

Beyond Addiction: The Health Effects of Nicotine



Nicotine is a highly addictive drug.¹ Addiction to nicotine is the fundamental reason people continue using tobacco products. Young people can show signs of nicotine addiction quickly, even if they are not using tobacco products regularly.² However, the impact of nicotine extends beyond addiction. While there is still much to learn about the various ways that nicotine alone can impact the body, it is clear that nicotine is not a harmless compound. A review by the Surgeon General found that nicotine activates multiple biological pathways through which smoking increases risk for disease.³

- **No tobacco products are safe.** There are no safe tobacco products, including nicotine pouches and e-cigarettes. Young people should not use any nicotine products, and people who don't currently use tobacco products should not start.⁴
- **Many e-cigarettes and nicotine pouches contain high levels of nicotine.**⁵ In addition, e-cigarette aerosol contains cancer-causing chemicals, heavy metals and other toxins.⁶
- **Nicotine has a negative impact on heart health and the cardiovascular system.** Nicotine affects the cardiovascular system in multiple ways.⁷ It can cause an increase in blood pressure and heart rate, impact the flow of blood to the heart, and narrow arteries around the heart. Nicotine may also contribute to the hardening of the arterial walls.⁸ As a result, nicotine contributes to the increased risk for cardiovascular disease among smokers.⁹
- **Nicotine impacts immune function.** Nicotine is known to suppress immune function throughout the body.¹⁰ E-cigarette aerosol, which usually includes nicotine, inhibits several kinds of immune cells in the lungs, compromising the ability to fight infection.¹¹
- **Nicotine interferes with normal insulin function and blood sugar control.** Nicotine can make the body's cells less responsive to insulin (a condition known as insulin resistance).¹² Over time, insulin resistance can worsen, leading to high blood sugar levels and eventually prediabetes or type 2 diabetes.¹³ Cigarette smoking increases the risk of developing type 2 diabetes due to the combined effects of nicotine and other toxic chemicals in tobacco smoke.¹⁴
- **Nicotine has negative impacts on oral health.** Nicotine affects blood flow to the gums and could lead to inflammation of the gums and gum disease after continued use.¹⁵
- **Nicotine is particularly harmful during pregnancy.** Nicotine is a health danger for pregnant women and the developing fetus. It can damage the brain and lungs during development.¹⁶ Nicotine also increases the risk of preterm delivery.¹⁷
- **Nicotine can harm brain development, which continues until about age 25.** It is unsafe for youth to use any products containing nicotine.¹⁸ Nicotine exposure during adolescence, a critical window for brain development, impacts attention, memory, learning, mood and impulse control, and may have lasting adverse consequences for brain development.¹⁹
- **Nicotine can prime the adolescent brain for addiction to other drugs.**²⁰ Nicotine addiction often precedes the use of other drugs and is a risk factor for future use of drugs and alcohol.²¹
- **High doses of nicotine are toxic.** At high-enough doses, nicotine can be poisonous and can carry serious consequences and even cause death, especially to young children.²²

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