Sound the Alarm: Youth Vaping Can Harm

VAPING IS THE USE of battery-operated devices to inhale nicotine, flavoring, or other drugs in the form of an aerosol. These devices go by many names and have various types including vapes, vape pens, e-cigarettes (e-cigs), cig-a-likes, mods, tanks, disposables, or electronic nicotine delivery systems (ENDS).

During the 2010s, e-cigarette use, commonly known as vaping, gained widespread popularity among youth. E-cigarette use rose dramatically, from just 220,000 high school students in 2011 to over 3 million by 2018.[1] This sharp increase, particularly between 2017 and 2018, led the 20th U.S. Surgeon General to declare youth vaping an epidemic.[1, 2] In 2019, vaping usage among high school students was nearly 1 in 3. Today, vaping continues to be the most used form of tobacco among youth, despite declines since the 2019 peak. In 2024, more than 1.6 million U.S. youth reported currently vaping.[3, 4]

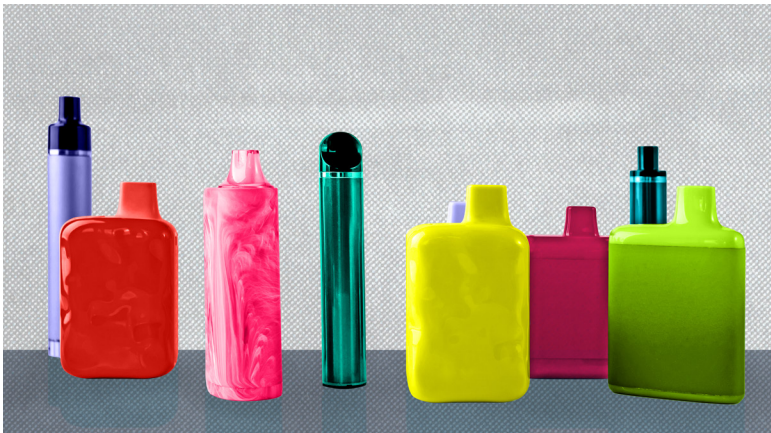
As of July 2024, more than 86% of e-cigarettes on the market were illegal products[5], the majority deriving from China, despite seizures of millions of illegal units by the U.S. Food and Drug Administration[6] and U.S. Customs and Border Protection. These unauthorized vapes, often flavored and marketed to appeal to youth, are flooding the U.S. market from China through deceptive shipping practices such as mislabeling packages as toys or electronics bypassing regulatory oversight and posing serious public health risks. In response, federal agencies have ramped up seizures and issued warning letters to combat the illicit trade.[6] These illegal imports from China constitute an unusual and extraordinary threat to the public of the United States.[7]

While there continue to be many unknowns about vaping due to their relatively recent development, there are several known dangers about the products and their threat to America's youth.

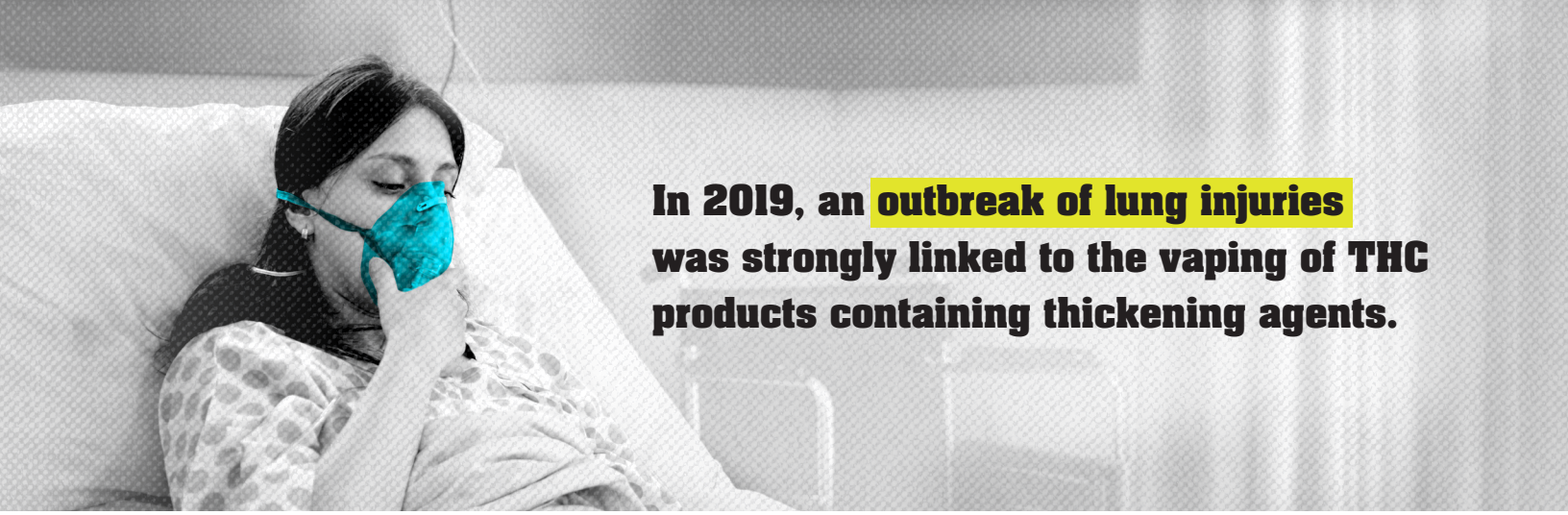
Learn the Basics

Vaping devices share similar basic components, i.e., a battery, heating element (usually a coil or wick), and a tank or pod that contains the e-liquid (fluid that is turned into aerosol in an e-cigarette).

The e-liquid within a vape usually contains nicotine, propylene glycol, vegetable glycerin or glycerol, flavorings, and may contain metal particles or other chemicals. Other e-liquids may contain cannabis concentrates like THC or CBD.[8]



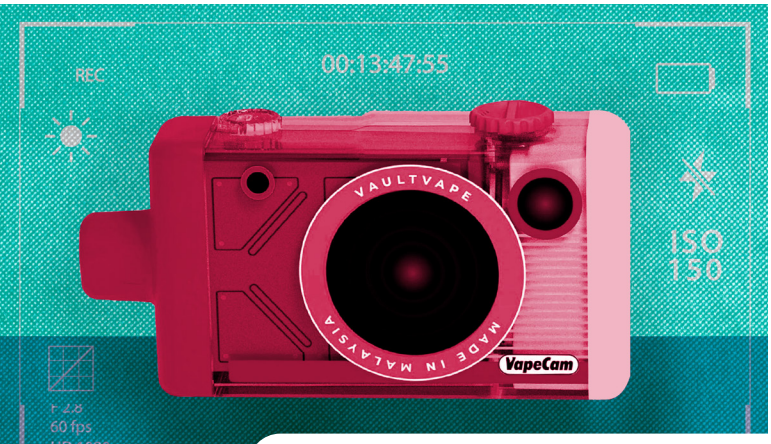
Vaping devices use sleek and colorful designs appealing to young consumers.



In 2019, an outbreak of lung injuries was strongly linked to the vaping of THC products containing thickening agents.

Know the Facts

- In 2024, more than 1.6 million U.S. youth vaped.[9]
- When vaping, nicotine absorbs rapidly and reaches the brain quickly, delivering a dopamine surge resulting in feelings of pleasure and reward.[10]
- Vapes have been the most commonly used tobacco product among middle and high school students in the U.S. for a decade.[11, 12]
- In 2024, 87.6% of current e-cigarette users vaped flavored e-cigarettes.[13, 14]
- Disposable e-cigarettes were the most common type of vape used, at 55.6%, by current vape users in 2024.[13, 14]
- As of September 2025, there are only 39 FDA authorized e-cigarette products for sale to persons over the age of 21.[15] The sale of e-cigarettes to persons under the age of 21 is prohibited.



Designed to resemble a toy camera, vapes like this one have added appeal to youth.

- Use of multiple tobacco products is also a concern among middle and high school students, with 38.9% and 36.6% of current users, respectively, using more than one type of tobacco product in 2024.[8]
- More than half of middle and high school students who currently use e-cigarettes want to quit and have tried to quit; in 2020 63.9% of current e-cigarette users reported wanting to quit and 67.4% reported trying to quit in the last year.[14]

Recognize the Risks

Youth should not use e-cigarettes and adults who do not otherwise use tobacco should not start.[9] Many vaping products accessible to youth are not authorized by the FDA and are illegally marketed.

Most vapes contain high concentrations of nicotine, which is the same **highly addictive** chemical found in cigarettes![8]

A human brain doesn't fully mature until around age 25. Nicotine exposure can negatively affect normal brain development by impacting concentration and reducing impulse controls. Additionally, nicotine can worsen mental health issues (e.g., anxiety or depression) and may enhance the risk of developing chronic diseases (e.g., cancer and heart disease).[16, 17]

Self-reported hypertension, of similar magnitude to that of cigarette smoking and hypertension, was found to be associated with vaping.[18] Accumulating evidence has indicated that exposure to e-cigarettes can lead to harmful cardiovascular effects, including blood vessel damage and heart failure.

Companies are using predatory marketing tactics to popularize and normalize vaping among youth.

Vaping aerosol can cause lung damage from harmful chemicals, e.g. formaldehyde, acrolein and acetaldehyde.[19] They are made from chemicals, which are not safe to inhale and can be harmful to the lungs when inhaled.[9] Secondhand nicotine vape exposure can result in the risk of asthma exacerbation.[20]

Research has detected arsenic along with other toxic metals in vapes, e.g. chromium, antimony, nickel, lead, tin, and aluminum.[21, 22] Inorganic arsenic and antimony are classified as carcinogenic and can lead to an increased risk of cancer and disruption of hormones.[21, 22] Further, the exposure to heavy metals through vaping can have brain remodeling effects that last beyond adolescence.[23]

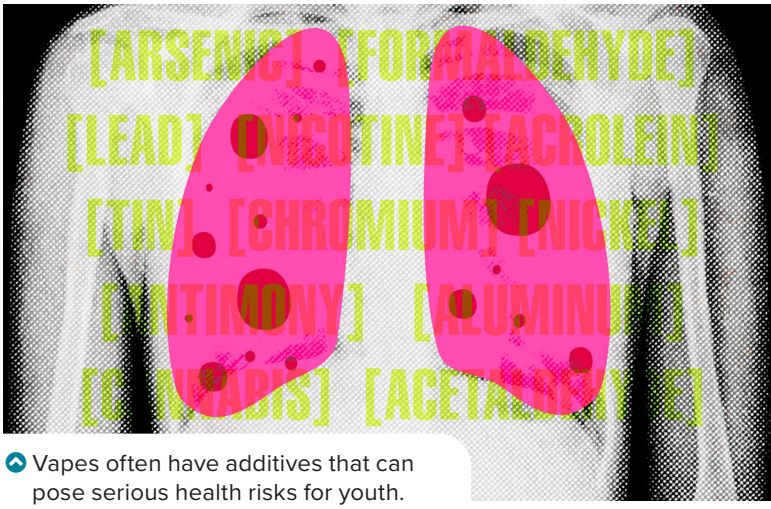
Teens should also not use vapes — especially from informal or illicit sources — containing THC, a psychoactive component of the marijuana plant. In 2019, an outbreak of lung injuries was strongly linked to the vaping of THC products containing thickening agents, like vitamin E acetate.[24]

Vaping leads to changes in the oral microbiome and inflammation, which may elicit oral disease.[25, 26] Oral effects from vaping include increased risks of gum disease, tooth decay, oral mucosal lesions, impaired wound healing, dry mouth, and bad breath.[27, 28, 29, 30, 31, 32, 33, 34, 35, 36] In addition, vape explosions can result in extensive damage to the mouth and face (e.g., burns, facial fracture, and tooth loss), and even death.[28, 29]

There is conclusive evidence linking vape use with seizures.[37] Nicotine and other chemicals present in vapes may play a role in the onset of seizures, especially in youth.[38, 39] Long term implications of seizures associated with vape use are still unknown.

Additional Harmful Effects of Vaping

- Increased risk of seizures, especially in youth[29]
- Severe burns or other injuries due to vape explosions[37,38]
- Altered oral microbiome leading to gum disease, tooth decay, oral mucosal lesions, impaired wound healing, dry mouth, and bad breath[28, 29, 30, 31, 32, 33, 34, 35]
- Short- and long-term effects on attention, learning, and memory
- Irritability and mood swings
- Insomnia, restlessness, and sleeplessness
- Coughing and wheezing
- Nausea, vomiting, headaches, and dizziness
- Nicotine addiction



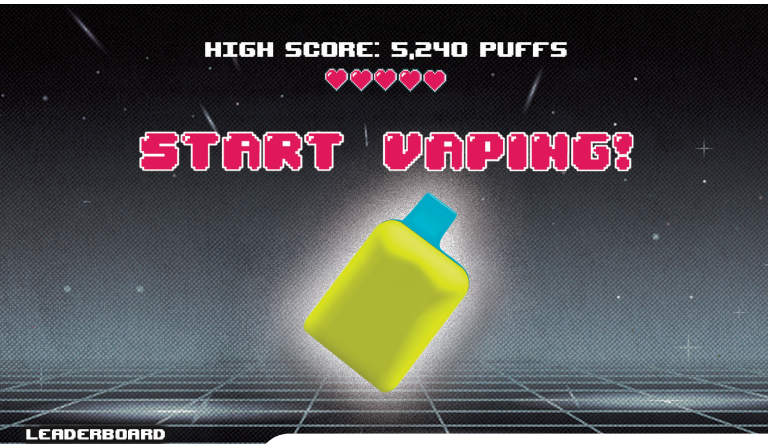
Vapes often have additives that can pose serious health risks for youth.

- New onset of seizures
- Cavities and gum disease

Understand the Popularity Among Youth

The popularity of vaping among youth is due to any combination of factors which include:

- most vapes having various flavors that youth find attractive
- some vapes costing less than regular cigarettes or users receiving price incentives or free samples[40]
- social influences and use of online or social media strategies to bypass in-store age verification[40]
- sleek and modern design of devices, featuring bright colors to give a less harmful appearance
- positioning of products at festivals and within digital games,[41, 42] and
- using similar predatory marketing tactics by tobacco companies with vapes like appealing flavors, advertisements or promotions in retail settings normalizing use, using bright colors and models.[40, 43]



Some vaping devices use illegal gaming elements to encourage and increase use.

More on the Gamification of Vaping

- Popularizes vaping through engaging features, competition, reward system, and collecting devices.
- Includes entertainment that is more appealing to teens, e.g., virtual pets or video games.[44]
- Accelerates the risk of nicotine addiction combining the behavioral addiction of both nicotine and gaming.
- Contributes to decline of physical activity and healthy cardiorespiratory fitness.[18]

Although FDA has authorized some e-cigarettes for sale, popular unauthorized vapes with gaming features, or those that come in flavors that may be attractive to youth, are on the market illegally. The FDA and its federal partners are addressing this issue through a wide range of actions, such as regularly seizing millions of unauthorized vapes at ports of entry and issuing monetary penalties to retailers violating the law.[6]

Get Informed

Would you like more information?

- Vapes: real facts - The Real Cost
- E-cigarettes (Vapes)
- Youth and Smoking
- Infographics: The Risks of Vaping,

Vaping Misperceptions, Talk to Kids About the Risks of Vaping, 2024 NYTS MMWR on E-cigs and Nicotine Pouches

Are you a parent, guardian, or caregiver?

- Check out the American Lung Association's course on Talking to Your Child about Vaping
- For families helping young people: text "QUIT" to 202.899.7550

Are you an educator who would like resources for your classroom or school?

- CDC's Empower Vape-Free Youth Campaign
- FDA's Vaping Prevention and Education Resource Center and Vaping and E-cigarettes: a Toolkit for Working with Youth

Interested in getting trained in tobacco product cessation interventions?

- USPHS-Rx for Change: Tobacco Cessation Intervention Program
- American Lung Association: Multiple Cessation Facilitator and Quit Programs

Additional Resources

Are you or do you know someone who is ready to quit vaping or smoking?

- Speak to a doctor, pharmacist, or tobacco treatment specialist about treatment options
- Ask trusted friends and family for support
- Visit teen.smokefree.gov and teen.smokefree.gov/quit-vaping
- Call the CDC Quitline at: 1-800-QUIT-NOW
- Text DITCHVAPE to 88709
- Try the American Lung Association's Not-on-Tobacco Program: Teen Smoking and Vaping Cessation Program or the mobile-friendly version, Not for Me
- Nonprofit organization committed to nicotine and tobacco cessation: truthinitiative.org

Are you a health professional or provider?

- Act-Counsel-Treat: Quick Reference Guide by the American Lung Association
- USPHS Tobacco Cessation and Counseling Billing Toolkit
- Penn State Nicotine Dependence Index to measure nicotine dependence

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