

E-Cigarettes: What Have We Learned and What Do We Need to Know?

Electronic cigarettes (e-cigarettes) are battery-powered devices that provide nicotine, flavorings, and other additives to the user in the form of an aerosol. The vapor in electronic cigarettes is created by heating a flavored fluid (e-liquid) that is used inside e-cigarettes.

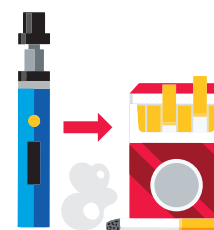
E-CIGARETTE CONSTITUENTS AND USERS' EXPOSURE TO HARMFUL CHEMICALS

- A single e-cigarette can deliver as much nicotine as a pack of combustible cigarettes.
- E-cigarettes are not harmless; in addition to nicotine, e-cigarettes contain and emit numerous potentially toxic substances including heavy metals, volatile organic compounds, tobacco-specific nitrosamines, aldehydes, phenolic compounds, and polycyclic aromatic hydrocarbons. Furthermore, e-cigarette aerosols contain numerous uncharacterized chemicals that might have health risks that are currently unknown.
- E-cigarettes expose individuals to carcinogens, but fewer than combustible tobacco.



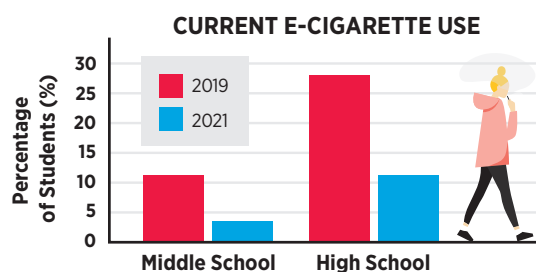
ROLE IN SMOKING CESSATION AND INITIATION

- FDA has not approved any e-cigarette as a cessation therapy. Only FDA-approved therapies like varenicline, nicotine replacement therapies, and counseling are demonstrated to improve chances of smoking cessation. E-cigarette manufacturers should follow FDA's regulatory pathways for cessation therapies by conducting clinical trials to assess the potential efficacy of helping smoking cessation.
- Individuals who stop using conventional cigarettes and switch to e-cigarettes have a higher risk of relapse compared to those who stop using all tobacco products.
- E-cigarette use increases the probability of youth or young adults transitioning to conventional cigarette use.



USE IN THE UNITED STATES

- Use is highest among youth (middle and high school students) and young adults (ages 18 to 24), and most young users prefer flavored e-cigarettes.
- Use among middle and high school students rose at an alarming rate between 2011 and 2019; of note, JUUL products comprised approximately 75 percent of the e-cigarette market in 2019 and were a major contributor to a doubling of youth e-cigarette use between 2017 and 2019. Use has declined since.



ADVERSE HEALTH EFFECTS

- Increasing evidence indicates that use of e-cigarettes can pose significant risks to vascular, respiratory, nervous system, and gastrointestinal health. Exposure to even a single session may have detrimental effects to the immune system.
- Preliminary data indicate that people who use both e-cigarettes and combustible cigarettes have similar levels of carcinogens in their urine as people who exclusively use combustible cigarettes.
- There is an urgent need for additional research to characterize definitively the long-term health risks, including cancer, cardiovascular and pulmonary diseases, and pregnancy outcomes.

