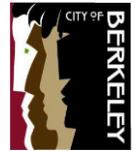




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JOINT HEALTH ADVISORY Alameda County and City of Berkeley

VAPING ASSOCIATED PULMONARY INJURY (VAPI)

September 4, 2019

UPDATED SITUATION

As of August 30th, California Department of Public Health has identified 43 potential cases of severe acute lung disease among people with recent history of vaping, some of whom vaped unlicensed or unregulated cannabis products, beginning in late June. Most patients report vaping cannabis compounds tetrahydrocannabinol (THC) and/or cannabidiol (CBD), and some patients also report vaping nicotine products. As of August 27th, the Centers for Disease Prevention and Control (CDC) reports that 25 states, including California, have documented over 215 possible cases of severe acute pulmonary disease associated with vaping over the past three months.

Patients typically present to the hospital with cough, shortness of breath, fever, and sometimes vomiting and diarrhea. Symptoms have also included chest pain, nausea, fatigue, and weight loss. Symptoms typically develop over a period of days but sometimes can manifest over several weeks. 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. All reported cases in California have been hospitalized, with most requiring respiratory support with supplemental oxygen, high-flow oxygen, or bi-level positive airway pressure (BiPAP). At least 10 patients had respiratory failure requiring mechanical ventilation. No deaths have been reported to date in California. One patient, in Illinois, with a history of recent e-cigarette use was hospitalized on July 29, 2019 with severe pulmonary disease and died in late August. There have been 3 cases reported to Alameda County Public Health Department and no cases to date reported to the City of Berkeley Public Health Division.

California Department of Public Health (CDPH) continues to work with local health departments to investigate cases of severe lung disease associated with vaping cannabis and to analyze vaping products recovered from patients.

UPDATED CASE DEFINITION OF VAPI

California case definition (as of 8/26/19):

Confirmed:

- Respiratory illness requiring hospitalization **AND**
- Using an e-cigarette (vaping) or dabbing¹ in 90 days prior to symptom onset **AND**
- Pulmonary infiltrate, such as opacities on plain film chest radiograph or ground-glass opacities on chest CT **AND**
- Absence of pulmonary infection on initial work-up: Minimum criteria include negative respiratory viral panel and influenza PCR or rapid test. All other clinically indicated respiratory

¹ Includes using an electronic device (e.g., electronic nicotine delivery system (ENDS), electronic cigarette, vaporizer, vape(s), vape pen, dab pen, or other) or dabbing to inhale substances (e.g., nicotine, marijuana, THC, THC concentrates, CBD, synthetic cannabinoids, flavorings, or other substances).

ID testing (e.g., urine strep pneumo/legionella/mycoplasma, sputum culture if productive cough, BAL culture if done, blood culture, HIV-related opportunistic respiratory infections if appropriate) must be negative **AND**

- No evidence in medical record of alternative plausible diagnoses (e.g., cardiac, rheumatologic or neoplastic process).

Probable:

- Respiratory illness requiring hospitalization **AND**
- Using an e-cigarette (“vaping”) or dabbing in 90 days prior to symptom onset **AND**
- Pulmonary infiltrate, such as opacities on plain film chest radiograph or ground-glass opacities on chest CT **AND**
- Infection identified via culture or PCR, but clinical team caring for the patient believes this is not the sole cause of the underlying respiratory disease process **OR** No evidence of pulmonary infection, but minimum criteria to rule out pulmonary infection not met (testing not performed) **AND**
- No evidence in medical record of alternative plausible diagnoses (e.g., cardiac, rheumatologic or neoplastic process).

UPDATED RECOMMENDATIONS FOR PROVIDERS

Please have a high clinical suspicion for VAPI. The clinical presentation of VAPI can initially mimic common pulmonary diagnoses like pneumonia, but patients typically do not respond to antibiotic therapy. In some cases, patients sought care at outpatient clinics in the days prior to hospital presentation and received antibiotics for presumed pneumonia or bronchitis, which did not improve their symptoms.

- Ask patients presenting with respiratory complaints in both outpatient and inpatient settings about their use of vaping or “dabbing” devices, especially patients who had an initial diagnosis of pneumonia or bronchitis that did not respond to antibiotics.

For patients who do vape, ask these follow-up questions:

- **Type of vape used:**
 - Do you vape nicotine-containing substances?
 - Do you vape substances that contain cannabis or cannabinoid compounds like THC and CBD?
- **Amount of use:**
 - When was the last time you vaped?
 - How often do you vape?
 - How long have you been vaping?
- **Source:**
 - Where do you purchase your vaping supplies?
 - What brands are your vaping devices, cartridges, and oils?
 - Do you still have any vape devices or cartridges that can be tested?
- Report suspected cases to public health within one business day.

For Alameda County residents please report suspected cases to the Alameda County Public Health Department at (510) 267-8020 M-F 8:30am-5:00pm or by email to: ACPHD-Surveillance@acgov.org or secure FAX at (510) 273-3744.

For City of Berkeley residents please call the City of Berkeley Communicable Disease Prevention and Control Unit at (510) 981-5292 M-F 8:00-5:00pm or FAX to 510-981-5345.

- A public health staff person from Alameda County or City of Berkeley will:

- interview the patient or family members.
- contact the hospital lab to arrange the transfer of biospecimens remaining from the patient to the public health lab. You do not have to order any specific tests on blood, respiratory samples, or urine.
- Alameda County or City of Berkeley will collect vape devices and cartridges from the patient or family for testing.

CLINICAL INFORMATION ON VAPING-ASSOCIATED PULMONARY INJURY

Clinical course:

Patients typically present for care within a few days to weeks of symptom onset. At the time of hospital presentation, patients are often hypoxic and meet systemic inflammatory response syndrome (SIRS) criteria, including high fever. In some cases, patients had progressive respiratory failure following admission, leading to intubation. Time to recovery for hospital discharge has been from days to weeks.

Symptoms:

Commonly reported symptoms include:

- Shortness of breath, cough
- Fatigue, body aches
- Fever
- Vomiting, diarrhea

Laboratory findings:

- Non-specific laboratory abnormalities have been reported, including elevation in white blood cell count, transaminases, procalcitonin, and inflammatory markers.
- Negative infectious disease testing (influenza, respiratory viral panel, cultures, etc.).

Imaging:

- Imaging abnormalities are typically bilateral and may be described as:
- Chest x-ray: pulmonary infiltrates or opacities
- Chest CT: ground-glass opacities

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. Common documented hospital diagnoses for these patients have included: acute respiratory distress syndrome (ARDS), sepsis, acute hypoxic respiratory failure, pneumonitis, and pneumonia.

Treatment:

Guidelines for treatment of VAPI are not yet available.

- Most patients require supplemental oxygen via nasal cannula, high-flow oxygen, bi-level positive airway pressure (BiPAP), or mechanical ventilation.
- Anecdotally, treating physicians have trialed the use of steroids with some possible benefit. Information on dosing and duration of steroids is not available.

RESOURCES

- CDC: About Electronic Cigarettes (E-Cigarettes) and other devices:
<https://www.cdc.gov/e-cigarettes>
- CDPH: Let's Talk Cannabis.
<https://www.cdph.ca.gov/Programs/DO/letstalkcannabis/Pages/LetsTalkCannabis.aspx>