



Statement by the COPD Foundation Medical and Scientific Advisory Committee on Use of Electronic Cigarettes

This statement is designed for healthcare professionals

Introduction

A recent outbreak of severe and sometimes fatal acute lung injury associated with use of electronic cigarettes (e-cigarettes) has caused the COPD Foundation Medical and Scientific Advisory Committee (MASAC) to evaluate the harms and benefits of these devices and to make recommendations to the COPD community. This statement is based on our current understanding of the scientific evidence which is rapidly evolving.

Background

E-cigarettes are sometimes called “e-cigs,” “vapes,” “e-hookahs,” “vape pens,” and “electronic nicotine delivery systems” (ENDS). The use of these devices is referred to as “Vaping”, “Juuling” or “Dabbing”, depending upon the type of product being used.

The devices use a cassette or pod that is filled with a solution that can contain nicotine, THC and CBD (the active components in marijuana), flavorings, glycerol or ethylene glycol (also used in antifreeze), and other known and unknown adulterants. None of these content are government regulated. Some devices use a tank that can be filled by the user with liquids or “juice” that may be home-manufactured, or purchased online, at vaping shops or in convenience stores.

The liquid is heated with a battery-powered heating element to form a vapor or aerosol that is inhaled into the lungs. The nicotine and other chemicals contained in the cassette or pod are quickly absorbed into the lungs and from there into the systemic circulation. The water vapor associated with e-cigarettes is not harmless water. It contains products that may be harmful. These products include volatile organic compounds (VOCs) that are irritants and can cause inflammation and internal organ damage. Flavoring substance such as diacetyl have been associated with “popcorn” lung (bronchiolitis obliterans). Heavy metals and formaldehyde which can cause cancer¹ have been detected in devices.

The Food and Drug Administration (FDA) has strict regulatory oversight over the safety of the food that we eat and drugs that we take. Since 2016, the FDA has had authority over the sale and distribution of e-cigarettes. This FDA authority includes a requirement for health warnings, prohibition of sales to minors under age 18, and marketing authorization for manufacturers of e-cigarettes. The date for manufactures to apply for FDA approval of their products has been extended until 2022, however a recent court action has set this date at 2020.^{2,3} This is being appealed by e-cigarette manufacturers to further delay FDA review.⁴ Thus, there are currently no FDA-approved manufacturers of e-cigarettes.

E-cigarette and Vaping Associated Lung Injury (EVALI) Epidemic

An outbreak of lung injury cases associated with e-cigarette use, termed “E-cigarette and Vaping Associated Lung Injury” (EVALI) has been reported. As of October 25, 2019, the CDC reported more than 1,600 cases of EVALI in 49 states, leading to 34 deaths. More cases and deaths are being reported every day. Many of these cases were initially thought to be due to severe pneumonia without an identifiable infectious cause. A majority of these patients used THC-containing products, particularly those obtained off the street or from other informal sources (e.g. friends, family members, illicit dealers). Importantly, about 1 out of 8 patients with EVALI used only nicotine products. All age groups were at risk, with deaths reported in patients ranging from age 17 to 75 years.⁵ Patients over the age of 50 had the highest rates of respiratory failure and the slowest recovery after EVALI⁶ Other high-risk groups include those with pre-existing heart and lung disease. At this time, it is unknown what substances or personal characteristics contribute to this life-threatening condition. It is also not known if this is a new outbreak or recent recognition of a longer-standing problem that had previously escaped identification.

Are e-cigarettes safer than cigarettes?

It is generally thought that complete replacement of tobacco cigarettes with e-cigarettes results in less exposure to toxic compounds and chemicals.¹ However, exposure of mice to vaping leads to changes in the lung that are similar to cigarette smoke exposure including emphysema-like changes.⁷ Importantly, the recent epidemic of EVALI suggests that there may be sporadic, severe, and sometimes fatal consequences associated vaping. People with underlying lung conditions such as COPD would be particularly vulnerable to respiratory failure and death should they develop EVALI.

Recommendations you may want to share with patients

Adapted from the CDC guidance,⁸ -MASAC endorses the following recommendations:

- You should avoid the use of any vaping products, particularly those that are purported to contain THC, or CBD or are purchased off the street or modified with other substances.
- Contact a healthcare provider if you have used vaping products and you develop symptoms of cough, shortness of breath, chest pain, or associated symptoms of nausea, vomiting, abdominal pain, or diarrhea, or if you have unexplained fatigue, fever, or weight loss. These symptoms may develop into acute lung injury over a few days or over several weeks. E-cigarette and vaping associated lung injury can occur in individuals who have used a vaping product as long as 90 days prior to the onset of symptoms.
- If you are an adult who uses vaping products because you have quit smoking cigarettes, you should not return to smoking cigarettes. It is recommended that you switch to an FDA approved nicotine delivery device such as nicotine gum, patches, lozenges, nasal spray, or inhaler. The FDA has also approved medications such as Varenicline and Bupropion that can reduce the urge to smoke. Talk to your doctor!

- If you are trying to quit smoking cigarettes by vaping e-cigarettes, you should switch to proven treatments including counselling and FDA-approved nicotine replacement products and non-nicotine smoking cessation medications.⁹ Talk to your doctor!
- If you are aware of any health or product issues related to e-cigarettes you are encouraged to submit them to the FDA via the online safety reporting portal.¹⁰

¹ National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division, Board on Population Health and Public Health Practice, Committee on the Review of the Health Effects of Electronic Nicotine Delivery Systems; Eaton DL, Kwan LY, Stratton K, editors. Public Health Consequences of E-Cigarettes. Washington (DC): National Academies Press (US); 2018 Jan 23. PubMed PMID: 29894118 https://www.ncbi.nlm.nih.gov/books/NBK507181/#sec_000021

² FORBES “Juul and Rivals, given 10 months to submit FDA application, face battle to keep selling E-cigs. July 16, 2019 <https://www.forbes.com/sites/kenrickcai/2019/07/16/juul-rivals-10-month-deadline-fda-application-battle-to-sell-e-cigarettes/#6d7586a71f3c>

³ N.Y. Times “E-Cigarettes went unchecked in 10 years of federal inaction”, October 14, 2019 <https://www.nytimes.com/2019/10/14/health/vaping-e-cigarettes-fda.html>

⁴ Associated Press: “Vaping companies sue to delay US review of e-cigarettes” August 14, 2019 <https://apnews.com/609232c1732a4cc39685c713aba32525>

⁵ <https://www.cdc.gov/media/releases/2019/s-1010-vaping-injury-update.html>

⁶ <https://www.cdc.gov/mmwr/volumes/68/wr/mm6841e3.htm>

⁷ Garcia-Arcos I, Geraghty P, Baumlin N, Campos M, Dabo AJ, Jundi B, Cummins N, Eden E, Grosche A, Salathe M, Foronjy R. Chronic electronic cigarette exposure in mice induces features of COPD in a nicotine-dependent manner. *Thorax*. 2016 Dec;71(12):1119-1129. doi: 10.1136/thoraxjnl-2015-208039.

⁸ https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease/need-to-know/index.html

⁹ <https://www.fda.gov/consumers/consumer-updates/want-quit-smoking-fda-approved-products-can-help>

¹⁰ <https://www.safetyreporting.hhs.gov/SRP2/en/Home.aspx?sid=4a255290-ae49-4e96-b911-5b511ba4fa5f>