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Moderate levels of secondhand smoke deliver nicotine to the brain

NIH-funded study shows how secondhand smoke may increase vulnerability to nicotine addiction

Exposure to secondhand smoke, such as a person can get by riding in an enclosed car while someone else smokes, has a direct, measurable impact on the brain—and the effect is similar to what happens in the brain of the person doing the smoking. In fact, exposure to this secondhand smoke evokes cravings among smokers, according to a study funded by the National Institute on Drug Abuse (NIDA), part of the National Institutes of Health.

The study, published today in *Archives of General Psychiatry*, used positron emission tomography (PET) to demonstrate that one hour of secondhand smoke in an enclosed space results in enough nicotine reaching the brain to bind receptors that are normally targeted by direct exposure to tobacco smoke. This happens in the brain of both smokers and non-smokers.

Previous research has shown that exposure to secondhand smoke increases the likelihood that children will become teenage smokers and makes it more difficult for adult smokers to quit. Such associations suggest that secondhand smoke acts on the brain to promote smoking behavior.

“These results show that even limited secondhand smoke exposure delivers enough nicotine to the brain to alter its function,” said NIDA Director Nora D. Volkow, M.D. “Chronic or severe exposure could result in even higher brain nicotine levels, which may explain why secondhand smoke exposure increases vulnerability to nicotine addiction.”

“This study gives concrete evidence to support policies that ban smoking in public places, particularly enclosed spaces and around children,” said Arthur Brody, M.D., of the UCLA Department of Psychiatry & Biobehavioral Sciences and corresponding author for the article.

The Surgeon General's Report concluded in 2006 that secondhand smoke causes heart disease and lung cancer in nonsmoking adults and many serious health conditions in children, including sudden infant death syndrome, respiratory infections, and more severe asthma. According to the [CDC](http://www.cdc.gov), almost 50,000 deaths per year can be attributed to secondhand smoke. For more information or for resources to help quit smoking, go to <http://www.nida.nih.gov/DrugPages/Nicotine.html>.

The study can be found online at: <http://archpsyc.ama-assn.org/>.

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The National Institute on Drug Abuse is a component of the National Institutes of Health, U.S. Department of Health and Human Services. NIDA supports most of the world's research on the health aspects of drug abuse and addiction. The Institute carries out a large variety of programs to inform policy and improve practice. Fact sheets on the health effects of drugs of abuse and information on NIDA research and other activities can be found on the NIDA home page at www.drugabuse.gov. To order publications in English or Spanish, call NIDA's new *DrugPubs* research dissemination center at 1-877-NIDA-NIH or 240-645-0228 (TDD) or fax or email requests to 240-645-0227 or drugpubs@nida.nih.gov. Online ordering is available at <http://drugpubs.drugabuse.gov>. NIDA's new media guide can be found at <http://drugabuse.gov/mediaguide/>.

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