

# Smoking abstinence research receives major financial boost

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Warren Bickel, an internationally recognized addiction expert at the Virginia Tech Carilion Research Institute, recently received a \$3.2-million grant from the National Institute on Drug Abuse for research on improving self-control in smokers seeking to quit cigarettes. The grant will provide Bickel's team with \$573,000 to \$716,000 a year over five years to develop innovative new ways to enhance the smokers' ability to abstain from acting on their nicotine cravings.

Smoking is the leading preventable cause of mortality and morbidity in the United States. Each year it contributes to nearly half a million deaths, more than those attributable to alcohol, [illicit drug use](#), homicide, AIDS, and suicide combined. The medical and [indirect costs](#) of smoking represent a substantial part of the overall [health care costs](#) in southwest Virginia and the entire nation.

"The fix seems simple," said Bickel, a professor at the Virginia Tech Carilion Research Institute, where he also directs the Addiction Recovery Research Center. "Rather than only spending billions of dollars treating the cancers and respiratory and cardiovascular diseases associated with tobacco use, we also need to get people to stop smoking. Yet [nicotine addiction](#) is extremely potent."

Bickel, who is also a professor of psychology at Virginia Tech and a professor of psychiatry and [behavioral science](#) at the Virginia Tech Carilion School of Medicine, has devoted much of his scientific career to understanding addiction. His research focuses primarily on [brain](#)

[processes](#) that support dysfunctional decision-making, and he places special emphasis on future discounting, the human instinct to choose [instant gratification](#) over a later benefit, such as good health.

Bickel noted that an important component of [tobacco dependence](#) is a failure of self-control, which occurs when a drug hijacks the brain's reward systems.

"Addiction can distort decision-making by causing the brain to overvalue immediate, drug-associated stimuli and undervalue longer-term rewards," Bickel said. "This excessive discounting of the future is associated with poor treatment outcomes. Our research has shown that people who relapse the most are those who discount the future the most. We speculate that smokers who can't envision the future well are those stuck in their immediate circumstances. So a nicotine craving has an exaggerated effect on them."

Bickel's research team will recruit hundreds of smokers into the study and characterize the degree to which they discount the future. The scientists will then compare the volunteers who discount the future the most with those who discount it the least. If, as Bickel suspects, the ones who discount the future the most are the ones most susceptible to smoking-related cues during mild tobacco withdrawal, the researchers will help them build resistance by offering a range of behavioral exercises – such as training aimed at enhancing working memory – that Bickel's previous research has shown to be effective in helping people envision a longer-term future.

The newly funded study will be the first to apply findings on self-control failure – discoveries that have largely been made by Bickel's team – into effective interventions to bolster resistance to nicotine cues among smokers.

"We're hoping to develop powerful new methods to help the brain overcome addiction," Bickel said. "We want to bring the power of science into people's daily struggles to stop smoking."

"In a time of tight funding for medical research in the United States, the competition to win such a major peer-reviewed research grant is fierce, with less than 10 percent of the very best proposals receiving funding," said Michael Friedlander, executive director of the research institute and associate provost for health sciences at Virginia Tech. "We're very fortunate to have an addiction expert of Dr. Bickel's caliber here at the institute. His research not only addresses a major health issue in southwest Virginia, but it also helps us better understand the human brain. It will contribute to improving health and reducing medical costs throughout the country and around the world."

Provided by Virginia Tech

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