

# Vaping: Know the Facts

A Toolkit for Schools, Parents and Teens



## About the Report

Addiction Policy Forum's educational campaign "Vaping: Know the Facts," aims to correct misinformation, explain the health risks of adolescent vaping, and empower schools, parents, and students to take action. As the real risks of e-cigarettes remain largely misunderstood by adults and teens alike, the campaign boils down the latest research into a digestible format for teens and adults. This toolkit includes videos, fact sheets, lesson plans, and school policy recommendations.

Addiction Policy Forum is a national nonprofit organization dedicated to eliminating addiction as a major health problem. With headquarters in Bethesda, MD, the organization has resources and services in every state.

## Authors

Lisbet Portman, Vice President of Science Translation, Addiction Policy Forum

Jessica Hulsey, Founder, Addiction Policy Forum

# Contents

<b>The Problem</b>	<b>4</b>
E-cigarettes recently surpassed conventional cigarettes as the most commonly used tobacco product among youth.	4
Adolescent nicotine use can increase the risk of substance misuse and addiction, mood disorders, and permanent lowering of impulse control.	6
Severe respiratory illness is associated with the use of vaping products	6
The current vaping epidemic is further complicated by the fact that more adolescents are vaping marijuana.	7
There are significant harms associated with adolescent marijuana use, including an increased risk for developing a substance use disorder, mental health issues, and cognitive impairments.	8
Marijuana use by adolescents and young adults impairs the developing brain	8
<b>Solutions</b>	<b>10</b>
Strategies to Address Vaping for Parents and Caregivers	10
Tools to Address Vaping for School Administrators and Teachers	11
<b>Appendix</b>	<b>12</b>
Video - “Vaping: The Hit Your Brain Takes”	12
Online Courses	13
Sample Parent Advisory	14
Classroom Activities	15
Additional Resources	17

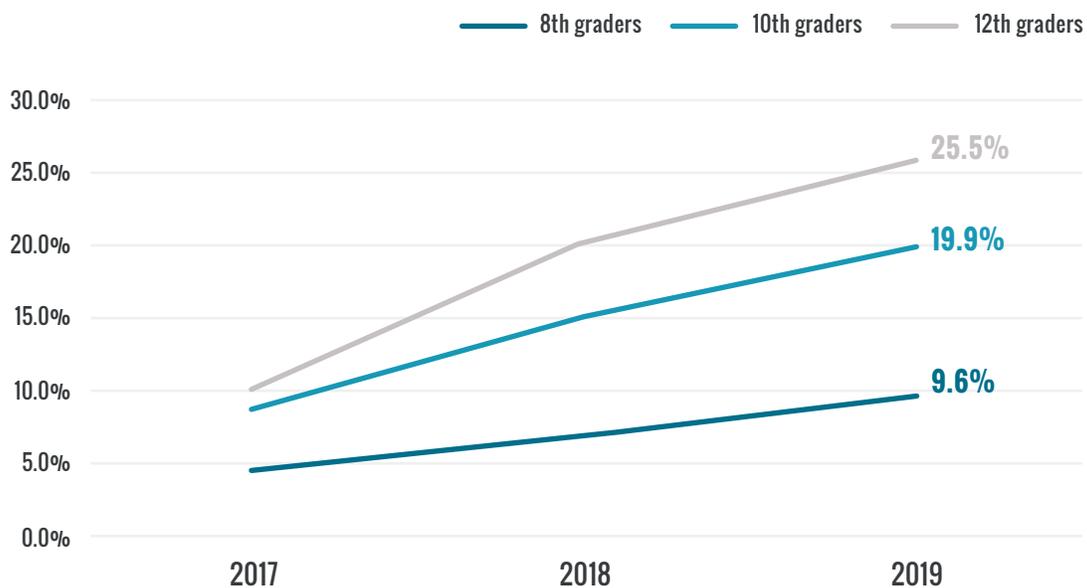
## The Problem

**E-cigarettes recently surpassed conventional cigarettes as the most commonly used tobacco product among youth.**

E-cigarettes were introduced to the U.S. in 2007 and marketed as a healthier alternative to smoking for adults despite lack of research to substantiate such claims. Since then, a culture of vaping has emerged among adolescents.

According to the 2019 Monitoring the Future Survey, vaping of nicotine and marijuana have increased significantly over the past two years. Twenty-five percent of 12th graders reported vaping nicotine in the past month, a 40 percent increase from 2017.<sup>i</sup> E-cigarettes recently surpassed conventional cigarettes as the most commonly used tobacco product among youth.<sup>ii</sup>

Figure 1: Past month nicotine vaping among 8th, 10th and 12th graders, 2017-2019



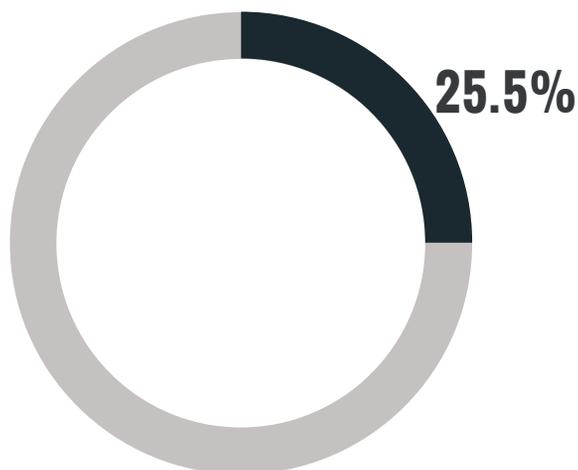
*"Monitoring the Future." National Institute on Drug Abuse, 31 Jan. 2020.*

To date, no e-cigarette or vaping product has undergone a government health and safety review, meaning that all available products are currently unregulated.<sup>iii</sup> Aggressive and falsified marketing has resulted in a misinformed consumer base that is largely unaware of the health risks of vaping and perceive it as a harmless alternative to smoking traditional cigarettes. Although companies claim that they never intended to grow such a following among minors, their marketing activities across youth-specific platforms suggest otherwise.

In contrast, scientists have found harmful ingredients in vapes, including:

- ultrafine particles that can be inhaled deep into the lungs;
- flavorings that are linked to serious lung disease;
- volatile organic compounds (like benzene, which is found in car exhaust)
- and toxic metals, like nickel, tin, and lead.

**Figure 2: Past month nicotine vaping among 12th graders, 2019**



*“Monitoring the Future.” National Institute on Drug Abuse, 31 Jan. 2020.*

Of additional concern are the findings that e-liquids (or “vape juice”) contained in vaping products are not a final product. Reactions that occur as the e-liquid is heated create new molecules and acetals that are not included in the ingredients listed or regulations testing.<sup>iv</sup>

## Adolescent nicotine use can increase the risk of substance misuse and addiction, mood disorders, and permanent lowering of impulse control.

Adolescent attitudes show reduced perceptions of harm comparing vaping to smoking cigarettes. Young people perceive that intermittent use of the following causes little or no harm:

- 9.7 percent for cigarettes
- 12 percent for smokeless tobacco
- 18.7 percent for hookah
- 37.5 percent for e-cigarettes<sup>v</sup>

---

## Young people who vape are 4x more likely to go on to smoke cigarettes than those who don't.

---

Adolescents are uniquely at risk for long-term, long-lasting harms of nicotine, which can change the way synapses are formed, harming the parts of the brain that control attention and learning. Adolescent nicotine use can increase the risk of substance misuse and addiction, mood disorders, and permanent lowering of impulse control. Early nicotine use also makes adolescents more sensitive to other drugs in the future, including traditional cigarettes. Young people who vape are **four times** more likely to go on to smoke cigarettes than those who don't. And Juuling delivers way more nicotine than a combustible cigarette— a single Juul pod is equivalent to 20 cigarettes— which makes all of these risks even more dramatic.

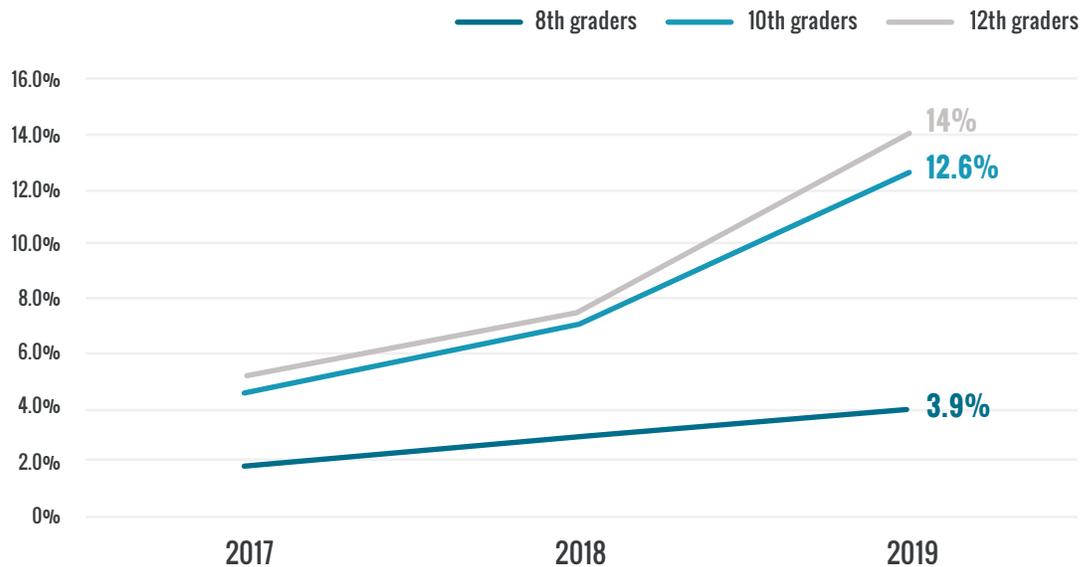
## Severe respiratory illness is associated with the use of vaping products

The 2019 outbreak of vaping-related lung illness (EVALI) brought widespread attention to the risks of vaping and prompted states to take action to reduce access. Gradually, more and more people were hospitalized with symptoms including cough, shortness of breath, chest pain, nausea, vomiting, abdominal pain, diarrhea, fever, chills, and/or weight loss. As of February 18, 2020, the CDC has reported total of 2,807 EVALI cases including 68 confirmed deaths. Recent studies show that vitamin E acetate, an additive in some THC-containing e-cigarette, or vaping, products, is strongly linked to the EVALI outbreak.<sup>vi</sup>

**The current vaping epidemic is further complicated by the fact that more adolescents are vaping marijuana.**

In 2019, 14 percent of 12th graders, 23.6 percent of 10th graders, and 3.9 percent of 8th graders reported vaping marijuana in the past month. These numbers have more than tripled since 2017.<sup>vii</sup>

**Figure 3: Past month THC vaping among 8th, 10th and 12th graders, 2019**



*“Monitoring the Future.” National Institute on Drug Abuse, 31 Jan. 2020.*

**1/5 of 12th graders reported that they had vaped marijuana sometime in the past year, nearly double the year before.**

Marijuana vaping products contain THC, the psychoactive ingredient in cannabis that produces a “high”. It is increasingly the preferred method of using marijuana by adolescents over other methods due to its ease-of-use and more discrete nature.

Vaping produces significantly greater physiological and psychological effects than smoking by delivering more THC per dose.<sup>viii</sup> This raises the potential for negative health effects and adverse reactions, especially for young people.<sup>ix</sup>

**There are significant harms associated with adolescent marijuana use, including an increased risk for developing a substance use disorder, mental health issues, and cognitive impairments.**

It is important to note that the marijuana being used by teens and adults today is not the same drug that existed in the 1970's. Reports indicate that the potency of cannabis has been consistently increasing from 1995-2014; levels of THC (the psychoactive ingredient in cannabis) have increased from 4 to at least 12 percent<sup>x</sup>. Cannabis sold in dispensaries in some states has average concentrations of THC from 17.7 to 23.2 percent. Additional products that are designed to be more concentrated, such as dabs and waxes, may contain between 23.7 and 75.9 percent THC. These high levels of THC pose higher, more dramatic risks to adolescents.

**■ Marijuana use by adolescents and young adults impairs the developing brain**

The adolescent brain is continuously developing until a person is in their early to mid 20s. Early use of any drug, including marijuana, impairs the developing brain and increases the likelihood that a young person will use other drugs and may develop a substance use disorder later in life.

---

**Several studies have linked early marijuana use to increased risk for psychiatric disorders among young people with a family history of mental illness, such as schizophrenia.**

---

One of the last parts of the brain to develop is the prefrontal cortex, the part of the brain that regulates decision making and impulse control. Using marijuana as a teen can harm this part of the brain, leading to impaired memory, problem-solving, and decision-making.<sup>xi</sup> Several studies have linked early marijuana use to increased risk for psychiatric disorders among young people with a family history of mental illness, such as schizophrenia.<sup>xii</sup>

Teens who regularly use marijuana perform worse in school than their classmates who don't, and are more likely to drive while high, which increases the risk of an accident by impairing reaction time and concentration.<sup>xiii</sup>

**Because marijuana is illegal in some states and for minors in all states, many teens use black market products, purchased both online and on the street.** As these vaping products are not regulated, they may contain a variety of unknown chemicals, including thickeners, synthetic marijuana, and even fentanyl, which can be extremely dangerous or deadly. The most commonly discussed ingredient is vitamin E acetate, which the CDC has identified in lung fluid samples of 48 out of 51 EVALI, or vaping-related lung injury, patients in a 2019 study.

In addition to purchasing black market vaping products, teens can also “hack” traditional vaping products to deliver THC. This practice involves disassembling a manufactured vaping product’s pod or cartridge, such as a Juul pod, and adding ingredients including THC oil and other substances. Alternatively, minors can purchase empty cartridges online through third-party retailers. A variety of videos and tutorials are available online that provide instructions for DIY vape hacks and recommended retailers for necessary ingredients and tools. This practice—popular among teens—is dangerous and may lead to a variety of injuries and harmful effects.

# Solutions

---

## Strategies to Address Vaping for Parents and Caregivers

Prevention research has shown that the rules parents and caregivers set at home about substance use has an enormous impact on whether or not teens will experiment with drugs and alcohol.

Steps that parents and caregivers can take:

### 1. Talk about vaping.

The research is clear—talk early and often with your kids about the risks of using alcohol, tobacco, marijuana, and other substances to help prevent use and protect your child. This isn't a one-time chat, but an ongoing dialogue that will change over time. Try to bring it up in casual settings where everyone can talk freely, such as during a meal, on a walk, or while in the car. Share the information above about the risks of vaping or watch the [Vaping: Know the Facts](#) video with your teen and discuss together.

### 2. Set clear expectations of no use.

A key element of prevention is delaying the age of first use, especially while the adolescent brain is still developing until the age of 25. Remind your kids that you expect them not to use nicotine, alcohol or drugs, and be clear about your reasoning. Don't assume they know what you are thinking.

### 3. Establish clear consequences.

Be clear, consistent, and specific about what the immediate consequences of substance use are in your family. Rather than saying “you'll be grounded” or “you'll be in big trouble,” be specific: *If you vape, then the consequence will be X for Y amount of time.* On the flip side, remember to reward your child for healthy behaviors and positive decision-making.

## ■ Tools to Address Vaping for School Administrators and Teachers

Schools have an important role to play in helping to curb the teen vaping epidemic. This toolkit focuses on how to respond to vaping on a school campus, both prevention and intervention strategies. Whether your school has specific policies and procedures in place, this toolkit contains information schools can use to initiate a coordinated response.

Key strategies to implement include:

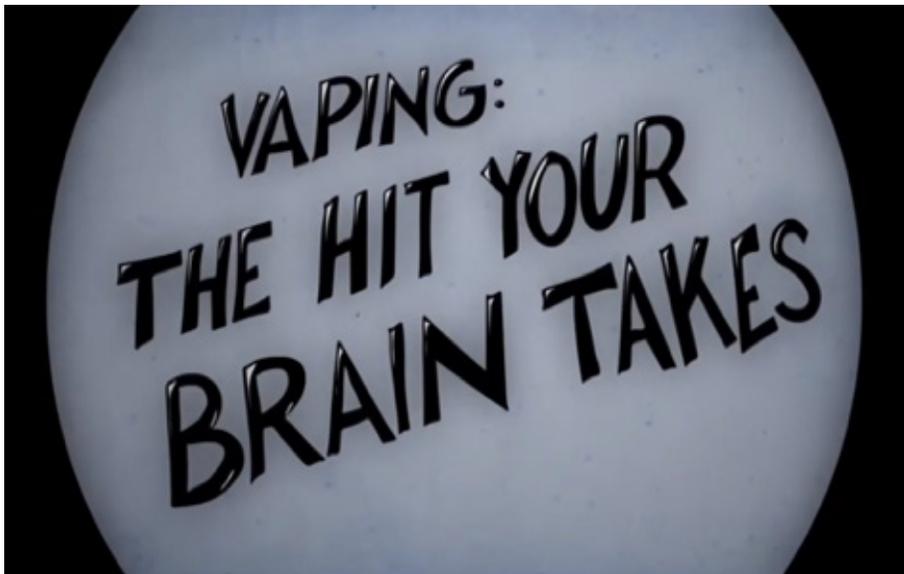
1. Create a clear policy for your campus.
2. Send out a parent advisory to inform and educate parents and caregivers. ([Appendix: Sample Parent Advisory](#))
3. Use the Classroom Activities and *Vaping: The Hit Your Brain Takes* Video to educate students about vaping. ([Appendix: Classroom Activity](#))
4. Implement an intervention policy that aims to engage students in immediate treatment for nicotine use disorder and an education plan. Whether a student is caught vaping or in possession of a vaping product, this is an opportunity to help educate teens about e-cigarettes and prevent substance use from progressing. ([Appendix: Detention Intervention](#))
5. Assign a campus-wide assignment to complete a free online course about vaping. Students will learn the basic brain science of addiction, how vaping affects the adolescent brain and lungs, and research that dispels common myths about vaping. ([Appendix: Online Course](#))

## Appendix

---

### ■ Video - “Vaping: The Hit Your Brain Takes”

Addiction Policy Forum’s “Vaping: The Hit Your Brain Takes” video explains what science says about adolescent e-cigarette use. The video can be used in classrooms, in-school service days, professional development and at PTA meetings. The content was developed in collaboration with educators, students, and experts in adolescent medicine and prevention.



<http://bit.ly/39ODKNU>

### ■ Online Courses

Addiction Policy Forum’s “Vaping: Know the Facts” free, self-paced online courses explain the known harms of adolescent vaping. As these risks remain largely misunderstood by adults and teens alike, these courses clarify the science and debunk common myths surrounding vaping.

## ■ Vaping: Know the Facts for Teens

By participating in this free online course, teens will learn the basic brain science of addiction, how vaping affects the adolescent brain and lungs, and the truth about common myths surrounding vaping and e-cigarettes. To enroll, visit <https://addictionschool.teachable.com/p/vaping-teens>



## ■ Vaping: Know the Facts for Parents

By taking this free online course, parents of and adults who work with pre-teens and teens will learn about why the adolescent brain is more vulnerable to addiction than the adult brain, the known harms of vaping, and strategies to decrease risk and strengthen prevention. <https://addictionschool.teachable.com/p/vaping-parents>



## ■ Sample Parent Advisory

Dear Parents:

Vaping has increased significantly among students nationwide. According to the 2019 Monitoring the Future Survey, vaping of nicotine and marijuana have increased significantly over the past two years. Twenty-five percent of 12th graders reported vaping nicotine in the past month, a 40 percent increase from 2017.<sup>xiv</sup> E-cigarettes recently surpassed conventional cigarettes as the most commonly used tobacco product among youth.<sup>xv</sup>

### Know the Facts

- Scientists have found harmful ingredients in vapes, including ultrafine particles that can be inhaled deep into the lungs; flavorings that are linked to serious lung disease; volatile organic compounds (like benzene, which is found in car exhaust), and toxic metals, like nickel, tin, and lead.
- Young people who vape are *four times* more likely to go on to smoke cigarettes than those who don't. And Juuling delivers a great deal more nicotine than a combustible cigarette— a single Juul pod is equivalent to 20 cigarettes— which makes all of these risks even more significant.
- Adolescent nicotine use can increase the risk of substance misuse and addiction, mood disorders, and permanent lowering of impulse control.

### Take Action

Prevention research has shown that the rules parents and caregivers set at home about substance use has an enormous impact on whether or not teens will experiment with drugs and alcohol. Below are a few action steps you can take at home to protect your teen:

**Talk about vaping.** The research is clear—talk early and often with your kids about the risks of using alcohol, tobacco, marijuana, and other substances to help prevent use and protect your child. This isn't a one-time chat, but an ongoing dialogue that will change over time. Try to bring it up in casual settings where everyone can talk freely, such as during a meal, on a walk, or while in the car. Share the information above about the risks of vaping, or watch the Vaping: Know the Facts video with your teen and discuss together.

**Set clear expectations of no use.** A key element of prevention is delaying the age of first use, especially while the adolescent brain is still developing until

the age of 25. Remind your kids that you expect them not to use nicotine, alcohol or drugs, and be clear about these expectations. Don't assume they know what you are thinking.

**Establish clear consequences.** Be clear, consistent, and specific about what the immediate consequences of substance use are in your family. Rather than saying "you'll be grounded" or "you'll be in big trouble," be specific: *If you vape, then the consequence will be X for Y amount of time.* On the flip side, remember to reward your child for healthy behaviors and positive decision-making.

We hope this information helps to address this issue at home and we will continue to prioritize at school to keep our students healthy and safe. If you have any questions, please let us know.

## ■ Classroom Activities

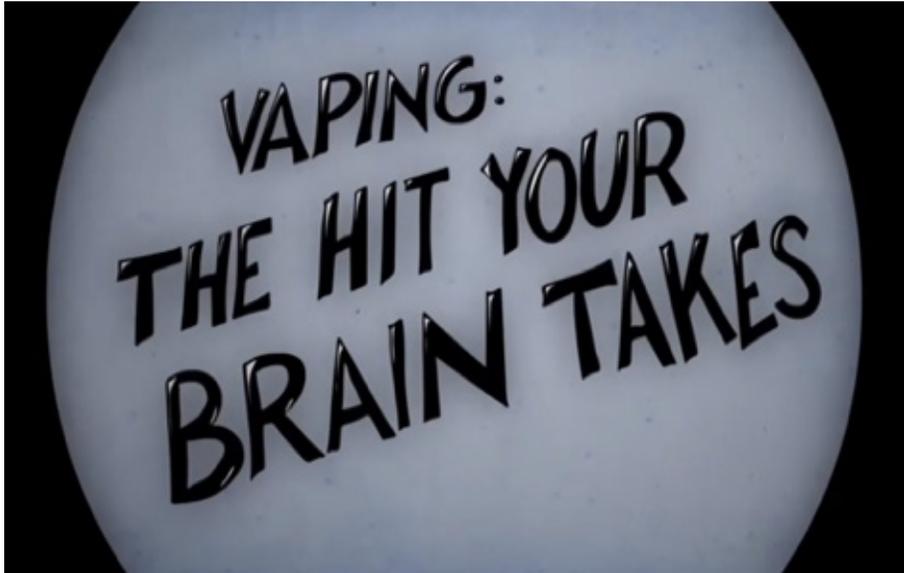
This classroom activity simplifies the science about e-cigarettes and vapes for teens in order to empower students with information and combat the myths perpetuated by the vaping industry.

### GRADE LEVEL: GRADES 6 - 12

#### Video Themes

- 1) Since e-cigarettes were first introduced to the US in 2007, scientists have found harmful ingredients in vapes, including:
  - a) ultrafine particles that can be inhaled deep into the lungs;
  - b) flavorings that are linked to serious lung disease;
  - c) volatile organic compounds (like benzene, which is found in car exhaust)
  - d) and toxic metals, like nickel, tin, and lead.
- 2) In addition to the harmful chemicals found in e-liquid that have been widely covered by the media, adolescents are uniquely at risk for long-term, long-lasting harms of nicotine, which can change the way synapses are formed, harming the parts of the brain that control attention and learning.
- 3) Adolescent nicotine use can increase the risk of substance misuse and addiction, mood disorders, and permanent lowering of impulse control.
- 4) Early evidence suggests that teens who vape are four times more likely to go on to use traditional cigarettes than those who don't.

## Video



<http://bit.ly/39ODKNU>

## Discussion Questions

1. The US Surgeon General declared teen vaping a national epidemic. How have the recent lung illnesses and national discussion changed vaping in our community?
2. There is misinformation that vaping is healthier than smoking tobacco and traditional cigarettes, yet the science says otherwise. What research from the video can help debunk this myth?
3. There are currently no regulations or safety standards for vaping products, which has led to widespread misinformation about its contents and harm for users. How would teens' opinions about vaping change if they knew big tobacco companies were using outlawed advertising tactics formerly used for traditional cigarettes?

## ■ Additional Resources

- [The Vape Talk](#) (American Lung Association)
- [E-cigarettes and Youth: What Parents Need to Know](#) (CDC)
- [Talk with your teen about e-cigarettes: A tip sheet for parents](#) (CDC)
- [Teachers and Parents: That USB Stick Might be an E-cigarette](#) (CDC)
- [Juuling: What Pediatricians and Families Need to Know](#) (American Academy of Pediatrics)
- [Parents: Facts on Teen Drug Use](#) (NIDA)

## ■ Resources to Quit

- [Tobacco Cessation Resources for Youth](#) (American Lung Association)
- [Smokefree Teen](#) (U.S. Department of Health and Human Services)
- [This is Quitting](#) or [BecomeanEx](#). Text “QUIT” to 202-804-9884; Text [DITCHJUUL](#) to 88709 (Truth Initiative)
- [My Life My Quit](#): text “Start My Quit” to 855-891-9989

# Endnotes

- i. Johnston, L. D., Miech, R. A., O'Malley, P. M., Bachman, J. G., Schulenberg, J. E., & Patrick, M. E. (2020). Monitoring the Future national survey results on drug use 1975-2019: Overview, key findings on adolescent drug use. Ann Arbor: Institute for Social Research, University of Michigan. <http://www.monitoringthefuture.org/pubs/monographs/mtf-overview2019.pdf>
- ii. U.S. Department of Health and Human Services, E-Cigarette Use Among Youth and Young Adults. A Report of the Surgeon General. (2016). U. S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health: Atlanta, GA. [https://www.cdc.gov/tobacco/data\\_statistics/sgr/e-cigarettes/index.htm](https://www.cdc.gov/tobacco/data_statistics/sgr/e-cigarettes/index.htm)
- iii. Hajek, P., Phillips-Waller, A., Przulj, D., et al. A Randomized Trial of E-Cigarettes versus Nicotine- Replacement Therapy. (2019) New England Journal of Medicine. <https://www.nejm.org/doi/full/10.1056/NEJMoa1808779>
- iv. Erythropel, H.C., Davis, L.M. et al. (2019). Flavorant–Solvent Reaction Products and Menthol in JUUL E-Cigarettes. American Journal of Preventive Medicine, Volume 57, Issue 3, 425 – 427 <https://doi.org/10.1016/j.amepre.2019.04.004>
- v. Wang, T.W., Trivers, K.F., Marynak, K.L., O'Brien, E.K., Persokie, A., Liu, S.T., King, B.A. (2016). Harm Perceptions of Intermittent Tobacco Product Use Among U.S. Youth. Journal of Adolescent Health. <https://doi.org/10.1016/j.jadohealth.2017.12.017>
- vi. Blount, B.C., Karwowski, M.P., Shields, P.G., et al. (2020). Vitamin E Acetate in Bronchoalveolar-Lavage Fluid Associated with EVALI. New England Journal of Medicine. <https://www.nejm.org/doi/full/10.1056/NEJMoa1916433>
- vii. Johnston, L. D., Miech, R. A., O'Malley, P. M., Bachman, J. G., Schulenberg, J. E., & Patrick, M. E. (2020). Monitoring the Future national survey results on drug use 1975-2019: Overview, key findings on adolescent drug use. Ann Arbor: Institute for Social Research, University of Michigan. <http://www.monitoringthefuture.org/pubs/monographs/mtf-overview2019.pdf>
- viii. Miech, R.A., Patrick, M.E., O'Malley, P.M., Johnston, L.D., Bachman, J.G. (2019). Trends in Reported Marijuana Vaping Among US Adolescents, 2017-2019. JAMA. <https://jamanetwork.com/journals/jama/article-abstract/2757960>
- ix. Spindle TR, Cone EJ, Schliez NJ, et al. (2018). Acute Effects of Smoked and Vaporized Cannabis in Healthy Adults Who Infrequently Use Cannabis: A Crossover Trial. JAMA Network Open. ;1(7):e184841. doi:10.1001/jamanetworkopen.2018.4841
- x. Elsohly, M. A., Mehmedic, Z., Foster, S. (2016). Changes in Cannabis Potency Over the Last 2 Decades (1995-2014): Analysis of Current Data in the United States. Biological Psychiatry, 79(7), 613-619. doi:10.1016/j.biopsych.2016.01.004.
- xi. Johnson, S. B., Blum, R. W., & Giedd, J. N. (2009). Adolescent maturity and the brain: the promise and pitfalls of neuroscience research in adolescent health policy. The Journal of adolescent health : official publication of the Society for Adolescent Medicine, 45(3), 216–221. doi:10.1016/j.jadohealth.2009.05.016
- xii. Pedersen, E. R., Miles, J. N., Osilla, K. C., Ewing, B. A., Hunter, S. B., & D'Amico, E. J. (2014). The effects of mental health symptoms and marijuana expectancies on marijuana use and consequences among at-risk adolescents. Journal of drug issues, 45(2), 151-165.
- xiii. Medina, K.L., Hanson K., Schweinsburg, A.D., Cohen-Zion M., et al. (2007). Neuropsychological functioning in adolescent marijuana users: Subtle deficits detectable after 30 days of abstinence. J Int Neuropsychol Soc;13(5):207–220. <https://www.ncbi.nlm.nih.gov/pubmed/17697412>
- xiv. Johnston, L. D., Miech, R. A., O'Malley, P. M., Bachman, J. G., Schulenberg, J. E., & Patrick, M. E. (2020). Monitoring the Future national survey results on drug use 1975-2019: Overview, key findings on adolescent drug use. Ann Arbor: Institute for Social Research, University of Michigan. <http://www.monitoringthefuture.org/pubs/monographs/mtf-overview2019.pdf>
- xv. U.S. Department of Health and Human Services, E-Cigarette Use Among Youth and Young Adults. A Report of the Surgeon General. (2016). U. S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health: Atlanta, GA. [https://www.cdc.gov/tobacco/data\\_statistics/sgr/e-cigarettes/index.htm](https://www.cdc.gov/tobacco/data_statistics/sgr/e-cigarettes/index.htm)

## Credits

© 2020 Addiction Policy Forum. All rights reserved.

For more information about this report, contact [info@addictionpolicy.org](mailto:info@addictionpolicy.org)

An electronic version of this report is posted on Addiction Policy Forum's website at <https://www.addictionpolicy.org/vaping>

Graphics and interior design by Mina Bellomy

Cover image: Rachel Handley

## Suggested citation

Lisbet Portman, Jessica Hulsey. Vaping Know the Fact: A Toolkit for Schools, Parents and Teens. Addiction Policy Forum, 2020.

