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Health Advisory for Health Care Professionals
Vaping Associated Pulmonary Injury (VAPI)

October 1, 2019

Key Messages

- Since June 2019, 102 cases of vaping-associated pulmonary injury (VAPI) requiring hospitalization have been reported to the California Department of Public Health (CDPH). Most patients report vaping the cannabis compounds tetrahydrocannabinol (THC) and/or cannabidiol (CBD), and some patients also report vaping nicotine products, although the exact cause of illness is not yet known.
- Clinicians who identify cases similar to those described in this health advisory are asked to report the cases to their local health department.
- Local health departments should report new cases or direct any inquiries to the CDPH Duty Officer dutyofficer@cdph.ca.gov or (916) 328-3605. Please also contact the CDPH Duty Officer when any vaping devices or supplies have been collected from a patient and can be turned over to CDPH for testing.
- CDPH is urging everyone to quit vaping altogether, no matter the substance or source, until current investigations are complete. For those who continue, consumers are urged to avoid buying any vaping products on the street, to purchase cannabis products from licensed businesses (whose products are tested), never modify a store-bought vape product, monitor themselves for respiratory illness, and seek immediate medical attention if they experience symptoms related to VAPI.
- Vaping is not safe. Consumers put themselves at risk any time they inhale a foreign substance into their lungs. Vape liquids contain several dangerous chemicals, some of which cause developmental harm or are on California's Proposition 65 list of chemicals known to cause cancer, birth defects, and other reproductive harm. Vaping nicotine and cannabis is particularly dangerous for youth, whose developing brains are more vulnerable to these neurotoxins. Additionally, pregnant and breastfeeding women should not use these products.

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Summary

This health advisory provides information about the emerging health threat of severe pulmonary disease associated with the use of vape products. It contains information on the case presentation, general diagnostic findings associated with VAPI, reporting a suspected VAPI case, and recommended messages to patients. E-cigarettes or vaping products include a variety of devices, e-liquids, refill pods and cartridges. The devices heat the liquid to produce an aerosol. E-liquids may contain nicotine, THC or CBD, alcohol, essential oils, or other substances. They may also contain toxic chemicals found on California's Proposition 65 list of chemicals known to cause cancer, birth defects, and other reproductive harm as well as propylene glycol, glycerin, ultrafine particles, heavy metals (lead, nickel, tin), volatile organic compounds, and flavoring chemicals (e.g., diacetyl).

Current Situation

Since June 2019, the California Department of Public Health (CDPH) has received reports from 22 California jurisdictions that 102 people who use e-cigarettes or vape devices, called "vaping," were hospitalized for severe breathing problems and lung damage, and two people have died. Across the United States (U.S.), there are over 805 reports of lung damage associated with vaping across 46 states and one U.S. territory, and more reports are coming in nearly every day. Nationally, twelve deaths are attributed to VAPI.

California VAPI Cases as of October 1, 2019

Total: 102 cases (63 men, 39 women)

Ages: 14-70 (median age 27)

Deaths: 2

CDPH will update its [Vaping Health Advisory](#) webpage every Thursday to reflect updated case counts.

All patients have reported use of e-cigarette products, or vaping, within 90 days of illness. Most have reported using cannabinoids such as THC or CBD. Some have reported nicotine use alone. No single device type has been reported consistently. No single vape product or substance (including cannabis products) has been reported consistently.

Patient History

If e-cigarette or vaping product use is suspected as a possible cause for a patient's lung injury, a detailed history of the substances used, the sources and the devices used should be obtained, as outlined in the [Health Alert Network](#) (HAN), and efforts should be made to determine if any remaining product, devices, and liquids are available for testing.

Primary Clinical Presentations and Findings

- Cough
- Pleuritic chest pain
- Shortness of breath
- Fever
- Headache
- Fatigue
- Nausea
- Diarrhea
- Anorexia
- Weight Loss

In general, the majority of patients are under 30 years of age and in otherwise good health. In many cases, the initial diagnosis was presumed to be infectious, but no evidence of infection or other process to explain the pulmonary disease was found. Symptom onset has ranged from days to weeks prior to presentation to a health care provider, and all patients reported use of various vape products. Many patients were seen in an outpatient setting one or more times prior to hospitalization. At the time of hospital presentation, patients are often hypoxic and meet systemic inflammatory response syndrome (SIRS) criteria, including high fever. All cases in California have been hospitalized, with most requiring respiratory support with supplemental oxygen, high-flow oxygen, or bi-level positive airway pressure (BiPAP). Approximately 30 percent of patients had respiratory failure requiring mechanical ventilation.

Radiography

- Abnormal findings may or may not be present on initial imaging, but develop eventually.
- Chest radiographs have demonstrated bilateral opacities or infiltrates. Computed tomography (CT) imaging of the chest has shown diffuse bilateral ground-glass opacities, often with sub pleural sparing.

Lab Findings

Non-specific laboratory abnormalities have been reported:

- Leukocytosis with neutrophil predominance
- Elevated markers of inflammation (e.g., ESR, CRP)
- Transient, mild elevation in serum transaminases
- Elevated procalcitonin

Frequently Performed Diagnostic Evaluations

- Evaluation for infectious etiologies is often completed without an identified cause
- Pulmonary function tests (PFTs)
- Some patients are evaluated for lung injury with bronchoscopy with bronchoalveolar lavage or lung biopsy

Diagnosis

VAPI is a clinical diagnosis of exclusion when infectious, rheumatologic, neoplastic, cardiac, or other processes cannot explain an acute pulmonary illness in a patient known to vape cannabinoids and/or nicotine. The diagnosis is commonly suspected when the patient does not respond to antibiotic therapy, and testing does not reveal an alternative diagnosis. Some, but not all, patients have been evaluated with

bronchoscopy with bronchoalveolar lavage, but findings are not pathognomonic and performing this evaluation is not a requirement for diagnosis.

Treatment

Guidelines for treatment of VAPI are not yet available.

- Many patients experience sub-acute or acute hypoxemic respiratory failure requiring supplemental oxygenation and at times ventilator support, including mechanical ventilation or extracorporeal membrane oxygenation.
- Treating physicians have used corticosteroids with possible benefit. The dosing, administration route, duration, and timing have varied.
- Follow-up plan has been determined on a case by case basis.

Case Reporting

- Clinicians who identify cases similar to those described in this health alert are asked to report the cases to their local health department.
- Local health departments should report new cases or direct any inquiries to the CDPH Duty Officer dutyofficer@cdph.ca.gov or (916) 328-3605. Please also contact the CDPH Duty Officer when any vaping devices or supplies have been collected from a patient and can be turned over to CDPH for testing.

Clinical Specimen Collection, Storage, and Shipping

- CDPH is asking that blood, urine, and BAL specimens obtained from patients during the course of evaluation for VAPI be saved for possible future analysis by CDPH or CDC. Plans for this testing are underway, but not yet finalized.
- Hospital laboratories should contact their local public health department to report that the hospital lab has remnant patient biospecimens. Until further guidance from the CDC is available, the hospital lab or local health department should store the biospecimens according to their existing protocols.
- CDC is updating their guidance on VAPI specimen collection, storage, and shipping; we expect to share this updated guidance with providers, laboratories, and public health departments very soon.

Messaging to Patients

- CDPH is urging everyone to quit vaping altogether, no matter the substance or source, until current investigations are completed.
- For those who continue, consumers are urged to avoid buying vaping products on the street, to purchase cannabis product only from licensed businesses (whose products are tested), to never modify a store-bought vape product, monitor themselves for respiratory illness, and to seek immediate medical attention if they experience symptoms related to VAPI.
- E-cigarettes/vapor products have not been adequately tested nor approved as tobacco cessation devices. Nicotine replacement therapy products approved by the Food and Drug Administration contain controlled doses of nicotine and have been tested for safety and efficacy.

- Tailored information for [patients and providers](#) is available from the California Smokers' Helpline. The patient section includes free cessation counseling and other resources for tobacco users that want to quit. The provider section has videos on how to talk to your patients about quitting, posters for waiting rooms, and review material for treating tobacco use and dependence. Counselors are available weekdays, 7 a.m. to 9 p.m., and Saturday, 9 a.m. to 5 p.m. Or [sign up](#) 24/7 online.
 - English: 1-800-NO-BUTTS (1-800-662-8887)
 - Chinese: 1-800-838-8917
 - Korean: 1-800-556-5564
 - Spanish: 1-800-45-NO-FUME (1-800-456-6386)
 - Vietnamese: 1-800-778-8440
- [Information about FDA - approved cessation pharmacotherapy](#) and prescribing information is available from the California Smokers' Helpline.
- Free cessation counseling is available from the California Smokers' Helpline tailored for teens, adults, pregnant women, and for people who vape. Cessation assistance is available via the telephone, text messages, and mobile applications. Telephone counseling services are available in English, Spanish, Chinese, Korean, and Vietnamese.

Information for Patients

[Let's Talk Cannabis](#)

[E-cigarette Quitting Fact Sheet in English and Spanish](#)

[Juil and Sourin Fact Sheet in English and Spanish](#)

[Secondhand Vape Aerosol and Kids Fact Sheet in English and Spanish](#)