Scientists seek unfiltered truth about 'light' cigarettes

7 March 2018

At issue are whether ventilation holes in the filters of cigarettes, which appear to change either smoke constituents, how cigarettes are smoked, or their addictive potential, have resulted in increased lung adenocarcinoma rates and other risks. Credit: David Hungate/Virginia Tech Carilion Research Institute

Would banning ventilated filters on cigarettes protect public health?

Scientists from multiple institutions, including a group of addiction neuroscience researchers from the Virginia Tech Carilion Research Institute, are gathering evidence under funding from the National Institutes of Health's National Cancer Institute to potentially inform a U.S. Food and Drug Administration (FDA) decision about whether to recommend design changes to filtered cigarettes.

Warren Bickel, the Virginia Tech Carilion Behavioral Health Research Professor and the director of the VTCRI Addiction Recovery Research Center, along with VTCRI co-investigators and research assistant professors Mikhail Koffarnus and Jeff Stein, are spearheading one of three integrated projects involving teams of multidisciplinary investigators, all determined to discover whether ventilated filters on cigarettes have been a boon or bane to public health.

VTCRI scientists will focus on how ventilated filters on cigarettes, product packaging, and messaging have affected cigarette use, and also how alternative nicotine delivery systems—such as electronic cigarettes—can be used to modify smoking behavior.

"My piece of the puzzle is to understand the role of filter ventilation on the likability and addictive potential of cigarettes," said Bickel, who is also a professor in the Department of Psychology in Virginia Tech's College of Science. "We are going to see how smokers respond to the same tobacco product, with and without filter ventilation. We want to understand the impact of the ventilated and unventilated products on how likely people will want to smoke. We also want to determine if filter ventilation reinforces smoking activity and thereby increases the likelihood of addiction."

When they were introduced in the 1960s, "light cigarettes," so called because of tiny ventilation holes in the filters, were touted as a safer, cleaner way to smoke because they purportedly lowered the amounts of tar and nicotine exposure.

However, a 2014 Surgeon General's Report named ventilation in cigarette filters as a potential contributor to lung cancer. In 2017, an influential study in the *Journal of the National Cancer Institute* recommended that the FDA consider regulating filter ventilation.

At issue are whether ventilation holes—which appear to change either smoke constituents, how cigarettes are smoked, or their addictive potential—have resulted in increased lung adenocarcinoma rates and other risks.

The new research effort, called Consortium on Methods Evaluating Tobacco: Filter Ventilation and Product Standards, involves scientists from four U.S. research facilities.

They are probing the health risks, perceptions, and habits surrounding the use of ventilated cigarettes versus unventilated cigarettes, as well as the

influence of e-cigarettes as an alternative nicotine delivery system.

The five-year, $13 million project is led by Dorothy Hatsukami, a professor in the Department of Psychiatry at the University of Minnesota, and is designed to address the impact on toxicity, uptake, and tobacco use if ventilated filters were regulated.

Bickel, Koffarnus, and Stein will work within the context of an experimental tobacco marketplace, or ETM, that their team has spent several years developing.

In these studies, volunteers who use tobacco will complete experimental purchasing procedures, which will illuminate consumer behavior toward cigarettes. More specifically, Bickel and colleagues will evaluate the addiction potential of ventilated versus unventilated cigarettes and the extent to which electronic cigarettes may serve as a substitute.

Other teams will address carcinogen exposure associated with ventilated and unventilated cigarettes, and whether alternatives, such as electronic cigarettes, add or subtract to the risks.

"There has been an explosion in the number and type of tobacco products in the world," Bickel said. "We are interested in what motivates people to switch from one tobacco product to another. In our experimental tobacco marketplace, we control the number and types of available products as well as their prices and watch how behavior shifts when we make alterations."

Among the products in the experimental tobacco marketplace are electronic cigarettes, also known as e-cigarettes, e-vaporizers, or electronic nicotine delivery systems, according to the National Institute on Drug Abuse. They are battery-operated devices that people use to inhale an aerosol, which usually contains nicotine, flavorings, and other chemicals.

Emerging evidence shows electronic cigarettes may be safer than conventional cigarettes, Bickel said.

"We need to be certain that if changes are made to how cigarettes are designed, we are moving toward something safer and not something that causes more harm," Bickel said. "Ultimately, we hope to have a body of knowledge for the FDA and the National Cancer Institute to understand the role of cigarette filter ventilation on health, inform prevention, and shift to safer products."

Cigarette smoking is responsible for more than 480,000 deaths per year in the United States, according to the national Centers for Disease Control and Prevention.

Provided by Virginia Tech