

E-cigarettes such as Juul are popular among teenagers—are they harmful?

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Nicotine exposure in adolescents is associated with problems with mood, attention, and learning. Credit: iStock

E-cigarettes are electronic devices that heat a liquid to produce an aerosol that can be inhaled. Such e-liquid usually contains nicotine, flavorings, and other chemicals. The U.S. Centers for Disease Control and Prevention reported that an estimated two million U.S. middle and high school students used e-cigarettes in the past thirty days. The percentage of high school students who reported using e-cigarettes in the previous month has increased from 1.5 percent 2011 to 11.7 percent in 2017. The U.S. Surgeon General issued a report saying that e-cigarette use among the young is a "public health concern."

Nicotine is a highly addictive substance and in excess amounts can be lethal. A single Juul pod can have as much nicotine as twenty cigarettes. Nicotine can adversely affect adolescent brain development, which continues until young adults are in their mid-twenties.

Nicotine exposure in adolescents is associated with problems with mood, attention, and learning. It

can make it harder to control impulses. It also has adverse effects on development of heart disease, aortic aneurysms, and associated with [peptic ulcer](#).

Besides nicotine, there are other harmful substances in e-cigarettes, such as flavorings. E-cigarettes are marketed in fruit, candy, and dessert flavors. These can be alluring to children and teens. While some flavorings may be safe to eat, they can be harmful breathed into the lungs.

Another common ingredient is [propylene glycol](#), which is also known to be an irritant when inhaled. Some ingredients can be carcinogenic and metals such as tin, nickel, and lead have been also found. The contents of e-cigarettes are not regulated and hence there can be considerable variation in their contents, even within same product.

Adolescents who vape are more likely to smoke traditional cigarettes in the future compared to their non-vaping counterparts. Thus, vaping can be a gateway to smoking conventional cigarettes. Vaping can also release vapors that can be inhaled by bystanders, causing harm to others. Similarly, malfunctioning equipment has led to burn injuries, and accidental ingestion of the e-liquid has resulted in seizures and even death. The health risk of e-cigarettes needs additional research. The long-term effects of e-cigarettes are not known.

E-cigarettes can look like traditional cigarettes, but also like daily items such as pens and USB drives, and can have a sleek modern design, which makes them easy to conceal in school or at home.

Provided by Tufts University

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