

Health Risks of Nicotine for Youth

Nicotine is a chemical commonly found in cigarettes, e-cigarettes, and other tobacco products. **Nicotine is highly addictive and can be toxic.**

No amount of nicotine is safe for youth.

Nicotine can harm brain development as teens grow.

Animal research has found that even in small doses, nicotine exposure in adolescence causes long-lasting changes in brain development, which could have negative implications in human adolescents for learning, memory, attention, behavior problems, and future addiction.^{1, 2, 3, 4, 5}



Nicotine is harmful to the health of unborn children.

Evidence shows that fetal exposure to nicotine can have negative long-term effects, including sudden infant death syndrome (SIDS), impaired fetal brain and lung development, hearing problems, effects on behaviors and obesity, and deficits in attention and cognition.⁶ Studies also indicate that fetal nicotine exposure is associated with nicotine dependence in adolescence.^{6, 7, 8}

Nicotine can be toxic, even deadly, in high doses.

Eating, drinking, or otherwise absorbing large amounts of nicotine can lead to nicotine poisoning, especially in children.⁶ Symptoms of poisoning include nausea, vomiting, seizures, and respiratory depressions.^{9, 10} In high enough doses nicotine can be deadly.

For poison emergencies or questions call the Minnesota Poison Control System at 1-800-222-1222. Service is available 24/7, free of charge, and is confidential.

E-cigarettes expose Minnesota teens to the dangers of nicotine.

Among 11th grade students, e-cigarette use is now more than double conventional cigarette use. Nearly all e-cigarettes contain nicotine.¹¹

Learn more about e-cigarettes at www.health.mn.gov/ecigarettes.

Learn more at www.health.mn.gov/nicotine.

Minnesota Department of Health
Tobacco Prevention and Control
PO Box 64882, St. Paul, MN 55164
651-201-3535
tobacco@state.mn.us
www.health.state.mn.us/nicotine

5/10/17

To obtain this information
in a different format, call:
651-201-3535

¹ Counotte et al., "Long-Lasting Cognitive Deficits Resulting from Adolescent Nicotine Exposure in Rats."

² Abreu-Villaca et al., "Short-Term Adolescent Nicotine Exposure Has Immediate and Persistent Effects on Cholinergic Systems: Critical Periods, Patterns of Exposure, Dose Thresholds."

³ Slikker et al., "Mode of Action: Disruption of Brain Cell Replication, Second Messenger, and Neurotransmitter Systems during Development Leading to Cognitive Dysfunction--Developmental Neurotoxicity of Nicotine."

⁴ Slotkin, "Nicotine and the Adolescent Brain: Insights from an Animal Model."

⁵ Gould and Leach, "Cellular, Molecular, and Genetic Substrates Underlying the Impact of Nicotine on Learning."

⁶ U.S. Department of Health and Human Services, "The Health Consequences of Smoking-50 Years of Progress: A Report of the Surgeon General."

⁷ England, L.J., et al., *Nicotine and the Developing Human: A Neglected Element in the Electronic Cigarette Debate*. Am J Prev Med, 2015.

⁸ De Genna, N.M., et al., *Prenatal tobacco exposure, maternal postnatal nicotine dependence and adolescent risk for nicotine dependence: Birth cohort study*. Neurotoxicol Teratol, 2017.

⁹ Benowitz et al., "Prolonged Absorption with Development of Tolerance to Toxic Effects after Cutaneous Exposure to Nicotine."

¹⁰ Okamoto et al., "Tolerance to the Convulsions Induced by Daily Nicotine Treatment in Rats."

¹¹ Marynak KL, Gammon DG, Rogers T, Coats EM, Singh T, King BA, "Sales of Nicotine-Containing Electronic Cigarette Products: United States, 2015", *American Journal of Public Health* 107, no. 5 (May 1, 2017): pp. 702-705. DOI: 10.2105/AJPH.2017.303660