

## Vaping and Electronic Nicotine Delivery Systems (ENDS) Fact Sheet

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ENDS (also called electronic cigarettes) are a diverse group of devices that simulate smoking for the person inhaling from the device. These devices contain cartridges filled with liquid that is vaporized by battery-powered heating elements. The liquid (e-liquid) typically contains nicotine derived from tobacco, flavorings and other chemicals. Users inhale the aerosol when they draw on the device, then exhale a cloud of aerosol much like secondhand smoke from a cigarette. The aerosol can contain ingredients including nicotine, ultrafine particles, volatile organic compounds such as Benzene which is a known carcinogen, and heavy metals.<sup>1, 2</sup> Most ENDS products contain and emit numerous potentially toxic substances<sup>2</sup>, including formaldehyde and acrolein, a cancer-causing toxicant.

ENDS products have a wide variety of names, including e-cigarette, vape pen, vapor pen, v-pen, e-hookah, hookah pen, personal vaporizer, mod, and tank system; use of these products is commonly referred to as 'vaping'. In 2015, the Juul electronic device was introduced, and that has created the term 'juuling'.

The U.S. Surgeon General has concluded that nicotine poses danger to youth, pregnant women, and fetuses. The use of nicotine in any form by youth, including ENDS, is unsafe.<sup>1</sup> The long term health effects of ENDS remain unknown;<sup>2</sup> however, there is evidence that completely substituting ENDS for combustible tobacco cigarettes reduces exposure to toxicants and carcinogens.<sup>2</sup>

### Key Points:

- Current evidence is *insufficient* to conclude that ENDS are effective for tobacco use cessation<sup>3</sup>; they are not a US Food and Drug Administration-approved aid for quitting
- More than half of the adults who use ENDS also smoke conventional cigarettes<sup>4</sup>
- ENDS use tripled among CT high school students from 2011 to 2015 and doubled again between 2015 and 2017<sup>5</sup>

### Examples of ENDS Products



Images courtesy of the Centers for Disease Control and Prevention and Juul Labs, Inc.

### Use of ENDS in Connecticut: Youth

- ENDS are the most prevalent form of tobacco product used by high school students.<sup>5</sup>
- 27.3% of high school students have ever tried vaping compared to 14.8% who have ever tried smoking a cigarette.<sup>5</sup>
- 14.7% of high school students currently use ENDS.<sup>5</sup>
- ENDS use increases the risk of youth and young adults using combustible tobacco.<sup>2,6</sup>

### Adults:

- 17.8% of adults have tried ENDS at least once in their lifetime, including 34.6% of adults 18-34 years old.<sup>7</sup>
- 4.1% of adults currently use ENDS (5.3% of males and 3.0% of females).<sup>7</sup>
- ENDS use is highest among young adults aged 18-24 years old (11.7%) followed by those 25-34 years of age (5.9%).<sup>7</sup>
- Symptoms of ENDS dependence result from ENDS use.<sup>2</sup>

## Tobacco Industry

- The ENDS industry has grown exponentially since its introduction in China in 2004 to \$3.5 billion in sales in the US in 2015.<sup>1</sup>
- Major tobacco companies produce their own ENDS product lines and are marketing ENDS using techniques previously used to market cigarettes.
- PAX (now Juul) Labs introduced the Juul electronic device in 2015, and it has quickly vaulted to represent more than three quarters of the ENDS market. In late 2018, Altria purchased a 35% stake in Juul Labs.
- There are thousands of flavors of “e-juice” and many are candy- or fruit-flavored, which are highly appealing to youth.<sup>1</sup>
- There have been no manufacturing or safety standards for ENDS. The FDA established authority to regulate ENDS in 2016, classifying them as a tobacco product, however implementation dates are widespread expanding to 2022.

## Other Facts

- Many ENDS devices are rechargeable and refillable, which allows users to create their own “e-juice” flavor and vary the nicotine levels.
- Over half of CT high school students report using their devices for substances other than nicotine, such as marijuana, THC or hash oil, or THC wax.<sup>5</sup>
- With a high concentration of nicotine, e-liquids are poisonous, especially for young children. Intentional or accidental exposure to e-liquids can result in adverse health effects.<sup>2</sup> Exposures occur via ingestion, inhalation, or absorption through the skin or eyes.
- ENDS devices can explode and cause burns, especially when they have been modified by the user, stored improperly, or the batteries are of poor quality.<sup>2</sup>

### Key Points:

- ENDS devices can have varying levels of nicotine and the most popular brand has very high nicotine content
- FDA has deemed authority to regulate ENDS products with implementation dates stretched to 2022.
- There are no current restrictions on advertising ENDS
- The majority of calls to the CT Poison Control Center involving ENDS are for ingestion and most reported exposures have occurred at home.<sup>8</sup>

## References

- <sup>1</sup> U.S. Department of Health and Human Services. *E-cigarette Use Among Youth and Young Adults: A Report of the Surgeon General*. 2016.
- <sup>2</sup> National Academies of Sciences, Engineering, and Medicine. 2018. *Public Health Consequences of E-Cigarettes*. Washington, DC: The National Academies Press. doi: 10.17226/24952.
- <sup>3</sup> U.S. Preventive Services Task Force. *Behavioral and Pharmacotherapy Interventions for Smoking Cessation in Adults, including Pregnant Women* 2015. <http://www.uspreventiveservicestaskforce.org>
- <sup>4</sup> National Center for Health Statistics. National Health Interview Survey, 2015 data; *Cigarette Smoking Status Among Current Adult E-Cigarette Users*. <http://www.cdc.gov/nchs/nhis>
- <sup>5</sup> State of Connecticut, Department of Public Health. Data from the 2017 *Connecticut Youth Tobacco Survey*
- <sup>6</sup> Bold KW, Kong G, Camenga DR, et al. *Trajectories of E-Cigarette and Conventional Cigarette Use Among Youth*. *Pediatrics*. 2018;141(1):e20171832.
- <sup>7</sup> State of Connecticut, Department of Public Health. Data from the 2015 *Connecticut Behavioral Risk Factor Surveillance System*
- <sup>8</sup> Connecticut Poison Control Center, Informal Communication. September, 2018