



This family education sheet was created by Boston Children's Hospital's Adolescent Substance Use and Addiction Program (ASAP). The aim is to see how much you already know about nicotine vaping and to give you some important information about what's true and not true about vaping.

Question 1

Smoking causes lung, mouth, throat, bladder, pancreas and kidney cancer. Does vaping also cause cancer?

- A. No
- B. Yes
- C. Probably

Answer: C. Probably.

Vape aerosols contain many of the same cancer-causing chemicals as cigarettes. Companies that make and sell e-cigarettes *claim* that vaping is safer than smoking because vape aerosol in general has lower concentrations of these chemicals compared to cigarette smoke, but this claim is only part of the story. Vape aerosol also has thousands of chemicals that are harmful to your health and that aren't in cigarette smoke. Some of these chemicals exist in very high concentrations (amounts).

Cancer takes years to develop and vapes have not been around that long. Scientists are doing research on this, but it will take some time to get a clear picture of the risk of cancer from vaping.

This is especially troubling because vaping as a teen seems to be a pathway to nicotine addiction. That means that there's a higher possibility that someone who starts out just vaping is likely to increase their habits and inhale (breathe in) more cancer-causing chemicals over a time. There's also a risk of inhaling cancer-causing chemicals when vaping "nicotine-free" liquid. This is especially true when flavoring or additives are involved.

Dierker L, Rose J, Selya A, Piasecki TM, Hedeker D, Mermelstein R. Depression and nicotine dependence from adolescence to young adulthood. Addict Behav. 2015; 41: 124-128. doi: 10.1016/j.addbeh.2014.10.004

Question 2

Is vaping safer than smoking?

- A. Yes
- B. No

Answer: B. No.

Companies that make e-cigarettes *claim* they are safer than smoking, but there's no scientific evidence that this is true. Doctors and scientists have found more and more links between vaping and medical problems in the past few years since vaping has become popular. These include lung injuries and neurological problems like addiction, trouble concentrating and problems with cognitive skills (thinking). **FOR PEOPLE WHO DON'T SMOKE, VAPING IS DEFINITELY MORE DANGEROUS THAN NOT USING NICOTINE AT ALL.**

Villar PG, Alhasan F, Lippmann S. Vaping: Safer Than Smoking?. South Med J. 2020; 113(3): 146. doi: 10.14423/SMJ.000000000001069, <https://www.nejm.org/doi/full/10.1056/nejmoa1911614><https://www.ccjm.org/content/86/12/789.long>

Question 3

True or False: By 12th grade, most kids have tried vaping.

- A. True
- B. False

Answer: B. False.

47% of high school seniors said in a 2020 study that they had vaped in their lifetime. This makes it clear that vaping is happening. But most high school seniors (53%) have never tried vaping. The number of high school students who vape has actually been leveling off over the past 2 years. This means that vaping is becoming less popular.

Miech RA, Johnston LD, O'malley PM, Bachman JG, Schulenberg JE, Patrick ME. Monitoring the Future National Survey Results on Drug Use, 1975–2019: Volume I, Secondary School Students.; 2020.

<http://monitoringthefuture.org/pubs.html#monographs>, <http://monitoringthefuture.org/data/20data/table1.pdf> <https://www.drugabuse.gov/drug-topics/related-topics/trends-statistics/infographics/monitoring-future-2020-survey-results>. Accessed January 25, 2021.

Question 4

How does nicotine make people feel?

- A. Nicotine helps people focus.
- B. Nicotine makes people happy.
- C. Nicotine makes people relaxed.

Answer: D. All of the above—for a short time. But read on ...

Nicotine can have all of these effects on people when they start using it. But **it can have the opposite effects over time**. Nicotine makes it hard to concentrate once someone has been using it for a little while. This makes people who use it more likely to be depressed and feel irritable.

Nicotine is a stimulant. This means that its main effects are higher heart rate, alertness and blood pressure. Many people feel more focused with nicotine at first. But in high doses, it can cause the opposite effect and nicotine can make it hard for people to concentrate. This can be a big problem for people with ADHD. They may find that their symptoms are worse, and their usual medication doesn't work as well if they are using nicotine regularly.

Nicotine also raises the brain concentration of "happy chemicals" (dopamine, serotonin, endorphins). This gives users a pleasant or happy feeling for a short time. But this good feeling doesn't last very long. People who use nicotine for a longer time are more likely to be depressed.

Nicotine also causes a lot of "downstream" chemical release. Nicotine raises levels of both epinephrine and acetylcholine in the body. These are thought of as the "yin and the yang" of the autonomic nervous system. Higher levels of these chemicals affect different people in different ways.

Some people use nicotine to relax. But the relaxation tends to be brief and is very quickly replaced by irritability when the nicotine wears off.

Dierker L, Rose J, Selya A, Piasecki TM, Hedeker D, Mermelstein R. Depression and nicotine dependence from adolescence to young adulthood. Addict Behav. 2015; 41: 124-128. doi: 10.1016/j.addbeh.2014.10.004

Question 5

Is vaping nicotine as addictive as smoking cigarettes or using other tobacco products?

- A. Cigarettes are more addictive than vapes
- B. Cigarettes and vapes are equally addictive
- C. Vapes are more addictive than cigarettes

Answer: C. Vapes are more addictive than cigarettes.

Nicotine is highly addictive. E-cigarettes deliver a big “blast” of nicotine in the first few puffs. This gives users a “head buzz.” E-cigarette manufacturers have also found ways of changing the nicotine to make it easier for the body to absorb. This means that the nicotine blast from a puff of an e-cigarette can be much stronger than from a regular cigarette. Bigger blasts are more addictive. This means that vaping is actually *more* addictive than smoking or using other tobacco products.

Nicotine is poisonous in very high doses. Vaping can cause you to have a headache and/or feel dizzy and nauseated. Some people talk about this as being “nic sic.” These are actually symptoms of nicotine poisoning.

https://www.nejm.org/doi/10.1056/NEJMra0809890#article_citing_articles <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6651627/>
<https://pubmed.ncbi.nlm.nih.gov/31848312/>

Questions are adapted from: <https://teens.drugabuse.gov/quiz/national-drug-alcohol-facts-week/take-iq-challenge/2021>, and SAMHSA’s “tips for teens” publications. Answers were compiled/edited by the ASAP team at Boston Children’s.

Please visit the ASAP website to learn about our program:

<https://www.childrenshospital.org/programs/adolescent-substance-use-and-addiction-program>