Vaping-Associated Lung Injury (VALI)

Interim Investigative Guidelines
October 2019

1. DISEASE REPORTING

1.1 Purpose of Surveillance and Reporting

To identify persons with vaping-associated lung injury (VALI) to better understand the epidemiology of the condition, and, if possible, determine its cause.

1.2 Laboratory and Physician Reporting Requirements

Physicians and other healthcare providers must report hospitalization or death due to radiographically or histologically demonstrated lung injury in a person who has used e-cigarettes or vaping products in the preceding 90 days. Such cases must be reported to the Local Public Health Authority (LPHA) by telephone within one working day. If LPHA staff are unreachable, cases must be reported to the Oregon Public Health Division (PHD).

1.3 Local Public Health Authority (LPHA) Reporting and Follow-Up Responsibilities

1. Complete the initial VALI intake form to determine case status and need for follow-up.
2. Report all cases under investigation (see definitions below) to PHD and enter case into Orpheus within one working day of initial physician report.
3. Interview confirmed and presumptive cases or proxies within one working day of case classification.
4. Assist PHD in collecting product and clinical specimens for testing, as directed.

1.4 Oregon Public Health Division (PHD) Responsibilities

1. Abstract information from medical record to determine case classification.
2. Collect any available product for testing.

2. THE DISEASE AND ITS EPIDEMIOLOGY

2.1 Etiologic Agent

VALI does not appear to be caused by an infectious agent. Chemical injury is possible, but cause is currently unknown.

2.2 Description of Illness

Cases have reported cough, shortness of breath, or chest pain. Symptoms develop over several days to weeks, eventually leading to radiographic imaging, with chest X-rays showing pulmonary infiltrates or computed tomographic (CT) scans of the chest showing a "ground-glass" appearance. Many cases also reported nausea, vomiting, diarrhea, abdominal pain, fatigue, or fever.

Among VALI cases with known substance-use histories, most reported having used products containing tetrahydrocannabinoid (THC), the main psychoactive ingredient in marijuana. Most had used nicotine-containing products, and a plurality reported having used both in the 30 days before illness onset.

2.3 Treatment

Supportive care until cases have recovered. Corticosteroids have been associated with clinical improvement in some VALI cases, but the decision to use corticosteroids should be made on an individual basis. Long-term sequelae are not yet known.

3. CASE DEFINITIONS, DIAGNOSIS AND LABORATORY SERVICES

3.1 Case Definitions for Hospitalized Cases

1. Cases Under Investigation. All cases under investigation must meet the following minimum criteria:

   - Use of an e-cigarette ("vaping") or dabbing* in the 90 days prior to symptom onset
     AND
   - Pulmonary infiltrates on plain chest radiography or ground-glass opacities on chest CT
     AND
   - Respiratory illness requiring hospitalization.

2. Confirmed Case Definition. Additionally, confirmed cases must:

   - Have no evidence in medical record of an alternative, more plausible diagnosis (e.g., cardiac, rheumatologic, or neoplastic process)
     AND
   - Have no evidence of pulmonary infection on initial workup, including:
     - Negative respiratory viral panel, and
     - Negative influenza PCR or rapid test, and
     - Negative findings for all other clinically indicated respiratory infectious disease testing (e.g., Strep pneumoniae/Legionella/Mycoplasm antigen,

* Includes using an electronic device (e.g., electronic nicotine delivery system [ENDS], electronic cigarette, e-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)

sputum culture if productive cough, bronchioalveolar lavage (BAL) culture if done, blood culture and HIV-related opportunistic respiratory infection testing, if appropriate.

3. Presumptive Case Definition. In addition to the minimum criteria, presumptive cases must:
   - Have no evidence in medical record of an alternative, more plausible diagnosis (e.g., cardiac, rheumatologic, or neoplastic process)
   - **AND EITHER**
     - 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)

4. Suspect Case Definitions. Suspect cases must meet two of the three minimum criteria
   - Using an e-cigarette ("vaping") or dabbing* in the 90 days prior to symptom onset

     AND EITHER
     - Pulmonary infiltrates on plain chest radiography or ground-glass opacities on chest CT
       OR
     - Respiratory illness requiring hospitalization

3.2 Case Definition for Deaths Outside the Hospital

1. Confirmed Case Definition
   - History of vaping in the prior 90 days
     AND
   - Pathologic evidence of acute lung injury (e.g. diffuse alveolar damage, acute fibrinous pneumonitis or bronchiolitis)
     AND
   - Absence of pulmonary infection (e.g., urine Strep pneumoniae/Legionella/Mycoplasma antigen, sputum culture if productive cough, bronchioalveolar lavage (BAL) culture if done, blood culture, HIV-related opportunistic respiratory infection testing if appropriate)
     AND
   - No alternative diagnosis for lung injury

2. Presumptive Case Definition
   - History of vaping in the prior 90 days

AND

- Pathologic evidence of acute lung injury (e.g. diffuse alveolar damage, acute fibrinous pneumonitis or bronchiolitis)

AND

- A positive result on testing for pulmonary infection, but the medical examiner or other forensic pathologist believes that the results are not the sole underlying cause of the acute lung injury

3.4 Services Available at Oregon State Public Health Laboratory (OSPHL)

OSPHL can receive and forward human specimens from clinical laboratories to CDC for testing. Specimens are collected at the discretion of the clinical treatment team and need PHD approval prior to submission to OSPHL.

- Complete guidance for blood, urine, and bronchoalveolar lavage (BAL) specimen collection can be found here: www.cdc.gov/tobacco/basic_information/e-cigarettes/pdfs/Lab-Clinical-Specimen-Collection-Storage-Guidance-Lung-Injury-508.pdf
- Complete guidance for lung biopsy specimens can be found here: www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease/healthcare-providers/pdfs/specimen-submission-req.pdf

4. CASE INVESTIGATION

4.1 Initial Intake Form

This form (see page 7) is used to determine whether the patient meets minimum criteria for further investigation. Interview the reporting provider or an attending physician, who may be able to provide the information requested on the form.

- Patient Information and Demographics
  Obtain patient demographics, including patient name, date of birth, guardian name (if <18 years of age), phone number, and address. This information will be used to request medical records.

- Patient Exposure Information
  Obtain information on the patient's vaping or dabbing history. If the patient did not vape in the last 90 days, then they are not considered a case and do not need to be entered in Orpheus.

- Patient Clinical Information
  Obtain information on patient hospitalization, symptoms, radiography, laboratory testing, and additional clinical information.

4.2 Reporting Cases to PHD

- Cases Under Investigation
  Cases under investigation should be reported to PHD within one working day. Create a VALI case in Orpheus, and set case status to "Under Investigation."

Attach the initial intake form in the “Docs” tab.

- Suspect Case
  If patient meets suspect case definition, there is no further action, but ask the reporting physician to report back if the patient meets all three minimum criteria.

4.3 Case Interviews

PHD epidemiologists will review the medical chart of all cases under investigation to determine whether the case meets confirmed or presumptive case definitions. If so, LHDs should interview the case or a proxy. The case-interview forms can be found in Orpheus.

4.4 Obtaining Product or Clinical Specimens

Contact PHD if the patient has product (e.g., THC-containing cartridges, JUUL pods, e-cigarette juice) for testing. PHD will arrange pickup of the product, requesting LHD assistance, as needed. If assisting, please be sure to fill out the *Chain of Custody* form.

Clinicians may submit clinical specimens to CDC via OSPHL. ACDP will work with LHDs to provide support in submitting clinical specimens from clinical laboratories to OSPHL.

5. CONTROLLING FURTHER SPREAD

5.1 Education

1 Advise the patient to refrain from using e-cigarette, or vaping products. For those who need help quitting vaping cannabis and nicotine, help is available including:

- Tobacco and Vaping
  - 800-QUIT-NOW (800-784-8669), http://www.quitnow.net/Oregon
  - Español: 855-DEJELO-YA (855-335356-92) https://www.quitnow.net/oregonsp
  - http://www.thisisquitting.com/ or text DITCHJUUL to 88709
- Substances other than nicotine
  - Oregon’s Drug and Alcohol Helpline: Call 800-923-4357 or Text RecoveryNow to 839863
  - SAMHSA national help line: 800-662-HELP

2. Online Tobacco Cessation Counseling Training. A short online course to help providers support patients who want to quit tobacco. The course is self-paced and takes approximately 45 minutes. The course can be started, paused and resumed later as needed. https://tcrc.rapidlearner.com/3462253711

3. Refer patients to the Oregon Quit Line. Referring patients to the Quit Line is easy and confidential. It can be done through fax referral or e-referral using your electronic health/medical record system. The Quit Line will call your patient to enroll them in phone or web-based counseling.

REFERENCES

1. Perrine CG, Pickens CM, Boehmer TK, et al. Characteristics of a multistate outbreak of lung injury associated with e-cigarette use, or vaping—United States, 2019. MMWR 2019;68:860–4. doi: http://dx.doi.org/10.15585/mmwr.mm6839e1external icon.

UPDATE LOG

October 2019. Created by Zhang & Poissant

Intake form last updated: 10/29/2019

Reported Case Intake Form: Vaping-Associated Lung Injury

Provider/Reporter Information

Caller Name

Organization

Phone Number

Date Reported

Patient Information and Demographics

Patient Name

Patient DOB **Age in years**

Parent/Guardian Name (if under 18)

Patient/parent phone number

Patient Street Address Line 1

Patient Street Address Line 2

City **State** OR **Zip Code**

County **Sex**

Race **Ethnicity**

Patient Exposure Information

Has patient ever vaped? (any product) Yes ◯ No ◯ Unk ◯

Did the patient vape in the last 90 days? Yes ◯ No ◯ Unk ◯

How often does the patient report vaping?

Did the patient vape a nicotine containing product? Yes ◯ No ◯ Unk ◯

Did the patient vape a THC containing product? Yes ◯ No ◯ Unk ◯

Intake form last updated: 10/29/2019

Reported Case Intake Form: Vaping-Associated Lung Injury

Patient Clinical Information

Patient Medical Record Number:

Date of initial symptom onset

Was patient hospitalized? **Admission Date**

Yes ◯ No ◯ Unk ◯ **Discharge Date**

Was patient in ICU? ◯ Yes ◯ No ◯ Unk

Was patient on mechanical ventilation? Yes ◯ No ◯ Unk ◯

Symptoms

Indicate whether the following symptoms were experienced by this patient:

☐ Fever ☐ Chills ☐ Chest pain ☐ Shortness of Breath

☐ Cough ☐ Diarrhea or loose stools ☐ Nausea ☐ Vomiting

☐ Weight loss ☐ Other:

Radiography

Was any radiographic imaging of the chest completed for this patient?

☐ Chest X-Ray ☐ Chest CT ☐ No radiographic imaging

Did radiographic imaging show pulmonary infiltrates?

☐ Yes, X-Ray ☐ Yes, CT ☐ No pulmonary infiltrates confirmed

Other Chest X-Ray findings:

Other Chest CT findings:

Did the patient have a pleural effusion? ☐ Yes ☐ No ☐ Unknown

Intake form last updated: 10/29/2019

Reported Case Intake Form: Vaping-Associated Pulmonary Illness

Laboratory Testing

Was laboratory testing performed? ☐ Yes ☐ No ☐ Unknown

Were all lab tests negative for an infectious process? ☐ Yes ☐ No ☐ Unknown

If no, please indicate results:

Did the patient undergo bronchoscopy? ☐ Yes ☐ No ☐ Unknown

If yes, please indicate results:

Additional clinical information

Underlying conditions:

Provider's current diagnosis for the patient:

Could the illness be explained by any other process?

Additional comments:

Case Determination

Use the checkboxes below to determine if the case should be reported to ACDP.

- ☐ 1) Vaped in last 90 days
- ☐ 2) Hospitalized overnight
- ☐ 3) Pulmonary infiltrates, such as opacities on plain chest radiograph or ground-glass opacities on chest CT

→If "Yes" to all three minimum criteria, enter case into Orpheus as Under Investigation
→If "Yes" to 1) and 2) or 1) and 3), then enter case into Orpheus as a Suspect case. Ask the provider to report back if the case develops the third criteria