



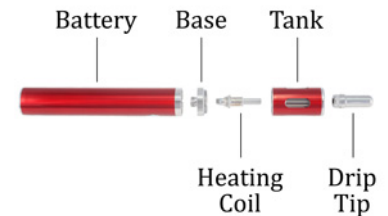
Basic Health Info

Should You Vape?

By Chet Zelasko, PhD

The appeal of e-cigarettes is that they seem to be safe—you're not actually burning tobacco with its associated chemicals and inhaling that into your lungs. E-cigarettes remove all that bad stuff and associated negative health effects. Or do they?

An electronic cigarette or e-cigarette is a nicotine-delivery system. There are three essential components: the nicotine source, a heat source used to vaporize the liquid source of nicotine, and a power source in the form of a battery. The last two are pretty straightforward. The heat has to get high enough fast enough to vaporize the fluid quickly, hence the term vaping instead of smoking.



The nicotine source provides the drug. That's correct: nicotine is a drug, one of the most addictive drugs sold. The reasoning behind vaping is that you can obtain the drug without the gamut of other substances found in regular cigarettes. Is that completely true?

The problem is that we just don't know, because the liquids that contain the nicotine are not tested for safety. Many brands add flavorings to the liquid. While fruits may seem to be great flavors, when the juice is burned, the by-products may not be healthy even if sourced from organic plants. The digestive process is not the same as inhaling the vapors of burning liquids. I'm not saying it's not safe; we just don't know due to the lack of testing. If you're inhaling something into your lungs, and subsequently the rest of your body, wouldn't you want to know that it's safe?

The logic behind the use of e-cigarettes is that they're better than traditional cigarettes and that vaping will help people quit smoking. Let's take a look.

The major benefit attributed to e-cigarettes is less exposure to toxic chemicals resulting in fewer harmful effects compared to smoking tobacco. It makes sense to avoid the chemicals that could be found in the soil and on the leaves; harvesting and processing won't remove those from tobacco products. In a few of the studies on chemicals found in the nicotine liquid, some metals such as cadmium, aluminum, and nickel were identified as well as the expected ingredients such as glycol and polyethylene glycol from glycerin usually found in e-cigarette liquid as a propellant (1). We don't know whether they're harmful; we just know that they're there. But there appear to be no pesticides, tar, or heavy metals as are often found in regular cigarettes.

What about vaping and quitting smoking? Opinions vary. A lot. The United Kingdom just released a report recommending e-cigarettes as part of a smoking-cessation program. One of the keys to their recommendation was that e-cigarettes are 95% less harmful than traditional cigarettes. In the U.S., healthcare professionals are less likely to endorse that position. A recently published study suggested that vaping may lead to smoking traditional cigarettes in teenagers (2); this small study was done in a Los Angeles school district. But two opinion pieces accompanied the research paper: concerns about e-cigarettes and the lack of research on health risks, and a concern that it may initiate nicotine addiction that proceeds to traditional cigarette use in young people.

The Effects of Vaping vs. Smoking

The research on nicotine from vaping shows that in addition to be highly addictive, it may also be bad for the cardiovascular system. In a small study, researchers examined the effects of traditional cigarettes and e-cigarettes on 40 volunteers (3). The most concerning finding is that both types of cigarettes interfered with the nitric oxide system, the system responsible for dilating blood vessels, especially in the cardiovascular system. Without the ability to dilate blood vessels when needed, the heart is stressed. While not as bad as traditional cigarettes, e-cigarettes had the same negative effect although to a lesser degree.

When the European Respiratory Society held their 2017 convention, important new research was introduced on e-cigarettes and vaping. In the first study (4), researchers recruited 15 subjects who had smoked cigarettes occasionally, fewer than 10 per month; subjects had also never used e-cigarettes. They were asked to smoke e-cigarettes for 30 minutes in a random order on different days; once with nicotine, the other without. The researchers measured blood pressure, heart rate, and arterial stiffness immediately after smoking the e-cigarettes and then two and four hours later. In the first 30 minutes after smoking e-cigarettes with nicotine, there was a significant increase in blood pressure, heart rate, and arterial stiffness. That didn't happen after the e-cigarettes without nicotine. While this is a small pilot study, it seems that vaping nicotine can impact the cardiovascular system in the same way regular cigarettes do.

The second study presented at the European Respiratory Conference on e-cigarettes that caught my attention was a study done in Sweden (5). Researchers questioned over 30,000 people, randomly selected from the Swedish population. The purpose was to ask the subjects about smoking: did they smoke, what did they smoke, and what type of respiratory symptoms did they have? Only 12.6% of those surveyed said they smoked, and the numbers broke down this way: 11% smoked only conventional cigarettes, 0.6% vaped only, and 1.2% said they used both. Researchers speculated they smoked cigarettes when allowed and vaped in public or other settings.



What about respiratory conditions? As you might expect, the highest percentage of respiratory issues came from those subjects who smoked both conventional and e-cigarettes at 56%; 46% of those who smoked only cigarettes had respiratory issues, and 34% of those who exclusively used e-cigarettes. Only 24% of non-smokers had respiratory conditions. The results clearly show that vaping causes the same respiratory issues such as wheezing or productive coughs as might be found in tobacco cigarettes.

Vaping e-cigarettes is supposed to be better than smoking cigarettes because the toxic chemicals will be gone. That may be true for the chemicals released from tobacco and paper, but the third area of concern is the e-liquids that make up the flavor component of e-cigarettes. The marketing tactic often focuses on the variety of flavors available. The question is this: are they safe or do they contain chemicals that could negatively impact the lungs?

Researchers obtained a random sample of e-cigarette liquids from the most popular brands on sale in Greece, Spain, Germany, the Netherlands, the UK, Hungary, Romania, Poland, and France. The samples included a variety of different flavors and nicotine strengths. They analyzed each sample to find out exactly which chemicals were present and in what quantities (6). Every liquid container that they tested contained at least one substance that has some level of health risk according to the United Nations classification system. The chemicals, with long complex names, can cause respiratory irritation, allergy or asthma symptoms, or breathing difficulties if inhaled. What they might do when heated is still to be determined.

In another recent study, researchers examined the sputum of non-smokers, e-cigarette users, and cigarette smokers (7), specifically the proteins involved with oxidative stress, chronic obstructive pulmonary disorder, immune function, and sputum thickness. For every class of proteins examined, the production of proteins in

vapers mimicked the response in cigarette smokers; that means that e-cigarette smokers showed similar potential for lung damage as those who smoked tobacco cigarettes.

Meanwhile There's the FDA—or Not

E-cigarettes probably never will be tested, at least in the U.S. In July 2017, the new head of the FDA Dr. Scott Gottlieb announced that he was suspending laws that govern e-cigarettes for five years. In the last administration, the governance over e-cigarettes was turned over to the FDA where they enacted restrictions that insisted the products be tested for safety before being brought to market. Those rules have been suspended so the industry could have time to set standards and comply with tobacco regulations.

I read Dr. Gottlieb's ruling. As a physician who has treated cancer patients, he has seen what cigarettes do first hand. His belief is that nicotine addiction is the primary issue and that vaping may help people quit smoking by using these products to help reduce reliance on nicotine. Gottlieb seems to believe that nicotine, while still addictive, does not kill people; it's the 5,000 other chemicals in cigarettes that do. I simply do not understand his reasoning. There are hazards to nicotine, as the research has shown. There are chemicals in the e-liquids that have not been identified, have not been tested, and we have no history with their use to investigate. How do we know what health issues we're facing without finding answers to those questions?

One more thing: Dr. Gottlieb is an investor in a vaping products company called Kure. He has said that he will divest his interest and recuse himself from decisions on vaping for one year. I guess physician years are like dog years; he seems to have made a big decision on vaping after being in office just a few months.

The Bottom Line

As a former smoker, I understand the addiction. If vaping products had been available when I quit, maybe I would have used them. As a healthcare professional today, there is not a chance. We're talking about inhaling substances that have never been subjected to any form of safety or toxicity testing. It's unreasonable to do that. The studies clearly show there is doubt. We know how long it took the tobacco industry to finally admit that tobacco was addictive when they had the data all along. The e-cigarette industry has no data at all.



The easiest recommendation on vaping would be to wait until there's more research. That's just too easy, so the bottom line is this.

- If you smoke cigarettes, and you want to try e-cigarettes as a step in quitting nicotine altogether, do it.
- If you smoke cigarettes and you want to switch to e-cigarettes to get the nicotine without the other chemicals of traditional smoking, do it. While we don't know everything, if nothing else it reduces exposure to the highly toxic chemicals in traditional cigarettes.
- If you don't smoke, don't try it—no matter what your age.

This might be a good opportunity to open the discussion with your kids, and you can pass this info along to them. Nicotine is addictive and based on the current research, it's not as benign as some people think. You never have to worry about quitting if you never begin.

References

1. Rev Environ Health. 2016 Apr 21.
2. JAMA. 2015;314(7):700-707.
3. Chest. 2016 Apr 21.
4. European Respiratory Society. 2017. Abstract OA1979.
5. European Respiratory Society. 2017. Abstract PA4485
6. European Respiratory Society. 2017. Abstract OA1978.
7. <https://doi.org/10.1164/rccm.201708-1590OC>.

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