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What Do We Know About E-cigarettes?

E-cigarettes are known by many different names, and sometimes people find it hard to understand what is really known about these devices. Here we address some of the common questions people ask about e-cigarettes.

You can also find shortened versions of this information in our handouts for parents and youth:

- [Questions and Answers About E-cigarettes for Parents¹](#)
- [What You Need to Know About E-cigarettes: For Middle and High School Students²](#)

What are e-cigarettes?

E-cigarettes are known by many different names, including e-cigs, electronic nicotine delivery systems (ENDS), alternative nicotine delivery systems (ANDS), e-hookahs, mods, vape pens, vaporizers, vapes, and tank systems.

E-cigarettes are available in many shapes and sizes. They can look like cigarettes, cigars, pipes, pens, USB flash drives, or may be in other forms.

E-cigarettes include a battery that turns the device on, a heating element that heats the e-liquid and turns it into an aerosol of tiny particles (sometimes called a “vapor”), a cartridge or tank that holds the e-liquid, and a mouthpiece or opening used to inhale the aerosol.

E-cigarettes do not contain tobacco, but many of them contain nicotine, which comes from tobacco. Because of this, the Food and Drug Administration (FDA) classifies them as “tobacco products.”

What is vaping?

The use of e-cigarettes is often referred to as “vaping” because many people believe e-cigarettes create a vapor, which is then inhaled. But in fact, e-cigarettes produce an aerosol made up of tiny particles, which is different from a vapor.

What is JUUL or JUULing?

“JUULing” refers to using one brand of e-cigarette called JUUL, which has been popular among kids, teenagers and young adults. All JUULs contain nicotine. JUULs and similar devices are typically small, sleek, high tech-looking, and easy to hide. They look like USB flash drives and can be charged in a computer. They can be hidden in the palm of the hand and are hard to detect because they give off very little vapor or smell. Kids and teenagers are known to use them in school restrooms and even in the classroom.

How do e-cigarettes work?

E-cigarettes heat a liquid – called e-liquid or e-juice – to turn it into an aerosol (sometimes called a “vapor”). E-cigarette users inhale this into their lungs.

Do e-cigarettes (including JUULs) contain nicotine?

The e-liquid in most e-cigarettes contains nicotine, the same addictive drug that is in regular cigarettes, cigars, hookah, and other tobacco products. However, nicotine levels are not the same in all types of e-cigarettes, and sometimes product labels do not list the true nicotine content.

JUULs typically have a significantly higher amount of nicotine per puff than some other types of e-cigarettes and cigarettes. Because of this, JUUL and JUUL-like products may be more addictive than other types of e-cigarettes. Some kids have become physically dependent on nicotine by using these products.

There are some e-cigarette brands that claim to be nicotine-free but have been found to contain nicotine.

What is in the aerosol (“vapor”) of an e-cigarette?

Although the term “vapor” may sound harmless, the aerosol that comes out of an e-cigarette is not water vapor and can be harmful. The aerosol from an e-cigarette can

contain nicotine and other substances that are addictive and can cause lung disease, heart disease, and cancer.

Again, it is important to know that most e-cigarettes contain nicotine. There is evidence that nicotine harms the brain development of teenagers. If used during pregnancy, nicotine may also cause premature births and low birthweight babies.

Besides nicotine, e-cigarettes and e-cigarette vapor typically contain propylene glycol and/or vegetable glycerin. These are substances used to produce stage or theatrical fog which have been found to increase lung and airway irritation after concentrated exposure.

In addition, e-cigarettes and e-cigarette vapor may contain the chemicals or substances listed below.

- **Volatile organic compounds (VOCs):** At certain levels, VOCs can cause eye, nose and throat irritation, headaches and nausea, and can damage the liver, kidney and nervous system.
- **Flavoring chemicals:** Some flavorings are more toxic than others. Studies have shown that some flavors contain different levels of a chemical called diacetyl that has been linked to a serious lung disease called bronchiolitis obliterans.
- **Formaldehyde:** This is a cancer-causing substance that may form if e-liquid overheats or not enough liquid is reaching the heating element (known as a “dry-puff”).

The FDA does not currently require testing of all the substances in e-cigarettes to ensure they are safe. It's also hard to know exactly what chemicals are in an e-cigarette because most products do not list all of the harmful or potentially harmful substances contained in them. Some products are also labeled incorrectly.

It's important to know the US Centers for Disease Control and Prevention (CDC) has stated that sometimes e-cigarette products are changed or modified and can have possibly harmful or illegal substances from unknown sources. You can read more about this statement on the [CDC newsroom page](#)³.

What are the health effects of e-cigarettes?

E-cigarettes are still fairly new, and more research is needed over a longer period of time to know what the long-term effects may be. The most important points to know are that the long-term health effects of e-cigarettes are still unknown, and all tobacco

products, including e-cigarettes, can pose health risks to the user.

For more information, see [Health Risks of E-cigarettes⁴](#).

The American Cancer Society is closely watching for new research about the effects of using e-cigarettes and other new tobacco products. (See "What is in the aerosol ("vapor") of an e-cigarette?" and "Do e-cigarettes [including JUULs] contain nicotine?")

What is known about the use of e-cigarettes by youth?

No youth, including middle schoolers and high schoolers, should use e-cigarettes or any tobacco product. (See "What is in the aerosol ("vapor") of an e-cigarette?")

It is important to know that most e-cigarettes contain addictive nicotine. There is evidence that nicotine harms the brain development of teenagers.

Some studies have shown that vaping by some youth may be linked to later use of regular cigarettes and other tobacco products. Using e-cigarettes may play a part in some kids or teens wanting to use other, more harmful tobacco products.

JUUL has been a favorite e-cigarette product among young people. Kids and teenagers are known to use them in school restrooms and even in the classroom.

The FDA has the authority to regulate all tobacco products, including e-cigarettes. The FDA is working on several options to prevent youth access to e-cigarettes, such as recent legislation to raise the minimum age for the sale of tobacco products.

Does e-cigarette use cause cancer?

Scientists are still learning about how e-cigarettes affect health when they are used for long periods of time. It's important to know that the aerosol ("vapor") from an e-cigarette contains some cancer-causing chemicals, although in significantly lower amounts than in cigarette smoke.

Can e-cigarettes explode?

There have been reports of e-cigarettes exploding and causing serious injuries. Usually the explosions are caused by faulty batteries or because the batteries were not handled as they should be. Visit the [Food and Drug Administration website⁵](#) for safety tips to

help avoid an e-cigarette battery explosion.

Is exposure to secondhand e-cigarette aerosol harmful?

Although e-cigarettes do not give off smoke like tobacco cigarettes, they do expose people to secondhand aerosol or "vapor" that may contain harmful substances. Scientists are still learning about the health effects of being exposed to secondhand e-cigarette aerosol.

The smoke-free and tobacco-free policies at schools, businesses, healthcare institutions, and other organizations should also cover e-cigarettes. This will help non-users avoid being exposed to potentially harmful e-cigarette aerosol.

Can e-cigarettes help people quit smoking (known as smoking cessation)?

E-cigarettes are not currently approved by the FDA as aids to help stop smoking. This is because there's just not enough research or evidence yet. On the other hand, there is a large body of evidence clearly showing that FDA-approved medications are safe and effective ways to help people quit smoking, especially when combined with counseling.

Some people who smoke choose to try e-cigarettes to help them stop smoking. Stopping smoking clearly has well-documented health benefits. But switching to e-cigarettes still exposes users to potentially serious ongoing health risks. It's important to stop using all tobacco products, including e-cigarettes, as soon as possible both to reduce health risks and to avoid staying addicted to nicotine. If you're having trouble quitting e-cigarettes on your own, get help from your doctor or from other support services, such as your state quitline (1-800-QUIT-NOW) or the American Cancer Society (1-800-ACS-2345).

People who have already switched completely from smoking to e-cigarettes **should not** switch back to smoking (either solely or along with e-cigarettes), which could expose them to potentially devastating health effects.

Some people who smoke choose to use both cigarettes and e-cigarettes at the same time on an ongoing basis, whether they are trying to quit or not. This is known as "dual use." The dual use of e-cigarettes and tobacco cigarettes can lead to significant health risks because smoking any amount of regular cigarettes is very harmful. People should not use both products at the same time and are strongly encouraged to completely stop using all tobacco products.

Where can I find more information about e-cigarettes?

To learn more about e-cigarettes, here are resources from the American Cancer Society and the FDA.

- [American Cancer Society Position Statement on Electronic Cigarettes](#)⁶
- [American Cancer Society Public Health Statement on Eliminating Combustible Tobacco Use in the United States](#)⁷
- FDA announcement: [FDA launches new, comprehensive campaign to warn kids about the dangers of e-cigarette use](#)⁸
- FDA information: [Vaporizers, E-Cigarettes, and other Electronic Nicotine Delivery Systems \(ENDS\)](#)⁹

To learn more about tobacco and its health effects, see [Tobacco and Cancer](#)¹⁰.

Hyperlinks

1. </content/dam/cancer-org/cancer-control/en/booklets-flyers/questions-and-answers-about-e-cigarettes-for-parents.pdf>
2. </content/dam/cancer-org/cancer-control/en/booklets-flyers/what-you-need-to-know-about-e-cigarettes-for-middle-and-high-school-students.pdf>
3. www.cdc.gov/media/
4. www.cancer.org/healthy/stay-away-from-tobacco/health-risks-of-tobacco/health-risks-of-e-cigarettes.html
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