

Nicotine: What is it and why is it in smoke-free alternatives?

Nicotine, while addictive and not risk-free, is not the primary cause of smoking related diseases.

The best choice any adult smoker can make is to quit tobacco and nicotine altogether. For those who don't, science based, smoke-free products are available, and while not risk-free, have the potential to be less harmful than continued smoking.

What is nicotine?

Nicotine occurs naturally in the tobacco plant. Once inhaled, nicotine is absorbed through the lungs straight into the bloodstream where it travels through the body into tissues and organs, including the brain. In the brain, nicotine binds to specific receptors and triggers the release of dopamine and other neurotransmitters. As a result, nicotine may stimulate and ultimately affect short-term brain functions such as emotion, learning, and memory.¹

After repeated nicotine stimulation, the brain adapts to the presence of nicotine, a process that is reversible when a person stops using nicotine-containing products.

The action of nicotine in the brain can also trigger physiological effects outside the brain. For example, the messenger epinephrine is released into the bloodstream, leading to temporary (and reversible) narrowing of blood vessels, higher blood pressure, and increased heart rate.²

Nicotine-containing products should not be used by people who have, or are at risk of heart disease, are diabetic, are epileptic, or are experiencing seizures. They should not be used during pregnancy or while breast-feeding, Minors should not use or have access to any tobacco or nicotine-containing products.



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Nicotine is not the primary cause of smoking-related diseases

Many public health authorities and experts have noted that nicotine, while addictive and not risk-free, is not the primary cause of smoking-related diseases. It's the high levels of harmful and potentially harmful chemicals in smoke that are. For example, a statement from NICE (National Institute for Health and Care Excellence) finds that "it is primarily the toxins and carcinogens in tobacco smoke—not the nicotine—that cause illness and death".³



Nicotine is one of the reasons that people smoke, along with taste and ritual.

A balanced perspective

Institutes like U.K. National Institute for Health and Care Excellence (previously Public Health England) and the U.S. Food and Drug Administration⁴ see the potential of nicotine-containing products as alternatives to continued smoking for adults who don't quit altogether. U.K. National Institute for Health and Care Excellence also weighs in on the public awareness of nicotine, saying "there is much public misunderstanding about nicotine (less than 10% of adults understand that most of the harms to health from smoking are not caused by nicotine)".⁵

Nicotine in smoke-free alternatives

Nicotine is one of the reasons that adults smoke, along with taste, ritual and sensory experience. In order for those who don't quit to switch from cigarettes to smoke-free alternatives, these products need to contain nicotine and also provide a taste and experience that is acceptable.

Adult smokers deserve an informed choice

Adult smokers who don't quit altogether deserve accurate and non-misleading information to be able to make an informed decision, and choices like these add up to affect public health outcomes. This is one of the reasons why it is so important to combat public misperceptions about nicotine. Many still mistakenly believe that nicotine is a major cause of tobacco-related diseases. A literature review of 54 studies has shown that peoples' assumptions about nicotine vary, and are often wrong.⁶

It is important to educate regulators, public health experts, adult smokers and adult nicotine users about nicotine and nicotine-containing products. A balanced perspective on nicotine in the context of tobacco harm reduction is necessary.

Certain groups of people should not use nicotine. But products containing nicotine can help to support public health goals by encouraging adult smokers who would otherwise continue to smoke to switch to them completely and abandon cigarettes.

Science-backed, smoke-free alternatives can complement existing measures to help address the global health issue of smoking by providing an avenue for adults who don't quit tobacco and nicotine altogether to make a better choice than continued smoking. Coupled with the right regulatory encouragement and support from society, we can reach a smoke-free future, faster.

¹"Pharmacology of Nicotine: Addiction, Smoking-Induced Disease, and Therapeutics" 2009 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2946180/>

²"Pharmacology of Nicotine: Addiction, Smoking-Induced Disease, and Therapeutics" 2009 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2946180/>

³"Pharmacology of Nicotine: Addiction, Smoking-Induced Disease, and Therapeutics" 2009 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2946180/>

⁴Public Health England, "Vaping in England: an evidence update including vaping for smoking cessation" February 2021" <https://www.gov.uk/government/publications/vaping-in-england-evidence-update-february-2021/vaping-in-england-2021-evidence-update-summary>

⁵Public Health England, "PHE publishes independent expert e-cigarettes evidence review", 2018, <https://www.gov.uk/government/news/phe-publishes-independent-expert-e-cigarettes-evidence-review>

⁶Czoli, CD. et al., "How do consumers perceive differences in risk across nicotine products? A review of relative risk perceptions across smokeless tobacco, e-cigarettes, nicotine replacement therapy and combustible cigarettes." *Tobacco Control*, 2017;(26:e49-e58), <https://pubmed.ncbi.nlm.nih.gov/27625408/>

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