Vermont Center on Behavior & Health
The University of Vermont

7th Annual Conference

Complementary Contributions of Tobacco Control and Regulatory Science Research to Protecting the Public Health

October 10-11, 2019
Burlington Hilton Hotel

Program

Funding

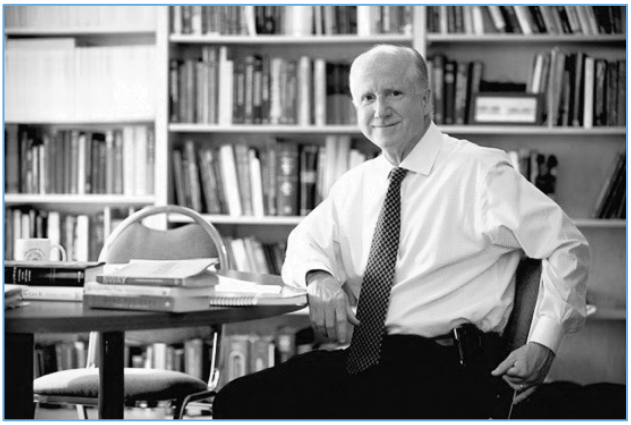
Funded in part by the NIGMS ***Centers of Biomedical Research Excellence*** (COBRE) and the NIDA/FDA ***Tobacco Centers of Regulatory Science*** (TCORS).

NIH National Institute of General Medical Sciences

NIH National Institute on Drug Abuse

FDA U.S. FOOD & DRUG ADMINISTRATION

Day 1 Opening Remarks



Stephen T. Higgins, PhD

Director, Vermont Center on Behavior & Health

Stephen T. Higgins, PhD, is Director of the University of Vermont's (UVM), Vermont Center on Behavior and Health, and Principle Investigator on five NIH grants on the general topic of behavior and health, namely the UVM Center of Biomedical Research Excellence (COBRE) and the Tobacco Center of Regulatory Science (TCORS), as well as two research grants and an institutional training award. He is the Virginia H. Donaldson Endowed Professor of Translational Science in the Departments of Psychiatry and Psychological Science and serves as Vice Chair of Psychiatry. He has held many national scientific leadership positions, including terms as President of the College on Problems of Drug Dependence and the American Psychological Association's Division on Psychopharmacology and Substance Abuse. He is the author of more than 350 journal articles and invited book chapters and editor of a dozen volumes and therapist manuals in the area of behavior and health.

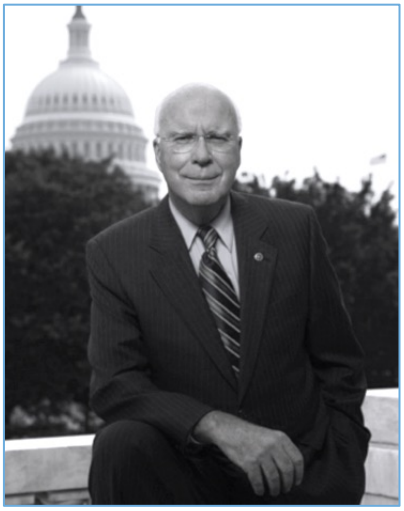
Richard L. Page, MD

Dean, Robert Larner College of Medicine

University of Vermont

Robert L. Page is dean of The Robert Larner College of Medicine at the University of Vermont (UVM) in October 2018. He joined UVM from the University of Wisconsin School of Medicine and Public Health, where he had been the George R. and Elaine Love Professor and Chair of the Department of Medicine since 2009. Page is a nationally recognized specialist in cardiac arrhythmias, with more than 200 publications, articles, and book chapters, and was recently acknowledged as one of the nation's most highly cited researchers. Nationally he served on the American College of Cardiology/American Heart Association Guidelines Task Force; and as Chair

of the Circulatory Devices Panel of the US Food and Drug Administration. He is a Fellow of the American Heart Association, and a Fellow of the Heart Rhythm Society, serving as President from 2009-2010. He is past-President of the Association of Professors of Cardiology and is a Councilor of the Association of Professors of Medicine.



The Honorable Patrick J. Leahy

United States Senator from Vermont

The conference kicks off with a special video message of appreciation and support from U.S. Senator Patrick Leahy of Vermont. Leahy is the Vice Chairman of the Senate Appropriations Committee. He is the senior-most member of the Senate Judiciary Committee and of the Senate Agriculture Committee. Leahy is the Ranking Member of the Appropriations Subcommittee on the State Department, Foreign Operations and Related Programs. He ranks first in seniority in the Senate.

Day 2 Opening Remarks

Mark A. Levine, MD

Vermont Commissioner of Health

Dr. Mark Levine was appointed commissioner of health by Governor Phil Scott in March 2017.

Prior to his appointment he was a Professor of Medicine at the University of Vermont, and most recently the Associate Dean for Graduate Medical Education and Designated Institutional Official at the College of Medicine and the UVM Medical Center. He also served as the Vice Chair for Education in the Department of Medicine. Dr. Levine received his M.D. degree from the University of Rochester. He completed his Internal Medicine Residency and a Chief Resident year at the University of Vermont and a fellowship in general internal medicine at the University of North Carolina, which emphasized clinical epidemiology, research training, teaching, and administration of educational programs. Dr.

Levine has successfully directed large NIH and HRSA educational grants addressing the generalist physician and nutrition-preventive medicine competencies he cares deeply about from a population health perspective. Dr. Levine actively practiced general internal medicine with special interests in solving complex diagnostic dilemmas, health promotion/ disease prevention, screening and clinical nutrition. As Health Commissioner, Dr. Levine takes great pride in leading the Department of Health's efforts to fulfill its mission – To protect and promote the best health for all Vermonters, and is honored to represent its vision of Healthy Vermonters living in healthy communities.

Keynote Address

"Role of Tobacco Harm Reduction in Tobacco Control"

Dorothy K. Hatsukami, PhD

Chair, Center Prevention

Masonic Cancer Center

University of Minnesota

Dorothy K. Hatsukami, PhD, is the Forster Family Chair in Cancer Prevention at the Masonic Cancer Center of the University of Minnesota and Professor of Psychiatry. She is the Associate Director of Cancer Prevention and Control at the University of Minnesota Masonic Cancer Center and Director of the Tobacco Research Programs. Her areas of expertise include: nicotine addiction and its treatment, including testing medications such as nicotine vaccine and combination medications, in smokers. She has over 400 publications and is currently PI/Co-PI of two large NIH-funded cooperative agreements/P01 that involve assessing the toxicity, appeal and addictiveness of various tobacco products. She has served on numerous scientific advisory boards for the U.S. government including the Food and Drug Administration, Tobacco Product Scientific Advisory Committee, and is currently a member of the World Health Organization Study Group on Tobacco Product Regulation.

Thursday, October 10: *Adirondack AB & CD*

7:30-8:15 ***Registration & Breakfast*** *(Prefunction, Adirondack AB)*

8:20-8:30 ***Opening Remarks:*** Stephen T. Higgins, PhD, Director, Vermont Center on Behavior and Health *(Adirondack CD)*

8:30-8:40 ***Welcome:*** Richard L. Page, MD, Dean, Larner College of Medicine

8:40-8:45 ***Video Welcome:*** United States Senator Patrick J. Leahy of Vermont

8:45-9:40 ***Keynote Address:***

Session Chair: John R. Hughes, MD, Professor of Psychiatry and Psychological Science, University of Vermont

Role of Tobacco Harm Reduction in Tobacco Control Keynote delivered by Dorothy K. Hatsukami, PhD, Forster Family Professor in Cancer Prevention, Professor of Psychiatry, Associate Director of the Masonic Cancer Center, University of Minnesota

9:40-9:50 ***BREAK***

Panel on Goals of Tobacco Control and Regulatory Science and the Tools to Achieve Them

Session Chairs: Stephen T. Higgins, PhD, Vermont Center on Behavior and Health Professor, Departments of Psychiatry and Psychological Science, University of Vermont & Jack E. Henningfield, PhD, Vice President, Research, Health Policy, and Abuse Liability, Pinney Associates, Professor of Psychiatry and Behavioral Sciences, The Johns Hopkins University School of Medicine

9:55-10:20 **Strategies for Effective Regulation** David L. Ashley, PhD, RADM (retired), US Public Health Service, Research Professor, Department of Population Health Sciences, Georgia State University

10:25-10:50 **Tobacco Control: The Past is Not the Future** Kenneth M. Cummings, PhD, MPH, Professor, Department of Psychiatry and Behavioral Sciences, Co-Lead of Cancer Prevention and Control, Hollings Cancer Center, Medical University of South Carolina

10:55-11:20 **Policy-making in the Face of Uncertainty: How to Balance Competing Objectives?** Steven A Schroeder, MD, Distinguished Professor of Health and Health Care, Division of General Internal Medicine, Department of Medicine, Director, Smoking Cessation Leadership Center, University of California San Francisco

11:25-11:50 **The Nature of Choice and the Role of Regulation** Eric C. Donny, PhD, Professor of Physiology and Pharmacology, Wake Forest School of Medicine

11:50-12:15 ***PANEL DISCUSSION***

12:15-1:20 ***LUNCH***

12:30-1:20 ***SPECIAL EVENT: FDA FUNDING OPPORTUNITIES FOR EARLY CAREER INVESTIGATORS*** **We invite session attendees to bring their boxed lunches.*
Ami L. Bahde, MPH, Program Analyst, Research Branch, Office of Science, Center for Tobacco Products, US Food and Drug Administration
Kay L. Wanke, PhD, MPH, Deputy Director, Tobacco Regulatory Science Program, Office of Disease Prevention, National Institutes of Health

Panel on Advances and Challenges of Reducing Tobacco Use in Vulnerable and Poly-vulnerable Populations

Session Chair: Jennifer W. Tidey, PhD, Professor, Departments of Behavioral and Social Sciences, and Psychiatry and Human Behavior, Brown University

1:25-1:50 **Which Youth Populations are At Risk for Use of Non-cigarette Products and do they Possess Similar Vulnerability Factors to those At Risk for Cigarettes?**
Jessica L. Barrington-Trimis, PhD, Assistant Professor of Preventive Medicine, Keck School of Medicine, University of Southern California

1:55-2:20 **The Influence of Rural Residence on Response to Incentive-based Cessation Intervention for Pregnant Smokers**
Stephen T. Higgins, PhD, Vermont Center on Behavior and Health Professor, Departments of Psychiatry and Psychological Science, University of Vermont

2:25-2:50 **A Randomized Trial of Counseling and Nicotine Replacement Therapy (NRT) for Treatment of African American Non-daily Smokers** Nikki L. Nollen, PhD, Professor, Department of Population Health, University of Kansas School of Medicine

2:50-3:00 ***Break***

3:05-3:30 **The Environmental Risk Factors for Tobacco Experienced by Rural and Urban Youth**
Megan E. Roberts, PhD, Assistant Professor, Department of Health Behavior and Health Promotion, College of Public Health, The Ohio State University

3:35-4:00 **Discussant** Steven A. Schroeder, MD, Distinguished Professor of Health and Health Care, Division of General Internal Medicine, Department of Medicine, Director, Smoking Cessation Leadership Center, University of California San Francisco

4:00-4:15 ***PANEL DISCUSSION***

4:15-5:45 **RECEPTION AND POSTER SESSION** ***(****Prefunction & Montpelier Room)*

Friday, October 11: *Adirondack AB & CD*

7:30-8:15 **Registration & Breakfast** *(Adirondack AB)*

8:20-8:40 ***Opening Remarks:*** Mark A. Levine, MD, Commissioner, Vermont Department of Health

Panel on Tobacco Use in Populations with Medical Co-Morbidities

Session Chair*:* Diann E. Gaalema, PhD, Associate Professor, Departments of Psychiatry and Psychological Science, University of Vermont

8:45-9:10 **Hospitalization: The Opportunity to Initiate Tobacco Cessation Treatment** Nancy A. Rigotti, MD, Associate Chief, General Medical Division, Director of Tobacco Research and Treatment Center, Massachusetts General Hospital, Professor, Harvard Medical School

9:15-9:40 **Effects of Very Low Nicotine Content Cigarettes in those with Psychiatric Disorders** Jennifer W. Tidey, PhD, Professor, Departments of Behavioral and Social Sciences, and Psychiatry and Human Behavior, Brown University

9:40-9:50 ***Break***

9:55-10:20 **Prevalence, Reasons for Use, and Risk Perception of Electronic Cigarettes among Cardiac Event Patients** Andrew M. Busch, PhD, Associate Professor, Department of Medicine, University of Minnesota

10:25-10:50 **Smartphone-based Financial Incentives to Promote Smoking Cessation Among Pregnant Women** Allison N. Kurti, PhD, Assistant Professor, Departments of Psychiatry and Psychological Science, University of Vermont

10:50-11:15 ***PANEL DISCUSSION***

Panel on Tobacco Control and Regulatory Issues Regarding e-Cigarettes and Non-combusted Nicotine Delivery Systems

Session Chair: Andrea C. Villanti, PhD, MPH, Associate Professor, Departments of Psychiatry and Psychological Science, University of Vermont

11:20-11:45 **Preventing Teens from Using E-Cigarettes** Kathleen Crosby, BA, Director, Health Communications and Education, FDA Center for Tobacco Products

11:50-12:15 **Evolution of Products and E-cigarette Market** Richard J. O'Connor, PhD, Professor of Oncology, Department of Health Behavior, Division of Cancer Prevention and Population Sciences, Roswell Park Comprehensive Cancer Center, Professor of Community Health and Health Behavior, State University of New York at Buffalo

12:15-1:15 ***LUNCH***

1:20-1:45 **Public Health Impact of E-cigarettes** Andrea C. Villanti, PhD, MPH, Associate Professor, Departments of Psychiatry and Psychological Science, University of Vermont

1:50-2:15 **E-cigarettes for Smoking Cessation: Where Have we Been and Where are we Going?** Theodore L. Wagener, PhD, Director, Center for Tobacco Research and Co-Leader, Cancer Control Program, Ohio State University Comprehensive Cancer Center; Associate Professor, Division of Medical Oncology, Ohio State University Wexner Medical Center

2:15-2:40 ***PANEL DISCUSSION***

2:40 **ADJOURN**

2019 VCBH CONFERENCE POSTER ABSTRACTS

Odd posters numbers: 4:15-5:00pm
Even posters numbers: 5:00-5:45pm

1. Is low positive affect a symptom of tobacco withdrawal? Preliminary results from a systematic review

Elias M. Klemperer, John R. Hughes, Catherine E. Peasley-Miklus, Jessica W. Cook, Peter W. Callas, Joanna M. Streck, & Nicolas E. Morley

Background: Most descriptions of tobacco withdrawal have not changed in >30 years despite a substantial amount of new research on the topic that identifies potential new symptoms. This review aimed to determine whether low positive affect (PA) is a symptom of tobacco withdrawal. Low PA and negative affect (NA) appear to be independent from one another and differ in that low PA refers to the absence of pleasant and energized mood states while NA refers to negative mood states like anxiety, sadness, and irritability. We searched for tests of whether PA decreases during abstinence from cigarettes. **Methods:** Our main inclusion criterion was a prospective within-participant test of change in PA during abstinence conditions among daily cigarette smokers who were not using a cessation medication. Our search of PubMed, PsycINFO, and personal libraries yielded a total of 36 tests. We independently entered study characteristics and results. Initial findings are reported here and results of the meta-analysis will be presented at the conference. **Results:** Trials were published between 1984 and 2019; most used the Positive and Negative Affect Schedule (36%) or Profile of Mood States (39%) to assess change in PA. The median duration of abstinence was 1 day. Median sample size was 40 (range=6 to 275). Participants were mostly (75%) white and moderately dependent. Most (78%) trials excluded people with psychiatric disorders. Most (61%) trials found a significant decrease in PA during abstinence, 14% found no change, and 25% did not include significance tests. **Conclusions:** Preliminary findings indicate that PA decreases after acute abstinence from cigarettes. If meta-analytic findings support this conclusion it could suggest a need to 1) add assessments of PA to withdrawal measures and diagnostic criteria, 2) examine the time-course of change in PA, 3) determine if PA effects occur independent of NA effects, 4) assess whether reductions in PA contribute to relapse, and, if so, 5) develop treatments to prevent reductions in PA after smoking cessation.

2. Psychosocial mechanisms associated with tobacco use in smokers with and without serious mental illness

T. DeAtley, R. Denlinger-Apte, P. Cioe, S. Colby, R. Cassidy, M. Clark, E. Donny, J. Tidey

Background: Smoking disproportionately affects individuals with serious mental illness (SMI). A recent review identified potential psychosocial barriers to cessation in smokers with SMI (e.g., high craving, stress, and exposure to smoke/smokers, low risk perceptions and cessation support), but noted that few studies have included a control group or used validated assessment tools. We compared validated measures of psychosocial barriers to cessation in smokers with and without SMI living in the same geographic area. **Methods:** Smokers with SMI (n=58) and without SMI (n=83), enrolled in two parallel clinical trials of very low nicotine content cigarettes, completed the following measures at baseline: Brief Wisconsin Inventory of

Smoking Dependence Motives (WISDM) scale, Fagerstrom Test of Cigarette Dependence (FTCD), Questionnaire on Smoking Urges (QSU), Respiratory Health Questionnaire, Perceived Health Risks Scale, Perceived Stress Scale, and Environmental and Social Influences on Tobacco Use Questionnaire (ESTQ). Because the ETSQ had not been validated, we first conducted construct validation in a larger sample of smokers without SMI. Scores were compared across samples using independent-sample t-tests and chi-squared tests. **Results:** Smokers with and without SMI smoked a similar number of cigarettes per day, but those with SMI had higher breath CO levels, urinary total nicotine equivalents, FTCD scores and craving (QSU, WISDM) scores (p's $< .05$). Smokers with SMI reported higher respiratory symptoms, but had lower perceived health risks of smoking (p's $< .05$). Smokers with SMI were more likely to have received quit advice from a medical professional within the last six months compared to smokers without SMI ($p < .05$). Perceived stress and exposure to smoke/smokers did not differ across samples. **Conclusions:** Our findings align with prior studies of psychosocial cessation barriers in people with SMI, and advance this research by comparing smokers with and without SMI on several validated measures. Findings highlight the need for interventions that increase risk awareness and reduce craving among smokers with SMI.

3. Effects of very low-nicotine cigarettes on smoking and substance use/cravings
Rohsenow, D.J., Martin, R.A., Tidey, J.W., Colby, S.M.

Background: Very-low nicotine content cigarettes (VLNCC) reduce craving and withdrawal with little/no compensatory smoking among smokers in general. A mandated reduction in the nicotine yield of cigarettes may be a method of reducing smoking-related disease in special populations resistant to quitting smoking, such as people with substance use disorders (SUD). Our focus is to determine if VLNCC increases substance use or compensatory smoking in smokers with SUD. **Methods:** Smokers with SUD in the community, unmotivated to quit, are randomized to VLNCC or normal nicotine content (NNC) cigarettes for 6 weeks. Assessments: baseline, weekly (6 weeks), and 3- and 6-months. Assessments include cigarettes smoked per day (CPD), nicotine dependence, heavy drinking, drug use, and substance cravings. Results: Presently, N=168 in intent-to-treat (target=190), 13 completed weekly appointments, 103 have 3- & 6-month data. Most (89%) used study cigarettes in all 6 weeks per the ratio of cotinine/CPD. Across the experimental period, smoking urges, nicotine withdrawal, and nicotine decreased similarly for VLNCC and NCC conditions (p's $< .002$ time). CPD decreased over the 6 weeks only in the VLNCC condiction (interaction $p < .013$). At follow-ups, drug use days reduced more after VLNCC than NCC (interaction $p < .03$) with no difference in heavy drinking days. **Conclusions:** Use of VLNCC vs. NNC did not result in compensatory smoking, nor increased substance cravings or heavy drinking days. VLNCC resulted in decreased drug use days. Thus, VLNCC appear to have no harmful effects on substance use in smokers with SUD.

4. Sociodemographic, behavioral, and psychosocial correlates of smoking during pregnancy
Carolyn Evemy, Allison Kurti, Stephen Higgins

Background: Various demographic and smoking characteristics are well-established predictors of women attempting to quit smoking upon learning of pregnancy. Associations between measures of executive functioning (EF) and pregnancy-related quit attempts have been less widely studied; however, examining this question may reveal important avenues for smoking

cessation interventions targeting pregnant women. The present study examined whether measures of EF are predicted quit attempts upon learning of pregnancy after controlling for conventional demographic and smoking history variables. **Methods:** Participants in this study were 261 pregnant women who completed an intake assessment to determine their eligibility for a smoking cessation trial. Associations were examined between sociodemographic data, smoking characteristics, EF measures, and self-reported quit attempts since learning of pregnancy, a proxy for late-pregnancy smoking abstinence. **Results:** Relative to women reporting no pregnancy-related quit attempts, women who attempted to quit smoking since learning of pregnancy were younger, more educated, lighter smokers, started smoking at a younger age, reported smoking more quickly upon waking, and exhibited higher EF based on the cigarette purchase task and time perspective-smoking scales (*ps* < 0.05). However, stepwise logistic regressions indicated that only three variables remained significant predictors of quit attempts in the final adjusted model: younger age, smoking more quickly upon waking, and higher educational attainment (*ps* < 0.05). **Discussion:** Although EF measures are associated with pregnancy-related quit attempts, efforts to intervene on these variables may have limited impact as sociodemographic and smoking history variables appear to account for a majority of the variance in predicting antepartum quit attempts.

5. Objective and subjective measures of smoking status: Demographics as a predictor of patient smoking upon entering cardiac rehabilitation programs

William A. Middleton, Diann E. Gaalema, Patrick D. Savage, Philip A. Ades

Introduction: Cigarette smoking is the strongest determinate of future morbidity and mortality in cardiac patients. Accordingly, smoking cessation is a primary goal within Cardiac Rehabilitation (CR). However, clinics generally rely on patient-report when objective screening would provide more accurate measurements. **Methods:** This analysis compares self-reported smoking status against objective measures within the University of Vermont Medical Center Cardiac Rehabilitation's research database (n=374, 72% male). Measures of exhaled carbon monoxide (cut-off CO ≥ 6ppm), and self-reported smoking status were taken at patients' entry to CR. **Results:** When compared, no significant difference was found between subjective and objective smoking status, (t = -1.94, *p* = 0.052). 8.3% of the sample self-reported currently smoking, while 10.2% of the sample could objectively be considered smokers. Women and men did not differ in smoking status, of men, 9.3% objectively were smokers, compared to 12.5% of women (t = .61, *p* = .172). Additionally, there was no relationship between BMI and smoking status (F = .54, *p* = .467). However, depression scores and age varied by smoking status, with higher PHQ-9 scores in smokers (M = 6.73, SD = 5.23 vs M = 3.78, SD = 4.0, β = .023) and smokers being younger than non-smokers (M = 59, SD = 11.02 vs. M = 69, SD = 11.2, β = -.068, p = .000, *OR*= .935). Education was found to have a negative relationship with smoking status (β = -.422, *p* = .000, *OR* = .656). **Conclusions:** Smokers in CR continue to be a high-risk group being younger, with lower educational attainment and higher depression scores.

6. Impact of alcohol and drug use on smoking and cessation in socioeconomically disadvantaged young adults

Julia C. West, Catherine Peasley-Miklus, Andrea Villanti

Introduction: Population studies highlight that alcohol and marijuana use are correlated with cigarette smoking and other tobacco use. Using qualitative data from focus groups, the aims of our study were to describe the ways in which alcohol and drug use affect cigarette smoking and cessation in socioeconomically-disadvantaged young adults (SDYA) smokers. **Methods:** Thirty-six SDYA smokers aged 18-29 participated in eight focus groups and two interviews in Burlington, Vermont in 2018. Structured focus groups addressed poly-tobacco use, other substance use and co-use with tobacco, and the contexts and facilitators that cue SDYA smoking. Participants were also asked their reasons for smoking, barriers to cessation and messages or modalities that would make smoking cessation more novel or relevant. Three coders implemented the Framework Method analysis to create a comprehensive coding structure based on pre-assigned transcripts, then one coded all study transcripts using NVivo software (QSR International). **Results:** Key themes emerged around the relationships between alcohol and drug use and smoking. SDYA smokers discussed co-use of tobacco and other substances stating that cigarettes go “hand in hand” with drugs and alcohol. Participants described changes in frequency of smoking when using other substances, including chain smoking when drinking and substituting cigarettes with marijuana. Several SDYA smokers with a history of addiction credited cigarettes as their last remaining addiction, and feared that quitting smoking would cause relapse to alcohol or drugs. **Discussion:** Co-use of cigarettes with alcohol and other drugs was a prominent theme that emerged from focus groups. Participants frequently highlighted substance use as a reason for smoking and a barrier to quitting. SDYAs reported smoking and craving cigarettes more when using other substances, cigarette smoking as a factor in sobriety from alcohol and drugs, and concern that quitting smoking would trigger drug or alcohol relapse. Interventions that address substance co-use may improve smoking cessation in SDYA smokers.

7. Addiction potential of cigarettes with reduced nicotine content in pregnant women

Cecilia Bergeria, Sarah H. Heil, Roxanne F. Harfmann, Janice Bunn, Haley Jo Tetreault, Stephen T. Higgins

Introduction: Studies testing the reduction of nicotine content of cigarettes to a non-addictive level have shown promising beneficial effects in the general population of smokers. However, these studies have uniformly excluded pregnant women, who may respond differently considering they metabolize nicotine more rapidly and could be at increased risk for untoward craving/withdrawal or compensatory smoking. To our knowledge, the current study is the first to report on response to very low nicotine content cigarettes (VLNCs) in pregnant women. **Methods:** A two-site, within-participant study recruited pregnant smokers of low socioeconomic status to complete experimental sessions after brief smoking abstinence. In Phase 1, participants sampled either usual brand (UB) or one of two VLNCs (0.4 and 2.4 mg/g) under double-blind conditions. Phase 2 directly compared the relative reinforcing effects of the cigarettes by allowing participants to choose which they preferred to smoke. The three cigarette dose-pair combinations were tested in separate sessions. Puffs were earned ad-lib by

clicking the letter code associated with their preferred cigarette 10x. **Results:** 10 pregnant smokers were enrolled (30.6±5.2 years old, 15.2±5.0 weeks gestation). Each of the cigarettes significantly reduced MNWS total score and desire-to-smoke. Participants chose the 0.4-mg/g dose less than their UB (22% vs. 78%) during concurrent-choice testing. Positive subjective effects of smoking on the mCEQ decreased by reducing nicotine content. No significant changes indicative of compensatory smoking were noted in smoking topography or breath CO levels. **Conclusions:** Reducing the nicotine content of cigarettes may decrease their addiction potential in pregnant smokers without causing untoward craving/withdrawal or compensatory smoking. Studies of extended exposure to VLNCs in pregnant women are warranted.

8. Examining associations between self-perceived mental health and cigarette use: Results from waves 2 and 3 of the population assessment of tobacco and health study
Hypatia Bolívar, Diann Gaalema, Sulamunn Coleman, Janice Bunn, & Stephen Higgins

Background: Tobacco use is disproportionally high in individuals with psychiatric comorbidities. Examining how mental health symptoms interact with tobacco use patterns may help inform policy. **Methods:** We used adult questionnaire data collected during Waves 2 (W2) and 3 (W3) of the Population Assessment of Tobacco and Health study (N=25,349). We categorized respondents based on self-perceived mental health (SPMH; poor, fair, good, very good, or excellent) and current use of cigarettes. We used multinomial logistic regression to examine relationships between changes in SPMH and cigarette use between waves. **Results:** SPMH at W2 was a significant predictor of change in mental health status from W2 to W3 in both the W2 cigarette smokers and the W2 non-cigarette smokers (p = 0.01 and p = 0.003, respectively). Individuals reporting Fair SPMH at W2 were more likely to increase their SPMH than individuals reporting Good SPMH in both smokers and non-smokers. The effect of W3 cigarette smoking status differed between W2 smokers and non-smokers. W2 non-smokers who reported smoking at W3 were more likely to report declines in SPMH (OR=1.59, 95% CI: 1.16, 2.19) than continued non-smokers. W2 smokers who reported not smoking at W3 were more likely to report improvements in SPMH (OR=1.12, 95% CI: 0.86, 1.46) than continued smokers. However, in W2 nonsmokers, odds of SPMH improvements were not different between those who started smoking at W3 versus those who did not (OR=1.12, 95% CI: 0.86, 1.46). Similarly, in W2 smokers, odds of declines were not different between those who stopped versus continued to smoke at W3 (OR=0.92, 95% CI: 0.72, 1.78). **Conclusions:** This study contributes to the broader research on the relationships between tobacco use and mental health. Policies regulating tobacco products should attend to potential effects on individuals with psychiatric comorbidities

9. Using the cigarette purchase task to examine the relative reinforcing value of cigarettes among mothers with versus without opioid dependence
Tyler D. Nighbor, Sulamunn R.M. Coleman, Janice Y. Bunn, Mike DeSarno, Adam L. Morehead, Katherine J. Tang, Diana Keith, Allison N. Kurti, Ivori Zvorsky, & Stephen T. Higgins

Background: The Cigarette Purchase Task (CPT), in which participants estimate the number of cigarettes they would smoke across increasing cigarette prices, measures the relative reinforcing value of cigarettes. Although opioid-dependent individuals are particularly

vulnerable to tobacco addiction, more research is needed to elucidate whether and to what extent their motivation to smoke differs from not-opioid dependent smokers with similar sociodemographic characteristics. **Methods:** Participants were 173 women (65 opioid-dependent) in an ongoing clinical trial for smoking cessation. CPT responses collected prior to treatment were compared between among opioid-dependent versus not-opioid dependent women using five demand indices: Demand Intensity; O_{max}; P_{max}; Breakpoint (*BP*); and α, and two latent factors: Demand Amplitude and Persistence. Final regression models adjusted for characteristics that differed between the two groups. **Results:** Opioid-dependent women had significantly higher Demand Intensity (i.e. number of cigarettes they would smoke if cigarettes were free) than not-opioid dependent women in the final regression model (F (1, 156) = 6.93, p = .016). No other demand indices significantly differed. Demand Amplitude (i.e., volumetric consumption), but not Persistence, was significantly higher for opioid-dependent women in the final model (F (1, 146) = 4.04, p = .046). **Conclusions:** These results further demonstrate that the CPT is a highly sensitive task that can illuminate potentially important individual and population differences in the relative reinforcing value of smoking. Greater Demand Intensity and Amplitude for cigarettes differentiates smokers with versus without comorbid opioid dependence; thus, decreasing smoking prevalence among opioid-dependent populations may require interventions and policies that decrease Demand Intensity and Amplitude.

10. Initial findings from a pilot program of a novel system to improve retailer compliance for tobacco product purchases

Shivaani Prakash, Jonah Joselow, Joseph O'Hara, Rasmus Wissmann,

Background: As part of youth-prevention initiatives, JUUL Labs is developing stringent point-of-sale standards for sales of JUUL products in brick-and-mortar retail. These standards structurally mandate age verification and limit quantity of JUUL products purchased, to reduce underage access via direct sales and social sourcing. A pilot of these Retail Access Control Standards (RACS) was conducted to understand effectiveness. **Methods:** The RACS pilot was conducted from May – June 2019 in three retail chains selling tobacco products across Pennsylvania, North Carolina and South Carolina. Employees at participating chains were trained to meet RACS requirements. Almost 4,000 "secret shop" audits were conducted at 171 stores before launch and following implementation. Audit failure rates were compared by chain, location and failure type (age verification [AV] vs. bulk purchase [BP]). Paired t-tests determined if differences in failure rates were significant post-implementation. **Results:** Before implementation, the audit failure rate was 36.8% for meeting AV standards, and 29.3% for meeting BP standards for JUUL purchases. Following the pilot, failure rates reduced to 0.2% and 1.0% respectively, a statistically significant decrease ($p<0.01$). Reductions in AV and BP failure rates from the pre- to post- period were significant across all chains and states ($p<0.01$). AV failure rates post-RACS were also lower than the 13.5% past-year national failure rate for tobacco product purchases reported by the FDA among retailers. **Conclusions:** This pilot provides compelling preliminary evidence of retail-level tobacco-control measures that improve compliance and restrict access to age-restricted products. Further evaluation of factors impacting long-term success of RACS is needed.

11. Regulatory implications of laboratory studies of little cigars
Wallace Pickworth, Bartosz Koszowski, Labasse Doumbia, Jess Wilhelm

Background: Little cigars (LCs) resemble cigarettes in size, shape, packaging, filter availability, and nicotine yield — characteristics that make them attractive to cigarette smokers. Despite their similarity to cigarettes, LCs are currently regulated as cigars in the U.S., resulting in lower prices and marketing of flavors, both of which appeal to young adults. The FDA has the authority to regulate LCs similarly to cigarettes but has not done so.
Methods: We performed a clinical study to asses use behavior and toxicant exposure of LCs relative to cigarettes. Participants (n=21), who were dual users of cigarettes and LCs, smoked a filtered unflavored LC and a cigarette. Participants had equal boosts of plasma nicotine but had more exhaled carbon monoxide (eCO) per gram of tobacco smoked (LC: 15ppm/g vs cigarette: 9 ppm/g; p=0.013). Following clinical data collection, we replicated observed puffing behavior using machine smoking and analyzed the amounts of toxicants in the smoke. Tobacco-specific nitrosamines (e.g. NNN: 485.2ng, NNK: 196.6ng) and polycyclic aromatic hydrocarbons, known carcinogens, were present in LC smoke at comparable or higher levels compared to cigarette smoke. **Results:** Smokers who use LCs are exposed to more carbon monoxide and comparable levels of other toxicants compared to cigarette smoking.
Conclusions: Together with other reports, this study provides a scientific basis for regulating LCs similarly to cigarettes in the interest of public health.

12. Association between psychological distress and cigarette smoking varies with food insecurity
Jin E. Kim-Mozeleski and Janice Y. Tsoh

Background: Psychological distress and tobacco use are known to co-occur for many reasons, including vulnerabilities associated with socioeconomic disadvantage. Food insecurity—a stressful condition due to inconsistent food access—is linked with increased psychological distress and is also an independent risk factor for cigarette smoking. **Methods:** We investigated the association between psychological distress and cigarette smoking, examining psychological distress occurring with or without food insecurity, and variations in the associations by socioeconomic status. We analyzed data from the 2015 U.S. Panel Study of Income Dynamics (n=9,048). A four-category variable was constructed based on responses to validated measures of psychological distress and of food insecurity: no distress and no food insecurity; food insecurity without distress; distress without food insecurity; and distress with food insecurity. Weighted, robust Poisson regression analysis examined associations with current smoking, with analyses stratified by socioeconomic status. **Results:** Smoking prevalence was highest among respondents experiencing psychological distress with food insecurity (39%). Results showed that respondents with food insecurity alone had higher smoking prevalence (33%) than respondents with psychological distress alone (20%). Only among respondents above poverty, psychological distress without food insecurity was significantly associated with current smoking (prevalence ratio=1.44; 95% CI [1.25, 1.65]). For respondents at/below poverty, psychological distress without food insecurity was not significantly associated with current smoking.
Conclusions: Further examining how socioeconomic stressors, such as food insecurity, intersect

with psychological distress is needed to address continued socioeconomic disparities in cigarette smoking, and to develop effective population-based interventions for whom existing tobacco control efforts have not been as effective.

13. The effect of smoking very low nicotine content cigarettes on appetite, food preference, and weight

Cara M. Murphy, Rosemarie A. Martin, & Damaris J. Rohsenow

Background: Cigarettes with low nicotine yield are associated increased likelihood of smoking cessation. Some research has suggested that smokers randomized to low nicotine content cigarettes gain more weight over 6 weeks than those smoking their usual brand. The effects of smoking very low nicotine content (VLNC) cigarettes on appetite and weight are not yet known. **Methods:** The current study aimed to evaluate the impact of smoking VLNC cigarettes on appetite, food preference, and weight over 6 weeks relative to smoking cigarettes with normal nicotine content (NNC). Adult cigarette smokers (n=118) with Substance Use Disorders and motivation to quit smoking were recruited from the community to participate in a double-blind study. Participants were randomly assigned to receive research cigarettes with NNC or VLNC for 6 weeks. Each week, appetite food preferences, and weight were assessed. Mixed ANOVA was used to assess changes in these variables as a function of condition and time (weeks 1-6). **Results:** Over 6 weeks, there were no differences in appetite, preference for sweet foods, overeating at mealtimes, consuming larger portions, or snacking as a function of condition. Similarly, there was no effect of time, condition, nor an interactive effect of the two on weight over 6 weeks. **Conclusions:** Results suggests that individuals did not engage in compensatory eating behaviors when smoking VLNC cigarettes. They did not experience noticeable differences in their eating behavior and did not experience weight gain despite reductions in nicotine. This work further supports the promise of regulatory policies that lower the nicotine content in combusted tobacco products.

14. Modeling the effects of an acute psychological stressor on vaping lapse behavior

Irene Pericot-Valverde, Morgan Tromblee, Valeria Diaz, Thomas Gallagher, Ethan Rogers, Riley Nesheim-Case, Ellaina Reed, Haley Tetreault, Douglas McLeod, & Diann E. Gaalema

Aim: This study aimed at exploring the effect of an acute psychological stressor on vaping lapse and relapse behavior among dependent e-cigarette users. **Methods:** Participants were 31 e-cigarette users (77% male, average age 19.5) who reported having used an e-cigarette for a mean length of 12.3 months and consuming an average of 3.4 mL of e-liquid daily. Participants attended two laboratory sessions under acute abstinence (≥12 hours since their last e-cigarette use) in which they were exposed to the Trier Social Stress Test (TSST) or a non-stress control condition. They subsequently started the choice task involving two periods: 1) delay period (participants had the option of starting vaping or delaying vaping for up to 50 minutes in exchange for money), and 2) self-administration period (participants were given a $5 tab to purchase e-cigarette uses for 60 minutes). Subjective (craving and stress) and physiological (heart rate) measures were also collected 5 times at each session. **Results:** The amount of time that e-cigarette users were able to resist vaping did not differ between conditions (control=7.6 minutes vs TSST= 10.6 minutes. The number of e-cigarette uses purchased was higher after the

TSS compared to the control condition ($p < .01$). Exposure to the stressor also produced significant increases in craving, stress, and heart rate among e-cigarette users ($p < .05$). **Discussion:** This study used a human laboratory model for estimating the effect of stress on lapse and relapse behavior among e-cigarette users. Results showed that exposure to a psychological stressor did not undermine the ability to resist vaping among dependent e-cigarette users (i.e., lapse), but it influenced the number of uses purchased once users decided to "give in" and vape (i.e., relapse). This study also provides further evidence that human laboratory models are time- and cost-efficient measures to identify the motivational processes underlying e-cigarette use.

15. Food reinforcement in infants of mothers treated for smoking during pregnancy
Danielle R. Davis, Joan Skelly, & Stephen T. Higgins

Introduction: Infants born to women who smoke during pregnancy have lower birth weights than infants of non-smokers, but often experience rapid weight gain and higher rates of obesity later. A change in the reinforcing value of food could be one explanation for this pattern. The aim of the current study is to determine if differences in reinforcement of food are observed among infants of non-smokers and women who smoke during pregnancy. **Methods:** Infants born to smokers (n=53) and never smokers (n=44) completed a two-session operant task. In sessions, either a food reinforcer or non-food reinforcer (bubbles) was available on a progressive ratio schedule. The relative reinforcing value of food (maximum responses for food in proportion to total responses across sessions) and the absolute reinforcing value of both food and bubbles were measured. Parents completed the Baby Eating Behavior Questionnaire (BEBQ), a five-subscale questionnaire assessing infant appetite. Linear regressions were used to estimate association of operant task outcomes and BEBQ subscales to mother's smoking status during pregnancy. **Results:** Operant task outcomes were not associated with smoking status during pregnancy (rs=0.01-0.02, ps<.05). BEBQ subscales Food Responsiveness and Satiety Responsiveness were associated with smoking status (r=0.21,p=.04; r=0.30,p=.003, respectively), with mean scores for both significantly lower in infants born to smokers. **Conclusions:** Using an operant task, differences in the reinforcing value of food in infants born to smokers and non-smokers were not observed. However, differences in appetite were observed, with a pattern suggesting infants born to smokers may be less sensitive to signals of both hunger and satiety.

16. Evaluating mobile apps for smoking in young people in community mental health care
Minda Gowarty, Nathan Kung, Ashley Maher, Mary Brunette

Background: Young adults with severe mental illness (SMI) are over twice as likely to have tobacco use disorder (TUD) than the general population, and while they report interest in quitting smoking, they are less likely to achieve abstinence. There is great need for scalable interventions for this group, but very little research has evaluated the efficacy of interventions among young adults with SMI and TUD. Over 70% of young adults with SMI own smartphones and are interested in using their phones for behavioral interventions, suggesting that smartphone apps may be an underutilized tool for treating tobacco use disorder. However, little is known about perceptions of apps for smoking cessation in young adults with SMI, or

about facilitators and barriers to their use in this population. **Methods:** Five focus groups involving 22 participants with SMI, aged 25-35 years old, in treatment at a community mental health center were conducted between May and August of 2019. Transcriptions of the focus groups were qualitatively coded using thematic analytic techniques by three independent researchers. **Results:** Participants were 22 daily smokers, of whom 10 (45%) self-identified as female, 20 (91%) self-identified as white, and 9 (41%) had psychotic disorders. Themes from focus groups will include perceptions of apps for smoking cessation, as well as facilitators and barriers to using apps for smoking cessation in young adults with SMI.
Conclusions: Quantitative data characterizing the study sample, and qualitative data characterizing the unique tobacco treatment needs of young adults with SMI will be presented.

17. An analysis of patterns of youth tobacco use in the population assessment of tobacco and health (PATH) study
Anthony Oliver and Sarah Heil

Background: Previous studies have used latent class analysis (LCA) to identify behavioral patterns of youth tobacco use. Given the increasing availability of alternative tobacco products, however, it is necessary to replicate such studies as they may not accurately reflect current patterns of tobacco use. To address this limitation, the current study was designed to assess tobacco use in a nationally representative sample of youth using LCA. **Methods:** Data from 1151 respondents from the Wave 1 youth questionnaire of the Population Assessment of Tobacco and Health (PATH) study who indicated using at least one type of tobacco product within 30 days prior to completing the survey were analyzed. The types of tobacco products included in the analysis were cigarettes, e-cigarettes, cigars, filtered cigars, cigarillos, hookah, snus, and smokeless tobacco. **Results:** The analysis identified five distinct classes: Class 1 'cigarette users' (32.5%), class 2 'poly-tobacco users' (6.4%), class 3 "e-cigarette and hookah users" (32.9%), class 4 'cigarillo users' (16.5%), and class 5 'smokeless tobacco users' (11.7%).
Conclusions: The results of the current study indicate that e-cigarette and hookah users were the largest class of tobacco users, followed closely by cigarette users. These findings contrast with previous research which has indicated cigarette users were the predominate group of youth tobacco users. This discrepancy may be reflective of changes in availability and acceptability of alternative tobacco products and warrants further investigations regarding youth tobacco use.

18. Demographic and smoking characteristics of methadone- and buprenorphine-maintained participants enrolled in studies examining the effects of reduced nicotine content cigarettes
Rhiannon C. Wiley, Joanna M. Streck, Stacey C. Sigmon, and Stephen T. Higgins

Background: Opioid-dependent individuals have a high prevalence of tobacco use, more severe nicotine dependence, and poorer smoking cessation outcomes. Previous research has suggested that opioid agonist medications may influence nicotine reinforcement and subsequent smoking behavior. We compared baseline demographic and smoking characteristics of cigarette smokers maintained on methadone, a full opioid agonist, or the partial agonist buprenorphine for opioid use disorder. **Method:** Participants (N=263) were methadone- (n=118) or buprenorphine-maintained (n=145) smokers enrolled in two large multi-site randomized controlled trials examining the effects of reduced nicotine content

cigarettes. All participants completed demographic questionnaires and measures of smoking characteristics at study intake, and groups were compared using chi-squared and Wilcoxon tests. **Results:** On average participants began smoking at age 15, smoked 22 cigarettes per day and presented with a Fagerström score of 6.5, indicating high nicotine dependence. Buprenorphine- and methadone-maintained participants did not differ significantly in terms of age, gender, marital status, level of education, employment status, age of smoking initiation, number of cigarettes smoked per day, or severity of nicotine dependence (*p's*>.05). However, buprenorphine-maintained participants did have lower household income (*p*=0.02), higher breath CO levels (*p*=0.01), and were more likely to be menthol smokers compared to methadone-maintained participants (*p*=0.002). **Conclusions:** Buprenorphine- and methadone-maintained tobacco smokers were generally similar in terms of demographic and smoking characteristics, though several variables suggested possible greater severity of nicotine dependence among those receiving buprenorphine.

19. Social determinates of smoking in patients eligible for cardiac rehabilitation
Diann E. Gaalema, Hypatia A. Bolívar, Rebecca J. Elliott, William Middleton, Jin H. Yoon, Charles C. Miller III, Chizimuzo T.C. Okoli, and Philip A. Ades

Background: Despite smoking (i.e., combustible cigarette use) being a known cause of cardiovascular disease, many individuals continue smoking after experiencing a major cardiac event. It is imperative to understand the determinants of continued smoking in this population, which stands to benefit from receiving smoking cessation services. In the current study, we examined whether patients with different social smoking environments (i.e., family or friends who also smoked) varied along several socio-demographic characteristics and health and smoking behaviors. **Methods:** Participants (N = 149) were patients hospitalized for a coronary event whose medical record indicated they smoked and were eligible for outpatient cardiac rehabilitation (CR). Participants completed a survey during hospitalization and were contacted 3-months later. Patients were dichotomized according to whether they responded as having "None or Few" versus "Some or Most" friends and family who also currently smoked. Socio-demographics, smoking behaviors, second-hand smoke exposure, smoking harm perceptions, and physical and mental health items were compared using *t*-tests and Chi-squared tests ($p < .05$). Odds ratios were calculated to compare rates of CR attendance and self-reported quitting at follow-up. **Results:** Participants did not differ with respect to socio-demographic characteristics, physical and mental health, smoking harm perceptions, or smoking. However, participants in the "Some or Most" group experienced more second-hand smoke exposure ($p < .01$). At follow-up, patients in this group were less likely to attend CR (OR 0.43, 95% CI [0.19, 0.99]). Fewer patients in this group self-reported quitting smoking but the difference was not statistically significant (OR 0.57, 95% CI [0.26, 1.28]). **Conclusions:** The social smoking environment may predict worse cessation outcomes and outpatient CR attendance. Clinicians might consider asking cardiac patients about their social environment when assessing smoking at hospitalization.

20. Cluster analysis of urinary tobacco biomarkers among U.S. adults: Population assessment of tobacco and health (PATH) biomarker study (2013-2014)
Ban Majeed, Daniel Linder, Yelena Tarasenko, Danielle Smith, Yutao Liu, Thomas Eissenberg, and David Ashley

Background: Urinary biomarkers of exposures (BOE) to nicotine, Tobacco-Specific Nitrosamines (TSNA), Volatile Organic Compounds (VOC), and Polycyclic Aromatic Hydrocarbons (PAH) offer objective measurement of toxicant exposure. We used cluster analysis to identify and describe data-driven groups (clusters) of tobacco users, based on concentrations of urinary tobacco biomarkers. **Methods:** Data are from Wave 1 of the PATH Study (2013-2014). The study included established current tobacco users, who had complete data on biomarkers of nicotine (TNE2), TSNA (NNN and NNAL), VOC (CYMA, CEMA, and MHB3), and PAH (1-NAP and 3-FLUO) (N=6,724). Adults were classified into smokers/users of: combustible cigarettes only; e-cigarettes only; other combustible tobacco (OCT; cigars, pipe, and hookah) only; smokeless tobacco (SLT) only; dual users; and poly users. Cluster analysis and multivariable multinomial logistic regression were used. **Results:** Half the sample were exclusive cigarette smokers; 32.3% were poly users; 5.2% were SLT users; and 4.2% were dual users. Based on concentrations of BOE, nine clusters were identified and cluster membership varied by pattern of use. Of adults who smoked cigarettes only, 37.6% were in cluster I (slightly high TNE2 and TSNA and somewhat high PAH and VOC) and 24% belonged to II (somewhat low TNE2, TSNA, PAH, and VOC). Third of exclusive e-cigarette users belonged to cluster VI (high TNE2 and very high TSNA, and low/very low PAH and VOC). **Conclusions:** Findings suggest that level of exposure to tobacco toxicants among users vary by type and number of product used, and provide some evidence for nicotine product continuum of risk.

21. Patient characteristics predictive of cardiac rehabilitation participation
Sherrie Khadanga, Patrick Savage, Diann Gaalema, Philip Ades

Introduction: Although the benefits of cardiac rehabilitation (CR) have been clearly established, participation rates remain quite low, ranging from 19-34%. **Purpose:** To assess the demographic, medical, and psychosocial factors that influence CR participation **Design:** Prospective observational study **Methods:** Patients hospitalized for an acute cardiac event and eligible for CR completed a series of assessments focusing on psychosocial factors including screening for anxiety (General Anxiety Disorder [GAD-7]), screening for depression (Patient Health Questionnaire [PHQ-9]), and assessment of social support via the Duke Social Support Index. Smoking status (current smoker vs former/non-smoker), education level ($\leq$high school vs college degree or higher), and diagnosis (surgical vs non-surgical) were also ascertained. One week post discharge, patients were called to assess the strength of physician recommendation to CR (5 point Likert scale with options ranging from 1 'recommend against CR' to 5 'strongly recommend CR'). We then followed patients to determine their participation and adherence. Statistical methods included logistic regression analysis, chi square, and non-paired t-tests. The following variables were included in the analyses: age, sex, diagnosis, smoking status, education level, referral via electronic medical record, depression score, anxiety score and strength of physician recommendation. A *p* value of <0.05 was used to determine significance. **Results:** 132 patients were approached and of those, 117 enrolled in the study. 55 individuals (47%) participated in CR of whom 16 were female (29%), 38 were male (71%), mean age was 69$\pm$11

years old, and 33 had a college degree or higher (60%). Current smokers were less likely to attend (p<0.01) compared to non-smokers. Similarly, those with an education level ≤high school were less likely to participate compared to those with a college degree or higher (p<0.006). Use of electronic referral (r=0.36, p<0.0001), surgical diagnosis (r= 0.24, p<0.009) and strength of physician recommendation to CR (r=0.27p<0.008) was associated with CR participation. Surgical diagnosis, level of education, electronic referral, smoking status, and strength of physician recommendation were independently associated with CR participation (adjusted R^2=0.396, p<0.001). **Conclusion:** Only half of eligible patients enroll in CR. Our results suggest that efforts should be directed toward ensuring that patients are referred and encouraged by physicians to participate in CR. Conversely, specific interventions need to be developed to increase participation among current smokers and patients of lower levels of education.

22. Assessing the neural correlates of the cigarette purchase task in three vulnerable populations

Adise, S., Sidwell, A., Chaarani, B., Spechler, P., Ivanciu, A., Higgens, S., and Garavan, H.

Background: The prevalence of smoking in vulnerable populations remains steady, suggesting that in these groups, mechanisms driving use are poorly understood. Because the brain plays a role in nicotine maintenance, we investigated the neural correlates of dependence, in three vulnerable populations (e.g., opioid-maintained users, low socioeconomic status women, and individuals with affective disorders). **Methods:** Nicotine dependence was assessed using a cigarette purchase task (CPT), which produced two factor scores: amplitude and persistence. The MRI battery consisted of a structural and 2 functional (f) MRI tasks: an inhibitory control and cue-reactivity task. Averaged cortical thickness (mm), subcortical grey matter volume (mm^3), and beta weights (for the fMRI) were extracted for *a priori* brain regions of interest (ROI) that have been associated with relapse vulnerability and nicotine dependence. Mixed models were run to examine if amplitude and persistence (in separate models) were related to sMRI and fMRI. Covariates included were age, sex, handedness, population, and intracranial volume (for sMRI only). **Results:** There was a main effect of amplitude on cortical thickness in the right orbitalis (p=0.008, **β**=-0.053) and a main effect of persistence on subcortical thalamic volume (p=0.001, **β**=-475.8.) There were no main effects of amplitude or persistence on any fMRI ROIs. **Conclusions:** Future studies should investigate how these regions are important for reducing nicotine dependence in these populations.

23. Comparison of demand for cigarettes and methamphetamine among individuals with methamphetamine use disorder

Jin H. Yoon, Robert Suchting, Rachel N. Cassidy, Peter K. Bolin, Yasmin Omar, Gregory S. Brown, Richard De La Garza, II

Background: Cigarette smoking is highly prevalent among populations that use psychomotor stimulants, with some of the highest reported rates (87-92%) among individuals with methamphetamine (MA) use disorder. However, relatively little research has examined the abuse liability of cigarettes vs. MA among individuals with MA use disorder in comparison to other psychomotor stimulants such as cocaine. The current study examined demand for MA and cigarettes. Drug demand is a behavioral economic measure that assesses how much drug an individual will consume as a function of increasing price. Drug demand has been useful for

measuring various drug-related constructs such as drug valuation, motivation to use drugs, and drug abuse liability. **Methods:** Participants consisted of non-treatment seeking volunteers with MA use disorder (N = 18) of which 17 reported cigarette smoking. Each participant completed hypothetical purchasing tasks for cigarettes and MA. **Results:** Results showed that an exponentiated model of demand provided a good fit to consumption data for cigarettes (r^2 = 0.94) and MA (r^2 = 0.89). Bayesian generalized linear modeling (GLM) found evidence that several demand characteristics were related to self-reported measures of drug use severity (cigarettes/day, days MA used in the past 30) for cigarettes (Q_0, α, P_{max}, break point) and MA (Q_0, α, O_{max}, P_{max}, break point). Comparison of normalized demand curves for cigarettes and MA revealed higher abuse liability for MA compared to cigarettes. **Conclusions:** The current results support the utility of drug demand assessments for cigarettes and MA among individuals with MA use disorder. These findings lay down the foundation for future studies to assess the impact of treatment cigarette smoking and MA use individually or together in this population.

24. Predictors of quit attempts or success after motivation phase interventions among people not ready to quit smoking

Elias M. Klemperer, PhD, Timothy B. Baker, PhD., & Jessica W. Cook, PhD

Background: Most people who smoke cigarettes are not ready to quit now but little is known about how to increase quit attempts (QA) or success of a QA (i.e., cessation) in this population. **Methods:** This is a secondary analysis of a randomized factorial trial of primary care patients (N=517) who were not ready to quit smoking and received 6 weeks of motivation phase interventions. Using logistic regression, we controlled for treatment condition and tested whether change in smoking related constructs during the 6 weeks of intervention predicted 1) making a ≥24 hour QA between weeks 6 and 26 and 2) quit success (7-day point-prevalence abstinence after a QA) at week 26. We tested cigarettes/day, time to first cigarette (TTFC), motivation to quit, confidence in quitting, expected urges to smoke if quit, positive affect, negative affect, and time spent around others who smoke. **Results:** When tested separately, increases in TTFC (OR=1.22) and confidence in quitting (OR=1.10) predicted making a QA. Among those who made a QA (n=250), an increase in motivation to quit (OR=1.35) and decrease in time spent around others who smoke (OR=1.84) predicted quit success (all $p<.05$). When all constructs were included in a multivariable model, motivation to quit no longer predicted quit success but all other findings remained significant. **Conclusion:** Though effect sizes are small, preliminary findings suggest predictors of QA differ from predictors of quit success. Motivation phase interventions could benefit by targeting TTFC and confidence to increase QAs as well as motivation and time spent around others who smoke to increases quit success.

25. Examining effects of cigarette smoking status on sucrose subjective response among opioid-maintained adults

Tatum Oleskowicz, Taylor Ochalek, Kelly Peck, Peter Lontine, William Pennington-Fitzgerald, Stacey Sigmon

Background: Empirical data suggest that nicotine administration may influence subjective response to sweet flavors in humans, though no studies have examined this among patients receiving opioid agonist maintenance for opioid use disorder (OUD). This clinical population is

important as opioids may themselves alter sweet taste, leading to weight gain during methadone and buprenorphine treatment. We are beginning to examine whether sucrose subjective responding varies as a function of smoking status among individuals with and without OUD. **Methods:** Participants were 40 adults receiving methadone or buprenorphine maintenance (n=33 smokers, O+CIG+; n=7 nonsmokers, O+CIG-) and a comparison sample of 40 adults without OUD (n=5 smokers, O-CIG+; n=35 nonsmokers, O-CIG-). Under double-blind, counter-balanced conditions, participants sampled six solutions of varying sucrose concentrations (0M-1.0M) and rated the pleasantness and intensity of each using 100-point visual analog scales. **Results:** Among opioid-dependent participants, both O+CIG+ and O+CIG- groups endorsed low ratings of pleasantness and intensity at lower sucrose concentrations and dose-dependent increases as concentrations increased. Among adults without OUD, ratings of sucrose pleasantness in the O-CIG+ group remained stable and essentially neutral across concentrations. In contrast, O-CIG- participants showed more pronounced increases in sucrose pleasantness, beginning below neutral at 0M to “slightly liking” the 0.75M and 1.0M concentrations. Sucrose intensity ratings also revealed a stronger dose-dependent increase in the O-CIG- group. **Conclusions:** Among adults without OUD, sucrose subjective response may be influenced by cigarette smoking status. Complete data analyses will be presented in October, though future studies with larger samples are needed to more definitively address sucrose subjective response in this population.

Session Chair & Speaker Bios *(in alphabetical order)*

David L. Ashley, PhD

Dr. David Ashley is currently a Research Professor in the School of Public Health at Georgia State University. He received his PhD in Physical Chemistry in 1982, from Emory University. He spent 27 years, from 1983-2010 at the Centers for Disease Control and Prevention, National Center for Environmental Health. During this time, he carried out research on the impact of toxic chemicals in the environment on health, developed methods and systems to respond to chemical and biological terrorism, and built a tobacco product and biomarker laboratory. He has performed extensive research related to the impact of cigarette design and contents on the emissions from tobacco products, how people use tobacco products, and resulting biomarkers of exposure. From 2010 until 2017, he was the inaugural Director of the Office of Science at the Center for Tobacco Products (CTP) of the U.S. Food and Drug Administration. In that role, he was instrumental in carrying out the regulatory authorities of the 2009 law which gave FDA authority to regulate tobacco products. He has published over 150 peer-reviewed articles and book chapters related to biophysics, environmental chemicals, biomarkers of exposure and the constituents of tobacco and tobacco smoke. He retired in May 2016 at the Public Health Service rank of Assistant Surgeon General. He has presented extensively at scientific meetings on the chemistry of tobacco and tobacco smoke and biomarkers of exposure. He serves on the World Health Organization (WHO) Study Group for Tobacco Product Regulation and was the Chair of the WHO Tobacco Laboratory Network from 2006 until 2010.

Ami L. Bahde, MPH

Ami L. Bahde, MPH is a Program Analyst in the Research Branch of the Office of Science at the Center for Tobacco Products (CTP) of the U.S. Food and Drug Administration. Her responsibilities include budget planning, program management, scientific support, and communication efforts. Ms. Bahde serves as a liaison to the National Institutes of Health (NIH) Tobacco Regulatory Science Program for various accepts of the program including the role of CTP Project Coordinator with three Tobacco Centers of Regulatory Science (TCORS). She is also the CTP representative on the FDA Women's Health Research Steering Committee. Prior to joining CTP in 2015, Ms. Bahde worked for 8 years in various roles within the Tobacco Control Research Branch (TCRB) at the National Cancer Institute. As a Public Health Advisor, Ms. Bahde worked on budget planning, acquisitions (contracts) management, branch operations, communication efforts, grant administration, and scientific support in TCRB. She was integral to the creation of Smokefree Women (women.smokefree.gov) and NIH Tobacco Regulatory Science Program. Ami holds a Master of Public Health degree in Health Promotion and Behavioral Sciences from San Diego State University and a Bachelor of Arts degree in Biology, Pre-medicine, and Spanish from Augustana College in Rock Island, Illinois.

Jessica L. Barrington-Trimis, PhD

Dr. Jessica Barrington-Trimis is an epidemiologist and Assistant Professor of Preventive Medicine at the University of Southern California, and faculty member in the USC Health, Emotion, and Addiction Laboratory, the USC Institute for Addiction Science, the USC Institute for Health Promotion and Disease Prevention Research, and the USC Norris Comprehensive Cancer Center. After receiving her BA in Philosophy and English (creative writing) from Bucknell University (2007), Dr. Barrington-Trimis joined Teach for America, earning an MA in Education (2009), while teaching high school chemistry in Los Angeles. Dr. Barrington-Trimis left her teaching position to earn an MS in Global Medicine (2010), and her PhD in Epidemiology (2014). From 2014-2016, Dr. Barrington-Trimis completed a postdoctoral fellowship in the FDA and NIH-supported USC Tobacco Center of Regulatory Science (TCORS), and in January 2017 accepted a faculty position at USC. Dr. Barrington-Trimis' research focuses on investigation of the rapidly changing tobacco, alternative tobacco, and cannabis landscape. Her work aims to identify intra-individual psychological, behavioral, and social processes associated with nicotine and cannabis product use in adolescence and early adulthood, and to elucidate the behavioral consequences (e.g., transition to more harmful patterns of substance use) and physiological consequences (e.g., adverse respiratory health effects of e-cigarette use) of varying patterns of cannabis and nicotine product use in adolescence.

Andrew M. Busch, PhD

Dr. Andrew Busch completed his doctoral work in clinical psychology at the University of Wisconsin-Milwaukee and his clinical internship and post-doctoral fellowship at Brown University. Dr. Busch is a Senior Psychologist in the Hennepin Healthcare Department of Medicine and directs the Hennepin Healthcare Tobacco Dependence Clinic. He is also an Associate Professor of Medicine at the University of Minnesota Medical School. Dr. Busch is the Director of the Behavioral Health Equity Research Group at Hennepin Healthcare, which targets 1) understanding physical health disparities among those with mental illness, 2) developing interventions that target improvement in both mental and physical health, and 3) developing counseling interventions to improve physical health among our most underserved communities. More information about the Behavioral Health Equity Research Group can be found at www.bheresearch.org. Much of Dr. Busch's work has focused on smoking cessation in vulnerable populations. He currently leads clinical trials targeting smoking cessation in post-cardiac event patients, recently incarcerated individuals, and patients with serious mental illness. Dr. Busch's funding is provided by NHLBI, NINR, and Clearway MN.

Kathleen Crosby, BA

Kathleen Crosby is Director of the Office of Health Communication and Education of the U.S. Food and Drug Administration's (FDA) Center for Tobacco Products (CTP). Ms. Crosby's career spans 30 years of senior-level marketing and advertising experience. In her tenure at CTP, she has successfully launched five major award-winning public health campaigns. The flagship

youth prevention effort "The Real Cost" has been proven to have prevented 580,000 at-risk teens from smoking saving these kids, their families and the country more than $53 billion in smoking-related costs in the future. Before joining CTP, Ms. Crosby was Senior Vice President, Group Campaign Director of the Washington office of the Ad Council, where she created integrated communication programs that have proven to inspire attitudinal and behavioral change on America's most pressing social issues for non-profit and government clients. Previously, while serving as Vice President of Strategic Planning at Arnold Worldwide, Ms. Crosby oversaw strategic development on the cutting-edge "Truth" campaign for the Truth Initiative. Ms. Crosby is a graduate of the University of Colorado.

Kenneth M. Cummings, PhD, MPH

Dr. Kenneth Cummings is a Professor in the Department of Psychiatry & Behavioral Sciences and member of the Hollings Cancer Center's Cancer Control Program where he co-leads the tobacco control research program. He is widely recognized for his research on smoking behavior, product marketing, consumer risk perceptions, and the influence of cigarette design on smoking behavior. Dr. Cummings has authored over 480 peer-reviewed scientific papers as well as contributing to reports for the Office of the Surgeon General, the National Cancer Institute, the Institute of Medicine, and the International Agency for Research on Cancer. In the late 1990s, Dr. Cummings was involved in digitizing and indexing millions of pages of previously secret internal tobacco industry documents which have helped to uncover how cigarette manufacturers directed their marketing to attract youthful replacement smokers and designed cigarettes in ways that make it hard for smokers to quit once they get addicted to nicotine. He has served as an expert witness in litigation against cigarette manufacturers in over 150 trials.

Eric Donny, PhD

Dr. Eric Donny is a Professor of Physiology & Pharmacology and Social Sciences and Health Policy and Director of the Tobacco Control Center of Excellence and program lead for Cancer Prevention and Control at the Wake Forest Baptist Comprehensive Cancer Center. He has published over 100 scientific articles on nicotine, tobacco and addiction and is a Fellow of both the Society for Research on Nicotine and Tobacco and Division 28 of the American Psychological Association. His work focuses on the behavioral, pharmacological and neurobiological mechanisms underlying nicotine use and dependence. His current focus is on regulatory approaches to reducing the health burden of tobacco. He co-directs the Center for the Evaluation of Nicotine in Cigarettes (CENIC), an NIDA/FDA-funded cooperative agreement that aims to increase understanding of how behavior and health might be affected if the nicotine content of cigarettes is greatly reduced.

Jack Henningfield, Ph.D.

Dr. Jack Henningfield is Vice President, Research, Health Policy, and Abuse Liability, Pinney Associates, and Professor, Adjunct, Behavioral Biology, Department of Psychiatry and Behavioral Sciences, The Johns Hopkins University School of Medicine. Dr. Henningfield was trained in addiction science in the Psychopharmacology Program at the University of Minnesota. He has been a faculty member of the Behavioral Pharmacology Research Unit at Johns Hopkins since 1978. During his tenure at the National Institute on Drug Abuse from 1980 until 1996, he served as Chief of the Clinical Pharmacology Branch, and the Biology of Dependence and Abuse Potential Assessment Section. In 1996 he left NIDA to consult on pharmaceutical development and health policy at Pinney Associates (PA). Through PA he consults on the development of new medicines for central nervous system disorders, as well cannabinoids, psychelics, and dietary supplements, and tobacco harm reduction involving FDA regulated noncombustible products including electronic nicotine delivery systems. Dr. Henningfield has contributed to the development and/or approval of most FDA approved treatments for tobacco and opioid use disorders since the 1980s. He has published more than 400 articles and books related to addiction, most Surgeon Generals reports since 1980 including co-editing "Nicotine Addiction" (1988), and numerous reports from the National Institute on Drug Abuse, Institute of Medicine, World Health Organization, and other organizations. Much of his work is focused on Dr. C. Everett Koop's goal of making it as easy for "all people" to get treatment for addiction as it is to get addicting drugs. This includes reducing disparities in health care faced by low income and minority populations and, indirectly, by increasing the diversity of participation in scientific organizations.

John R. Hughes, MD

Dr. John Hughes is Professor of Psychiatry, Psychology and Family Practice at the University of Vermont. Dr. Hughes is board certified in Psychiatry and Addiction Psychiatry. His major focus has been clinical research on tobacco use. He is a co-founder and past president of the Society for Research on Nicotine and Tobacco, and the Association for the Treatment of Tobacco Use and Dependence (ATTUD). Dr. Hughes received the Ove Ferno, Alton Ochsner and the John R. Hughes ATTUD Excellence in Tobacco Treatment, Training and Advocacy Award. Dr. Hughes has been Chair of the Vermont Tobacco Evaluation and Review Board, which oversees VT's multi-million-dollar tobacco control program. He has over 450 publications on nicotine and other drug dependencies and is one of the world's most cited tobacco scientist. Dr. Hughes has been a consultant on tobacco policy to the World Health Organization, the U.S. Food and Drug Administration, the U.S. Office on Smoking and Health and the White House. Dr. Hughes has received fees from companies who develop smoking cessation devices, medications and services, from governmental and academic institutions, and from public and private organizations that promote tobacco education or control and serves as a consultant to Swedish Match for their snus product.

Allison N. Kurti, PhD

Dr. Allison Kurti is a Research Assistant Professor in the Departments of Psychiatry and Psychology, at the University of Vermont. Dr. Kurti's research focuses on multifaceted approaches to reducing substance use among vulnerable populations. Specifically, Dr. Kurti is interested in innovate methods of reducing tobacco use among reproductive-aged women that span the domains of tobacco control and tobacco regulatory science. Her research includes developing a smartphone-based smoking cessation treatment for pregnant women, examining effects of low nicotine content cigarettes among non-pregnant women of reproductive age, and leveraging national datasets to study cross-sectional and longitudinal tobacco use patterns among both non-pregnant and pregnant women.

Nikki L. Nollen, PhD

Dr. Nikki Nollen is a professor in the Department of Preventive Medicine and Public Health at the University of Kansas School of Medicine. Her research focuses on understanding determinants of health and health behaviors, both at the individual- and systems-level, among high risk groups. Specific research interests are in evaluating promising behavioral and pharmacotherapy treatments for nicotine addiction, as well as examining psychosocial and biological mechanisms underlying tobacco use and treatment outcomes. Dr. l is PI of two NIH funded R01s to examine disparities in quitting between African American and White smokers (R01DA031815), to improve short-term treatment outcomes in African American smokers through a novel optimized pharmacotherapy approach (R01DA046576), and an ongoing PCORI-funded study that is the first treatment study for African American non-daily smokers (AD-1310-08709). Dr. Nollen has mentored over 10 junior faculty, pre- and postdoctoral fellows, and undergraduate students, the majority of whom are from diverse backgrounds underrepresented in biomedical research. Her current mentees hold a diversity supplement to her R01, two NIH K01 awards, and an NIH SC3 award for junior faculty in non-research institutions.

Richard J. O'Connor, PhD

Dr. Richard O'Connor is a Professor of Oncology at Roswell Park Comprehensive Cancer Center. He joined Roswell Park's staff in 2004 as a Postdoctoral Fellow and was appointed Member of the Department of Health Behavior, Division of Cancer Prevention and Population Sciences in 2015. Additionally, he serves as Director of Graduate Studies for the Cancer Pathology and Prevention doctoral program in the Roswell Park Graduate Division (University at Buffalo), Adjunct Assistant Professor of Community Health and Health Behavior, and as Research Assistant Professor of Epidemiology and Environmental Health with the University at Buffalo School of Public Health and Health Professions. Dr. O'Connor has authored more than 100 scientific papers on topics related to tobacco control. His program of research focuses on building the evidence base for tobacco regulatory science, with a particular focus on product-user interactions. He is a co-investigator on the International Tobacco Control Policy Evaluation

Project (ITC), which is investigating the impact of national level tobacco control policies across more than 20 different countries. He is also a project director on the NCI-funded Consortium on Methods for Evaluating Tobacco (COMET), which is working to develop state-of-the art methods for assessing tobacco product abuse liability, consumer perceptions, and toxicity.

Nancy A. Rigotti, MD

Dr. Nancy Rigotti is a Professor of Medicine at Harvard Medical School and the founder and director of Massachusetts General Hospital's Tobacco Research and Treatment Center. A board-certified general internist, Dr. Rigotti is internationally known for her research to reduce the health burden of tobacco use by evaluating tobacco cessation treatments and promoting their adoption in health care settings, both inpatient and outpatient. Dr. Rigotti was a member of the National Academies of Science, Engineering, and Medicine panel that produced the landmark 2018 report, Public Health Consequences of E-Cigarettes. Her current work includes addressing the role of e-cigarettes for tobacco smoking cessation and harm reduction. Dr. Rigotti has authored over 300 publications and served as President of the Society for Research in Nicotine and Tobacco and as President of the Society of General Internal Medicine, which in 2015 awarded her its highest research award the John Eisenberg National Award for Career Achievement in Research. She is an elected member of the American Association of Physicians and a graduate of Stanford University and Harvard Medical School.

Megan E. Roberts, PhD

Dr. Megan Roberts is an Assistant Professor in Public Health at the Ohio State University. She has a PhD in psychology from Dartmouth College, and engaged in postdoctoral work at Brown University's Center for Alcohol and Addiction Studies as well as at the Ohio State University's Center of Excellence in Regulatory Tobacco Science. Her research focuses on tobacco use among vulnerable populations, particularly adolescents and young adults, racial/ethnic minorities, and individuals living in rural areas. The ultimate aim is to better understand the factors that contribute to tobacco initiation and tobacco-related disparities, as well as how such factors can be targeted for prevention. Broadly informed by the socioecological model, her work considers factors at many levels of analysis, including those at the individual level (e.g., sensation seeking), interpersonal level (e.g., peer and family use) and at the community/environmental level (e.g., federal, state, and local policy). For several years, she has been a Co-Investigator on the Buckeye Teen Health Study, an observational cohort study monitoring tobacco use among youth in both Urban and Rural Appalachian regions of Ohio. She currently has an R21 grant from the NIH to examine how licensing-law strategies could impact current disparities in the density of tobacco retailers.

Steven A. Schroeder, MD

Dr. Steven Schroeder is Distinguished Professor of Health and Healthcare at the University of California San Francisco, where he directs the Smoking Cessation Leadership Center (SCLC). A

graduate of Stanford University and Harvard Medical School, he trained in internal medicine at Harvard and in epidemiology at the CDC. He held faculty positions at Harvard and George Washington University. Between 1990 and 2002 he was President of the Robert Wood Johnson Foundation, where he initiated programs in tobacco control that resulted in $500 million in grant expenditures during his tenure. The SCLC, which he founded in 2003, works with professional societies, federal and state organizations, and advocacy groups to both increase the number of smokers who attempt to quit and increase the probability of a successful quit. It has partnered with over 80 organizations, launched the "Ask, Advise, Refer (to a quitline)" alternative for busy clinicians, developed the blue card for 1 - 800-QUIT NOW (over 5 million now in circulation), broadened the range of clinicians involved in smoking cessation, and helped to focus more attention on the lethal combination of smoking and behavioral health conditions. A member of the National Academy of Medicine (formerly IOM), he chaired the American Legacy Foundation Board of Directors (now Truth Initiative), and served on the editorial board of the New England Journal of Medicine for 19 years. In 2014, he was named a public member of the Congressionally-mandated federal Interagency Committee on Smoking and Health.

Jennifer W. Tidey, PhD

Dr. Jennifer Tidey is a Professor of Behavioral and Social Sciences at the Brown University School of Public Health and a Professor of Psychiatry and Human Behavior at the Brown University Alpert Medical School. She has been conducting NIH-funded research on tobacco use in people with serious mental illness for over 20 years. Dr. Tidey is a transdisciplinary scientist whose current research includes laboratory studies and clinical trials aimed at understanding how potential FDA tobacco policies might impact tobacco use in vulnerable populations, especially those with mental health conditions. At Brown, she is based in the Center for Alcohol and Addiction Studies, where she is Associate Director of the NIDA T32 post-doctoral training program and Clinical Laboratory Core Director of a new COBRE center on substance use and disease. She is a Deputy Editor for the journal Nicotine & Tobacco Research and is on the editorial board for Experimental and Clinical Psychopharmacology and Tobacco Regulatory Science.

Andrea C. Villanti, PhD, MPH

Dr. Andrea Vilanti is Associate Professor in the Departments of Psychiatry and Psychology, at the University of Vermont. She also holds an adjunct faculty appointment at the Johns Hopkins Bloomberg School of Public Health. Dr. Villanti's primary focus is on young adult tobacco use, including predictors and patterns of use and interventions to reduce tobacco use in young adults. She also has expertise in translational research to improve tobacco control policy and program decision-making, including tobacco regulatory science. Her work focuses on design, collection, and analysis of population survey data and conducting experiments and intervention trials in large, online samples. Dr. Villanti's current NIH-funded research projects include developing a smoking cessation intervention for lower-income young adult smokers delivered

via mobile app and text messages and examining how young adults' beliefs about nicotine influence their perceptions of tobacco product addictiveness and harm.

Theodore L. Wagener, PhD

Dr. Theodore Wagener serves as Director of the Center for Tobacco Research and Co-Leader of the Cancer Control Program at The Ohio State University Comprehensive Cancer Center and as an Associate Professor in the Department of Internal Medicine at the OSU Wexner Medical Center. His research program focuses on tobacco regulatory science, with a specialized focus on evaluating the behavioral, pharmacological, and toxicological effects of cigarette and non-cigarette tobacco products, such as electronic cigarettes and hookah. He also has expertise developing and testing motivational enhancement-based smoking cessation and secondhand smoke reduction interventions for children of parents who smoke. His work has been extramurally funded since 2012, serving as the principal investigator or co-investigator on more than 20 NIH- and FDA-funded grants. Dr. Wagener is committed to mentoring and training the next generation of tobacco researchers. He has mentored/co-mentored numerous student-led projects as well as graduate students who have gone on to prestigious psychology residencies, fellowships, and academic faculty positions. He has served as the primary mentor or sponsor on five NIH training awards, as well as a co-mentor on several others.

Kay L. Wanke, PhD, MPH

Dr. Kay Wanke is the Deputy Director of the Tobacco Regulatory Science Program (TRSP), the trans-NIH collaborative effort with the FDA's Center for Tobacco Products (CTP) to foster tobacco regulatory research. Previously, Dr. Wanke served as a program official at the National Institute on Drug Abuse (NIDA) in the Epidemiology Research Branch, where she co-led the development of the program for the Tobacco Centers of Regulatory Science and managed a portfolio of grants in tobacco control, tobacco regulatory science, and genetic and behavioral epidemiology of tobacco and other drugs of abuse. She also previously served as a Health Scientist Administrator in the NIH Office of Behavioral and Social Sciences Research, where she developed programs to foster and support research in behavioral and social science genetics. Dr. Wanke received her Ph.D. in clinical psychology from Southern Illinois University at Carbondale, her MPH at the Harvard School of Public Health, and her postdoctoral fellowship through the NCI's Cancer Prevention Fellowship Program.

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