

Department of Health Services

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The “Nico-teen” brain



The adolescent brain is especially vulnerable to the addictive effects of nicotine

Nicotine is the addictive chemical in tobacco smoke and e-cigarette vapors. Doctors say the teenage brain is no place for it to end up. This is especially true as it enters the body quickly when a teen uses a vapor pen.

The area of the brain responsible for controlling emotions is known as the prefrontal cortex. It's very vulnerable to nicotine's effects, research shows; especially teens. The prefrontal cortex isn't finished developing until about age 25.

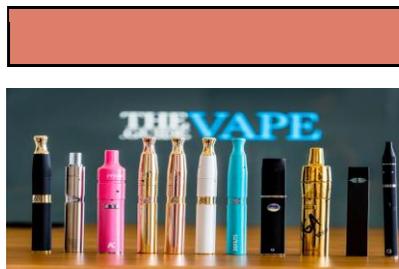
Nicotine causes receptor molecules on brain cells to release signaling molecules. These signals travel across a gap between nerve cells, a synapse. When the signals reach a neighboring nerve cell, they release their “message.” This “message” gives users a high. After repeated exposure to nicotine, those brain cells can change. The effect of these changes is to reduce the body's ability to release its own, natural pleasure-giving chemicals. Meanwhile, the brains of teens who vape may create more receptors to handle the flood of nicotine they expect. As the number of receptors increases, teens will need more nicotine to get the same high. In teens, this can cause side effects. For example, it can make it hard for them to stay focused. It might also trigger depression or anxiety, research suggests.

Some of the negative effects of nicotine on the young brain will fade with time — if exposure ends. Others, however, may persist. For instance, scientists found nicotine exposure made it harder for former smokers to focus their attention — even later, as adults.

Perspectives in Medicine. Vol. 2, December 2012, p. a012120. doi: 10.1101/cshperspect.a012120.

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Nico-Teen Addiction

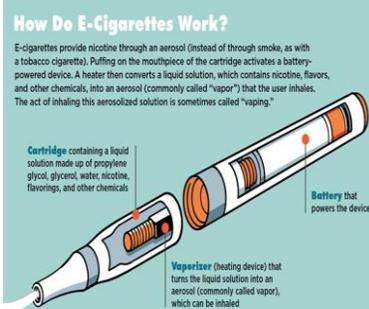
The adolescent brain appears uniquely susceptible to nicotine addiction.

Animal studies have demonstrated that nicotine exposure during the adolescent period has long-standing effects in the brain, including cell damage, that lead to both immediate and persistent behavior changes

These effects are not found with nicotine exposure to the adult, supporting the idea that the adolescent is uniquely susceptible to nicotine addiction

E-cigarette use is strongly associated with the use of other tobacco products among youth and young adults, particularly the use of combustible tobacco products. For example, in 2015, 58.8% of high school students who were current users of combustible tobacco products were also current users of e-cigarettes. U.S. adolescents and young adults who had never smoked but used e-cigarettes at baseline were 8.3 times more likely to progress to cigarette smoking after 1 year than nonusers of e-cigarettes.

Slottkin, Neurotox & Teratol 2002
Leventhal AM, Strong, DR, Kirkpatrick MG, et al. Primack BA, Soneji S, Stoolmiller M, et al. JAMA Pediatr 2015



E-cigarettes and Nonsmoking Youth



Among nonsmoking youth, those that have ever used e-cigarettes have greater intentions to smoke conventional cigarettes than those who have never used e-cigarettes

Burnell RE, Agaku IT, Arora RA, et al. Nicotine Tob Res 2015

Spotlight on Dianne Chorny

Registered Nurse, Masters in Public Health, Doctorate in Nursing



Dianne has been a nurse with Jeffco for 8 years and she loves working with health aides and other staff to understand the complexities of diabetes care.

Her favorite aspect of school nursing is that “aha” moment that occurs when staff begin to grasp how they can support our students with diabetes. She is originally from New Jersey and currently serves Parmalee Elementary, West Jefferson Middle, and Evergreen Middle Schools.

Dianne also serves as the Diabetes Resource Nurse for the district. Before she became a district nurse she was a diabetes educator.

Her favorite sports team is the New York Mets. Her favorite food is pizza she likes to spend her free time going on walks, reading and belly dancing.