

Electronic nicotine delivery systems (ENDS)

What physicians should know about ENDS

- Electronic nicotine delivery systems (ENDS), also called electronic cigarettes, e-cigarettes, vaping devices, or vape pens, are battery-powered devices used to smoke or “vape” a flavored solution.
- ENDS solution often contains nicotine, an addictive chemical also found in cigarettes.
- ENDS use is popular—the rate of adults trying an e-cigarette at least once more than doubled from 2010 to 2013,¹ and more youth are current users of e-cigarettes than combustible cigarettes.²
- In 2016, the Food and Drug Administration (FDA) expanded its regulatory authority to include the manufacture, import, packaging, labeling, advertising, promotion, sale, and distribution of all tobacco products, including ENDS. Under this new law, often called the "Deeming Rule," the FDA:
 - Requires health warnings on ENDS and other tobacco products.
 - Prohibits the sales of ENDS to youth under the age of 18.
 - Bans free samples and prohibits the sale of ENDS in vending machines.
 - Requires that ENDS manufacturers receive marketing authorization from the FDA.
 - Requires vape shops that mix e-liquids to comply with legal requirements for tobacco manufacturers.
- Exhaled ENDS vapor is not harmless water vapor—it has been shown to contain chemicals that cause cancer,³ can cause harm to unborn babies,⁴ and is a source of indoor air pollution.⁵ ENDS are promoted as a way to smoke where smoking is prohibited. However, state and local officials are incorporating ENDS use into existing smoke-free air regulations to protect health.
- Some people use ENDS as a way to quit smoking combustible cigarettes, but current evidence is insufficient to recommend ENDS for tobacco cessation in adults,⁶ and some people use both devices due to the addictive nature of nicotine.

ENDS are a health hazard

- ENDS companies can legally promote these products by using techniques that cigarette companies have not been able to use since the 1998 Master Settlement Agreement, including television and radio ads, billboards, outdoor signage, and sponsorships.
- ENDS and ENDS solutions are available in many flavors (bubble gum, chocolate, peppermint, etc.) that appeal to youth. Flavors, design, and marketing renormalize and glamorize smoking.
- In 2016, the Child Nicotine Poisoning Prevention Act was signed into law. This law requires packaging safety standards for ENDS and the containers that hold ENDS solution. Under this law, liquid nicotine must be packaged in child-proof packaging, in accordance with Consumer Product Safety Commission standards. This law is an important step to protect children’s health. Prior to the passage of this act, poison control centers in the United States reported skyrocketing adverse exposures from e-cigarettes and liquid nicotine since 2011.⁷

What physicians should tell patients and families about ENDS

- ENDS emissions are not harmless water vapor. Both the user and those around them are exposed to chemicals, some of which cause cancer.
- There is insufficient evidence to suggest ENDS are less harmful to a fetus than traditional cigarettes. Women who are pregnant or trying to become pregnant should be informed about the risks that ENDS pose for both maternal and neonatal health.
- The U.S. Preventive Services Task Force concludes that the current evidence is insufficient to recommend ENDS for smoking cessation.⁶ Patients may ask about ENDS because they are interested in quitting smoking. Be ready to counsel as appropriate.
- Ask the right questions: “Do you smoke?” is a less effective way to get patients talking. Also ask patients, “Do you vape or use electronic cigarettes?”
- Recommend FDA-approved cessation products and refer patients to the state quitline (1-800-QUIT NOW), a text-based program (text QUIT to 47848), or an in-person cessation program.
- Insurance covers some medications and programs, and grants may be available to offer free cessation help. Do not let cost be a barrier to quitting.
- In 2016, the U.S. Surgeon General released a report,⁸ which concluded that youth use of ENDS products is a public health concern. The report found that:
 - Youth use of e-cigarettes is associated with the use of other tobacco products.
 - Youth use of nicotine in any form, including ENDS, is unsafe.
 - Secondhand exposure to ENDS aerosol contains nicotine and other harmful constituents.

References

- 1) King BA, Patel R, Nguyen KH, Dube SR. Trends in awareness and use of electronic cigarettes among U.S. adults, 2010-2013. *Nicotine Tob Res.* 2015;17(2):219-27
- 2) Johnston LD, et al. Monitoring the future. National survey results on drug use. 1975-2014. Overview. Key findings on adolescent drug use. National Institutes of Health. National Institute on Drug Abuse. The University of Michigan. Institute for Social Research. Ann Arbor, MI. 2015. <http://www.monitoringthefuture.org/pubs/monographs/mtf-overview2014.pdf>. Accessed 10/2/15.
- 3) Grana R, Benowitz N, Glantz SA. E-cigarettes: a scientific review. *Circulation.* 2014;129(19):1972-86.
- 4) Bahl V, Lin S, Xu N, Davis B, Wang YH, Talbot P. Comparison of electronic cigarette refill fluid cytotoxicity using embryonic and adult models. *Reprod Toxicol.* 2012;34(4):529-37.
- 5) Schober W, Szendrei K, Matzen W, et al. Use of electronic cigarettes (e-cigarettes) impairs indoor air quality and increases FeNO levels of e-cigarette consumers. *Int J Hyg Environ Health.* 2014;217(6):628-37.
- 6) Siu AL. Behavioral and pharmacotherapy interventions for tobacco smoking cessation in adults, including pregnant women: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med.* 2015;163(8):622-634.
- 7) American Association of Poison Control Centers. Electronic cigarettes and liquid nicotine data. August 31, 2015. https://aapcc.s3.amazonaws.com/files/library/E-cig__Nicotine_Web_Data_through_8.2015_BjqUYv.pdf. Accessed Oct. 1, 2015.
- 8) U.S. Department of Health and Human Services. E-cigarette use among youth and young adults: a report of the Surgeon General. Atlanta, GA: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2016.

Last Updated: May 2017

