

## Summary and Action Items

### **IDPH recommends the following to clinical providers:**

1. All patients with serious respiratory illness of unknown etiology be asked about recent vaping
2. A urinary toxicology screen (including THC, quantified as necessary) be obtained for these patients if a reliable vaping history is unavailable, or if otherwise clinically indicated
3. Obtaining a chest radiograph for patients with unexplained respiratory symptoms and vaping exposures presenting to both inpatient and outpatient settings
4. Ruling out common infections (e.g. with a respiratory viral panel, influenza testing, blood/sputum cultures), and any other clinically-warranted infectious, and non-infectious, etiology, in patients with unexplained respiratory illness and vaping exposures.

### **IDPH asks clinical providers to:**

1. Report patients with unexplained serious respiratory illness and recent vaping to their local health department (LHD) within normal business hours, using the attached preliminary case report form. The case report provides a link to your LHD contact information.
2. Retain vaping product or devices from case-patients for testing
3. Hold clinical samples from bronchoalveolar lavage (BAL) and /or lung tissue biopsies after processing and diagnostic evaluation for potential submission to the IDPH laboratory.

## Background

The CDC has received reports of over 450 possible cases across 33 states of pulmonary illness related to recent vaping (use of e-cigarette and similar devices to inhale aerosolized liquid)<sup>1</sup>. As of September 12, 2019, 52 cases have so far been reported to the Illinois Department of Public Health (IDPH), and IDPH continues to work closely with local health departments, hospitals, the CDC, and the FDA to further investigate these illnesses.

Among our cases, 81% have been men, with a median age of 22 years (range: 15-41). Nearly all have been hospitalized and many have required intensive care management.

Patients are considered cases associated with this investigation if they have respiratory illness without an identified etiology and have a history of vaping in the past 3 months. Cases have been reported from 20 local health departments in Illinois, but are concentrated in the northeast of the state, with onset dates ranging from April 2019 until present.

## Potential Exposures and Transmission

Patients have all reported vaping in the weeks to months prior to illness. Products used by cases may contain THC, CBD, nicotine, flavors and other chemicals. As of 27<sup>th</sup> August 2019, 80% of Illinois and Wisconsin cases reported vaping some form of THC-containing product, and 61% reported vaping some form of nicotine-containing product. Although the FDA has identified

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<sup>1</sup> [https://www.cdc.gov/mmwr/volumes/68/wr/mm6836e2.htm?s\\_cid=mm6836e2\\_w](https://www.cdc.gov/mmwr/volumes/68/wr/mm6836e2.htm?s_cid=mm6836e2_w)

Vitamin E acetate in some THC-containing samples<sup>2</sup>, the significance of this is not yet known and, as of 12<sup>th</sup> September 2019, no single product or device has been conclusively implicated.

**IDPH is requesting any remaining vaping product or devices be retained for testing.**

## Symptoms

Almost all patients have respiratory symptoms including cough, shortness of breath or pleuritic chest pain. The majority also have gastrointestinal symptoms. Constitutional symptoms including fever, chills, weight loss, fatigue or malaise are also very common.

The majority of patients have required hospital admission. Symptoms worsen over a period of days or weeks before admission. The majority have sought care from a primary care provider, an urgent care clinic or an emergency department in the days prior to their admission.

On admission to hospital, most patients are febrile, tachycardic and hypoxic. Several patients have had progressive respiratory compromise requiring endotracheal intubation, two patients in Illinois have required ECMO and one has died. The following article describes the first 53 cases reported in Illinois and Wisconsin ([NEJM](#)).

## Diagnosis

Chest radiographs are abnormal in all cases. Radiographs often show bilateral opacities, typically in the lower lobes, and CT imaging of the chest shows diffuse ground glass opacities, often with subpleural sparing. When performed, urinary toxicology screens for THC have usually been positive and – when quantified – very high levels of THC have been observed.

Despite presenting with a fever, tachycardia and raised inflammatory markers (including a neutrophilia and high CRP and ESR), evaluation for infectious etiologies have been negative. Though non-specific, some patients have mildly low serum sodium and/or potassium; some have a mild transaminitis at presentation. The decision to consider a bronchoalveolar lavage (BAL) and/or transbronchial biopsy should be considered on individual clinical circumstances. BAL and pathology specimens have revealed lipid-laden macrophages on Oil Red O staining.

**IDPH recommends asking all patients with respiratory illness about recent vaping practices. We recommend considering a chest radiograph in patients with unexplained respiratory illness and vaping exposures presenting to inpatient and outpatient facilities.**

**We also recommend considering a urinary toxicology screen for patients with significant respiratory illness of unclear etiology in whom a reliable vaping history is unavailable.**

**We request that BAL samples and tissue biopsies be held for potential submission to the IDPH laboratory. BAL samples examined for lipid-laden macrophages may be indicative of vaping exposure if a vaping history is unavailable. No specific testing or processing of BAL or biopsy specimens is required for the public health investigation at this time.**

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<sup>2</sup> <https://www.fda.gov/consumers/consumer-updates/vaping-illnesses-consumers-can-help-protect-themselves-avoiding-tetrahydrocannabinol-thc-containing>

## Management

**IDPH asks that all patients presenting with this clinical picture and a history of vaping be reported to your local health department using the case report form below.**

Common infectious etiologies should be ruled out (respiratory panel, 'flu panel, sputum/blood cultures) and less common infectious, rheumatologic or neoplastic processes considered as clinically indicated. Aggressive supportive care is warranted. Some clinicians in Illinois and across the US have documented clinical improvement with high dose IV steroids, however whether steroids cause this improvement is not yet known with certainty.

## Prevention

At this time, it is not known what product(s), chemicals or devices are linked to these illnesses.

The CDC recommends the following for patients:

1. While this investigation is ongoing, if you are concerned about these specific health risks, consider refraining from using e-cigarette products.
2. Regardless of the ongoing investigation, anyone who uses e-cigarette products should not buy these products off the street (e.g., e-cigarette products with THC, other cannabinoids) and should not modify e-cigarette products or add any substances to these products that are not intended by the manufacturer.
3. Regardless of the ongoing investigation, e-cigarette products should not be used by youth, young adults, pregnant women, as well as adults who do not currently use tobacco products. If you use e-cigarette products, monitor yourself for symptoms (e.g., cough, shortness of breath, chest pain) and promptly seek medical attention if you have concerns about your health. CDC and FDA will continue to advise and alert the public as more information becomes available.
4. Adult smokers who are attempting to quit should use evidence-based treatments, including counseling and FDA-approved medications. If you who need help quitting tobacco products, including e-cigarettes, contact your doctor.

## IDPH and Local Health Department (LHD) Response

LHDs and IDPH are conducting interviews with case-patients to identify possible exposures. IDPH continues to work closely with other states, the CDC and the FDA.

LHDs who hear about suspect cases should continue to notify IDPH. IDPH is collating medical records, including chest radiographs and CT images, and reviewing information from LHDs to assess for common exposures. Information will be placed on the Communicable Disease web portal under "Vaping and Severe Respiratory Illness". Information will continue to be shared through regular teleconferences with affected LHDs.

## Contact

Clinicians can report suspected cases to their local health departments using the attached form. Clinicians or LHDs can contact Dr. Isaac Ghinai (Isaac.ghinai@illinois.gov) or the IDPH Communicable Disease Section with any queries.

## Target Audience

Local Health Departments, Infectious Disease Physicians, Pulmonology Physicians, Intensive Care Physicians, Hospital Emergency Departments, Infection Preventionists, Health Care Providers, and Laboratories

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**Author**

IDPH Communicable Disease Section