

## FUNDED PILOT GRANTS CANCER CONTROL AND POPULATION HEALTH

### **Discovering barriers to smoking cessation among cancer patients**

**Lead Investigator:** Steven A. Branstetter, PhD  
Assistant Professor, Biobehavioral Health  
College of Health and Human Development  
Penn State University

**Abstract:** The lack of an empirically-validated smoking cessation program specifically designed to meet the needs of cancer survivors represents a critical problem for the comprehensive treatment and long-term survival of a vulnerable population. Each year, hundreds of thousands of smokers receive a cancer diagnosis. Although many of these smokers quit following their diagnoses, as many as 60% may not quit or soon relapse back to regular smoking. Continued smoking following a cancer diagnosis is related to a number of deleterious outcomes including tumor recurrence, development of secondary tumors, decreased quality of life and lower survival rates. Additionally, smoking may reduce the effectiveness of cancer therapy and may increase treatment-related side effects. A cessation program tailored to the specific issues and needs of cancer patients is likely to result in higher rates of cessation among survivors and improved long-term outcomes; unfortunately, only a limited number of interventions have been developed and evaluated specifically to assist this population. Moreover, few of these interventions have demonstrated compelling treatment effects. Our long-term goal is to improve cancer treatment outcomes and cancer patient quality of life through the reduction or elimination of a key behavioral risk-factor: continued cigarette smoking. The objective of this application, which is the first step in achieving our long-term goals, is to garner a comprehensive understanding of the factors relating to ongoing smoking in this population, the barriers to successful cessation attempts, and how family members and the cancer treatment team may help or hinder cessation. By conducting extensive focus groups and individual interviews with cancer patients, family members, and treatment providers we intend to gather critical preliminary data that will allow us to seek federal funding to develop and test a comprehensive, integrated smoking cessation program tailored specifically to the needs of cancer patients who continue to smoke. Such an intervention will enhance the lives of survivors, improve cancer treatment outcomes and reduce the likelihood of further illness.

### **Examining the influence of incentives on inhibitory control in adolescent smokers**

**Lead Investigator:** Charles Geier, PhD  
Assistant Professor, Human Development and Family Studies  
College of Health and Human Development  
Penn State University

**Abstract:** Theories of drug dependence have focused attention on the relationship between drug use and non-drug reward processing. Interest in this relationship centers on the observation that drug use alters sensitivity to non-drug rewards as a consequence of pharmacological activation of reward circuitry<sup>1</sup>. These processes may be particularly important for nicotine dependence. Extensive preclinical and human experimental data have

demonstrated that abstinence after chronic nicotine use results in a decrement in the sensitivity to non-drug reward<sup>2-9</sup>. However, how drug use relates to reward processing during adolescence is not well understood. This gap in the literature is particularly striking given that adolescents normatively show relative hypersensitivity to rewards and that most individuals initiate smoking during adolescence. Moreover, developmental differences in reward processing may be especially important when rewards are used to support the inhibition of a response, like refraining from smoking. Inhibitory control is also immature in adolescence, and in particular in adolescent smokers<sup>10</sup>, but the adolescent's relative hypersensitivity to reward may be useful for overcoming this deficit. In this application, we propose to examine whether adolescent compared to adult daily smokers demonstrate unique alterations in non-drug reward processing, and whether this processing, in turn, differentially affects inhibitory control. Functional magnetic resonance imaging (fMRI) and behavioral eye tracking will be used to assess late adolescent (18-19 years) and adult (25+ years) daily smokers' and non-smokers' performance on a rewarded antisaccade task. Daily smokers will be assessed following 24-h abstinence and compared to non-smokers. The knowledge gained will be critical for understanding the nature of emerging nicotine dependence in adolescents and may guide age-specific prevention and treatment efforts. Moreover, these initial experiments will lay critical groundwork for a future prospective longitudinal study that aims to assess core reward and inhibitory control systems before, during, and after adolescents initiate smoking.

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## **Patterns of Modifiable Behaviors for Cancer Prevention among U.S.- and Foreign-Born Vulnerable Populations**

**Lead Investigator:** Patricia Y. Miranda, PhD, MPH  
Assistant Professor, Department of Health Policy and Administration  
College of Health and Human Development  
Penn State University

**Abstract:** Overall, individuals from vulnerable populations – groups who are less integrated because of their ethnicity/race, citizenship, or economic status – are more likely to be diagnosed with advanced stages of cancer, suffer from larger tumors, and experience higher rates of cancer mortality. Individual behaviors have been shown to modify these risks. For example, lower rates of cancer screening and higher rates of obesity, sedentary lifestyle and smoking are described as independent risk factors for multiple cancers. To understand the link between behavior and cancer risk among vulnerable groups, specifically immigrants, the proposed study

will use linked survey data to identify predictors of identified modifiable behaviors for cancer prevention, providing a foundation for translation into future community-engaged interventions for cancer prevention among U.S.- and foreign-born vulnerable populations. The sample will include non-institutionalized U.S. adults aged 18 years and older (N=190,965), linking data from the Medical Expenditure Panel Survey (years 2000-2008) to the National Health Interview Survey.

### **Blood nicotine absorption, subjective and neurocognitive effects of different types of electronic nicotine delivery devices (ENDDs) in current daily users**

**Lead Investigator:** Stephen J. Wilson, PhD  
Assistant Professor, Department of Psychology  
College of Liberal Arts  
Penn State University

**Abstract:** Smoking is the leading cause of premature death from diseases such as lung cancer and chronic respiratory disease. Seventy percent of smokers want to quit, but they find it difficult because they are addicted to the psychological effects of the spikes of nicotine they receive from inhaling tobacco smoke. In addition to nicotine, cigarette smoke contains thousands of chemicals, including over 60 carcinogens. Medicinal nicotine replacement products help smokers to quit, but compliance is poor and they are perceived as unsatisfying, partly because of their low or slow nicotine delivery. In 2007 electronic nicotine delivery devices (ENDDs) were launched in the US as “electronic cigarettes.” Recently, these devices have become quite popular. ENDDs use rechargeable battery power to create a vapor of propylene glycol (the same substance in theatre mist and some medicines). Preliminary studies confirm that they do not deliver smoke, and they also deliver very little nicotine. However, more recent studies suggest that, while many ENDDs deliver only minimal nicotine in their propylene glycol vapor, some (with higher battery power) are capable of delivering cigarette-like spikes of nicotine. The present study aims to compare the blood nicotine concentrations obtained by current users of these two types of ENDDs, as well as to compare the subjective and neural effects of these two ENDDs variants using functional magnetic resonance imagery (fMRI). Ten regular users of high battery power ENDDs and ten regular users of low battery power ENDDs will abstain overnight from all nicotine containing substances and then will attend the laboratory to have their subjective experiences, cognitive performance, blood nicotine and brain activity measured before and after puffing on their usual brand of ENDDs. This study will attempt to clarify which types of ENDDs deliver nicotine like a cigarette and consequently have the greatest potential to help smokers quit.