

Vaping: Understand the risks

Kaustubh G. Joshi, MD

From 2017 to 2018, the 30-day prevalence of “vaping” nicotine rose dramatically among 8th graders, 10th graders, 12th graders, college students, and young adults; the increase was the greatest among college students.¹ As vaping has become a common phenomenon in our society, it is prudent to have a basic understanding of what vaping is, and its potential health risks.

How it works

Vaping is the inhaling and exhaling of aerosol that is produced by a device.² Users can vape nicotine, tetrahydrocannabinol (THC), or synthetic drugs. The aerosol, often mistaken for water vapor, consists of fine particles that contain varying amounts of toxic chemicals and heavy metals that enter the lungs and bloodstream when vaping.² In general, vaping devices consist of a mouthpiece, a battery, a cartridge for containing the e-juice/e-liquid, and a heating component that turns the e-juice/e-liquid into vapor.² The e-juice/e-liquid usually contains a propylene glycol or vegetable glycerin-based liquid with nicotine, THC, or synthetic drugs.² The e-juice/e-liquid also contains flavorings, additives, and other chemicals and metals (but not tobacco).²

There are 4 types of vaping devices³:

E-cigarettes. This first generation of vaping devices was introduced to US markets in 2007. E-cigarettes look similar to cigarettes and come in disposable or rechargeable forms.³ They may emit a light when the user puffs. E-cigarettes have shorter battery lives and are less expensive than other vaping devices.

Vape pens. These second-generation vaping devices resemble fountain pens. Vape pens also come in disposable and recharge-

able forms.³ They can be refilled with e-juice/e-liquid.³

Vaping mods. These third-generation vaping devices were created when users modified items such as flashlights to create a more powerful vaping experience; however, these self-modifications often are unsafe. Vaping mods are larger than vape pens and e-cigarettes and include modification options. They also have large-capacity batteries that are replaceable. Vaping mods are typically rechargeable and deliver more nicotine than earlier-generation vaping devices.

Pod systems. Pod systems, such as Juul, are the latest generation of vaping devices. These small, sleek devices resemble a USB drive.³ They can be recharged on a laptop or any USB charger.³ Pods combine the portability of e-cigarettes or vape pens with the power of a mod system. There are 2 types of pod systems: open and closed. Open pod systems consist of removable pods that are filled with the user’s choice of e-juice/e-liquid and then replaced after being refilled several times. Closed pod systems are purchased pre-filled with e-juice/e-liquid and are disposable, similar to single-use coffee pods. Juul is the most popular vape brand in the United States.⁴ For a visual guide of the different vaping devices, see https://www.cdc.gov/tobacco/basic_information/e-cigarettes/pdfs/ecigarette-or-vaping-products-visual-dictionary-508.pdf

What are the risks?

Vaping is relatively new, so the long-term health effects are not well studied. Although less harmful than smoking cigarettes, vaping is still not safe because users are exposed to chemicals in the aerosol, such as nicotine, heavy metals such as lead, volatile organic

Dr. Joshi is Associate Professor of Clinical Psychiatry and Associate Director, Forensic Psychiatry Fellowship, Department of Neuropsychiatry and Behavioral Science, University of South Carolina School of Medicine, Columbia, South Carolina.

Disclosure

The author reports no financial relationships with any companies whose products are mentioned in this article, or with manufacturers of competing products.

doi: 10.12788/cp.0189



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While safer than smoking, vaping still exposes users to harmful chemicals

compounds, and cancer-causing agents.³ Vaping nicotine can result in the same cardiac and pulmonary complications as smoking cigarettes. Vaping nicotine can also be more addictive than smoking cigarettes because users can buy cartridges with higher concentrations of nicotine or increase the vaping device's voltage to get a greater "hit" of nicotine (or whatever substance the user is vaping.) Vaping devices can also cause unintentional injuries due to fires and explosions from defective batteries.³

Vaping—particularly vaping THC—has been linked to a condition called e-cigarette, or vaping, product use-associated lung injury (EVALI).⁵ As of February 18, 2020, the CDC had received reports of approximately 2,800 patients with EVALI who were hospitalized or had died.⁵ Most EVALI cases have been linked to e-cigarette or vaping products that contained THC, particularly products obtained from informal sources such as friends, family, or in-person or online dealers.⁵ Vitamin E acetate, an additive in some THC-containing vaping products, has been strongly linked to EVALI.⁵ When ingested as a vitamin supplement or applied to the

skin, vitamin E usually is harmless, but when inhaled, it may interfere with normal lung functioning.⁵ The CDC recommends that individuals who vape do not use products that contain THC; avoid getting vaping products from informal sources, such as friends, family, or online dealers; and not modify or add any substances to a vaping device other than as intended by the manufacturer.⁵

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