Youth Vaping Newsletter: An Update on Clinical Cases of Vaping Associated Pulmonary Injury (VAPI) and Recommendations for Clinicians

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Background:

Electronic cigarette (e-cigarette) use among youth is a growing public health concern in the United States (US). Since the introduction of e-cigarettes to the US marketplace in 2007, their popularity and use has spiked, particularly among youth.[1-2] Between 2017 and 2018, current e-cigarette use among high school students increased by 78%.[1] In 2018, 20.8% or 3.1 million high school students reported current e-cigarette use.[1]

The increase in e-cigarette use among youth can likely be attributed to their sleek design, ease of accessibility through online retailers and vape shops, and appealing flavors, with more than 15,500 unique e-cigarette flavors available online as of 2017.[3-5] Retailers have marketed these flavors using a variety of media channels and advertising strategies. In 2016, 20.5 million youth were exposed to e-cigarette advertising.[6] Exposure to e-cigarette advertisement may contribute to youth's misperception that e-cigarettes are safer than traditional combustible cigarettes.[6]

Although e-cigarettes may have the potential to help adult smokers' transition away from conventional cigarettes, e-cigarettes are not approved by the FDA as tobacco cessation aids, and e-cigarettes can expose users to harmful substances including nicotine, cancer-causing chemicals such as acrolein and formaldehyde, heavy metals, and volatile organic compounds.[2,7-10] E-cigarettes may also be used as a delivery system for illicit drugs and cannabinoids.[11]Some e-cigarettes are used for "dripping" or "dabbing."[12] Dabbing refers to the superheating of substances such as butane hash oil that contain high concentrations of THC and inhaling the resultant vapors.[13] Dripping involves directly placing e-cigarette liquid on the hot coils of the e-cigarette, resulting in high concentrations of THC and cannabinoid compounds.[12]Several case reports have demonstrated the adverse effects of e-cigarettes on the pulmonary system. Cases of lipoid pneumonia, bronchiolitis, acute eosinophilic pneumonia, hypersensitivity pneumonitis and organizing pneumonia have all been reported in patients with a history of e-cigarette use.[14] More recently, the outbreak of severe pulmonary injury across the United States has highlighted the negative health effects associated with e-cigarette use.

Summary of Vaping Associated Pulmonary Injury:

Since June 2019, 1,080 possible cases of vaping associated pulmonary injury (VAPI) across 48 states and 1 U.S. territory, and 18 deaths across 15 states have been reported to the CDC.[12, 15] Although the exact etiology of e-cigarette associated pulmonary disease remains unknown, all patients involved have reported using e-cigarette products, and some have reported using e-cigarette products containing cannabinoid products such as THC or CBD.[12] Some patients have reported using e-cigarette products purchased from unregulated and unlicensed entities.[16]

Patients have presented to the hospital with fever, tachycardia, hypoxia and respiratory symptoms including cough, shortness of breath, or chest pain, though some have reported gastrointestinal symptoms including nausea, vomiting or diarrhea.[12] In some patients,

gastrointestinal symptoms have preceded respiratory symptoms, with symptoms developing over the course of several days to weeks after e-cigarette use.[12] Most patients have required supplemental oxygen via nasal canula, while others have progressed to respiratory failure requiring ventilatory support and intubation. Some patients have experienced symptomatic improvement with steroids, though information on dosing and duration of treatment is not yet available.[16]

Recommendations for Clinicians:

The increase in VAPI highlight the potential dangers associated with e-cigarette use among youth. Clinicians are a trusted source and it is important for clinicians to take an active role to halt this youth vaping epidemic. Considering the increase in severe pulmonary injury associated with e-cigarette use, clinicians should incorporate the following in their clinical practice:

1. Screen youth for e-cigarette use

Clinicians have the unique opportunity to screen patients for e-cigarette use. Screening is especially important in patients with respiratory symptoms, in patients who continue to have respiratory symptoms after failing to respond to antibiotic therapy for presumed pneumonia or bronchitis, or in patients with suspected VAPI.[16] For patients who do vape or report a vaping history, clinicians should ask a detailed history regarding:

- **Product and Method of Use.** Patients should be asked about the type of vape used, including the product name, the brand name, and the manufacturer, and if any modifications have been made to the product by the user. Patients should also be asked the method of substance use including aerosolization, dabbing, or dripping.
- **Substances in Product.** Patients should be asked about the substances contained in the e-cigarette including nicotine, cannabinoids (e.g.,THC CBD, CBD oil, synthetic cannabinoids, hash oil), flavors or other substances.
- **Product Source.** The source from which the e-cigarette was obtained, whether commercially available, homemade, or reuse of former products.
- **Amount of Use.** Clinicians should ask patients about the last time they vaped, how often they vape, and how long they have been vaping.

2. Report suspected VAPI cases

Clinicians should report suspected VAPI cases to their local or state health department within one business day for further investigation.[16] Clinicians should also collect vape devices, cartridges, e-cigarette liquid or oils for possible testing of e-cigarette materials.[16] Collected samples should be sealed, stored in a secure manner and location, ideally under refrigeration.[16]

3. Educate youth about e-cigarettes and connect youth to tobacco cessation resources

Clinicians have the unique opportunity to educate youth and their families about the dangers of e-cigarette use. Clinicians should deliver the clear message that e-cigarettes are not safe for youth and that youth should avoid using these products, especially considering the recent outbreak of severe lung injury. Youth who are using e-cigarette devices should be connected to tobacco cessation resources including:

- *California Smoker's Helpline,* 1-800-NO-BUTTS

- *The Truth Initiative E-cigarette Quit Program*. A free text message program that provides youth and young adults appropriate recommendations for quitting. Youth can access the program by texting "DITCHJUUL" to 88709. Parents can text "QUIT" to 202-899-7550.

4. **Support local tobacco control policy**

Beyond the bedside, clinicians can support local tobacco control policies that reduce youth access to vaping products by participating in city council meetings, public hearings, or community gatherings.

By performing the above action items, clinicians can take an active role in identifying cases of VAPI, educating youth and their families about the dangers of e-cigarette use while connecting them to community resources to aid in reducing this youth vaping epidemic.

Resources:

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