

TEACHER RESOURCE GUIDE: FACTS ABOUT E-CIGARETTES

Presented by: U.S. Food and Drug Administration



Disclaimer: This information is not a formal dissemination of information by the FDA and does not represent Agency position or policy.

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DISCLAIMER



- As an educator, you can play an active role in fighting the teen vaping epidemic. FDA research suggests that changing social norms around e-cigarette use on campus may help prevent teen vaping. Use this presentation to learn more about the fact-based resources available to start an honest conversation with your students and to try to change social norms in your school.
- The content outlined in this presentation applies to youth use of e-cigarettes – or vaping – but is specific to vaping nicotine. This presentation does not address vaping other substances, such as THC or CBD.

HOW TO USE THIS PRESENTATION



- This presentation is primarily designed to be used as a resource guide for middle and high school educators and parents.
- It can be used for a variety of purposes, such as:
 - School board meetings
 - PTA meetings
 - In-school educator trainings
- If this material will be presented to a youth audience, please be aware that not all slides are appropriate for teens.
 - Slides that should be removed for a presentation to youth are indicated in the notes section.



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E-CIGARETTES & THE VAPING CRISIS

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WHAT IS AN E-CIGARETTE?



- Battery-powered device that uses an “e-liquid” usually containing nicotine, as well as varying compositions of flavorings, and other additives such as propylene glycol, vegetable glycerin
- The liquid is heated to create an aerosol that the user inhales
- Known by different names, such as vapes, vaporizers, vape pens, hookah pens, electronic cigarettes, e-cigs, and e-pipes
- Some brand examples include Juul, Puff Bar, Suorin, Vuse, Blu, and NJOY

Note: These slides do not contain information on e-cigarettes that may be used with other drugs.

RISKS OF VAPING

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Because most e-cigarettes contain nicotine, using them can lead to addiction

- Nicotine is the **highly addictive drug** found in cigarettes and other tobacco products
- Some e-cigarettes, like Juul, can contain **as much nicotine as a pack of 20 cigarettes**
- Ten puffs of Juul can deliver the same amount of nicotine as smoking a cigarette
- Teens who vape may **end up addicted to nicotine faster** than teens who smoke because vapes are typically used very often and can expose youth to high levels of nicotine
- Teens who vape are **more likely to start smoking** cigarettes

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Sources:

1. U.S. Department of Health and Human Services (USDHHS). *How Tobacco Smoke Causes Disease: The Biology and Behavioral Basis for Smoking-Attributable Disease: A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office of Smoking and Health; 2010
2. Wynne C, Waaka DS & Cohen G. (2018, February). *Acute Use of Nicotine Salt-based ENDS and Combusted Cigarettes*. Poster session presented at the Annual Meeting of the Society for Research on Nicotine and Tobacco, Baltimore, MD.
3. PAX Labs, Inc. (2015, December 22). *PAX Labs, Inc. granted U.S. patent for nicotine salt e-cigarette* [Press release]. Retrieved from <https://www.prnewswire.com/news-releases/pax-labs-inc-granted-us-patent-for-nicotine-salt-e-cigarette-300196459.html>
4. Jackler RK & Ramamurthi D. Nicotine arms race: JUUL and the high-nicotine product market. *Tob Control*. Published Online First: 06 February 2019. doi: 10.1136/tobaccocontrol-2018-054796.
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RISKS OF VAPING

FDA

Nicotine can harm the developing brain

- Nicotine can **rewire the brain** to crave more nicotine, particularly because adolescent brains are still developing
- Nicotine exposure during adolescence may have long-lasting effects such as **increased impulsivity** and **mood disorders**
- Nicotine exposure during adolescence may have **long-term effects on** parts of the brain responsible for **attention, learning, and memory** that promote addiction to nicotine
- Nicotine exposure during adolescence **affects brain functions important for reward processing**, which makes it easier for youth to become addicted to nicotine


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Sources:

1. U.S. Department of Health and Human Services (USDHHS). *How Tobacco Smoke Causes Disease: The Biology and Behavioral Basis for Smoking-Attributable Disease: A Report of the Surgeon General*. Atlanta, GA: 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; 2010.
2. U.S. Department of Health and Human Services (USDHHS). *E-Cigarette Use Among Youth and Young Adults: A Report of the Surgeon General*. Atlanta, GA: 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, 2016.
3. England LJ, Aagaard K, Bloch M, et al. Developmental toxicity of nicotine: A transdisciplinary synthesis and implications for emerging tobacco products. *Neuroscience & Biobehavioral Reviews*. 2017; 72:176-189.
4. Ehlinger DG, Bergstrom HC, Burke JC, Fernandez GM, McDonald CG, Smith RF. Adolescent nicotine-induced dendrite remodeling in the nucleus accumbens is rapid, persistent, and D1-dopamine receptor dependent. *Brain Struct Funct*. 2016; 221(1):133-145.
5. McDonald CG, Eppolito AK, Brielmaier JM, et al. Evidence for elevated nicotine-induced structural plasticity in nucleus accumbens of adolescent rats. *Brain Res*. 2007; 1151:211-218.

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7. Xu Z, Seidler FJ, Tate CA, Garcia SJ, Slikker W Jr, Slotkin TA. Sex-selective hippocampal alterations after adolescent nicotine administration: effects on neurospecific proteins. *Nicotine Tob Res.* 2003; 5(6):955-960.
8. Bergstrom HC, Smith RF, Mollinedo NS, McDonald CG. Chronic nicotine exposure produces lateralized, age-dependent dendritic remodeling in the rodent basolateral amygdala. *Synapse.* 2010; 64(10):754-764.
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10. Lee H, Kang MS, Chung JM, Noh J. Repeated nicotine exposure in adolescent rats: Reduction of medial habenular activity and augmentation of nicotine preference. *Physiol Behav.* 2015; 138:345-350.
11. Trauth JA, Seidler FJ, Ali SF, Slotkin TA. Adolescent nicotine exposure produces immediate and long-term changes in CNS noradrenergic and dopaminergic function. *Brain Research.* 2001; 892(2):269-280.
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RISKS OF VAPING


- Chemicals in vapes and vape aerosol can harm the lungs
- Vape aerosol can contain *formaldehyde and acrolein* – some of the same toxic chemicals found in cigarette smoke
- Vape aerosol can contain *microscopic metal particles* like nickel, tin, and lead, which can be inhaled deep into the lungs
- Some chemicals found in e-cigarette aerosols may cause DNA damage

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Sources:

1. Goniewicz ML, Hajek P, McRobbie H. Nicotine content of electronic cigarettes, its release in vapour and its consistency across batches: regulatory implications. *Addiction*. 2014; 109(3):500-7.
2. Cheng T. Chemical evaluation of electronic cigarettes. *Tobacco Control*. 2014; 23:ii11–ii17.
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CORRECTING MISPERCEPTIONS

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CORRECTING MISPERCEPTIONS **FDA**

"It's just flavoring."

FACT: Vapes get their flavors from chemicals. While some flavorings are safe to eat in food, they're not safe to inhale. Inhaling flavor chemicals can harm your lungs.

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Want an example? Some buttery-flavored vapes like caramel, toffee, or chocolate contain diacetyl and acetoin. Inhaling diacetyl has been linked to popcorn lung, a lung disease that doesn't have a cure.

Source:

U.S. Food and Drug Administration. Infographic - "How much do you know about the epidemic?" U.S. Food and Drug Administration, Center for Tobacco Products. 2018.

<<https://www.fda.gov/downloads/TobaccoProducts/AboutCTP/UCM624891.pdf>> Accessed Jan. 29, 2019.

CORRECTING MISPERCEPTIONS

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<<https://www.fda.gov/downloads/TobaccoProducts/AboutCTP/UCM624891.pdf>> Accessed Jan. 29, 2019.

CORRECTING MISPERCEPTIONS **FDA**

“It’s just water vapor.”

FACT: But it’s not.
Vaping can expose your lungs to harmful chemicals like formaldehyde, acetaldehyde, and acrolein, which are known to cause irreversible lung damage

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Source:

U.S. Food and Drug Administration. Infographic - “How much do you know about the epidemic?” U.S. Food and Drug Administration, Center for Tobacco Products. 2018.

<<https://www.fda.gov/downloads/TobaccoProducts/AboutCTP/UCM624891.pdf>> Accessed Jan. 29, 2019.

CORRECTING MISPERCEPTIONS

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“My vape says it’s nicotine-free. There’s no way I’ll become addicted.”

FACT: Some vapes that claim they are nicotine-free, are not.

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Source:

U.S. Food and Drug Administration. Infographic - “How much do you know about the epidemic?” U.S. Food and Drug Administration, Center for Tobacco Products. 2018.

<<https://www.fda.gov/downloads/TobaccoProducts/AboutCTP/UCM624891.pdf>> Accessed Jan. 29, 2019.

CORRECTING MISPERCEPTIONS **FDA**

“I don’t have an addictive personality – I won’t get hooked on vapes.”

FACT: Vaping delivers nicotine to the brain in as little as 10 seconds. A teen’s brain is still developing, making it more vulnerable to nicotine addiction.

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Source:

U.S. Food and Drug Administration. Infographic - “How much do you know about the epidemic?” U.S. Food and Drug Administration, Center for Tobacco Products. 2018.

<<https://www.fda.gov/downloads/TobaccoProducts/AboutCTP/UCM624891.pdf>> Accessed Jan. 29, 2019.

CORRECTING MISPERCEPTIONS **FDA**

“Nicotine isn’t that bad for me.”

FACT: Nicotine exposure during the teen years can disrupt normal brain development and may have long-lasting effects, like increased impulsivity and mood disorders.

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Source:

U.S. Food and Drug Administration. Infographic - “How much do you know about the epidemic?” U.S. Food and Drug Administration, Center for Tobacco Products. 2018.

<<https://www.fda.gov/downloads/TobaccoProducts/AboutCTP/UCM624891.pdf>> Accessed Jan. 29, 2019.

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Doura, M. B., Luu, T. V., Lee, N. H., & Perry, D. C. (2010). Persistent gene expression changes in ventral tegmental area of adolescent but not adult rats in response to chronic nicotine. *Neuroscience*, 170(2), 503-513. doi:10.1016/j.neuroscience.2010.06.071

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ADDITIONAL RESOURCES

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THE REAL COST CAMPAIGN

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- “The Real Cost” Youth E-Cigarette Prevention Campaign educates youth that using e-cigarettes, just like cigarettes, puts them at risk for addiction and other health consequences
- “The Real Cost” campaign provides youth with science-based facts about tobacco products – so that they can make educated decisions about tobacco use



FOR MORE INFORMATION:
RESOURCES FOR TEENS



- “The Real Cost” campaign website: www.whatsinavape.com
 - Facebook.com/Knowtherealcost; Instagram @TheRealCost
- Smokefree Teen Quit Vaping: <https://teen.smokefree.gov/quit-vaping>
- Quick Facts on the Risks of E-cigarettes from CDC: https://www.cdc.gov/tobacco/basic_information/e-cigarettes/Quick-Facts-on-the-Risks-of-E-cigarettes-for-Kids-Teens-and-Young-Adults.html
- Truth Initiative Youth Text Messaging Quit Program: Text DITCHJUUL to 88709
- CDC Quitline: 1-800-QUIT-NOW

FOR MORE INFORMATION:
RESOURCES FOR EDUCATORS




- INDEPTH Program: The American Lung Association's Alternative to Teen Nicotine Suspension or Citation Program
 - <https://www.lung.org/stop-smoking/helping-teens-quit/indepth.html>
- ALA N-O-T (Not On Tobacco): Proven Teen Smoking and Vaping Cessation Program
 - <https://www.lung.org/stop-smoking/helping-teens-quit/not-on-tobacco.html>
- Center for Tobacco Products Exchange Lab: Free Tobacco Education Resources
 - https://digitalmedia.hhs.gov/tobacco/print_materials/search

NOTE: This slide should be removed when talking to youth.

FOR MORE INFORMATION:
OTHER RESOURCES



- U.S. Surgeon General's website on teen vaping: <https://e-cigarettes.surgeongeneral.gov/>
- FDA's webpage on youth and tobacco: <https://www.fda.gov/tobacco-products/public-health-education/youth-and-tobacco>
- CDC's webpage on electronic cigarettes: https://www.cdc.gov/tobacco/basic_information/e-cigarettes/index.htm
- Tips for safe disposal of e-cigarettes and nicotine waste: https://digitalmedia.hhs.gov/tobacco/print_materials/CTP-163



THANK YOU!

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