

# E-Cigs – Safe or Not?

## Are e-cigarettes a better alternative?



Cigarettes are less popular, but e-cigarettes are becoming more popular, especially with teens. E-cigarettes are being sold as a safer and cooler alternative to tobacco cigarettes. In 2014, there were 4 million e-cigarette users in the US. E-cigarettes will outsell cigarettes by 2023 ("So Your Teenager Is Vaping E-Cigarettes – Should You Worry?"). E-cigarette use in teens doubled between 2011 and 2012 ("E-Cigarette Pros and Cons"). E-cigarettes can easily be bought by teens in some areas. In other areas they can be purchased online. E-cigs are sold in colors and flavors such as s'mores, chocolate, and taffy to appeal to a younger audience. However, the safety of e-cigarettes is unknown, and there is not much research. Inside the e-cig, there is a battery, a heating element, and a cartridge that holds nicotine or other liquids and flavorings. The heating element boils the liquid until it produces a vapor just like steam on a stove. E-cigs produce a vapor (a gas). An e-cigarette starter kit costs between \$30 and \$100. E-cigarettes are about \$1000-

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\$2000 per year cheaper than smoking tobacco.

(Neporent, "5 Things to Know About E-Cigarettes").

E-cigarettes may be safer than tobacco because they do not produce smoke. They do not have the dangers of **secondhand smoke** for people nearby, and they do not stink, stain clothing, or stain hands and teeth like tobacco cigarettes. E-cigarettes may be a safer alternative to cigarettes for smokers. Some think that e-cigarettes could help smokers to quit. Although e-cigarettes still contain nicotine, they do not contain many of the **carcinogens** (cancer causing chemicals) such as carbon monoxide, tar, arsenic, ammonia, cyanide, and acetone. They usually contain propylene glycol, vegetable glycerin, nicotine, flavoring ("E-Cigarette Pros and Cons"). Boston University School of Public Health stated, "few if any chemicals at levels detected in electronic cigarettes raise serious health concerns." ("E-Cigarette Pros and Cons").

E-cigarettes are readily available, cheaper than tobacco, and thought to be safer than tobacco cigarettes, but they still have risks. E-cigarettes still contain nicotine, like tobacco cigarettes, which is **addictive**. A user will still get withdrawal symptoms. E-cigarettes can be a gateway drug that people start using, and then use other drugs. Using e-cigarettes may make smoking more popular again. There have been

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cases of the propylene glycol in the e-cigarette causing dehydration. There is also a risk of the batteries exploding and injuring the mouth, teeth, and tongue. Although e-cigarettes contain hazardous chemicals, there are much lower levels than in tobacco cigarettes. Since e-cigarettes are not regulated, we do not really know how harmful they are, or could be. Not all E-cigarettes are especially dangerous for people with heart conditions and for the teenage brain (Feldhausen, "Explainer: The nico-teen brain").

For children and teens, e-cigarettes could affect brain development. Nicotine can reach the brain within seven seconds of puffing on a cigar, hookah, cigarette, or e-cig (Feldhausen, "Explainer: The nico-teen brain"). The area of the brain known as the **prefrontal cortex**, controls emotions and impulses. This section of the brain is still developing until age 25, and affected by nicotine. Nicotine releases special **receptor molecules** in the brain. These receptor molecules release **signaling molecules** such as dopamine. When the signaling molecules travel to the neighboring nerve cell and deliver their message, the user gets a "high."

However, after repeated exposure, these nerve cells can change. The brain and body is less able to

release these chemicals on its own. It gets used to getting this 'high' only from the nicotine. Since teenage brains are still growing, the brain actually grows additional receptor molecules because of the large amount of nicotine. Therefore, to get the same 'high,' users will have to use more nicotine. These changes in the brain can cause long-term depression, anxiety, and difficulty focusing for teens.

The long-term risks of e-cigs and the risks of secondhand exposure to e-cigs are unknown. They are a new product, and have not been studied very much. Tobacco (containing nicotine) causes cancer (is a carcinogen). However, it is unknown if nicotine is a carcinogen alone. Because e-cigarettes are not regulated, when you buy an e-cigarette, you do not really know what you are getting. The Federal Drug Administration is starting to **regulate** e-cigs. Some major cities have outlawed e-cig smoking in public places (Neporent, "5 Things to Know About E-Cigarettes"). However, for now, e-cigs are not very regulated, and are a fast growing product, particularly for teens. Are they a safe choice?

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