

# 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. By December 2017, Juul held the largest market share of any e-cigarette in the U.S.

## Constituents and user's exposure to toxicants

- One Juul pod delivers as much nicotine as a pack of cigarettes; exposure to other toxic substances is lower.
- Completely switching to e-cigarettes from regular use of conventional cigarettes can reduce exposure to toxic chemicals; however, it should be noted that 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.

## Use

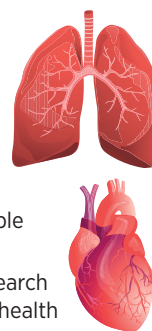
- Use is highest among youth and young adults.
- Use among middle and high school students continues to rise sharply: middle-school [3.3% in 2017; 5% in 2018; 11% in 2019]; high school [12% in 2017; 21% in 2018; 28% in 2019]. Juul is the most commonly used brand; most current users prefer flavored e-cigarettes such as fruit, menthol or mint, and candy/desserts/sweets.

## Role in smoking cessation and initiation

- More research is needed to evaluate their value as smoking cessation aids.
- Use increases the probability of youth or young adults transitioning to conventional cigarettes; the use of modifiable (mods) devices, which allow users to adjust the amount of nicotine delivered, is especially concerning. According to a recent report, young adults using modifiable (versus pen-like) e-cigarette devices smoked greater than six times as many cigarettes after transitioning.

## Human health effects

- There are early indications that vaping can pose significant risks to vascular and respiratory health.
- Preliminary studies indicate that people who vape may have similar carcinogens in their urine as do combustible cigarette users.
- 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.



## Possible harm reduction compared to combustible tobacco

- Completely switching to e-cigarettes from regular use of conventional cigarettes can reduce exposure to toxic chemicals.



## Poisoning, injuries, and other health hazards

- Intentional or accidental exposure to e-liquid (from drinking or other contact) can have serious adverse health effects.
- E-cigarettes can explode causing burns and other injuries.
- The FDA is aware of and investigating the causes of 35 cases of seizures following e-cigarette use, mostly in youth and young adults, since 2010.
- E-cigarette, or vaping, product use-associated lung injury (EVALI)—The CDC, FDA, and the state health authorities reported a sharp rise in symptoms or cases of EVALI since August 2019, a peak in September, and a gradual decline since then. By February 18, 2020, a total of 2,807 hospitalized cases or deaths were reported to CDC. Researchers identified that vitamin E acetate, an additive in some tetrahydrocannabinol (THC)-containing e-cigarettes, or vaping products, was strongly linked to the EVALI outbreak. THC is the primary psychoactive ingredient in marijuana. Eighty-two percent of patients with EVALI reported using THC products and 78 percent, especially adolescent users, reported obtaining their products only from informal sources such as family, friends, and in-person or online dealers.