, amusement centre was found statistically significant with restaurants ($p=0.026$), offices ($p=0.007$), shopping malls ($p=0.027$) and hospitals ($p=0.003$). The study recommends the necessity of more enforcement activity in these workplaces by the employers to reduce "involuntary smoking" among workers.

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POS5-55

EARLY INITIATED TOBACCO USE IS A RISK FACTOR FOR INCIDENT SUICIDE IDEATIONS: LONGITUDINAL ANALYSIS AMONG TWINS FROM ADOLESCENCE TO ADULTHOOD

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It has been debated whether tobacco use is an independent risk factor for suicide related outcomes. We investigated whether early tobacco use initiation during adolescence predicts suicide ideations in young adulthood. We used the FinnTwin12 longitudinal data with assessments of tobacco use and depression at age of 14 and of suicide ideations at age of 22. Data were collected by interviews using a structured psychiatric instrument (SSAGA) at both time points. The sample included 1,330 individual twins with data on tobacco use at age 14 and suicide ideations at age 22. Age when the participant had smoked a cigarette or cigar or pipe or used smokeless tobacco for the very first time was categorized as follows: not at all (45%); late (≥12 yrs=36%); early (<12 yrs=19%). The variable of suicide ideations was a dichotomy, 13% of men and 20% of women reporting any. We analyzed the onset of suicide ideations as young adult among 1238 twins who did not report any thoughts of suicide as adolescent. Twins

were analyzed as individuals in the logistic regressions. However, since observations on twins within twin pairs may be correlated, twin ship was statistically accounted for. When adjusted for sex and major depressive disorder, those with early tobacco initiation had higher risk for incident suicide ideations (OR=1.6, 95%CI=1.1, 2.5; p=0.03) compared to those who had not initiated. When additionally adjusted for tobacco use at age 22, the effect of early initiation remained independent (OR=1.7, 95%CI=1.0,2.6; p=0.04). There was no interaction with sex (p=0.14). In order to control for familial factors, we utilized the fact that our sample consisted of twins and the co-twins share their family environment. We conducted pair-wise conditional logistic regression restricted among twin pairs discordant for suicide ideations. Among those 119 discordant twin pairs, the size effect of early initiation (OR=1.9) was replicated, even though not reaching statistical significance. Our results provide further evidence that early initiated tobacco use may play an important role in the development of serious mental health problems.

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POS5-56

INTERACTIVE VOICE RESPONSE SYSTEM FOR SUSTAINING A SMOKING INTERVENTION AFTER HOSPITAL DISCHARGE: A PROCESS EVALUATION

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Background: Hospital-initiated smoking cessation intervention is effective only if it includes follow-up contact for 1 month post-discharge. Interactive voice response (IVR) technology can be used to assess tobacco use, provide information, and triage patients to tobacco cessation resources. We report on the feasibility and acceptability of an IVR system during the initial phase of a randomized controlled trial of the efficacy of a post-discharge intervention. Method: In 2010, 48 hospitalized smokers (5 pilot, 43 randomized) who received tobacco counseling at Massachusetts General Hospital and agreed to try to stay quit after discharge and use smoking cessation medication, received 5 IVR calls (at 2, 12, 28, 58, & 88 days post-discharge) and free smoking medication for 3 months. IVR calls assessed smoking status, provided tailored motivational messages, and offered callbacks (live calls from a counselor) for smoking counseling and medication refills. Satisfaction with IVR was assessed 1 month post-discharge. Results: IVR call completion rates (participants answering calls) were 78% (38/49) at 2 days, 84% (36/43) at 12 days, 65% (24/37) at 28 days, 56% (15/27) at 58 days, and 50% (9/18) at 88 days. Participants requested callbacks at 58/122 (48%) of IVR calls accepted, and 52 (90%) of them were reached. Medication refills and counseling were requested at 40 (80%) and 19 (37%) of the callbacks, respectively. The most frequent counseling topics were “slips/relapse” and “cravings.” At 1 month-follow-up, 77% of the 35 patients who accepted an IVR call rated the calls as “somewhat/very” helpful, citing that it was helpful to have someone “check-in” about smoking. 97% would recommend the system to a friend. Conclusion: An IVR system for smokers after hospital discharge providing tailored information, motivational messages and triage to telephone counseling and medication refills was feasible to implement and well accepted by patients. Most patients requesting services from the IVR wanted medication refills and one-third requested counseling. IVR may be a viable, scalable means of continuing a hospital-initiated intervention post-discharge.

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POS5-57

THE ECONOMIC BURDENS OF SMOKING IN HUNGARY

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Introduction: Hungary is a medium-developed country with very poor public health indicators. The prevalence of vascular and oncology cases is high, 36% of the citizens smoke regularly, as a result of which one fifth of the deaths is related to smoking. In Hungary, a person dies in lung cancer every hour, so no genuine improvement can be reached without suppressing smoking. Without knowing the social and economic damages of smoking the public health situation cannot improve significantly. In the developed countries the size and the trends of the health expenditures related to smoking are published annually. The post-communist countries of Central and Eastern Europe devote little attention to this problem; only the Czech Republic and Hungary make such analyses with varying frequency. This publication aspires to assess the results of the last Hungarian research of this type and purpose.

Methodology: We have calculated the economic burdens of the illnesses caused by smoking using 16 ICD codes and the data of the Health Care Fund, which reliably reflect the direct costs. We calculated the indirect costs - the size of which was not known so far even to the health and the political decision-makers - on new methodology bases and with a more accurate approach. But since the state realizes huge tax revenues (VAT, excise tax) from smoking, it behaves rather in a Janus-faced manner in this matter.

Conclusion: The smoking-related economic burdens are huge and their full extent is not known. The above-indicated direct and indirect costs have reached 1.7% of the GDP and the Hungarian state realizes slightly less tax revenue than that. The analyses of this type can fundamentally influence the attitude of the political and the health policy decision-makers, which can help reverse the extremely bad trends.

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POS5-58

AN EXAMINATION OF SMOKING-RELATED CHARACTERISTICS AMONG INDIVIDUALS DIAGNOSED WITH OBSESSIVE COMPULSIVE DISORDER

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INTRODUCTION: Recent estimates indicate that 20.8% of adults in the U.S. smoke cigarettes, and that higher prevalence rates exist among individuals with anxiety disorders. However, little is known regarding the relationship between smoking and certain anxiety disorders, and in particular obsessive compulsive disorder (OCD), which has among the lowest rates of tobacco use (~10-15%). This study assessed differences in smoking-related characteristics among those diagnosed with OCD, and examined whether symptomatology specific to OCD is associated with, among other factors, nicotine withdrawal or subjective cigarette craving.

METHODS: A community sample (N = 98) participated in a larger laboratory assessment study of transdermal nicotine and cue reactivity among smokers with anxiety disorders. Individuals with current OCD (n = 15), an anxiety disorder other than OCD (n = 44), or no current Axis I diagnoses (n = 34) were compared. Self-report measures of cigarette craving and withdrawal were administered prior to and following a 5-hour nicotine and tobacco deprivation period. Indices of negative affect and smoking characteristics (Obsessive-Compulsive Smoking Scale; OCSS) were also assessed.

RESULTS: Baseline between-groups differences were analyzed using one-way ANOVAs. Preliminary analyses revealed higher state levels of depression [p<.001], anxiety [<.001], and stress [p<.001] among those with OCD. Those with OCD also possessed significantly greater levels of OCSS preoccupation with smoking [p<.05]. For the primary analyses, OCD group membership predicted higher levels of smoking withdrawal [p<.05] and craving to relieve negative affect [p<.05]. These findings suggest that smokers with OCD experience higher levels of negative affect and smoking preoccupation when compared to those with non-OCD anxiety disorders and controls. Not surprisingly, after a 5-hour tobacco abstinence period, individuals with OCD also experienced disproportionate levels of withdrawal and craving related to the relief of negative affect. A clearer understanding of these differences among those with OCD could lead to improved smoking cessation efforts tailored for specific anxiety disorders.

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POS5-59

IDENTIFYING A RISK GROUP FOR LUNG CANCER SCREENING: ASSOCIATIONS BETWEEN COPD AND LUNG CANCER MORBIDITY IN CORRELATION WITH SMOKING HABITS

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Background: Hungary’s lung cancer mortality rates are currently highest in the world (69/100 000). COPD, lung cancer, and cardiovascular diseases are the “big trias,” because of the common risk factor, smoking. In addition, COPD is also an independent risk factor for lung cancer.

Aim: Identification of a well-defined risk group, with large concentration of lung cancer cases.

Method: This prospective follow up study completed questionnaires for patients with

lung cancer in 2009. We collected data on detection, diagnosis, smoking habits, COPD like comorbidity. The follow up will continue until the death, or until three years.

Results: We collected data on 929 lung cancer patients (male:521; female:408; 99%>40 years old). Method of detection: screening, or other exam, but without symptoms 54%; symptoms: 46%. Smoking habits: smokers, or ex smokers 79% (currently 68%, quit 32%; Pack Year index >20 in 79%). COPD was comorbidity:44% (COPD prevalence in general population: 4-9%). The occurrence of COPD with smoking was 69% in this survey (COPD prevalence among smokers: 20%). COPD comorbidity was 16% among nonsmokers (non smoker population: 2%).

Conclusions: Our survey has validated that 79% of lung cancer patients are smokers and 76% of smoker's Pack Year index were higher than 20. Our results have verified that COPD is an independent risk factor, because of the higher COPD prevalence in the studied group compared with the general population. Lung cancer risk is 15 times higher among smokers and 2,4 times higher among COPD patients. This means that lung cancer risk is 36 times higher in cases where smoking and COPD disease occur together. The risk would double to approximately 70 times higher among over 40 years old smokers with COPD. No international evidence for lung cancer screening, however, it would be beneficial to organise lung cancer screening programs with any traditional screening methods for this risk group in order to increase detection of lung cancer in early stages.

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POS5-60

THE LANDSCAPE OF TOBACCO USE IN EIGHT ECONOMICALLY DISADVANTAGED DOMINICAN REPUBLIC COMMUNITIES

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Objective: To qualitatively characterize tobacco use in 8 economically disadvantaged Dominican Republic (DR) communities. Background: In 2002, Proyecto Doble T (PDT), a collaborative effort of DR & U.S. scientists, began a 5 year study including a 3 year randomized controlled trial of community-partnered tobacco cessation. Three years post-trial the team returned to study 8 communities for a new trial that includes 4 original communities.

Methods: 4 teams of DR/US researchers conducted qualitative assessments of 2 communities each. About 50 residents per community were interviewed (leaders, local residents, health care providers (HCPs), policymakers, teachers, pregnant women). Observations were conducted in clinics, pool halls, bars, churches, local parks, streets, baseball games and government buildings. Domains included tobacco use, secondhand smoke (SHS), tobacco control laws, HCP practices, and pregnancy.

Findings: Overall, differences in tobacco use were found across ages, with highest use in older- (>65; smoked mostly hand-rolled, raw tobacco) and middle-aged adults (40-65; commercial cigarettes), and lowest in younger adults (18-39; smokeless tobacco). Novel chewing tobacco mixtures with baking soda, mint, sugar, and alcohol were found. Most identified some risks of tobacco use and believed SHS was harmful but could not identify specific risks. Most reported that they smoked in their homes, with variability in acceptability of smokefree home policies, knowledge of laws, and visibility of smoking in public places. HCP advice varied, with generally inconsistent intervention. Many reported that pregnant women rarely smoked, though few were aware of risks and hidden smoking was noted. In all but one original community, there was evidence for sustainability of intervention infrastructures. Community cohesiveness and less income disparity may mediate this effect.

Conclusions: Key targets for the upcoming trial include middle-aged, older, and pregnant smokers, smokeless tobacco use in youth, and hidden smoking, along with strengthening HCP role in cessation and SHS reduction. Supporting community infrastructures may enhance sustainability.

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POS5-61

EXTINCTION OF CUE-PROVOKED CRAVING DURING CUE-EXPOSURE THERAPY FOR SMOKING CESSATION

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Based on the principles of Pavlovian learning and extinction, cue exposure therapy (CET) involves repeated exposure to substance-associated cues to extinguish conditioned cravings and reduce the likelihood of relapse. To date, few studies have examined the effects of repeated smoking cue exposure on craving to smoke. The present study set out to extinguish cue-provoked cravings in smokers undergoing multiple CET sessions as part of a comprehensive smoking cessation treatment. The current analyses are based on 74 moderately dependent, treatment-seeking smokers who completed at least four CET sessions in addition to six cessation counseling sessions. The sessions were scheduled twice per week and participants began using nicotine transdermal patches on their quit day, which occurred immediately prior to initiation of CET. Every CET session consisted of 4 sets of trials, with each set comprising presentation of 3 neutral cues followed by 2 blocks of smoking (12 images per block) and 1 block of negative affect (8 images) cues. During each of these trials, an image was presented on a computer screen for 12 sec, and participants rated their cravings after every block. The procedure allows for the calculation of both within-session extinction and across-session extinction. Craving to smoke was assessed using 3 visual analog scale ratings. A Session by Set by Cue Type (smoking vs. neutral) repeated analysis of variance revealed significant main effects for Session, Set, and Cue Type, and significant Session by Cue Type and Set by Cue Type interactions. Specifically, results showed a progressive decline in cue-provoked craving both within and across sessions. A similar pattern of findings was observed among a smaller subset of participants (n = 32) that completed all six CET sessions. These data support the premise that repeated CET can produce progressive extinction of laboratory-based cue-provoked cravings. Limitations to the study and implications for treatment will be discussed.

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POS5-62

PREGABALIN REDUCES SMOKING BEHAVIOR IN ABSTINENT SMOKERS

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In preclinical and clinical studies, medications enhancing the GABA neurotransmission attenuated nicotine reward. Pregabalin, an antiseizure medication, presumably interacts with brain glutamate and GABA neurotransmission. The goal of this study was to determine pregabalin's effects on smoking behavior, nicotine withdrawal severity, and attentional bias for smoking cues and smoking related words. Twenty-four smokers participated in an outpatient double-blind, placebo-controlled, crossover study. Subjects had a 4-day treatment period with either pregabalin (300 mg/day) or placebo and then were crossed over for 4 days of the other treatment. In each treatment period, starting at midnight of Day 1, participants were asked to stop smoking until the experimental session on Day 4. Pregabalin treatment, compared to placebo, reduced the CO levels during the first 3 days of treatment (treatment-by-time interaction; $F(2, 112) = 3.1$ $p<0.05$). For the total score of the Nicotine Withdrawal Symptom Checklist, treatment effect was not significant ($p<0.05$). Among individual items pregabalin reduced the ratings of frustration (treatment main effect; $F(1, 22) = 5.5$; $p<0.05$), restlessness (treatment main effect; $F(1, 22) = 4.2$; $p=0.05$), and anxiety (treatment main effect; $F(1, 22) = 4.6$; $p<0.05$). Pregabalin treatment attenuated the ratings for drug liking (treatment main effect; $F(1, 20.8) = 5.3$; $p<0.05$) in response to sample smoking. Pregabalin did not have significant effects on the cognitive assessments. These findings warrant further studies examining the potential use of pregabalin for the treatment of nicotine addiction.

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POS5-63

EFFECTS OF MENTHOLATION ON CIGARETTE SMOKE EMISSIONS

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The 2009 Family Smoking Prevention and Tobacco Control Act empowered the FDA Tobacco Products Scientific Advisory Committee (TPSAC) to study "the impact of the use of menthol in cigarettes on the public health" and to provide the FDA with recommendations. Current scientific evidence comparing human exposures between menthol and nonmenthol smokers show mixed results. This is largely because of the many differences between commercial menthol and non-menthol cigarettes other than menthol levels. We have conducted a study using two types of test cigarettes: (1) a commercial nonmenthol brand that we mentholated at four different levels, and (2) Camel Crush, a commercial cigarette containing a small capsule in the filter that releases menthol solution into the filter when crushed. Four cigarettes were machine-smoked at each of the five menthol levels investigated, and the total particulate matter (TPM) was collected on a Cambridge filter pad and analyzed by GC/MS for menthol, nicotine, the tobacco-specific nitrosamines (TSNAs), NNN and NNK, the PAHs, pyrene and benzo[a]pyrene, and cotinine and quinoline. The mainstream smoke was also monitored continuously in real time on a puff-by-puff basis for eight gas-phase constituents (acetaldehyde, acetonitrile, acrylonitrile, benzene, 1,3-butadiene, isoprene, 2,5-dimethylfuran, and menthol), using a proton transfer reaction-mass spectrometer. Average yields (in micrograms/cigarette) for the analytes were determined. Menthol in the TPM samples increased linearly with applied menthol concentration, but the amounts of nicotine along with the target TSNAs, PAHs, cotinine, and quinoline in the cigarettes remained essentially unchanged. Similarly, yields of the targeted gas-phase constituents were largely unaffected by the levels of menthol present in the cigarettes. Examples of these measurements will be presented and the importance of the real-time analytical techniques in future studies of menthol cigarette toxicity will be discussed.

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POS5-64

SECONDHAND SMOKE EXPOSURE PATTERNS AMONG PATIENTS HOSPITALIZED WITH CORONARY HEART DISEASE

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BACKGROUND: Although secondhand smoke (SHS) exposure increases nonsmokers' risk of cardiovascular disease, this risk factor is not routinely addressed in cardiac care settings. We characterized SHS exposure patterns and attitudes in nonsmokers hospitalized with coronary heart disease (CHD).

METHOD: From May to December 2010, we surveyed self reported non-smoking patients who were admitted with CHD to Massachusetts General Hospital, Boston, MA. The survey assessed SHS exposure in the past 7 and 30 days at home, car, and work; beliefs about SHS; and provider intervention around SHS.

RESULTS: Among 186 patients surveyed (24% female, 83% white, mean age=68 years), 17% reported SHS exposure in the past 7 days (8% home, 6% car, 9% work) and 25% reported SHS exposure in the last 30 days (9% home, 11% car, 12% work). Patients reporting 30-day SHS exposure were younger ($p<0.001$) and less educated ($p=0.003$) than those without exposure. Over two thirds of patients had a no-smoking policy for their home (68%) or car (72%). Twenty-five patients (13%) lived with a smoker; 12 (48%) lived with a smoking spouse and 14 (56%) lived with an adult child who smoked. Over 90% of all patients (n=169/186) believed that SHS was harmful, but only 56% correctly reported that SHS exposure increased non-smokers' risk of a heart attack "some or a lot"; 23% reported "a little or none"; 21% did not know. Nineteen percent of patients were asked about SHS exposure in the hospital; only 2% were advised to maintain a smoke-free home and car. SHS exposed and non-exposed patients did not differ in awareness of risks of SHS or in rates of provider assessment of SHS risk.

CONCLUSION: One-quarter of hospitalized nonsmokers with CHD reported past 30 day SHS exposure in the home, car or at work. Surprisingly, adult children were more likely than spouses to be the household smoker living with an exposed patient. Nearly one-half of nonsmokers with CHD were unaware of the cardiac risk of SHS, and health care providers rarely addressed SHS. These data identify a need to educate nonsmoking cardiac patients about SHS risk and help them minimize this exposure.

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POS5-65

THE GENERATION OF A NICOTINE AEROSOL FOR PULMONARY DELIVERY USING THE STACCATO® SYSTEM

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INTRODUCTION: Existing nicotine replacement therapies and electronic cigarettes fail to reproduce the rapid absorption of nicotine obtained through smoking. The pulmonary delivery of pure nicotine could enable more rapid relief from acute cravings, and thus improve long-term smoking cessation rates. The Staccato system generates a highly pure drug aerosol appropriate for deep-lung deposition that achieves pharmacokinetics comparable to intravenous bolus. However, using the Staccato system with drugs that are liquid at room temperature (such as nicotine) poses significant technical challenges, as the flow properties of liquids preclude them from being coated as physically stable thin films on a substrate for subsequent vaporization. One viable solution is to formulate the liquid drug in a solid, salt form. This series of studies examined the physicochemical properties of a variety of nicotine salts to identify a lead candidate to take into preclinical and clinical development.

METHODS: A series of studies examined the physiochemical properties of pure nicotine combined with fumaric acid, salicylic acid, and tartaric acid, which produces nicotine fumarate, nicotine salicylate and nicotine bitartrate, respectively. These studies included tests of solubility, consistency of coated dose, evaporation loss, physical and chemical stability of the coated films, and important aerosol attributes (emitted dose, particle size, and aerosol purity).

RESULTS: Of the 3 salts, nicotine bitartrate had the best combination of traits, including technical feasibility with up to 200mcg per dose, aerosol purity exceeding 99%, and particle size acceptable for deep lung delivery. In contrast, both nicotine salicylate and nicotine fumarate had excessive drug loss due to evaporation and were not suitable for further development.

DISCUSSION: This series of studies suggest that nicotine bitartrate has the best balance of physiochemical properties for additional drug development. Future studies will explore its preclinical toxicology profile. Subsequent clinical studies will explore the safety and efficacy of inhaled nicotine bitartrate as a smoking cessation aid.

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POS5-66

CLIENT AND CLINICIAN PERSPECTIVES ON DEVELOPING A TAILORED SMOKING CESSATION INTERVENTION FOR METHADONE MAINTAINED SMOKERS

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Over 75% of drug abusers receiving methadone maintenance treatment (MMT) are tobacco smokers, and smoking cessation interventions have had little success helping those in MMT to quit long-term. We conducted a qualitative study to gather information from current and former smokers in MMT as well as from methadone clinic clinical staff to determine obstacles to quitting and the optimal structure and elements of a new smoking cessation treatment that will help smokers in MMT quit smoking and maintain long-term abstinence. In two urban methadone clinics, we held five focus groups for methadone clinic clients (including 35 current and former smokers) and ten individual interviews with clinical staff. Focus groups and interviews were audio recorded, transcribed, and coded with qualitative data software. Clients had a mean age of 44; 54% were female, and 65% were White. Among the staff, 80% had a Bachelors degree, and 30% were current smokers. Findings indicate that clients and staff were enthusiastic about having a tailored smoking cessation intervention available in their methadone clinics, and felt that a combination of weekly group and individual counseling, including education about health risks and information about how to deal with cravings, over at least three months would be most helpful. Both clients and staff also felt that a contingency management program would be helpful for motivating clients to quit smoking. Many of the methadone clinic clients reported extreme cravings for cigarettes that they felt were related to the methadone itself. Also, clients and staff described a MMT culture, among both the clients and the staff, which supports cigarette smoking among those in MMT. Most clients had little knowledge about smoking-related pharmacotherapy; however, those who did felt that it may be useful as an aid to quitting. While almost all clients believed that it was possible to quit using tobacco and illicit drugs at the same time, they were concerned that quitting smoking could trigger a relapse to using illicit drugs. These findings provide valuable

information for developing and implementing a tailored smoking cessation intervention for smokers in MMT.

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POS5-67

SMOKING CESSATION AND FACTORS RELATED TO WEIGHT GAIN

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INTRODUCTION: The weight gain during smoking cessation is generally known, but not all factors influencing weight gain known. AIM: To compare the weight gain with the baseline body mass index (BMI) and baseline level of nicotine dependence according to FTND (Fagerström Test of Nicotine Dependence).

METHODS: Data of patients of our Tobacco Dependence Treatment Centre collected between 2005–2009, after one-year follow-up, abstinence validated by carbon monoxide measurement.

RESULTS: We analyzed sample of patients - abstainers (N=607) one year after the intervention. The mean weight gain after one year since the quit date was 5.1 kg (-18;+27). In patients with severe nicotine dependence (FTND 5 and/or more) was shown significantly higher mean weight gain than in patients with lower FTND score (FTND between 2- 4). Patients were divided into 3 groups according to BMI – normal (BMI between 18.5 and 25), overweight (BMI between 25.1 and 30) and obese (BMI over 30.1). Those being overweight have bigger weight gain (5.5 kg) than those being obese (3.8 kg). Further details will be shown.

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POS5-68

COMMON CYP2B6 GENETIC VARIANTS ALTER THE RATES OF NICOTINE C-OXIDATION

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In humans, Cytochrome P450 2B6 (CYP2B6) is the primary enzyme responsible for metabolism of the smoking cessation drug bupropion (BUP), and CYP2B6 is also the second most active nicotine (NIC) C-oxidation enzyme. Thus, genetic variation in CYP2B6 may alter BUP and NIC pharmacokinetics in vivo, leading to altered smoking behaviors and cessation outcomes. In the case of NIC, the evidence on whether CYP2B6 genotypes alter NIC clearance in vivo is inconsistent; some studies suggest that CYP2B6*6 is associated with higher in vivo NIC clearance while others have not observed this. The absence of data on how different CYP2B6 variants metabolize NIC in vitro limits the interpretation of the in vivo genetic association results.

Objective: To investigate the effect of CYP2B6 genetic variation on BUP and NIC metabolism.

Methods: We investigated the impact of four common CYP2B6 genetic variants (CYP2B6.4, .5, .6 and .18) on in vitro BUP and NIC metabolism using site directed mutagenesis and an E.coli expression system. We established similar kinetics for the wild type variant expressed in E.coli expression system to human liver microsome for in vitro BUP metabolism prior to testing the impact of the variants on BUP and NIC metabolism.

Results: The CYP2B6.4 and .6 variants expressed similar CYP levels compared to the wild type, whereas the CYP2B6.5 and .18 had lower expression. CYP2B6.4 and .6 exhibited increased rates of BUP metabolism per nmol of CYP compared to wild type, whereas CYP2B6.18 had a slower rate of BUP metabolism compared to wild type. Similar trends were observed when using NIC as a substrate; CYP2B6.4 and .6 displayed higher velocities compared to wild type, whereas CYP2B6.18 had reduced velocity compared to wild type.

Conclusion: Together with human liver bank data, the CYP2B6.4 is predicted to metabolize NIC faster in vivo, CYP2B6.6 is predicted to metabolize NIC at a similar rate as the wild type due to increased rates of metabolism and decreased protein expression in vivo, and the CYP2B6.18 and .5 variants would metabolize NIC slower in vivo due to lower protein expression and for .18 slower metabolism compared to the wild type enzyme.

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POS5-69

CLINICAL RESPONSE TO BIOMARKER DOCUMENTATION OF CHILD SECONDHAND SMOKE EXPOSURE

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Guidelines urge healthcare providers to screen children for SHS exposure and to recommend that parents restrict exposure, but compliance is poor. More than 25% of children in the US are involuntarily exposed to SHS. This pilot study tests the effects of laboratory documentation of childhood SHS exposure on provider counseling and parent smoking behavior. We held focus groups with providers and parents to develop a new pediatric clinic system to routinely measure and report tobacco exposure in young children, concurrent with lead screening. We are conducting a quasi-experimental pilot study to compare provider counseling behavior and parental participation in smoking treatment before and after implementation of the system. Parents who smoke and whose children are scheduled for a 12- or 24-month well-baby visit are eligible. A single blood draw is done to measure lead and cotinine. Results are reported in the electronic medical record to providers and by letter to parents. Providers can refer parents to a counselor to facilitate quitting and promote home smoking restrictions. Our target sample is 80 parent-child pairs. Preliminary data show that 16/96 (17%) of parents of children scheduled for well-baby visits were smokers. Two refused to participate in screening. Many parents reported protecting children from SHS, but 14/14 (100%) of children had measurable cotinine (mean 2.4 ng/ml, range 0.1-12.2 ng/ml). Providers requested an automatic counseling referral system for parents of children with a positive cotinine value. Of 14 parents, 11 have accepted one counseling call, 9 two calls and 4 three calls. The counseling protocol is ongoing. Of parents eligible for 8-week follow-up, 3/8 reported 7-day point prevalent abstinence. Results suggest that providers and parents accept routine concurrent screening for lead and tobacco exposure at well-baby visits. Providers quickly instituted a system to guarantee follow-up of positive results. Parents who smoke accept calls and report quitting. Pending confirmation of feasibility, results will be used to design a full scale RCT to test the effect of biomarker documentation of child SHS exposure on parental smoking cessation.

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POS5-70

WHAT KIND OF SMOKERS FREQUENTLY USE ONLINE SOCIAL NETWORKS? DEMOGRAPHIC CHARACTERISTICS FROM SMOKERSHELPLINE.CA AND STOPSMOKINGCENTER.NET

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Background: Web-Assisted Tobacco Interventions (WATIs) are a cost-effective way to treat many smokers. Online social networks are popular components of behaviour-change websites, likely because of 24-hour access and support. To date, research has identified the participation of certain social network members who assume leadership roles by providing support, advice and direction to other members. In the literature, these individuals have been variously defined as key players, poster, or active users. Despite this knowledge, very little research has been conducted on the behaviour or demographic characteristics of this population. For the purposes of this study, key players, posters and active users were defined as SuperUsers.

Objective: In order to gain insight on behaviour and characteristics of SuperUsers, this study analyzed user data from two large WATI social networks.

Methods: Cross-sectional data sets containing posting behaviours and demographic characteristics were extracted from a free, publicly funded program (the Canadian Cancer Society's Smokershelpline.ca: CCS), and a free, privately run program (StopSmokingCenter.net: SSC). Pearson correlations were conducted to investigate links between posting behaviour and demographics. Logistic regression was utilized in an attempt to model user demographics.

Results: Through a structured analysis, 95 SHO and 124 SSC SuperUsers were

identified. Within the reporting period, SHO and SSC SuperUsers accounted for 17.8% and 16.7% of members, and 29,422 (39%) and 61,820 (51%) of all posts. Despite vast differences in group management rules and promotion, a logistic regression revealed no statistically significant differences in demographic characteristics between the two populations. Further, no statistically significant links were found between posting behaviour and demographics. Key insights will be discussed.

Evolution Health Systems and Smokers' Helpline Online.

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POS5-71

THE EFFECT OF VARENICLINE ON CUE-INDUCED CRAVING FOR TOBACCO AND ALCOHOL IN TOBACCO-DEPENDENT HEAVY AND LIGHT DRINKERS: A RANDOMIZED PLACEBO-CONTROLLED TRIAL

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Varenicline decreases generalized craving for cigarettes in smokers trying to quit and recent evidence suggests that it may have a specific effect on cue-induced cigarette craving in non-treatment seeking smokers. Furthermore, there is evidence that varenicline may also decrease alcohol craving and self-administration. Since smoking and drinking often occur simultaneously, this study examined the effects of 2-weeks treatment with varenicline or placebo on the subjective craving induced by simultaneous exposure to pictoral and in vivo alcohol and tobacco cues. We hypothesized that varenicline would decrease cue-induced craving for both substances compared to placebo. Study subjects were daily, dependent smokers who were classified as either heavy drinkers (n=24) (>25 drinks/wk for males and >20 for females) or light drinkers (n=24) (14 drinks/wk for males and <9 for females). Following a baseline study session where their subjective craving was measured under both neutral cue and tobacco-alcohol cue conditions, subjects were randomized to either placebo or varenicline treatment (standard dosing regimen) for 2 weeks. At the end of the treatment period they again underwent the cue-induced craving paradigm. When craving ratings following neutral cue presentation were subtracted from craving ratings following tobacco-alcohol cue exposure there was a significant effect of varenicline on alcohol craving using both a VAS measure (RM ANOVA day x drug; p=0.022) and the alcohol craving questionnaire (RM ANOVA day x drug; p=0.002). There was no significant effect when drinker type (heavy vs. light) was added as a variable in the analysis. Also, while varenicline did decrease overall tobacco craving there was no significant effect of varenicline on cue-induced tobacco craving after subtracting neutral cue response scores. In summary, varenicline treatment results in a robust decrease in cue-induced alcohol craving in a laboratory setting compared to placebo in both heavy and light drinking smokers. However, there was no specific effect of varenicline on alcohol intake over the course of the study. A longer treatment period may show such an effect.

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POS5-72

TEXT WARNINGS ALONE ON CIGARETTE PACKAGES MAY NOT BE SUFFICIENT FOR BEHAVIOR CHANGES AMONG NEVER SMOKED ADOLESCENTS. LONGITUDINAL COHORT STUDY FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL POLICY EVALUATION SEA PROJECT

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Objective: Our objective was to evaluate and compare the impact of tobacco health warning on cigarette packages among adolescent's towards susceptibility to smoking and experimenting between Malaysia and Thailand.

Methodology: The study involved two samples of never smoked adolescents at baseline from Malaysia (N=845) and Thailand (N=833). They were part of larger prospective longitudinal cohort survey, first recruited during the year 2005 using households stratified multi-stage cluster sampling technique. Throughout period of study, respondents answered two self-administered questionnaires at the first year and one year later. "Noticing tobacco health warnings" and "thinking of risk of smoking because of health warnings" were treated as main predictor variables to predict susceptibility to smoking and experimenting smoking in the following year. The variables "noticing anti-smoking media messages," "noticing things encourage smoking," "smoking is allowed in home," "people smoked inside home," "of five closest friends, how many smoke?", "parents/guardian consider smoking acceptable?", "older brothers smoke?", "older sisters smoke?", "bought cigarettes for friends or family in LM?", "age," "gender," and "rural/urban" were treated as covariates. Data were analyzed cross-sectional and longitudinally.

Results: Multivariate analyses revealed that noticing tobacco warnings on cigarette packages in Malaysia and Thailand were not significantly associated with any protective effects. However, "thinking a lot about risk of smoking because of health warnings" was significantly associated with a decreased susceptibility to smoke in Malaysia [OR=0.41; 95%CI (0.25-0.69)] and Thailand [OR=0.52; 95%CI (0.32-0.84)] and it was protective against smoking in Malaysia [OR=0.36; 95%CI (0.12-1.11)]. Susceptible youths in both countries were more likely to smoke.

Conclusion: Label health warnings (text only) on cigarette alone are inadequate to protect never smoked adolescents from experimenting. Thinking is a mediator for behavior changes. Multiple interventions may give better effect on mediator and subsequent behavior change.

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POS5-73

CLEARING THE AIR: COMMUNICATING THE NEED FOR A SMOKE-FREE VIETNAM

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In Vietnam, the use of tobacco with its high rate of death and disease is a serious problem. Over 47% of adult males, but less than 2% of females are current smokers. There are 40,000 deaths/year related to tobacco use. Inpatient health care costs attributed to smoking was approximately $77.5 million USD in 2005. Mass media has the potential to reach the broadest audience. However, media correspondents lack information on tobacco control and are, thus, limited in their ability to write accurate and widely read pieces. The American Cancer Society and VINACOSH, a multi-ministry committee housed within the Ministry of Health in Vietnam, collaborated to conduct two media awareness workshops. The purpose of these workshops was to (1) Increase journalists' motivation, knowledge and skills in reporting on tobacco control issues, and (2) Increase the quality of information that is made available to them. The Society and VINACOSH (Vietnam Committee on Smoking and Health) invited Vietnamese journalists to apply for the workshop. Requirements were to: (1) Participate in a one-year journalist fellowship program; (2) Advocate for tobacco control issues; (3) Produce good stories at least once a month; (4) Join an on-line forum quarterly. At the Hanoi 2010 Workshops, 26 journalists completed a survey that assessed their knowledge and experience on tobacco control issues. Survey results confirmed the importance of (a) strengthening the alliance between tobacco control organizations and the media, (b) providing journalists with tobacco control information needed to produce interesting, accurate, and public health-relevant stories. Full survey results and samples from the media pieces published as a result of the workshop will be presented and future efforts to generate accurate tobacco-focused journalism in Vietnam – which will be focused on the enforcement of current smoke-free policies and the adoption of new tobacco control laws – will be described.

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POS5-74

IMPACT OF CURRENT WORK PLACE SMOKING STATUS OF SMOKERS TOWARDS SUPPORT OF SMOKE FREE WORK PLACES IN MALAYSIA: FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL POLICY EVALUATION PROJECT

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Objective: To evaluate the impact of socio-demographical and current work place smoking status of smokers towards support of smoke free work places in Malaysia.

Methodology: The study involved 2045 of adult smokers at baseline. They were part of larger prospective longitudinal cohort survey recruited between July and December 2009 using households stratified multi-stage cluster sampling technique. In the survey respondents were interviewed using standard validated questionnaire. Smoking status at current work places, socio demographic and annual household income variables were treated as main predictors to predict support of work place smoke free policies. Descriptive analyses, chi-square test and univariate and multivariate logistic regressions techniques were used to analyze the data.

Results: Around 87% of the smokers supports on smoke free work places in Malaysia. Multiple logistic regression analysis revealed that smokers from partial and completely smoking work places were less likely to support smoke free work places in Malaysia (Adj.OR=0.28, 95%, CI:0.18-0.43 and Adj.OR=0.25, 95% CI: 0.12-0.52 respectively). Average and high-income smokers were less likely to support smoke free work places (Adj.OR=0.42, 95%, CI: 0.24-0.75 and Adj.OR=0.71, 95% CI: 0.38-1.31 respectively). The demographic characteristics of smokers had no any significant impact on smoke free work places ($p<0.05$).

Conclusion: Though most of Malaysian smokers support smoke free work places in Malaysia, current working environment is more influenced on decision making about support of smoke free work places.

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POS5-75

THE EFFECTS OF ENLISTING SPOUSAL SUPPORT IN A COMMUNITY-BASED 'SMOKE-FREE HOMES' INTERVENTION ON QUITTING BEHAVIOURS: A QUALITATIVE ANALYSIS

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Introduction: Studies showed that home was the primary source of exposure to secondhand smoke for non-smokers who live with a smoker. In order to better protect infants from household secondhand smoke, we tested a family-based smoking cessation intervention by empowering non-smoking mothers to initiate household no-smoking policy at home and providing individualized stage-matched cessation counseling to smoking fathers. Previous studies suggested that spousal support can assist in smoking cessation, but it is not clear whether promoting support and interaction through a family intervention is helpful in the fathers' quitting process.

Methods: This is a qualitative study on 10 families with a smoking father and a non-smoking mother who have participated in the intervention group of a RCT testing the effectiveness of a family-based smoking cessation intervention. Three focus group interviews were conducted at 12 months after the delivery of the intervention.

Results: Most participants highlighted the importance of enlisting spousal support in the quitting process. With the spousal support and absence of criticism, they were more encouraged to smoke fewer cigarettes per day, and were more conscious of the possible infants' exposure to secondhand smoke when they smoked at home. Most participants also suggested that spousal support, both concrete and psychological, enhance attempts to quit smoking or change smoking behaviour. A few participants reported quitting smoking because of the strong motivation to protect their infants from being exposed to secondhand smoke.

Conclusions: The results reflected a converging view of the participants on the importance of social support in smoking cessation. Spousal support and the absence of spouse criticism play decisive roles in promoting behavior change. The addition of spousal support to the intervention appears to be effective in improving smoking behavior among Chinese fathers with an infant.

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POS5-76

EFFECTIVENESS OF ANTI-SMOKING MESSAGES AMONG ADULTS SMOKERS: LONGITUDINAL COHORT STUDY FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL POLICY EVALUATION SEA (MALAYSIA) PROJECT

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Objective: To evaluate the impact of anti-smoking messages on the knowledge of health effects, negative thinking of smoking and behaviour changes in following year among adult smokers in Malaysia.

Methodology: The study involved 2004 of adult smokers at baseline. They were part of larger prospective longitudinal cohort survey, first recruited during in 2005 using households stratified multi-stage cluster sampling technique. Throughout period of study, respondents answered two survey questionnaires at the first year and one year later. Exposure to anti-smoking messages through various channels was treated as main predictors to predict knowledge of health effects, negative thinking of smoking and subsequent attitude and behavior changes in the following year. The demographic variables were treated as covariates. Data were analyzed using cross-sectional and longitudinal analyses techniques.

Results: Multiple logistic regression analysis revealed that exposing to anti-tobacco media messages and noticing health warnings on cigarette packages were positively associated with knowledge of health effects of smoking (Adj.OR=1.39, 95%, CI: 1.15-1.68 and Adj.OR=1.35, 95% CI: 1.03-1.78 respectively). The high knowledge gained from all form of anti smoking messages had made smokers to think smoking less social desirable (Adj.OR=1.73, 95%, CI: 1.37-2.19), think health risk of smoking (Adj.OR=1.68, 95%, CI: 1.30-2.17) and think to quit smoking (Adj.OR=1.74, 95%, CI: 1.39-2.17). The negative thinking about smoking because of the knowledge gained by anti-smoking messages was significantly and positively associated with quit attempt in following year (Adj.OR=1.23; 95%CI: 1.03-1.47).

Conclusion: Anti smoking messages in Malaysia are effective to deliver knowledge of health effects of smoking, negative thinking and positive behavior changes among adult smokers.

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POS5-77

IMPACT OF OVERALL ANTI-SMOKING INFORMATION (MESSAGES) ON KNOWLEDGE, THINKING, AND BEHAVIOUR CHANGES AMONG ADOLESCENTS IN MALAYSIA AND THAILAND: LONGITUDINAL COHORT STUDY FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL POLICY EVALUATION SEA PROJECT

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Objective: Our objective was to evaluate the impact of anti-smoking messages on the knowledge of health effects, negative thinking of smoking, susceptibility to smoking, and behaviour changes in following year among adolescents in Malaysia and Thailand.

Methodology: The study involved 1859 of adolescents at baseline from both countries. They were part of larger prospective longitudinal cohort survey, first recruited during in 2005 using households stratified multi-stage cluster sampling technique. Respondents answered two self-administered questionnaires at the first year and one year later. Exposure to anti-smoking messages through various channels was treated as main predictors to predict knowledge of health effects, and negative thinking of smoking. Impact of negative thinking on susceptibility to smoking and subsequent experimenting and actual smoking in following year were analyzed. The demographic variables and country were treated as covariates. Data were analyzed cross-sectionally and longitudinally.

Results: Multivariate analyses revealed that exposing to anti-tobacco education by health professionals and at schools was positively associated with knowledge of health effects of smoking (Adj.OR=1.24, 95%, CI: 0.98-1.57 and Adj.OR=1.39, 95% CI: 1.11-1.73 respectively). And high exposure to anti-smoking media messages was significantly associated with the increased knowledge (Adj.OR=1.90, 95% CI: 1.04-2.44). High knowledge shown significant mediator effect on think harm of smoking to smokers and non-smokers (p<0.001). Thinking a lot about risk of smoking because of the knowledge gained by anti-smoking messages was significantly associated with a decreased susceptibility to smoke (OR=0.47; 95%CI: 0.29-0.76) and not susceptible adolescents were more likely to be protected from experimenting and actual smoking in the following year.

Conclusion: Anti smoking messages in Malaysia and Thailand are effective to deliver knowledge of health effects of smoking among youth, but only merely expose or notice anti smoking messages without gaining any knowledge may not be sufficient to increase the negative thinking of smoking among adolescents.

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POS5-78

INCORPORATING LATINO MIGRATION EXPERIENCE WITHIN SMOKING CESSATION

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Background: Many Latinos are recent immigrants who maintain close ties with their home countries. In order to develop effective and culturally effective interventions, it may be useful to understand how migration affects smoking patterns and quitting.

Objectives: To gather recent Latino immigrants' perspectives on smoking and quitting in their countries of origin and in the U.S., and how their migration affected their smoking or quitting.

Methods: We conducted semi-structured interviews with 26 Latino immigrant smokers recruited via promotores de salud and media. Open-ended questions began with a question about participants' immigration experience. Next we explored Latino smokers' perspective on aspects they liked and disliked about smoking, smoking and smoking cessation in their country versus the U.S. Interviews were coded using Ethnograph VI and we assessed inter-rater reliability.

Results: 13 were male and 20 spoke primarily Spanish at home. They primarily migrated from Mexico as adults. The majority smoked <10 cpd and half were non-daily smokers. Participants described similarities and differences between their country of origin and the U.S. in smoking and cessation behaviors (e.g., not smoking in front of family). Participants stated that smoking was part of their lifestyle: a means of connecting to others while enjoying alcohol on the weekends and even an aid in making bowel movements. Several participants cited feelings of hopelessness and despair related to immigration experience as reasons for smoking. Many participants reported cons to smoking, including embarrassment and guilt. Smoking figured into their relationship with God: fear of God for smoking and talking with God about quitting. While participants reported a negative attitude toward using any medications including cessation medication, the majority reported a positive attitude about having a culturally sensitive counselor.

Discussion: Cessation interventions for Latino immigrants should address immigration experience, the role of religion and family in treatment planning, helping smokers cope with feelings of guilt and hopelessness and awareness and benefits of medication.

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POS5-79

ROLE FOR CHOLINERGIC MECHANISMS IN A RODENT MODEL OF THE IOWA GAMBLING TASK

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Impulsive behaviour is a maladaptive characteristic found in a number of psychiatric disorders. The neurochemical basis of this behavioural impairment is poorly understood, and despite widespread recognition of its functional role in cognition, little research has explored the cholinergic system as a mediator of impulsivity. The present study investigated the effects of cholinergic compounds on performance in a novel rodent version of the Iowa gambling task (IGT) - an effective model of impulsivity and decision-making. Rats are presented with four different options that govern the amount of food earned within 30 minutes. Each option is associated with the delivery of a different number of food pellets, but also with a different probability and duration of punishing time-out periods during which reward cannot be earned. Rats acquire the optimal strategy of choosing the smaller rewards with smaller penalties, as this ultimately results in a greater number of food pellets earned over time. Tests with nicotine (0.05-0.4 mg/kg) and mecamylamine (0.3-3.0 mg/kg) produced little change on performance in the rodent gambling task (rGT). The muscarinic antagonist scopolamine (0.01-0.1 mg/kg), however, was found to significantly increase choice preference of the disadvantageous options. In contrast, the muscarinic agonist oxotremorine (0.01-0.03 mg/kg) decreased preference of the advantageous option with no effect on the disadvantageous options. These data imply an involvement of muscarinic receptors in mediating impulsivity measured in the rGT, while no role of nicotinic receptors could be ascribed in the rGT.

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POS5-80

CIGAR USE MISREPORTING AMONG YOUTH IN VIRGINIA

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For decades, the national rate of cigarette use nearly tripled the rate of cigar smoking for all major U.S. demographic groups. However, recent advances in tobacco surveillance suggest that differences between cigarette and cigar use rates may have been overestimated in earlier years due to cigar use misreporting, especially among youth populations. Cigar use misreporting is the result of reporting discrepancies in the measurement of general (i.e., cigars, little cigars, and cigarillos) and brand-specific (i.e., Black & Mild) cigar use and differs from tobacco underreporting whereby youth fail to report lifetime or current use of a tobacco product. The objective of this study was to determine the likelihood of cigar use misreporting among specific youth subpopulations in Virginia. This study draws from a representative sample of 3,093 youth who completed the 2009 Virginia Youth Tobacco Survey (YTS). Respondents were asked about general and brand-specific cigar use. Misreported use was defined as respondents who did not report smoking cigars, cigarillos, or little cigars in the past 30-days, but reported using Black & Milds in the past 30-days. Respondents also reported their current use of cigarettes, smokeless tobacco (SLT), and waterpipe, demographic information (age, gender, and ethnicity) and acute medical profiles (i.e., asthma diagnosis, incidence, and severity). Results indicated substantial cigar use misreporting: about half of Black & Mild users (N = 522; 46.2%) did not report current cigar use. Black adolescents were more likely than white youth to report Black & Mild use rather than cigar use. Among acute subpopulations, misreporting of cigar use was highest among asthma suffers and among those with the greatest asthma severity. Misreporting, like underreporting, is a significant problem in part because tobacco use prevalence rates impact federal and state tobacco control policy, resource allocation and priority funding for tobacco research, and the dissemination of tobacco prevention materials and curricula.

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POS5-81

INFORMING TOBACCO CONTROL WITH CANADA'S INUIT PEOPLE: A QUALITATIVE STUDY

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Objective: To gather insight on tobacco use and its perceived effects on Canada's Inuit people, ideas about quitting tobacco and what can help, as well as views on tobacco control methods used in other parts of Canada.

Methods: Qualitative research (25 focus groups and 5 individual interviews) was conducted with 110 individuals from three communities (Cambridge Bay, Rankin Inlet, Iqaluit) in the Canadian Territory of Nunavut (predominantly north of the Arctic Circle). Discussions were recorded, transcribed, translated and transferred to NVivo software for narrative analysis.

Results: Early tobacco use was common with some children trying it as early as age four. Cigarette butts were a common source for young children. It was also common for parents and other family members to give tobacco to youth. Knowledge of health effects was mostly limited to those listed on cigarette packages (lung cancer, heart disease and stroke). The high financial and social costs of tobacco use were also reported. Support from friends, parents, elders and spiritual leaders played an important role in quitting, as well as being away from other smokers. Some used nicotine patches, gum, and the Nunavut Quitline. There was some interest in and support for higher prices on tobacco, more public education, more quitting services, more smoke-free spaces, and controlling illegal sales of tobacco to children and youth. The role of elders and various Inuit organizations was also emphasized.

Conclusions: To help reduce tobacco-related diseases among Canada's Inuit people, culturally specific, community driven activities are needed to improve basic knowledge and change attitudes towards tobacco either before or together with more standard tobacco control activities.

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POS5-82

PATTERNS OF ALTERNATIVE TOBACCO USE AMONG YOUTH CIGARETTE SMOKERS

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Increasingly, youth cigarette smokers are experimenting with alternative tobacco products (ATP) like smokeless tobacco and cigars. Nine in 10 youth cigarette smokers have tried ATPs in their lifetime, with current established smokers (100+ cigarettes lifetime, plus past 30-day use) more likely than current and nonsmokers to have used ATPs in the past month. ATP use among youth cigarette smokers is of particular concern given that ATP use in adulthood is associated with increased nicotine dependency even among light-to-medium cigarette smokers. Unfortunately, we know very little about the disparate smoking patterns and characteristics of youth cigarette and ATP users. This study sought to identify subgroups of adolescent cigarette smokers based on patterns of concurrent ATP use. The current analysis was based on a weighted sample of 2,019 youth cigarette smokers who participated in the 2009 National Youth Tobacco Survey. A total of six observed variables representing past month cigarette frequency and quantity and ATP use (smokeless, cigars, bidis, and kreteks) were selected for the latent class analysis (LCA). Global goodness-of-fit indices and residual diagnostics showed the 5-class model to have the best fit. The first latent class (LC1, 30%) was characterized by "light" cigarette smokers who also used cigars, but not other ATPs. The second (LC2, 37%) and third (LC3, 6%) latent classes were characterized by "moderate" cigarette smokers; however, smokers' use of ATPs differed substantially between these two classes. The fourth (LC4, 23%) and fifth (LC5, 4%) latent classes were characterized by "heavy" cigarette smokers, with considerable variation between classes in the use of bidis and kreteks. Subsequent regression analyses revealed significant differences between classes based on demographics (ethnicity and gender) and other smoking-related variables (smoking norms, risk perceptions, and quit efficacy). This research informs tobacco prevention specialists and other health professionals about the different types of adolescent cigarette smokers, and also provides insight into the development of tailored interventions targeting multiple tobacco use behaviors.

Funding support was provided to Aashir Nasim, Ph.D. from the National Center on Minority Health and Health Disparities (NCMHD).

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POS5-83

THE TOBACCO INTERVENTION PRACTICES OF POST-SECONDARY CAMPUS NURSES IN ONTARIO

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Background: Repeated unsuccessful quit attempts are common among university students. Unfortunately, they are less likely than adults to receive advice to quit from clinicians. Nurses in campus clinics are ideally situated to give brief advice. The objective of this study is to describe the tobacco intervention practices of nurses working in campus clinics.

Methods: This study surveyed nurses working at one of 16 universities in Ontario, ten schools were involved in Leave The Pack Behind (a government-funded campus initiative). Participants reported the frequency they asked about smoking status during different patient visit contexts. Nurses reported the extent they: advised students to quit; provided assistance and arranged for follow-up.

Results: 83 participants completed the survey (n = 52, LTPB). Response rates were higher at non-LTPB sites, chisquare (1, n = 107) = 7.47, p = .006. No differences were observed between nurses from universities that were or were not operating LTPB. Nurses were: 97.6% female, 47.5 years old (sd = 8.8) and 9.9% were smokers. In this sample, 8.2% ask all or almost all patients about their smoking status; 5.5% asked most; 31.3% asked about half; 21.74% asked some and 23.48% asked none or almost none. A main effect was found that nurses from campuses not involved in LTPB asked more frequently about tobacco use, F(1, 81) = 4.94, p = .029. A main effect was also detected for type of patient visit, F(8, 74) = 59.42, p < .001. Posts hoc tests reveal nurses are more likely to ask about tobacco use during respiratory visits, and least likely during skin or musculoskeletal visits. Overall, 83.1% of nurses advised smokers to quit and 63.9% offered assistance. 67.1% of nurses referred patients to another professional; 7.9% advised calling a quitline; 6.6% suggested the web and 5.3% offered a follow-up appointment. On LTPB campuses, 57.9% of nurses gave patients LTPB's age-tailored self-help materials.

Conclusion: Nurses must be trained in how to intervene around tobacco use during non-respiratory type visits, particularly during common visits such as for mental health, reproductive and skin concerns.

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POS5-84

TOXICANT EXPOSURE, CARDIOVASCULAR RESPONSE, AND SUBJECTIVE EFFECTS OF CIGARILLO SMOKING

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Cigar smoke contains many of the same toxicants as cigarette smoke, including the dependence-producing drug nicotine, gases like carbon monoxide (CO), and numerous carcinogens. As such, cigar smoking is linked to the same adverse health outcomes as cigarette smoking. Unlike cigarette smoking, however, cigar use rates have not declined in recent years; in fact, the use of a certain type of cigar – the cigarillo – has increased substantially during the past decade. Yet no controlled laboratory evaluation of the effects of cigarillos exists. Sixteen Black & Mild (B&M) cigarillo smokers (mean = 1.9/day, SD = 2.5) participated in two counterbalanced conditions: lit (OWN) or unlit (SHAM) B&M of their preferred flavor and tip type. B&M were smoked twice per session, with 60 minutes separating the two uses, according to a standardized procedure: 10 puffs with 30 sec inter-puff-intervals. Measures included plasma nicotine, heart rate, expired air CO, subjective effect ratings, and smoking topography. For plasma nicotine, relative to baseline (mean±SEM = 2.0±0.0 ng/ml), concentrations for OWN increased significantly at 5-minutes post bouts 1 (4.8±0.8 ng/ml) and 2 (4.7±1.0 ng/ml), but for SHAM did not did not increase above 2.0±0.0 ng/ml at any timepoint. Similarly, heart rate increased significantly from pre- to immediately post-smoking for OWN, but not for SHAM. Average expired air CO levels, collapsed across time, were 14.3±0.8 ppm for OWN and 4.5±0.2 ppm for SHAM. Neither condition reliably reduced symptoms of nicotine/tobacco abstinence, though ratings for some measures (e.g., "urges to smoke," "craving a B&M") were significantly lower for OWN than for SHAM. OWN, but not SHAM, produced a variety of positive effects related to product sensory characteristics (e.g., "satisfying," "pleasant," "taste good"). Smoking topography did not differ across the two conditions. These results suggest that 10 puffs from a B&M cigarillo delivers active doses of nicotine and considerable amounts of CO, but does not reliably suppress withdrawal symptoms typically observed following a period of nicotine/tobacco abstinence.

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POS5-85

LONGITUDINAL AGE-STRATIFIED TOBACCO USE PREVALENCE AMONG EMERGENCY DEPARTMENT PATIENTS COMPARED TO THE GENERAL POPULATION

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This longitudinal study was designed to systematically track tobacco use prevalence in emergency departments (ED) and compare age-stratified rates to the general population using national, provincial, and regional comparisons. A tobacco use question was integrated into the ED electronic registration process in 11 northern hospitals (10 rural, 1 urban) and asked by admitting staff. From 2007 to 2010, ED visits averaged 130,416/year. Patients' first visit each year was used to censor the data for independence, resulting in an average of 63,616 individual patients included in the analyses for each year of the study. Tobacco use documentation (86-89%) and tobacco use (26-27%) were consistent across years with the only discrepancy occurring in 2007 (32%). Prevalence was consistently higher in the rural hospitals compared to the urban. Age-stratified tobacco use for all hospitals remained high up until 50 years of age (35%); rates began to decrease for patients in their 50's (26%) and 60's (16%), and decreased substantially after age 70 (5%). The age-stratified ED tobacco rates were almost double those of the general population nationally and provincially for all but the oldest age groups but were virtually identical to regional rates across all ages. In conclusion, the tobacco use tracking and age-stratified general population comparisons in this study improve on previous attempts to document prevalence in the ED population. Adding the tobacco use question to the ED registration as an electronic non-clinician-based system centralized the process of identifying and documenting tobacco use consistent with clinical practice guidelines, allowed standardization of the wording and location of tobacco use in the chart thereby contributing to the ease of data extraction and analysis, and resulted in the ability to systematically track the status of the entire ED population rather than a select sample. At a more local level, the findings provide a "big picture" overview that highlights the magnitude of the tobacco-use problem in these northern, rural communities.

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POS5-86

RECOVERY FROM NICOTINE DEPENDENCE AMONG THOSE WITH MENTAL ILLNESSES

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Persons with mental illnesses have exceedingly high and increasing prevalence of nicotine dependence. Smoking, the single greatest preventable cause of death, is a leading cause of morbidity and mortality among those with mental illnesses. Although treating smoking is one of the most important activities a clinician can do in terms of lives saved, quality of life, and cost-effectiveness, the mental health communities have largely ignored tobacco dependence among smokers with mental illnesses. This is due to low levels of knowledge, confidence, perceived ability and smoking cessation interventions in clinical practice. Also, although unprepared to treat nicotine dependence, many residents reported moderate to high interest in further training for smoking cessation. Psychiatrists who felt they had adequate training exhibited greater knowledge, confidence, received ability and engagement in generally accepted stages of smoking cessation. The Mental Health Professional Training (MHPT) Policy targets primary intervention, diagnosis and treatment. This policy will mandate a comorbidities curriculum between mental illnesses and smoking both in psychiatric residency training and in required continuing education credits. The curriculum would also include research and novel therapies. Mental health professionals will be required to utilize evidence-based interventions from recognized and respected professional sources, thus effectively disseminating and providing the most effective treatments. The MHPT policy will increase education, communication, awareness and reduce social stigma that people with mental illnesses cannot quit or have lower quit rates. Training health professionals to provide tobacco cessation interventions can have a measurable effect on performance through counseling, setting quit dates and follow-up visits, distributing materials and recommending nicotine replacement therapy. This holistic and integrative policy, targeting mental health professionals, who work most closely with this disparate comorbid population, would be an effective strategy for positive change.

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POS5-87

FACTORS ASSOCIATED WITH HOMELESS FORMER SMOKERS' INTEREST IN PROVIDING PEER SUPPORT FOR QUITTING

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Prevalence of smoking among homeless persons is alarmingly high at 70%, three times the national average. Peer social support for quitting smoking is emerging as a potentially effective and novel approach to improving smoking cessation rates, yet requires further evidence of efficacy. Due to uniquely social living conditions of homeless persons, we explore interest in providing peer social support among former smokers as a tool for enhancing smoking cessation in a homeless population. Data for the current study was derived from a 2009 statewide survey of homeless people in Minnesota. Of the sample surveyed, 73% (n=3192) were current smokers, 12% (n=546) were former smokers. Among former smokers, 59% expressed interest in providing peer support to current homeless smokers. Of the former smokers interested in providing peer support, 43% were African American and 33% were Caucasian. Univariate analysis showed that former smokers who expressed interest in providing peer support had experienced homelessness more times than those who were not interested in providing support (4.2 vs. 3.7 times, p=.0073). Also, being male, being African American, history of having lived in foster care, and knowing one or more persons who had successfully quit smoking significantly increased the likelihood of expressing interest in providing peer support. Logistic regression analysis showed that former smokers who knew five or more persons who had successfully quit smoking were more than twice as likely to report interest in providing peer support (p=.0074). Findings from the present study show that homeless former smokers are interested in providing peer support for homeless smokers. Homeless former smokers represent important resource that should be incorporated into smoking cessation interventions targeting homeless populations.

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POS5-88

TIME TO FIRST CIGARETTE AND SERUM COTININE LEVELS IN ADOLESCENT SMOKERS

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The presence of the most common nicotine metabolite, cotinine, increases in a dose-dependent manner with the number of cigarettes smoked per day. However, cotinine levels plateau at a level of approximately 20 cigarettes per day. Because the risk of lung cancer risk associated with cigarette smoking also plateaus with high smoking consumption, cotinine levels might be a marker of risk and not just exposure. As such, assessing cotinine is becoming an important way to assess nicotine exposure and potential risk. However, despite numerous self-report measures of nicotine exposure and dependence, most have not reliability predicted cotinine levels; this is especially true among adolescent populations. Nevertheless, recent research has identified that a specific measure of dependence, the time from waking to the first cigarette of the day, has been shown to predict cotinine levels in adult smokers, even controlling for cigarettes per day and other covariates. The present study sought to explore if the time of the first cigarette of the day is a predictor of cotinine levels in a sample of adolescent smokers, who tend to have different smoking patterns, smoking histories, and levels of overall dependence. The present study used a sample of 161 (96 male) smokers between the ages of 12 and 19 years from the 2007-2008 National Health and Nutrition Examination Study (NHANES). On average the sample smoked an average of 5.84 cigarettes per day (SD = 8.80). As part of the standard protocol participants were asked, "how soon after you wake up do you smoke?" Additionally, serum cotinine levels we analyzed from samples provided by participants during laboratory visits. Results demonstrate that smoking sooner after waking was predictive of serum cotinine, even after controlling for age, gender, length of time as a regular smoker, and number of cigarettes per day. These findings suggest that the time to first cigarette is a strong predictor of nicotine uptake and should be considered in the design of smoking interventions. Implications and future directions are discussed.

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POS5-89

EFFECT OF NICOTINE ON ANTICIPATORY LEARNING AS MEASURED BY EYE TRACKING AND BRAIN ACTIVATION

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Nicotine enhances performance in several cognitive and motor domains. Using a task of anticipatory learning of eye movements, we tested the hypothesis that nicotine enhances the cognitive rather than motor aspect of smooth pursuit eye tracking and determined the brain areas associated with such learning. Smokers (n=19) received nicotine patch (21/35mg) and placebo patch 1 week apart. Eye behavior and imaging data were simultaneously collected in a 3T scanner using an event-related fMRI design. Eye data were collected using an infrared MR-Eyetracker camera. Each of 24 blocks consisted of 2-3 target movement trials with no auditory cue before eye movement onset (no-cue trials), followed by 2, 3 or 4 trials of auditory cue + target movement (cue trials). The target was a crosshair, moving from the central fixation point to the left and returning to the fixation point within 1 sec. Preliminary data analyses examined behavioral effects of event (no-cue vs. cue trials, examining a learning effect), drug, and event x drug interactions on eye movement initiation and pursuit. Nicotine enhanced initiation velocity compared to placebo and produced a significant learning effect from no-cue to cue trials ($p<0.05$). Similar findings were observed for pursuit gain in the early phase of pursuit. During maintenance pursuit, there was no effect of nicotine. Nicotine significantly activated three brain regions under the anticipatory learning condition compared with placebo: right middle/inferior frontal lobe, right parietal lobe, and left cerebellum. Nicotine enhanced anticipatory learning with respect to eye movement initiation and during the early phase of smooth pursuit. Nicotine had no effect on maintenance pursuit that does not require anticipatory learning, suggesting that the nicotine effect was associated with cognitive rather than motor aspects of the eye movement system. These effects were associated with part of a known eye movement circuit consisting of frontal-parietal-cerebellar areas, suggesting that the nicotinic effects on anticipatory learning were expressed within smooth pursuit eye movement neural pathways.

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POS5-90

PROMOTORES DE SALUD INCREASING UTILIZATION OF SMOKING CESSATION RESOURECES AMOUNG LATINO IMMIGRANTS

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Introduction: Promotores de salud are currently used for effectively delivering health messages to Latinos and improving access to medical services, including smoking cessation.

Objective: To implement a community-based training program for promotores de salud to enhance knowledge about smoking cessation and promote utilization of smoking cessation resources among Latinos.

Methods: Fourteen Spanish speaking promotores de salud (1 male and 13 females), between ages 30 and 50, recent immigrants completed a community-based training curriculum. During the seven, 2-hour sessions, promotores learned about: cigarette contents and its health effects, counseling and motivational interviewing, and quit smoking medications. After the training, the promotores identified smokers at restaurants, Latino-owned businesses, churches, schools, and health fairs. The promotores de salud referred the smokers to the state tobacco quitline and they conducted smoking prevention sessions with Latino adolescents.

Results: During the four months of implementation, each promoter identified between 2 to 15 smokers. Out of 320 smokers 157 (49%) were referred to the free Kansas and Missouri smoking cessation telephone counseling. Of the 157 smokers who were enrolled in the Quitlines, only 35 (22%) received at least one call from the quitlines and nicotine pathces, 20 (13%) smokers "declined the service and the remaining smokers (65%) have been reported as "unreachable" or a progress report from the Quitlines have not been received. During the smoking prevention sessions with Latino adolescents, the promotores reached approximately 465 individuals, in which 155 were adolescents whom received comprehensive information and resource about reducing exposure to ETS, preventing adolescent tobacco initiation, and promoting smoking cessation.

Conclusion: Futures studies should closely monitor the lost of motivated smokers after they are referred to state quitline.

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POS5-91

PRODUCTION OF MAKE YOUR OWN (MYO) CIGARETTES IN A LABORATORY AND HOME ENVIRONMENT

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In countries where there is vigorous tobacco regulation and higher cigarette prices there has been a notable increase in the prevalence of smokers making their own cigarettes. Self-produced cigarettes are made by rolling shredded tobacco in paper leaves (Roll Your Own, RYO) or using a machine that injects tobacco into a preformed cigarette paper tube (Personal Machine Made, PMM). In one of an on-going series of studies, we characterized RYO and PMM cigarettes produced by exclusive MYO smokers during a single lab visit. Participants reported to the laboratory with 5 cigarettes they had made at home and all of the tobacco, papers, tubes and equipment needed to produce an additional 25 cigarettes while being videotaped. Participants answered demographic questions, use and reasons for using MYO, and overall smoking history. Fifty-nine participants were enrolled in the last 8 months: RYO, n = 39 and PMM, n = 20. Most participants were white (n = 50) and male (n = 53). The average weight of the RYO prepared at home (0.48g ± 0.16) was significantly larger ($p < 0.05$) than the RYO prepared in the lab (0.45g ± 0.15). The average weight of the PMM prepared at home was 1.06g ± 0.13 and those prepared in the lab averaged 1.02g ± 0.15 (n.s.). All of the PMM were made with a filter but only 8% (n = 3) of the RYO were made with a filter. Average time to produce 25 RYO cigarettes (24 min ± 7) was significantly longer ($p < 0.05$) than the average time to produce 25 PMM cigarettes (17 min ± 9). All 59 participants cited lower cost as one of the reasons for using MYO cigarettes. These preliminary findings suggest that recruitment of MYO smokers is relatively quick and easy, indicating a growing number of MYO domestic users. Although lower price is a primary reason for self-producing cigarettes, the products and the manner of production are distinctly different.

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POS5-92

LIGHT CIGARETTE USE PREDICTED QUIT BEHAVIOR AMONG ADULT MEXICAN SMOKERS: DATA FROM INTERNATIONAL TOBACCO CONTROL (ITC) MEXICO

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Aim: This study examined the prevalence and correlates of using Light cigarettes among adult Mexican smokers, as well as whether the use of Lights predicted quit behavior.

Method: Population-based, representative data were analyzed from the third (November 2008) and fourth (January 2010) administration of the International Tobacco Control (ITC) Policy Evaluation Project in six 6 Mexican cities (Mexico City, Guadalajara, Tijuana, Monterrey, Puebla, and Mérida). Regression models were used to assess correlates and predictors of consuming Lights, misperceptions of light cigarettes, and quit behavior.

Results: 1853 smokers whom 29% reported that their preferred brand was Light, with a higher prevalence found among women than men (Adjusted OR=2.36) and among those with higher educational attainment (AORuniversity vs. primary school=1.86), and who had selected the preferred brand because it is healthier than other brands (AORyes vs. no=3.28). In bi-variate and multivariate models, smoking light cigarettes was the most consistent correlate of misperceptions that Lights are less dangerous, less addictive, and easier to quit than regular cigarettes. Finally, in models predicting downstream quit behavior, those who smoked lights were no more likely to attempt to quit or to be quit for at least 30 days at follow up. However, those who believed that lights were less harmful than regular cigarettes were less likely to try to quit.

Conclusions: People incorrectly believe that Light cigarettes are safer, less addictive and easier to quit than regular cigarettes. The Mexican government has eliminated misleading descriptors, but this policy may not be enough to counter industry strategies that use colors and other descriptors to continue misleading consumers. Research is

needed to determine which policy measures will effectively eliminate consumer misperceptions about the relative risk of smoked tobacco products.

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POS5-93

CAN EXERCISE ATTENUATE CUE-REACTIVITY TO SMOKING IMAGES: AN FMRI STUDY

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Nicotine dependent individuals experience cue-elicited cravings when presented with stimuli that have smoking-related (versus neutral) content (Carter & Tiffany, 1999). While there is debate as to whether this measure has clinical significance (i.e., predict relapse), it is important for studies to explore how treatments can aid an individual to overcome cravings. Single sessions of exercise have gained support as they have been found to attenuate cravings as well as delay ad lib smoking (Taylor et al., 2007). There is preliminary evidence to suggest that exercise can reduce cigarette cravings in the presence of smoking-related cues (Taylor & Katomeri, 2007). Demonstrating that exercise can reduce cravings in the presence of cigarette cues can further advocate exercise as a utility for aiding cessation attempts. In a within subject design, following overnight smoking abstinence, n=10 underwent functional Magnetic Resonance Imaging (fMRI) to examine if regional brain activation to smoking cues was attenuated by a single session (10 mins) of exercise (stationary cycling) versus a passive control treatment. In response to smoking cues, participants showed an increase in activation in areas of the brain associated with reward (i.e. limbic lobe) and visual attention (i.e., cuneus). Following the exercise, participants showed no significant activations to the same cues. Self report desire to smoke was significantly reduced following the session of exercise versus passive control $F(2,32) = 12.5$, $p < .001$. Results show that a single session of exercise can reduce cue-elicited cravings and adds further support for the role that exercise can play in smoking cessation.

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POS5-94

THE SEPARATE AND COMBINED EFFECTS OF NICOTINE AND DENICOTINIZED CIGARETTE SMOKING ON CEREBRAL BLOOD FLOW

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Aims: Smoking behavior involves exposure to nicotine, as well as distinct sensorimotor factors. Putatively, these factors play a role in tobacco smoking and addiction. Whereas the effects of smoking versus abstinence on cerebral blood flow (CBF) have been examined, little is known regarding the unique contribution of nicotine and non-nicotine components to these effects. This was investigated in a preliminary study in which nicotine patches and denicotinized cigarettes were administered in a factorial design.

Methods: 20 smokers underwent a 7-min resting state perfusion MRI scan (pASL FAIR) on 4 occasions, following 24 hours in each condition: (1) 21mg nicotine patch + denicotinized (denic) cigarette smoking, (2) placebo patch + denic smoking, (3) nicotine patch + no smoking, and (4) placebo patch + no smoking. Condition orders were counterbalanced. Significant effects were identified at a cluster corrected threshold of $p < .005$, $k=33$. CBF was preprocessed and analyzed using SPM8.

Results: A global analysis of whole brain gray matter CBF found no effects of nicotine or cigarette smoking. Regional analyses found a main effect of cigarette (denic > no smoking) in the left temporal lobe, including the superior temporal gyrus, limbic lobe and hippocampus, and fusiform gyrus. There was also an interaction effect in the inferior, middle, and superior frontal gyri (nicotine+denic > placebo+no smoking > nicotine+no smoking = placebo+denic). Main effects of nicotine were not observed.

Conclusion: These preliminary data suggest that neither nicotine nor other components of cigarette smoking (i.e., carbon monoxide) affect global cerebral blood flow among regular daily smokers. Regionally, smoking denic cigarettes appears to enhance blood flow to areas subserving associative learning and memory; the effects of smoking on cognitive control regions appear to be moderated by the presence of nicotine.

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POS5-95

OVERNIGHT ABSTINENCE AND VARENICLINE PREDICT BETTER SMOKING CESSATION OUTCOMES FOLLOWING EXPERIMENTAL LAPSE EXPOSURE

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One proposed mechanism by which varenicline aids in smoking cessation is by reducing the likelihood of relapse following a lapse episode during a quit attempt. The current study investigated this effect in an outpatient prospective laboratory model. Smokers were randomly assigned to receive varenicline or placebo during a 4-week practice quit attempt in which an experimentally induced lapse occurred following an initial period of overnight abstinence (OA). Abstinence-contingent incentives were used to induce initial abstinence. Twenty-one of 26 participants (81%) in the placebo group and 19 of 27 participants (70%) in the varenicline group achieved OA. Data were analyzed separately for participants who achieved OA and those who did not with the use of mixed models ANOVAs and Holm-Sidak post-hoc group comparisons. A reduction from baseline smoking rates was observed among those who achieved OA independent of medication condition. However, participants receiving varenicline, as well as achieving OA, had significantly lower CO (mean = 5 ppm) and cotinine (mean = 741 ng/mL) at the end of the quit attempt compared with those receiving placebo (CO = 11 ppm, Cot = 1593 ng/mL), and were more likely to be continuously abstinent throughout the study (N = 7, 37%) compared with those receiving placebo (N = 1, 5%). For those participants unable to achieve initial OA, a brief reduction in smoking occurred during the first week of the quit attempt, but smoking levels returned to baseline by the end of the study for both medication groups. In this study, varenicline, compared with placebo, had no effect on rates of initial abstinence, but significantly reduced smoking among those who did achieve an initial period of abstinence. This is consistent with prior studies indicating a relapse prevention effect of varenicline and suggests that combining varenicline with behavioral incentives or pharmacotherapies known to induce initial smoking abstinence may result in improved treatment outcomes.

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POS5-96

E-CIGARETTE AWARENESS, USE AND RISK PERCEPTIONS AMONG CURRENT AND FORMER SMOKERS

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E-cigarettes (e-cigarettes) are battery-powered vaporizers that deliver nicotine via a propylene glycol mist. These products have been marketed as a high-tech, low-risk alternative to cigarettes, but there is little data on their public health impact. Data for this study is drawn from the second wave of the EX Smoker Cohort, used to evaluate Legacy's EX cessation media campaign. In 2008, a baseline sample of 5,616 smokers aged 18-49 was randomly drawn from eight designated market areas with an oversample of Hispanics and a response rate of 65.9% (Vallone, D. M., J. C. Duke, et al. (2010). "Evaluation of EX: A national mass media smoking cessation campaign." Am J Public Health: e-pub ahead of print). The second follow-up survey, conducted in 2010, yielded a total of 3,638 current and former smokers and resulted in a response rate of 63.2%. Respondents were asked if they had ever heard of an e-cigarette, if they had ever tried one, and to what extent they perceived e-cigarettes as a risk in relation to regular cigarettes. Results indicate that 58.1% (2,135) of the sample had heard of e-cigarettes, and 5.3% (192) had ever used one. Multivariable results demonstrate that respondents aware of e-cigarettes were more likely to be male, White, and have at least a high school diploma. Awareness of e-cigarettes was equally common among former and current smokers (58.0% vs. 58.2%), but use was more prevalent among current smokers (3.1% vs. 6.4%). Men, Whites, college graduates, and young adults (18-24 year olds) were most likely to report ever use of e-cigarettes. Neither smoking status nor poor health status predicted e-cigarette use after controlling for demographic characteristics. Among respondents aware of e-cigarettes, 63.4% believed that they are less harmful, 9.9% believed they are about the same, and 2.1% believed they are more harmful than regular

cigarettes. Whites and young adults were the most likely to believe that e-cigarettes are less harmful than regular cigarettes. Extrapolating our results to the population, this suggests that as many as 4 million former and current smokers are using a device with unknown health risk impact.

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POS5-97

INDICATORS OF NICOTINE DEPENDENCE AND CESSATION IN ADOLESCENT SMOKERS

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Extensive research demonstrates that certain psychosocial and behavioral variables are associated with smoking uptake and cessation; among of the strongest of which may be the influence of nicotine dependence. Indeed, conventional wisdom, backed by empirical research, suggests that most smokers use tobacco because they are addicted to nicotine; and the majority of adults smokers began using in their teenage years. Furthermore, an increasing body of research shows that nicotine dependence may be expressed differently in teens than in adults. Unfortunately, however, little is understood about how specific aspects of nicotine addiction may influence cessation outcomes among an adolescent population. The present study sought to examine how aspects of nicotine addiction, as measured by the Fagerstrom Tolerance Questionnaire (FTQ), influences both cessation of smoking and changes in smoking patterns following involvement in a group-based cessation intervention. The sample for the present study was 1,173 adolescents (675 female) who participated in either the American Lung Association's Not On Tobacco (NOT) program or a Brief Intervention program between the years of 1998 and 2008. All data were collected both at enrollment into the cessation program and again 10-weeks later. Find suggest that, controlling for treatment group, baseline smoking (number of cigarettes per day),age and number of months as a regular smoker, the strongest predictors of smoking cessation at the end of 10 weeks was smoking more in the morning than the rest of the day (OR = 4.01) and frequency of inhaling cigarette smoke (OR = 3.30). Predictors of changes in smoking patterns (smoking fewer cigarettes post-intervention than pre-intervention) were different: the time to the first cigarette of the day, smoking more in the morning, and smoking even when ill in bed were found to be the strongest predictors of reductions of smoking frequency. Implications and future directions are discussed.

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POS5-98

HEALTH PLAN INITIATIVE FOR TOBACCO CESSATION

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Since August 2004, The New York State (NYS) Department of Health has funded 19 Cessation Centers (CCs) that provide cessation training and resources to healthcare providers. CCs help insurers advance prevention efforts by providing free on-site and evidence-based training to their network providers. In addition, the NYSDOH provides funding to the Quitline, a free program providing telephonic coaching, online support and evidence-based services to assist tobacco-users in quitting. In April of 2007, the CCs, working in collaboration with the NYS Smokers' Quitline embarked on an initiative to partner with health plans in NYS, offering health plans an opportunity to participate in an inaugural partnership program, launched in March, 2008. This initiative invited NY health plans to partner with CCs and the Quitline to reduce barriers and improve patient access to cessation medications. Health Plans are key stake holders in each of these domains. As a result of initial efforts, twenty health plans signed an agreement to become a part of this NYS Partnership for Tobacco Cessation to work with the Quitline and CCs. CDC guidelines recommend state-level comprehensive approaches for addressing tobacco use and dependence. The CC and Quitline Health Plan Workgroup expands that clinical impact by directly accessing health plan providers and obtaining information on health plan cessation coverage to assist their members who contact the Quitline, thus providing enhanced services. NY CCs have successfully improved awareness and utilization of evidence-based methodologies for treating tobacco use and dependence among targeted health plan stakeholders in NYS. Methods: NYS Smokers'Quitline and the CC's invited NYS Health Plans (HPs)to participate in a partnership as well as to complete a survey regarding cessation benefits. In response to the data received from the surveys,the NYS Smokers'Quitline and the CC's, have begun to minimize barriers by implementing a systems change approach with partnering Health Plans to improve and increase cessation benefits in NYS. Initial results and lessons learned are discussed.

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POS5-99

THE EFFECTS OF LOW VERSUS HIGH EXERCISE INTENSITY ON CRAVINGS TO SMOKE AND MOOD DURING TEMPORARY ABSTINENCE

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Evidence suggests that a single session of exercise can reduce desire to smoke and withdrawal symptoms experienced during nicotine abstinence (reviewed by Taylor et al, 2007). Little is known about whether different levels of exercise intensity will produce different effects. The aim of this study was to assess whether two different intensities of exercise, compared with a passive control treatment, will produce effects on urge to smoke and mood during temporary nicotine deprivation. In a between subject design 162 overnight deprived smokers (mean age= 30.8 (±9.8) years; smoked 18.0 (±6.7) per day; FTND= 4.4 (±2.05)) were randomized into either 20 mins passive control (video watching), low-intensity (40% Heart Rate Reserve; HRR) or high-intensity exercise (75% HRR). Self reported urges to smoke (QSU-brief, Cox et al, 2001) and mood (PANAS, Watson et al, 1988) were assessed at baseline, immediately following and 25 minutes post- each treatment. Findings indicated that both levels of exercise intensity produced a significant reduction in Factor 1 (desire-behave) and Factor 2 (desire-affect) of the QSU-brief immediately following exercise, as compared with the control treatment, $F(2, 158) = 11.34$, $p < .001$; $F(2, 159) = 8.29$, $p < .001$, respectively. There was a significant effect of exercise on positive mood, $F(2,157) = 7.50$, $p = .001$, with increased positive mood in the high intensity versus the control treatment, $t(112) = -2.87$, $p = .005$, and a trend towards increased positive mood in the low intensity versus control treatment, $t(92) = -1.95$, $p = .054$. No significant differences were found for negative mood. Finally, there was no significant difference between low and high intensity exercise for either urge to smoke or mood, and there were no effects found at 25 mins post treatment. Results are in line with two previous studies (Everson et al., 2008; Scerbo et al., 2010) that suggest that both moderate and vigorous exercise reduces cigarette cravings. Taken together, these studies suggest that it may be more favorable to advocate the use of low intensity exercise from a public health and adherence perspective.

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POS5-100

IMPACT OF THE U.S. FEDERAL CIGARETTE TAX INCREASE ON UTILIZATION OF 16 STATE QUITLINES

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Background: On April 1, 2009, the federal cigarette excise tax increased from 39 cents to $1.01 per pack. Combined with the average state excise tax for cigarettes, the total average tax rose to $2.21 per pack. Tobacco control policies can have a direct effect on motivating people to stop smoking, so evaluating the utilization and effectiveness of quitline services in response to the tax will aid state cessation program development and planning.

Methods: This study describes call volumes to 16 state quitlines and characteristics of quitline callers in the year before (December 2007 – May 2008) and year of (December 2008 – May 2009) the tax increase. Four state quitlines also provided data from their 7-month follow-up surveys for an evaluation of cessation outcomes.

Results: Compared with the same 6-month period in 2008, calls to the quitlines increased by 23.5% in 2009. The increase started in March (a month before the federal tax increase) and tapered off in May (a 59.1% increase in calls March-May). The characteristics of callers also differed significantly. During the peak period of the tax increase (March to May 2009), more whites, older smokers (> 25 years of age), smokers of shorter duration, those with less education and those who live with other smokers enrolled with quitlines, compared with the year before. Callers who enrolled during the post tax period completed more calls, but seven-month outcomes revealed no significant differences in cessation rates.

Conclusions: The federal excise tax on cigarettes had an immediate and dramatic effect on calls to state quitlines but not on subsequent quit rates. This is not surprising given that quitline services did not change post tax. Since increasing the taxes on cigarettes drives calls to quitlines, there is a critical need to direct increased revenue

from cigarette taxes to fund cessation services so that smokers will have access to the effective cessation treatments that they seek.

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POS5-101

VARENICLINE FOR SMOKING CESSATION IN PEOPLE WITH BIPOLAR DISORDER

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BACKGROUND: Given the high rates of tobacco dependence and low quit rates in patients with bipolar disorder compared to general population, effective pharmacotherapies are needed for this population. The aim of this preliminary study is to investigate the safety and efficacy of the nicotinic partial agonist, varenicline for smoking cessation in nicotine-dependent cigarette smokers with bipolar disorder.

METHODS: Using a double-blind, randomized, placebo-controlled 10-week trial design, N=5 bipolar smokers have been randomized to receive varenicline (1mg BID) or placebo, and weekly smoking cessation counseling. Participants were stable outpatients who smoked at least 10 cigarettes a day with no drug abuse or dependence in the last 3 months. The target quit date was set at week 3. The primary outcome was biochemically verified smoking abstinence at endpoint. The trial is on-going and a blinded analysis of preliminary study outcomes is presented.

PRELIMINARLY FINDINGS: Of 5 randomized subjects, 1 is in treatment, 2 completed the trial and 2 dropped out before the quit date. At trial endpoint, completers vs. non-completers had lower CO (Completers 3.5+/-5.0 vs. non-completers 22.5+/-10.6 ppm), CPD (Completers 2.0+/-2.2 vs. non-completers 20.5+/-5.0 cigarettes) and Tiffany QSU desire to smoke (Completers 1.1+/-0.1 vs. non-completers 3.3+/-0.1). One trial completer met the criteria for smoking abstinence. Study medication was generally well tolerated, apart from mild to moderate gastrointestinal symptoms (nausea) in one completer and passive suicidal ideation in another (a non-completer who dropped out at week 3). Psychiatric symptoms (mania and depression ratings) were not changed in any subject from baseline to endpoint (mean % change for HAM-D 0.2+/-0.6% and CAR-S 0.1+/-0.1%). Baseline neurocognitive tests revealed better performance in completers on Visual Spatial Working Memory (40 vs.18 mm) and Controlled Oral Word Association Test (48 vs.34 words).

CONCLUSION: While our study data has not been unblinded, our early results reveal that varenicline is well tolerated, psychiatric symptoms are not altered and treatment outcomes show promise in bipolar smokers.

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POS5-102

SMOKING HABITS AND CLINICAL OUTCOME IN PATIENTS WITH SCHIZOPHRENIA HOSPITALIZED IN MEXICO CITY

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Cigarette smoking is the largest preventable cause of morbidity and mortality in mentally ill patients. Psychiatric care providers often do not address tobacco use among people with mental illness, possibly owing to the belief that their patients will not be able to quit successfully or that even short-term abstinence will adversely influence psychiatric status. Our aim was to assess tobacco use in hospitalized patients with schizophrenia in Mexico City, using a brief tobacco interview to raise awareness in the possible relationship between schizophrenia clinical outcome and smoking behavior.

Methods: We assessed 73 in-patients with the diagnosis of schizophrenia by a structured interview (DIGS). In addition we evaluated all patients using a brief tobacco interview including the FTND.

Results: Of the total sample 77% of males and 60% of females patients met criteria for nicotine dependence diagnosis (NDD). The maximum number of cigarettes smoked in 24hrs was in average 5 while they were inside the hospital. There were no relationships among the number of hospitalizations, or number of medications used. All patients treated with clozapine CZ had a NDD (n=8).

Discussion: Smoking-related illnesses are a major contributor to excess mortality and morbidity. Treatment efficacy could be enhanced through promoting smoking reduction as an initial treatment goal, extending the duration of treatment, and delivering it within an integrated care model that also aims to reduce the availability of tobacco inside the psychiatric hospital. A younger age of onset and a probably more severe form of psychosis implied by the criteria of the clinician to administer CZ were associated to NDD. However, pharmacokinetic studies have demonstrated more rapid clearance of olanzapine OZ and lower CZ concentrations in smokers compared to nonsmokers. This study may also help the clinician to reconsider CZ prescription without addressing NDD treatment. Nonspecific signs and symptoms of elevated CZ or OZ concentrations should be considered in relation to clinical status while the patient is hospitalized.

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POS5-103

UNANNOUNCED TELEPHONE PILL COUNTS FOR ASSESSING VARENICLINE ADHERENCE IN A PILOT TRIAL

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Little attention has been paid to pharmacotherapy adherence in smoking cessation trials, partially because of lack of objective adherence measures. Observed pill counts are well validated, but are costly and inconvenient. Telephone pill counts may be a viable and more practical alternative. This study examined the validity of unannounced pill counts by comparing concordance on the number of pills counted by phone to those counted during a routine office visit an average of 4 days later among 46 African American smokers enrolled in a 3-month varenicline trial. All participants received a 28-day supply of 1 mg twice daily varenicline in a pill box on Week 0 and were scheduled for a refill at Month 1. Participants were not aware that they would be called to complete a phone pill count prior to this visit. At both the phone and in-person counts each compartment of the pillbox was opened and the number of pills remaining was recorded. Participants were 48(13) years of age, predominately female (59%), low income (60% family income < $1800/month), and smoked an average of 17(7) cigarettes per day. Contacting 46 participants required 85 calls; 71% were contacted on the first two attempts. A high degree of concordance (rs= 0.94, p<0.001) was observed between the number of pills counted by phone [3.6 (7.1) and in-person 3.9(7.1)]. Of the 92 counts (46 phone, 46 in-person), 85 (92%) were exactly the same and 7 (8%) were discordant. Participants with discordant counts (n=7) had lower varenicline adherence [mean (SD)=77%(18%) versus 95%(9%), p<0.05], but attended more study visits [4.0(0.0) versus 3.8 (0.4), p<0.05] and reported better past medication adherence [Medication Adherence Questionnaire; 1.0 (0.8) versus 2.8(1.0),p< 0.01] than participants with matching phone and in-person counts (n=39). Findings will be discussed within the context of social desirability bias. Careful monitoring of pharmacotherapy adherence has been linked to improved outcomes in smoking cessation trials. Unannounced phone pill counts are a valid and practical method for objectively measuring pharmacotherapy adherence that could lead to improved adherence and higher quit rates.

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POS5-104

RELATIONSHIP BETWEEN SMOKING AND PAIN FACTORS AMONG CHRONIC PAIN PATIENTS

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Cigarette smoking, the leading cause of morbidity and mortality, is a frequently co-occurring health risk behavior in individuals with chronic pain. Smoking rates among treatment-seeking chronic pain patients are more than double those of the general population. Given that pain is among the most frequent presenting problems in the healthcare system, treatment for chronic pain may be an ideal opportunity to deliver smoking cessation interventions. However, to date, little is known about cessation-related factors among chronic pain patients. The purpose of the present study was to

examine the relationship between smoking, cessation, and pain-related factors among patients undergoing treatment for chronic pain. The current analyses were based on 79 moderately dependent smokers, who were seeking treatment for a chronic pain condition at a VA medical center. Participants completed a series of questionnaires that assessed pain-related factors (pain intensity, disability, catastrophizing), pain-specific smoking factors (pain-specific smoking expectancies, pain-specific barriers to quitting, and pain-specific temptation situations), and smoking-related factors (nicotine dependence, cessation motivation). Correlational analyses failed to find relationships between pain-related factors or pain-specific smoking factors and motivation to quit. However, results revealed that patients with greater pain-related disability and catastrophizing experienced more pain-specific temptations to smoke and endorsed more pain-specific barriers to quitting smoking. Additionally, all of the pain-specific smoking factors were positively related to nicotine dependence. Interestingly, pain intensity was not related to any smoking or pain-specific smoking factors. These preliminary findings begin to shed light on the relationship between pain and smoking factors among chronic pain patients. Limitations to the study and implications for the development of intervention strategies that address the unique needs of smokers with chronic pain will be discussed.

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POS5-105

A COUNTERFACTUAL VIEW: TOBACCO PRODUCTS CONSUMPTION IN URUGUAY WHEN AFFORDABILITY, DEMAND CROSSES EFFECTS AND TOBACCO CONTROL MEASURES ARE TAKEN INTO ACCOUNT

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Uruguay, a country with a solid tobacco control policy since 2005, shows a slight decrease in sales of tobacco products in the last years. However, a counterfactual view is needed to evaluate the tobacco control policy, because the comparison should be done with a situation without tobacco control measures. The analysis addresses an assessment of the tobacco control policy in Uruguay. The approach used involves a simple question: ¿Which would have been the consumption of tobacco products under the hypothesis of no tobacco control measures? Using econometric error correction models for demand of cigarette, roll your own and total tobacco demand consumption (cigarette plus roll your own), simulations were carried out introducing a dummy variable which accounts for the laws of 100% smoke free areas, the ban of advertising and pictograms on cigarette packs. If tobacco control measures would not have been taken the consumption of cigarette had returned to the previous level, a 23% higher. Simulations carried out with econometric models show that the 100% smoke free areas and the ban of advertising and pictograms laws account for a 9% reduction in cigarette sales; models cannot discriminate the impact of each measure. The remaining fall of 14% in cigarette sales is explained by increases in the price of cigarette, mostly due to tax increases. However, the same kinds of simulations for the consumption of roll your own show it would have been 13% lower than the actual consumption, suggesting that to some degree it would have been some substitution between cigarette and roll your own. The previous analysis reveals that the sole view of actual sales and consumption is a misleading approach, and a fair assessment of tobacco control policies requires a counterfactual analysis. Countries where income is growing fast and with a potential for substitution towards cheaper products require substantial and simultaneous tax and price increases in both products. The availability of roll your own as a cheaper substitute of cigarettes which is consumed by poorest people states the need for identify vulnerable groups and focus tobacco control policies on them.

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POS5-106

IMPROVEMENT IN SCHOOL PERFORMANCE IN FEMALES, BUT NOT MALES, FOLLOWING SMOKING CESSATION

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Smoking among adolescents is associated with a number of negative outcomes including decreased quality of life, increased economic burdens, and risk of premature mortality. Additionally, youth smokers tend to have a range of social difficulties such as greater conflict with parents and peers. For example, it is well established that school performance is inversely related to smoking status among adolescents. Specifically, adolescents who smoke tend to do less well in a range of scholastic activities, including grades, attendance, extracurricular activities, and overall behavioral outcomes. Furthermore, it has been suggested that those who do below average at school are less likely to quit smoking than smokers who do above average. School achievement has often been linked with key variables such as self-confidence and motivation. Not coincidentally, many smoking cessation programs emphasize the development of such characteristics to achieve abstinence. It is unknown however, if smoking cessation is accompanied by an improvement in overall school performance. The present study sought to examine if overall school performance improved among those who quit smoking. The sample for the present study was 1,173 adolescents (675 female) who participated in either the American Lung Association's Not On Tobacco (NOT) program or a Brief Intervention cessation program between the years of 1998 and 2008. All data were collected both at enrollment into the cessation program and again 10-weeks later. Findings suggest that females who quit smoking reported fewer days absent from school, more participation in extracurricular clubs and activities, fewer disciplinary actions, and placed a greater importance on regular school attendance following treatment. Males reported no significant changes in school performance following cessation. Implications and future directions are discussed.

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POS5-107

EFFECTS OF CIGARETTE MENTHOL LEVELS ON RESPIRATORY PATTERN AND URINARY 4-(METHYLNITROSAMINO)-1- (3-PYRIDYL)-1-BUTANONE (NNK) AND ITS METABOLITES IN RODENTS AFTER EXPOSURE TO MAINSTREAM SMOKE

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The purpose of this study was to evaluate the effects of menthol levels in cigarettes on respiratory physiology and metabolism of smoke carcinogens. Cigarettes with menthol levels of 0.14% and 0.22% (w/w with respect to tobacco) were generated by direct vapor deposition using temporal control. These menthol cigarettes were identical to the reference cigarettes except for the menthol levels. Mainstream smoke (MSS) was generated from the mentholated and the reference cigarettes using a Borgwaldt-KC SM85 30-port rotary cigarette smoking machine under ISO conditions. Female C57BL/6 mice were exposed to MSS for one hour at a target concentration of 150 µg/L WTPM (wet total particular matter). Tidal volume, respiratory rate, and minute volume (MV) were measured in 5 mice/group throughout the 60 min exposure using whole body plethysmography. The MV was increased by 12% and 19% in mice exposed to mentholated MSS in the 0.14% and 0.22% menthol groups, respectively, compared to the reference cigarette group. Female Sprague-Dawley rats were exposed to MSS for one hour at a target concentration of 800 µg/L WTPM. Immediately after exposure, rats (10 rats/group) were placed into individual metabolism cages and urine was collected over a twenty-two hour period. Urine samples were analyzed using HPLC-MS/MS to measure 4-(methylnitrosamino)-1- (3-pyridyl)-1-butanone (NNK), and its metabolite 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL, a carcinogenic metabolite of NNK), and 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol-N-B-D-glucuronide (NNAL-N-B-D-glucuronide). Urine levels of NNK, NNAL and NNAL-N-B-D-glucuronide were below the detection limits using the current method of measurement in both menthol and reference cigarette groups. These results indicate further studies are needed to elucidate the impact of menthol levels on the respiratory pattern and metabolism of smoke constituents by using a larger sample size, longer smoke exposure duration/ repeated smoke exposures, and using higher sensitivity assays for urinary metabolites in experimental animals and humans. (This project was supported by Battelle IR&D funds).

Battelle IR&D funds.

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POS5-108

THE NICOTINIC PARTIAL AGONIST VARENICLINE BLOCKS MOTIVATION FOR NICOTINE AND SIGNIFICANTLY REDUCES CUE-INDUCED REINSTATEMENT OF NICOTINE-SEEKING IN RATS

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The effects of varenicline (Champix), a nicotinic partial agonist, were evaluated on subjective effects of nicotine (drug discrimination), motivation for nicotine taking (progressive ratio schedule) and reinstatement (cue-induced reinstatement of previously extinguished nicotine-seeking). Effects on motor performance were assessed in rats trained to discriminate nicotine from saline under a fixed-ratio schedule of food delivery and on rats trained to respond for food under progressive ratio schedule. There was a strong influence of pre-treatment time on the ability of 1 mg/kg varenicline to substitute for nicotine, with full generalization occurring when varenicline was administered less than 20 min before testing and minimal substitution at 2 or 4 hours pretreatment time. Varenicline potentiated discriminative stimulus effects of low doses of nicotine, but slightly attenuated the discriminative stimulus effects of high doses of nicotine. No effect on motor performance under the drug discrimination paradigm were noted following administration of various doses of varenicline alone or in combination with nicotine. Varenicline (0.3, 1 and 3 mg/kg, 2 hours pretreatment time) dose-dependently blocked motivation to self-administer nicotine ($p<0.0001$), whereas no effect was found on motivation for food. Varenicline also significantly reduced the ability of cue presentation to induce nicotine-seeking ($p<0.0001$). These findings support the duality of effects of varenicline (affecting both nicotine-taking and nicotine-seeking) that can contribute to its high efficacy to treat human smokers. In addition, those findings reveal the importance of the pretreatment time while assessing the effects of varenicline, an effect that is consistent with its partial agonist profile.

Compound utilized (varenicline) was a gift from Pfizer. Supported by CAMH and in part by Intramural Research Program of NIDA, NIH, DHHS.

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POS5-109

PERSONALIZED AND ADAPTIVE TREATMENT FOR SMOKING CESSATION

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Smokers'chances of successfully quitting may be increased by offering treatments that are personalized and adaptive, modifying treatment as needed based on early markers of therapeutic response. Our previous studies have shown that >50% reduction in ad lib smoking (assessed by expired air CO) while on pre-cessation nicotine patch treatment predicts 2-3 times higher rates of smoking abstinence. Moreover, smoking in the first week after the target quit date (TQD) strongly predicts relapse. In this trial, we tested the hypothesis that smokers who do not: (1) reduce CO reduction during precessation NRT or (2) cease smoking after the TQD, can be rescued from likely failure by adaptive treatment changes. Smokers initially receive tailored nicotine patch treatment (21 mg/day or 42 mg/day based on expired air CO) in the two weeks prior to the TQD. "Responders," who reduce CO by more than 50% during the first week of prequit NRT and abstain from smoking in the first week post-TQD, remain on NRT (open label). "Non-responders," who fail to meet these criteria, are randomized, double-blind, to either: (a) varenicline; (b) bupropion added to NRT; or (c) continued NRT (control). Data for the primary outcome (four-week continuous abstinence from weeks 8-11 after TQD) from the first 423 randomized participants reveal that both switching to varenicline and adding bupropion to NRT increase abstinence rates in "non-responders." Quit success is thus 14.7% for NRT alone, 29.9% for varenicline ($P=0.007$) and 26.6% for bupropion + NRT ($P=0.03$). Quit success for the NRT "responder" group was the highest (58.2%). Scores for the "v1.0 quit success" genotype score, calculated from Affymetrix 6.0 data from the first 89 participants, provided a significant correlation with abstinence in individuals who received NRT or bupropion ($P=0.005$). These results, taken together, support the feasibility of individually tailored treatments based on genotype and phenotype that can be adapted over time based on early assessments of therapeutic response.

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POS5-110

ASSOCIATIONS BETWEEN PAIN SEVERITY AND SMOKING CESSATION-RELATED FACTORS AMONG CANCER PATIENTS

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Both pain and smoking are highly prevalent among persons diagnosed with a smoking-related cancer, and there is recent evidence to suggest that cancer patients who continue to smoke despite their diagnosis experience greater pain than nonsmokers (Ditre et al., 2011, PAIN). However, little is known about how pain may influence smoking cessation-related factors in the cancer population. Furthermore, although associations between cancer pain and relevant psychosocial factors have been examined, we are unaware of any studies that have investigated such relations among cancer patients who are currently smoking or have recently quit. The current findings represent a secondary, cross-sectional analysis of data collected during the baseline assessment for a larger study examining trajectories and predictors of smoking relapse in lung and head/neck cancer patients following surgical treatment. Participants included 81 thoracic and 87 head and neck cancer patients. Baseline measures were completed at pre-operative (head and neck) or post-surgical (thoracic) visits. Separate linear regressions were conducted with average pain severity as the primary independent variable, while statistically controlling for cancer type/surgical status, age, and income. Results indicated that while desire to quit smoking remained stable regardless of pain reporting [$b = -.09$, $p = .14$], more severe cancer-related pain was positively associated with: (1) beliefs that quitting smoking would be more difficult [$b = .22$, $p = .03$], and (2) greater intentions to resume smoking after treatment [$b = .10$, $p = .02$]. Pain severity was also associated with several psychosocial variables that may have mechanistic relevance to the current findings, including: depression [$b = 1.67$, $p < .001$], fear of cancer recurrence [$b = .42$, $p < .01$], frequency of intrusive thoughts [$b = .64$, $p < .001$] and avoidant behaviors [$b = .61$, $p < .01$], and fatigue [$b = .60$, $p < .001$]. Results are discussed with deference to the correlational nature of these findings, and with regard to how future research in this area may have implications for the development of targeted smoking cessation interventions for cancer patients in pain.

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POS5-111

CAN THE "5A'S" EFFECTIVELY BE APPLIED IN HOSPITAL SETTINGS?

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Objectives: To describe the results of two years of quality improvement efforts on implementing the "5A's" for tobacco dependence treatment in a hospital setting.

Methods: Effectively initiating tobacco dependence treatment during hospitalization with follow-up after discharge increases abstinence rates and improves health outcomes. Integrating the 5A's into a complex hospital environment presents challenges. In 2009, Oregon Health & Science University, an academic health center in Portland, Oregon, USA began two years of quality improvement (QI) efforts to increase the effectiveness of tobacco cessation services to hospital patients. Initial implementation of a hospital version of the 5A's required integration into the hospital workflow and the electronic medical record (EMR); delineation of roles and responsibilities of the medical team; and provision of information and outreach to the medical staff. QI efforts in 2009 and 2010 included proactive outreach to attending MD's, a nursing leadership program (Ask, Educate, Refer), establishing a nursing advisory committee and providing regular QI feedback to nursing units. QI measures include percent documentation of: smoking status in the EMR (Ask), completion of brief patient education by nurses (Advise, Assist), MD orders plus nurse referrals to specialists for bedside tobacco cessation treatment (Advise, Assess, Assist), and patients agreeing to post-discharge follow-up (Arrange).

Results: Documentation of smoking status increased from 72% in January 2009 to 96% by December 2010, orders and referrals for bedside treatment (consult orders)

increased from 28/month to 103/month by September 2010, and decreased slightly to 92/month during the November/December holiday months; brief patient education from nurses remained unchanged at 60%. Patient agreement to post-discharge follow-up increased from 53% in 2009 to 69% in 2010.

Conclusions: Following the integration of the 5A's into a complex hospital system, QI activities improved documentation and referral to tobacco cessation specialists. Nursing demands may limit capacity for increasing patient tobacco education by nurses.

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POS5-112

ROLE OF CIGARETTE SMOKING IN THE SEQUENCE OF DRUGS USE INITIATION AND TREND OF CIGARETTE SMOKING AMONG INDIANA ADOLESCENTS

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Background: Empirical evidence confirms that the majority of individuals' legal or illicit drug use begins after use of cigarettes, alcohol, or marijuana, which are also called gateway drugs.

Objectives: To study the sequences of initiating cigarette smoking in relation to other drugs using the method of Market Basket Analysis and to determine trends of smoking prevalence among 12th-grade students in the state of Indiana.

Methods: Data from the 1993-2009 Annual Surveys of Alcohol, Tobacco, and Other Drug Use by Indiana Children and Adolescents was used for the current study. A self-administered, anonymous questionnaire asked adolescents about their use of 20 types of drugs. Market Basket Analysis, which is utilized in marketing to understand how particular items were bought in conjunction with other items, was used to identify sequences and association among drugs use and linear regression was used for trend analysis.

Results: Of the 48,227 twelfth grade students, who provided data on their drug use, 70.4% used non-prescription drugs and 75.5% of those non-prescription drug-users abused gateway drugs only as well as 8.4% used cigarettes only. Overall drug abuse and cigarette smoking has decreased during the past few years. The majority of adolescents initiated drug use with cigarettes and other gateway drugs followed by combining them with prescription drugs.

Conclusion: Programs aimed at reducing drug use in adolescents should address the following issues: sequences of drugs use initiation, gender, racial, and ethnic differences in cigarette smoking, common patterns of behavior when first engaging in the use of specific drugs, and normative beliefs of parents and peers regarding drug use.

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POS5-113

CHARACTERISTICS OF HOMELESS NONSMOKERS

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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. Although smoking is pervasive in homeless populations (~ 70% prevalence), little is known about homeless nonsmokers. Co-substance use and psychiatric comorbidities complicate the challenges to smoking cessation for homeless persons. Knowing more about homeless nonsmokers could provide useful insights for developing smoking cessation interventions for homeless smokers. The purpose of this study was to identify socio-demographic characteristics of homeless nonsmokers and to assess the relationship between smoking status and homelessness. Data were obtained from 2009 statewide survey of homelessness in Minnesota. Among survey respondents (n=6090 adults), the prevalence of current cigarette smoking was 73.1%. Of the 1637 non- smokers, 53.9 % were never smokers while 46.1% were former smokers. The majority of former smokers were African American or Black (45.6%) and female (55.3%). Nonsmokers were less likely to consider themselves alcohol dependent, or to have been treated in an outpatient treatment programs but were more likely to have a regular place for medical care. Additionally, nonsmokers were more likely to experience fewer times of homelessness ($\chi2(1, N = 297) = 128.545$, $p < .001$). Among nonsmokers, never smokers were less likely to consider themselves alcohol dependent, or to have been treated in an outpatient treatment program ($\chi2(1, N = 134) = 40.232$, $p < .001$). When compared to current smokers, never smokers were less likely to be consider themselves alcohol dependent or to have been treated in an alcohol treatment programs, this was coupled with significantly less times and shorter periods of homelessness ($\chi2(1, N = 395) = 10.284$, $p < .001$). These findings suggest that gender, number of times of homelessness as well as alcohol dependency treatments are factors associated with non-smoking behaviors among this vulnerable population. Further interventions for homeless smokers should address the characteristics of this unique population.

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POS5-114

EFFECTIVENESS OF SMOKING CESSATION ASSISTANCE FOR CANCER PATIENTS

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Tobacco plays a causal role in at least 15 types of cancer, accounts for almost one-third of all cancers, and has deleterious consequences on cancer treatment outcomes. Since 2006 the Tobacco Treatment Program (TTP) has provided smoking cessation assistance for cancer patients at MD Anderson Cancer Center (MDACC). TTP provides a 3-month program of behavioral counseling and pharmacotherapy (NRT, Bupropion, Varenicline, Nortriptyline, or Clonidine), for smoking cessation supplemented by psychological counseling and/or psychiatric treatment for conditions directly affecting a patient's cessation attempt. Support sessions are provided both in-person and by telephone. The majority of TTP patients are directly referred by institutional providers (clinics) at MDACC. This empirical study summarizes treatment outcomes overall and as a function of referring clinic measured at multiple follow-up intervals. From 2006-2009 the TTP provided assistance to 1425 cancer patients for whom complete follow-up data are available. The proportion of TTP patients by referral clinic was Head and Neck Surgery 19%, Breast Medical Oncology 14%, Thoracic Medicine 14%, Genitourinary 12%, Prevention (no active cancer diagnosis) 11%, Others (other clinics with <2% each) 10%, Hematology 9%, Gastrointestinal 8%, and Dermatology 4%. Overall quit rates were relatively stable over assessment intervals. The overall 7-day point-prevalence quit rate was 40% at end of 12-week treatment, 43% at 3-month follow-up, and 42% at 6-month follow-up. There were no significant differences in quit rates as a function of referral clinic at any of the three intervals. Quit rates for referrals from Dermatology (no causal link established between smoking and related cancers) vs. referral centers with an established causal link between smoking and related cancers were lower at 3-month follow-up (31% vs. 45%, $p < 0.05$). A similar, but non-significant, relationship existed at 6-month follow-up (35% vs. 42%). Quit rates for Prevention referrals (no active cancer diagnosis) ranged from 40%-44%, indicating TTP was comparably effective for patients with and without active cancer diagnoses.

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POS5-115

EFFECTS OF NICOTINE REPLACEMENT THERAPY ON MARIJUANA WITHDRAWAL SYMPTOMS IN CANNABIS-DEPENDENT INDIVIDUALS

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Abstinence from marijuana smoking in cannabis-dependent individuals results in withdrawal symptoms that largely parallel those of tobacco withdrawal in terms of nature and severity. To date, there are few efficacious pharmacological treatments for cannabis dependence. The current study tested the hypothesis that transdermal nicotine patch, relative to placebo patch, would decrease withdrawal symptoms associated with 15 days of marijuana abstinence in cannabis dependent (14-30 uses per week) individuals (N = 20). Urine THC metabolite/creatinine ratios indicated that all 20 subjects maintained marijuana abstinence across the 15-day assessment. A multivariate ANOVA indicated that there was a significant reduction of negative affect in the nicotine relative to placebo condition, $F=2.47$, $p=0.0135$. Follow-up analyses found that, relative to placebo, nicotine tended to reduce negative affect at day 1 ($p = .035$), day 7 ($p = .036$), day 11 ($p = .043$), day 13 ($p = .047$), and day 15 ($p = .034$). The effects of treatment did not vary as a function of tobacco smoker (n = 10) vs. nonsmoker status (n = 10), and men and women exhibited similar tendencies for the nicotine patch to reduce negative affect at day one and then again during the second week of abstinence. A multivariate ANOVA

revealed a predicted significant, F=2.231, p=0.121, Treatment x Time interaction, such that nicotine tended to reduce negative affect-motivated craving across the fifteen day assessment period. Positive affect-motivated craving was not significantly reduced by nicotine, relative to placebo, though the trend was in the predicted direction beginning at day five of marijuana abstinence. These results suggest that transdermal nicotine patch may provide an over-the-counter treatment for cannabis dependence and may provide an efficacious pharmacologic alternative for reducing marijuana withdrawal symptoms, including negative affect and associated craving. These findings are consistent with recent reviews concluding that nicotine and marijuana have many common neurobiological, psychological, and motivational effects that may contribute to the high comorbidity of the abuse of the two drugs.

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POS5-116

DYNAMICS OF IMPULSIVE CHOICE AND IMPULSIVE BEHAVIOR DURING SMOKING CESSATION

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The degree to which impulsivity decision-making and behavior are dynamic during a smoking cessation attempt is unknown. In the current study, adult daily smokers carried electronic diaries for one week before and three weeks after attempting to quit smoking. Electronic diaries were used to assess impulsive decision-making using a delay discounting paradigm and impulsive behavior using a brief version of Connors' Continuous Performance Task-II (CPT-II). Delay discounting was measured using an 8-item, tailored sequence of choices between smaller rewards available sooner and larger rewards available later to assess the degree to which subjects' discounting rates changed from baseline levels over time. Impulsive behavior was measured using a 60-trial version of the CPT-II in which subjects had to inhibit a dominant key-pressing response on 10 percent of trials. All subjects received nicotine lozenges and brief individual counseling to aid in quitting smoking. Interim multilevel modeling demonstrated significant inter-individual variability in discounting rates and discounting dynamics. Changes in discounting rates were not related to self-reported impulsivity, but were related to pre-quit discounting rates assessed using a full laboratory paradigm. Significant variability was also documented in CPT-II commission error levels and dynamics. This variability was not significantly related to self-reported impulsivity, but was related to pre-quit commission error rates on the full CPT-II. Results of these interim analyses of an ongoing study suggest that smokers exhibit highly variable trajectories in impulsive decision making and behavior, and that these dynamics are not related to self-reported impulsivity, but are related to laboratory assessments of impulsivity.

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POS5-117

UTILIZING FOCUS GROUP DATA REGARDING THE EXPERIENCES OF PREGNANT SMOKERS AND THEIR PROVIDERS AS FOLLOW-UP TO A QUANTITATIVE STUDY ON CESSATION IN A RURAL POPULATION

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Our previous study of 194 rural pregnant smokers enrolled in the Smoke Free Baby & Me Program integrated into routine perinatal care found significant differences in validated smoking cessation at the postpartum visit in the women who had quit just prior to their first prenatal visit, but no differences between groups in the total sample during pregnancy. Results published elsewhere also showed a profound discordance between self-reported smoker status and urinary cotinine levels. Therefore, the purpose of this follow-up study was to increase our understanding of the experiences of the pregnant smoker and their health care providers in rural areas. A qualitative descriptive study was conducted utilizing focus groups. Four semi-structured questions guided the group discussions, which were audiotaped and transcribed verbatim. Nine groups (Total N = 66) were held in two counties and in three distinct communities; six consisted of providers and three of pregnant women. Transcripts were read and coded independently; themes were identified using constant comparative analysis and were validated by consensus process. Participants in the provider groups (N = 45) were predominantly White (93.3%), Female (93.3%), and Registered Nurses (68.9%). The groups of pregnant women (N = 21) were White (100%); average age, 24.4 years; 100% smoked at the beginning of pregnancy; 19% (4) were recent quitters. Four common themes transcended the provider and pregnant women groups: *barriers to quitting, mixed messages, attitudes/approach,* and *program modalities*. They corroborate previous findings that cigarette smoking is used for stress relief especially when the pregnancy itself is a stressor. Pregnant women often feel guilty about smoking but do not want to be "nagged" or "preached to." Health care providers need to be cognizant of their approach when addressing the subject. Specific educational suggestions include putting a label and "face to the problem" of tobacco use during pregnancy, similar to Fetal Alcohol Syndrome. These results have implications in how smoking cessation programs for pregnant women are redesigned and how USDHHS Clinical Practice Guidelines are implemented.

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POS5-118

AN EXPERIMENTAL ANALYSIS OF REACTIVITY TO FREQUENT ECOLOGICAL MOMENTARY ASSESSMENT

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The degree to which frequent assessment of tobacco withdrawal and affect experiences changes them is not fully known. The current study randomly assigned heavy daily smokers to complete one EMA report or six EMA reports per day. The content of the reports did not vary across conditions. Withdrawal symptoms including negative affect, urges to smoke, and hunger were assessed, along with positive affect, motivation to quit smoking, and confidence related to quitting. Subjects (N=97) completed both daytime reports assessing momentary ratings and bedtime reports assessing the same constructs over the past 24 hours. Data were analyzed using hierarchical linear models predicting subjective ratings as a function of time, recent smoking, EMA frequency condition, and EMA adherence. Results indicated that those in the high frequency condition reported lower momentary negative affect pre-quit on average than those in the one-report-per-day condition. Those in the high frequency condition also reported greater drops in motivation from pre- to post-quit and greater declines in momentary motivation over three weeks post-quit than those in the comparison condition, but this decline was stronger for those who did not adhere to the assessment schedule than for those who completed more scheduled reports. Hunger, in contrast, increased upon quitting more for those who were in the high frequency condition than in the control group. This effect was also moderated by adherence, however, so that those in the high frequency condition who were highly adherent experienced drops, rather than increases, in hunger. Bedtime reports indicated that positive affect tended to drop more upon quitting for those in the high-frequency condition. Bedtime reports of quitting confidence were also related to condition and adherence, such that those who were low in adherence and in the high frequency condition experienced greater increases in confidence pre-quit than those in the low frequency condition, but this was not true for highly adherent subjects. These data suggest that affect, hunger, motivation, and confidence may be influenced by EMA frequency, but in complex ways.

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POS5-119

A LOGICAL MODEL FOR DEVELOPING PLAIN PACKAGING POLICIES

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Some studies suggest that the plain packaging of cigarettes has the potential to increase the visibility of health warnings and hence deter individuals from smoking. There are five vehicles through which branded packs communicate misleading information to the public: brand descriptors, references to product design, product emissions, brand imagery, and brand colors. Some studies have shown that plain packs can block these vehicles and thus prevent the utilization of packs as a marketing venue for smoking advertisement. Plain packaging policies are useful to guide the implementation of plain packaging initiatives. However, there are legal challenges to plain packaging policies that are centered on the claim of the tobacco companies that such policies

infringe intellectual property rights. As a consequence, tobacco companies could sue governments for implementing plain packaging policies. This review summarizes the findings of previous plain packaging studies, constructs a logical model framework, suggests some recommendations based on the model in order to guide future studies, and assists in the development of future plain packaging policies.

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POS5-120

APPLYING LESSONS FROM TOBACCO LITIGATION TO ALCOHOL LAWSUITS

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This review examines the utilization of litigation as a protection measure for public health. The history of tobacco litigation provides a guide to evaluate the potential of utilizing litigation strategies against industries that negatively affect public health, especially the alcohol industry. This review demonstrates that national legislation is unlikely to be effective. Alcohol marketing is similar to previous tobacco marketing strategies, as both products are social drugs. This paper takes into consideration the similarities between alcohol and tobacco, to suggest litigation strategies against the alcohol industry; based on the lessons learned from tobacco litigation. The tobacco industry has been successful in fighting individual injury lawsuits via utilizing a "scorched earth approach" that outmatched the plaintiffs' financial and human resources. The alcohol industry is likely to utilize the same "scorched earth approach." The reason behind predicting the alcohol industry's potential to utilize such an approach in individual injury cases would be the prevention of the multiplier effect of the first winning case. The tobacco industry was forced to negotiate with the state attorney's in the Master Settlement Agreement due to the state lawsuits. These state lawsuits were represented by plaintiffs that were not outmatched by the human and financial resources of the tobacco industry. In addition, lawsuits that are based on consumer protection acts have been successful against the tobacco industry, at least in terms of modifying its deceptive marketing strategies, and are less complicated compared to other lawsuits that require proving causation. The understanding of the history of tobacco litigation can equip alcohol control advocates with the knowledge needed to modify the behaviour of the alcohol industry and improve public health.

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POS5-121

TOBACCO CESSATION EDUCATION FOR DENTAL STUDENTS: USABILITY TESTING OF AN INTERACTIVE COURSE

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Introduction: A survey administered to 56 U.S. dental schools to examine tobacco cessation course content examined the methods used to deliver course material, and the barriers to implementing tobacco cessation into the curriculum. Only 38% schools had a specific tobacco cessation course. Lack of time and lack of faculty knowledge were the most common barriers to implementing tobacco cessation into the dental curriculum. Based on the results of this survey, and previous studies that report that dental clinicians do not exhibit strong prescribing behaviors the first module of a new interactive self-paced web-based tobacco course was designed to educate dental students about selecting and prescribing tobacco cessation pharmacotherapy. The course consisted of educational content presented as text and video, brief interactive knowledge and skills assessments, and a final virtual patient exercise. The virtual patient exercise presents the tobacco use and relevant medical health history of a hypothetical patient. A determination is then made by the student on what medication(s) to prescribe. Feedback is provided on appropriateness of the Rx.

Methods: The module underwent two phases of usability testing: 1)initial testing during development with five pre-doctoral students who were observed and recorded using the program, and a 2)post development pilot with five periodontal residents who conducted independent reviews and completed written evaluations.

Results: Results of the evaluation found that nearly all residents were pleased with the didactic content provided, the videos, prescription writing exercises and the virtual patient exercise.

Conclusions: The digital content, exercises, quizzes, videos and virtual patient features of the course will enable the dental student to develop clinical competence in tobacco cessation interventions. The course is designed to provide knowledge and skills on how to incorporate tobacco cessation into clinical practice, and is intended to provide instruction without requiring additional course time and faculty training although both are recommended.

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POS5-122

SMOKING CESSATION AND ROMA PEOPLE MINORITY IN CZECH AND SLOVAK REPUBLIC

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Aim: Detect numbers of Roma people (ethnic group with origins in India widely dispersed in Europe with diaspora populations in the Americas and Middle West) wanting to quit smoking and their quit rate with the help of Nicotine Dependence Centers (NDC) and specialists in Czech Republic (CR) and Slovak Republic (SR) in February/March 2009.

Method: In CR about 2.8% of the Czech population is Roma (~ 300,000 people), and in Slovakia it is about 5.9% of the population (320,000 people). Following the 1980 census (last where ethnicity was assessed by the questioner), the lifespan of an average Roma men was 55.3 years (66.8 years for men of the majority), the lifespan for Roma women was 59.3 years (73.8 years for women of the majority). Following the European Survey on Health and the Roma Population (2009) there are 67% smokers among Czech Roma people and 59.9% smokers among Slovak Roma people. There are 25.5% smokers in Czech (2008, WHO) and Slovak adult population. We sent questionnaires to all 112 NDC, specialists in CR and 35 centers in SR. We obtained 46 responses (response rate 31%). 10 centers or specialists had not been practicing longer than 1 year. There is no data from insurance companies for multiple reasons, recording of ethnicity in medical records is illegal. The ethnicity was assessed by questioners for disbelief of Roma people to any evidence based on historic reasons (persecution, Nazi's camps of concentration). The treatment included psychobehavioral support and medication (NRT, varenicline, bupropion).

Results: responding centers and specialists served 14157 clients in total, only 28 of them were Roma by ethnicity (0.198% of the total). The quit rate after one year (Russell Standard) of the white majority was 35.87%, for Roma people only 14.3 % (4 clients).

Conclusion: reason for lack of interest of Roma people in professional help for smoking cessation rises from many factors like low motivation, low compliance and weak perseverance of some Roma people or lack of health promotion. Promising results in shorter term were observed in small NDC working in the Roma ghetto in Kosice, Slovakia.

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POS5-124

BEHAVIORAL AND DEMOGRAPHIC FACTORS: RELATIONS WITH ABSTINENCE IN EIGHT RANDOMIZED CLINICAL TRIALS OF SMOKING CESSATION THERAPIES

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The goal of the Pharmacogenetics of Nicotine Addiction Treatment (PNAT) research program is to generate the evidence base to optimize treatment decisions for individuals who want to quit smoking. We performed a random effects meta-analysis of 26 therapy arms from eight randomized clinical trials of different smoking cessation therapies (N=3237), to evaluate the relations of six demographic and four behavioral factors with end of treatment (EOT) and 6 month (6MO) 7-day point prevalence abstinence. We observed significant (P<0.05) relations of CPD ([Pooled Effect Size, 95% CI] 0.96, 0.95-0.98), education (1.28, 1.02-1.60), FTND (0.87, 0.82-0.91), and gender (1.35, 1.12-1.62) at EOT, and of CPD (0.97, 0.95-0.99), education (1.34, 1.11-1.61) and FTND (0.87, 0.82-0.93) at 6MO. Gender interacted with CPD at EOT (1.03, 1.01-1.05); with

increasing CPD, males were more likely, and females, less likely, to abstain. Analyses of arms grouped by pharmacotherapy (bupropion, N=662; nicotine replacement therapy, N=991; combined NRT and BUP, N=456; varenicline, N=565; and placebo, N=563) revealed differences between and within groups in relations of behavioral and demographic factors and abstinence. For CPD, significant relations with abstinence were found with four groups at EOT, and with two groups at 6MO. Significant differences in effect size (heterogeneity) of CPD were observed within one group each, at EOT and 6MO, and between two groups each, at EOT and 6MO, respectively. For FTND, significant relations were found with four groups at EOT, and with three groups at 6MO, while significant heterogeneity was observed only within one group at 6MO. Education and gender exhibited only two significant associations with, between or within groups, reflecting weaker but more consistent effects on abstinence across therapy groups compared with nicotine dependence measures. These results will be incorporated into model analyses with genetic and/or metabolic factors to identify participant factors that predict smoking cessation treatment outcome. Such factors may be useful in pharmacotherapy treatment assignment algorithms.

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POS5-126

CHANGES IN RISK PERCEPTION FOLLOWING A SMOKING CESSATION INTERVENTION: THE ROLE OF ACCULTURATION IN A SAMPLE OF LATINO CAREGIVERS

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To our knowledge, no studies have examined the effect of acculturation on perception of the risks of smoking (to self and others) among Latino smokers with children. The purpose of the present study was to determine (1) if both caregiver self-perceived risk of smoking and their perception of the risks of smoking to their child increased following a brief smoking cessation intervention, and (2) if this change was moderated by level of acculturation. The present study used data from a randomized clinical trial in which smoking caregivers received home-based asthma education for their child from a bilingual Latina health educator one of two smoking cessation interventions (Borrelli et al., 2010). Participants were 133 Latino caregivers who smoked (72.9% female; mean age 36.8 years) and had a child with asthma. Risk perception measured perceived vulnerability (PV), optimistic bias (OB), and precaution effectiveness (PE). Each construct was measured with separate items for personal risk vs. risk to child (see Wagener et al., 2010). Acculturation was measured using the Short Acculturation Scale for Hispanics (SASH, Marin et al., 1987). Assessment was conducted at baseline, end-of-treatment, and at 2- and 3-month follow-up. We analyzed all study outcomes with Generalized Estimating Equations. All models adjusted for treatment assignment, baseline risk perception, motivation to quit, nicotine dependence, income, child age, caregiver age, and previous quit attempts. Results indicated that caregivers increased from pre to post treatment in PV of smoking on their child's health ($p<.001$), and acculturation was a significant moderator of this change in PV to child ($p=.001$). Specifically, caregivers low in acculturation had a greater increase in PV to child than did high-acculturated caregivers. Caregiver self-perceived PE also increased over time, but was not moderated by caregiver acculturation. These findings should be considered in the design of clinical interventions seeking to influence risk of caregiver behavior on child health.

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