



## Editorial

# The Harms of Vaping: How Clinicians Can Help Patients Quit

Despite growing evidence of the harms of vaping, many patients still use e-cigarettes. For clinicians, this presents a dilemma: what should we tell a patient who is vaping? Telling patients to “just stop” often fails and can cause alienation. However, remaining silent – or worse, being misinformed – misses an opportunity to help patients quit. As healthcare professionals, our role is to listen without judgment, provide accurate information about all tobacco or nicotine products, and offer behavioral counseling and evidence-based cessation medications to support patients in quitting vaping.

Clinicians must be clear: vaping is not harmless. While some patients believe they are “just inhaling water vapor,” this is a misconception. E-cigarette aerosols contain nicotine, heavy metals like lead and nickel, volatile organic compounds, and other toxic substances [1]. The presence and levels of these harmful constituents vary widely between products, manufacturers, and even batches. E-cigarettes are classified as a tobacco product, so they bypass the premarket animal and human safety tests required for drugs and medical devices [2]. Common ingredients in e-cigarettes pose severe inhalation toxicity. Growing laboratory and translational research provides credible evidence of long-term dangers, including cardiovascular disease, chronic obstructive lung disease, and cancer. The evidence highlights the importance of clear risk communication during clinical counselling [3].

Many patients are unaware of the high nicotine content in e-cigarettes. Even some nicotine-free e-cigarettes have been found to contain trace amounts of nicotine. In popular pod-based systems like JUUL, each pod contains approximately 40–48 mg of nicotine in a 5% (by weight) formula, roughly equivalent to the nicotine content of a pack of 20 cigarettes. The nicotine concentration in commercial e-liquids typically ranges from 3 mg/mL to 85 mg/mL. Pod-based and disposable devices tend to be at the higher end of this spectrum, often delivering 40–60 mg/mL or more, particularly when using nicotine salts [4].

The significance of nicotine delivery lies in its direct impact on dependence potential, toxicity risk, and long-term health outcomes. Device operating power, liquid formulation, and user behaviors (such as puff duration and frequency) also affect nicotine delivery, leading to substantial variability in exposure and potential harm, especially among adolescents and those new to nicotine [5].

Vaping use is particularly worrisome for adolescents. Nicotine exposure during adolescence can alter neural connectivity, synaptic activity, and neurotransmitter systems (including dopaminergic

and cholinergic pathways), resulting in lasting changes to reward processing, increased addiction vulnerability, and long-term behavioral and cognitive impairments [6,7]. There is also evidence of sex-specific effects and an elevated risk of developing substance use disorders later in life [8].

Flavored e-cigarettes are especially popular among adolescents, and companies capitalize on this trend. Of concern is that the cytotoxicity of certain flavoring agents used in e-cigarettes is well documented, with significant variation depending on the specific chemicals and their concentrations. Multiple laboratory studies have shown that compounds such as cinnamaldehyde (cinnamon), vanillin (vanilla), ethyl maltol (hazelnut, tropical fruit, and melon), menthol, benzaldehyde, and others can induce cytotoxic effects in human bronchial epithelial cells, endothelial cells, macrophages, and oral epithelial cells, even at concentrations commonly present in commercial e-liquids [9].

Furthermore, the vapor exhaled by users, often perceived as harmless, can still pose risks to bystanders. Epidemiologic studies have shown that secondhand exposure to e-cigarette aerosol is associated with increased risk of bronchitic symptoms and shortness of breath among young adults, regardless of whether they actively smoke or vape. Additionally, acute respiratory irritation and systemic effects of nicotine, such as palpitations and increased blood pressure, may occur in children, especially in poorly ventilated environments [10].

Some patients turn to vaping to quit smoking, seeing it as a step toward smoking cessation. A meta-analysis associated nicotine-containing e-cigarettes with higher smoking cessation rates compared to nicotine replacement therapy (NRT) or behavioral support alone [11]. However, emerging evidence shows that e-cigarette use maintains nicotine dependence, reduces quit rates among smokers, and increases relapse among former smokers [12].

The World Health Organization does not endorse e-cigarettes as cessation aids [13]; clinicians should avoid recommending them and guide patients against starting use. Among youth, e-cigarettes are creating a new generation of nicotine dependence and increasing vulnerability to other drug use. For patients considering quitting vaping, healthcare providers should discuss the benefits of behavioral therapy combined with evidence-based cessation medications, such as nicotine replacement therapy, varenicline, bupropion, or cytisinicline, as first-line treatments [14].

While living a vapor- or smoke-free life is the ideal goal, many patients are not ready or willing to start counseling or medications. In such cases, our role is to provide patients with accurate information about e-cigarettes. This information could help them move from the contemplation stage into action.

Clinicians should consider discussing these points with patients who vape:

- Vaping is neither harmless nor a safer alternative to combustible tobacco.
- One pod can hold as much nicotine as a pack of 20 cigarettes or even more.
- Some nicotine-free e-cigarettes have been found to contain small traces of nicotine.
- E-cigarette aerosol is not just water vapor; it may contain heavy metals, carcinogens, and other toxic substances.
- Adolescent nicotine exposure is associated with decreased impulse control, attention, and cognitive deficits, and a higher risk of attention-deficit/hyperactivity disorder and mood disorders.
- Ultrafine particles and residual nicotine have been detected in secondhand aerosol, posing potential risks to children and household members.
- Flavored vapes, especially cinnamon, vanilla, and menthol, may increase toxicity.
- Vaping is not a safe alternative to quitting smoking due to unknown health risks and ongoing nicotine dependence.
- When quitting vaping, avoid going back to combustible tobacco or switching to new nicotine products (e.g., nicotine pouches, heated tobacco).
- Several attempts are normal before becoming smoke- or vapor-free.
- Behavioral counseling and approved pharmacotherapy are the safest and most effective methods to quit vaping.

By providing this information, we empower patients to make better-informed decisions and encourage deeper conversations about their readiness to quit vaping. Unlike combustible cigarettes, where most patients know they need to quit smoking, some people might not realize that vapes are harmful, so sharing this information can be helpful.

Perhaps the most significant change we can make is in how we talk about vaping. Start the conversation with curiosity. Ask patients why they vape, what they know about the product, and if they have ever tried to quit vaping. This approach helps maintain rapport, build trust, and improve outcomes [15]. When patients feel heard rather than judged, they are more likely to engage in future discussions about behavior change.

E-cigarette availability and use are unlikely to disappear anytime soon. As clinicians, we must accept this reality and be ready to guide our patients with clarity and empathy. Combining behavioral therapy with evidence-based cessation medications and sharing information about e-cigarettes remains our most effective approach. Equally important is engaging health authorities and public agencies, urging them to take clear stands against vaping and to issue public warnings about its risks. Let us use these tools wisely.

## Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the author utilized OpenEvidance to locate references and Grammarly to verify spelling and grammar. After using these tools, the author reviewed and edited

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I, Irina Gonzalez, declare that I have no conflicts of interest that could be seen as influencing the content of the manuscript, either directly or indirectly. I have no conflicts of interest with any tobacco or vaping industry.

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