

Overview: Understanding the Health Risks of E-Cigarettes



As the evidence of the health risks from e-cigarettes continue to emerge, we still have much more to learn. The U.S. Surgeon General found that “the long-term health effects of using [e-cigarettes] remain unknown, and short-term risks are only slowly coming into focus.”¹ E-cigarettes deliver fewer toxins than combustible cigarettes, but that doesn’t mean that they are safe or without risk, especially for kids and those who do not currently use tobacco products.

- **E-cigarette aerosol is a mix of thousands of chemicals, including those that are harmful and potentially harmful.** While the aerosol from e-cigarettes contains lower levels of some toxins compared to cigarette smoke, it can contain nicotine and numerous other toxicants, including carcinogens and heavy metals like nickel and lead, that may pose health risks.² The 2024 Surgeon General’s report determined that inhaling flavoring chemicals in the aerosol “may be directly toxic to the lungs or could result in higher absorption of toxicants.”³
- **Emerging evidence suggests that vaping can harm lung health.** E-cigarette aerosols have been shown to promote inflammation in the respiratory system.⁴ The 2020 Surgeon General’s Report also found that these aerosols can contain fine and ultrafine particles, which may increase respiratory risks.⁵
- **E-cigarettes can harm heart health and the cardiovascular system.** Nicotine in e-cigarettes have been found to increase heart rate and blood pressure⁶ and may contribute to the hardening of the arterial walls.⁷ The World Health Organization (WHO) Global Tobacco Control Report detailed initial evidence of the harmful effects of e-cigarettes, including studies suggesting that e-cigarettes have negative effects on aspects of cardiovascular health.⁸
- **E-cigarettes pose serious risks to the health of young people.** The U.S. Surgeon General found that youth use of nicotine in any form, including e-cigarettes, is unsafe.⁹ Nicotine is a highly addictive drug and can harm adolescent brain development, particularly the parts of the brain responsible for attention, memory and learning.¹⁰ Nicotine can also negatively impact mental health, be a source of stress, and increase risk of future addiction to other drugs among youth.¹¹
- **E-cigarettes are not safe for pregnant women.** The U.S. Centers for Disease Control and Prevention (CDC) warn, “Nicotine is a health danger for a pregnant woman and her developing fetus. It can damage the brain and lungs as they develop. Also, some of the flavorings used in e-cigarettes may also be harmful.”¹²
- **E-cigarette use can have a negative impact on oral health.** The nicotine in e-cigarettes can affect blood flow to the gums and could lead to inflammation of the gums and gum disease after continued use.¹³
- **Initial research suggests the biological plausibility of increased cancer risk from e-cigarette use over time.**¹⁴ E-cigarette aerosol can damage DNA.¹⁵ However, leading cancer expert groups agree that the evidence remains uncertain whether the level of exposure is high enough to contribute to the formation of cancer in humans.¹⁶

More information on the health risks of e-cigarettes is available at
<https://assets.tobaccofreekids.org/factsheets/O418.pdf>

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- ³ HHS, *Eliminating Tobacco-Related Disease and Death: Addressing Disparities: A Report of the Surgeon General*. Atlanta, GA: HHS, CDC, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2024.
- ⁴ Traboulsi, Hussein et al. "Inhalation Toxicology of Vaping Products and Implications for Pulmonary Health." *International journal of molecular sciences* vol. 21,10 3495. 15 May 2020, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7278963/>.
- ⁵ HHS. Smoking Cessation. A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2020.
- ⁶ National Academies of Sciences, Engineering, and Medicine (NASEM), *Public Health Consequences of E-Cigarettes*, Washington, DC: The National Academies Press, 2018, <http://nationalacademies.org/hmd/Reports/2018/public-health-consequences-of-e-cigarettes.aspx>.
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- ⁸ WHO report on the global tobacco epidemic 2021: addressing new and emerging products. Geneva: World Health Organization; 2021. <https://www.who.int/publications/i/item/9789240032095>
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