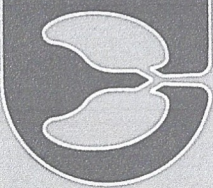


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# An Update on E-cigarette, or Vaping, Product Use - Associated Lung Injury (EVALI)

Teresa Wang, PhD, MS

Epidemiologist, CDC Office on Smoking and Health  
LCDR, United States Public Health Service Commissioned Corps  
Emergency Partners Information Connection (EPIC) Webinar

December 4, 2019





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# Continuing Education for this EPIC Webinar



- All continuing education for EPIC Webinars are issued online through the CDC Training & Continuing Education Online system (<https://tceols.cdc.gov/>).
- Those who participated in today's EPIC Webinar and who wish to receive continuing education should complete the online evaluation by **January 6, 2020** with the course code **WC4028**.
- Those who will participate in the on demand activity and wish to receive continuing education should complete the online evaluation between **January 7, 2020** and **January 7, 2022** and use course code **WD4028**.
- Continuing education certificates can be printed immediately upon completion of your online evaluation. A cumulative transcript of all CDC/ATSDR CE's obtained through the CDC Training & Continuing Education Online System will be maintained for each user.

# Background

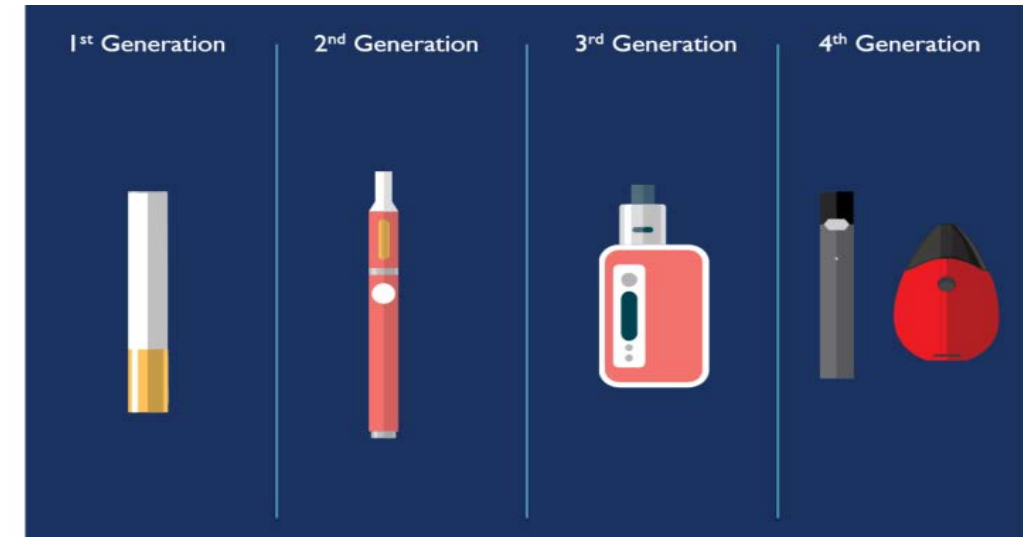


CDC, U.S. Food and Drug Administration (FDA), state and local health departments, and public health and clinical partners are investigating a multistate outbreak of **E**-cigarette, or **V**aping, Product Use - **A**ssociated **L**ung Injury (**EVALI**).

# Key Facts about Use of E-cigarette, or Vaping, Products



- E-cigarettes are also called vapes, e-hookahs, vape pens, tank systems, mods, and electronic nicotine delivery systems (ENDS)
- Using an e-cigarette product is commonly called vaping
- E-cigarettes work by heating a liquid to produce an aerosol that users inhale into their lungs
- The liquid can contain
  - Nicotine
  - Tetrahydrocannabinol (THC) and cannabinoid (CBD) oils
  - Other substances and additives



# Urgent Public Health Action Needed – CDC's Response



POLITICS | HEALTH POLICY

## CDC Reports Rising Incidence of Vaping Injuries

Agency tells lawmakers its next tally of e-cigarette-linked respiratory illnesses will surpass last estimate of 530 a week ago



Dr. Anne Schuchat, principal deputy director of the U.S. CDC  
PHOTO: MARK WILSON/GETTY IMAGES

### CDC activates emergency center for vaping lung injury investigation

© Sep 16, 2019 - 02:46 PM



The Centers for Disease Control and Prevention today [activated](#) its Emergency Operations Center to enhance the inter-agency response to the outbreak of lung injuries associated with e-cigarette use. As of last week, 36 states and the U.S. Virgin Islands have reported at least 390 confirmed or probable cases and six deaths. "CDC has made it a priority to find out what is causing this outbreak of e-cigarette or vaping-related injuries and deaths," said CDC Director Robert Redfield, M.D. "Activation of CDC's Emergency Operations Center allows us to enhance operations and provide additional support to CDC staff working to protect our Nation from this serious health threat." CDC has [encouraged](#) clinicians to report possible cases of e-cigarette-associated pulmonary disease to their local or state health department, and the public not to use e-cigarettes until investigators identify a specific cause.

- **August 2019:** CDC implemented an incident management structure
- **September 16, 2019:** CDC activated its Emergency Operations Center
- To date, approximately 300 CDC staff have been engaged in response efforts

# EVALI Symptoms



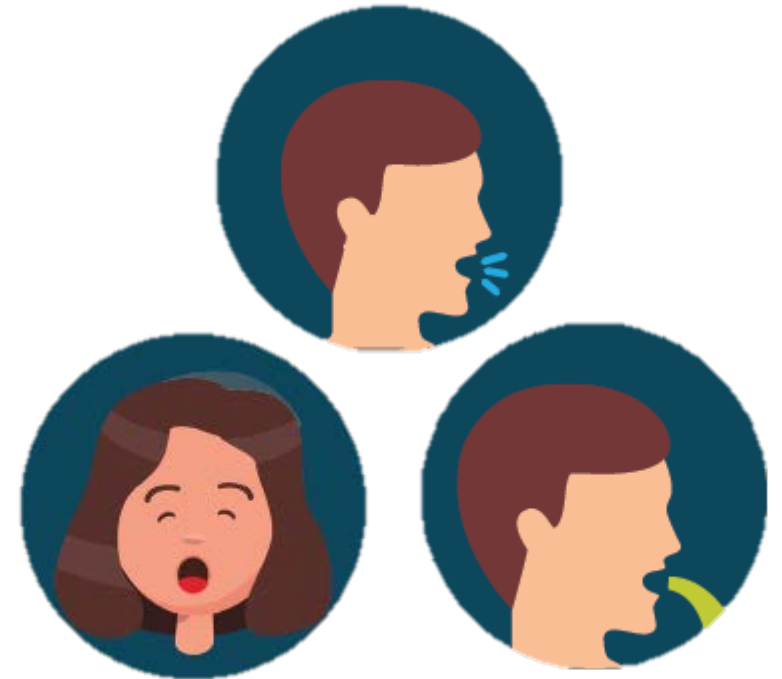
- Patients in this investigation have reported symptoms such as:
  - Cough, shortness of breath, or chest pain
  - Nausea, vomiting, abdominal pain, or diarrhea
  - Fever, chills, or weight loss



# EVALI Symptoms



- Some patients reported symptoms developed over a few days, while others reported symptoms developed over several weeks
- Gastrointestinal symptoms preceded respiratory symptoms in some patients

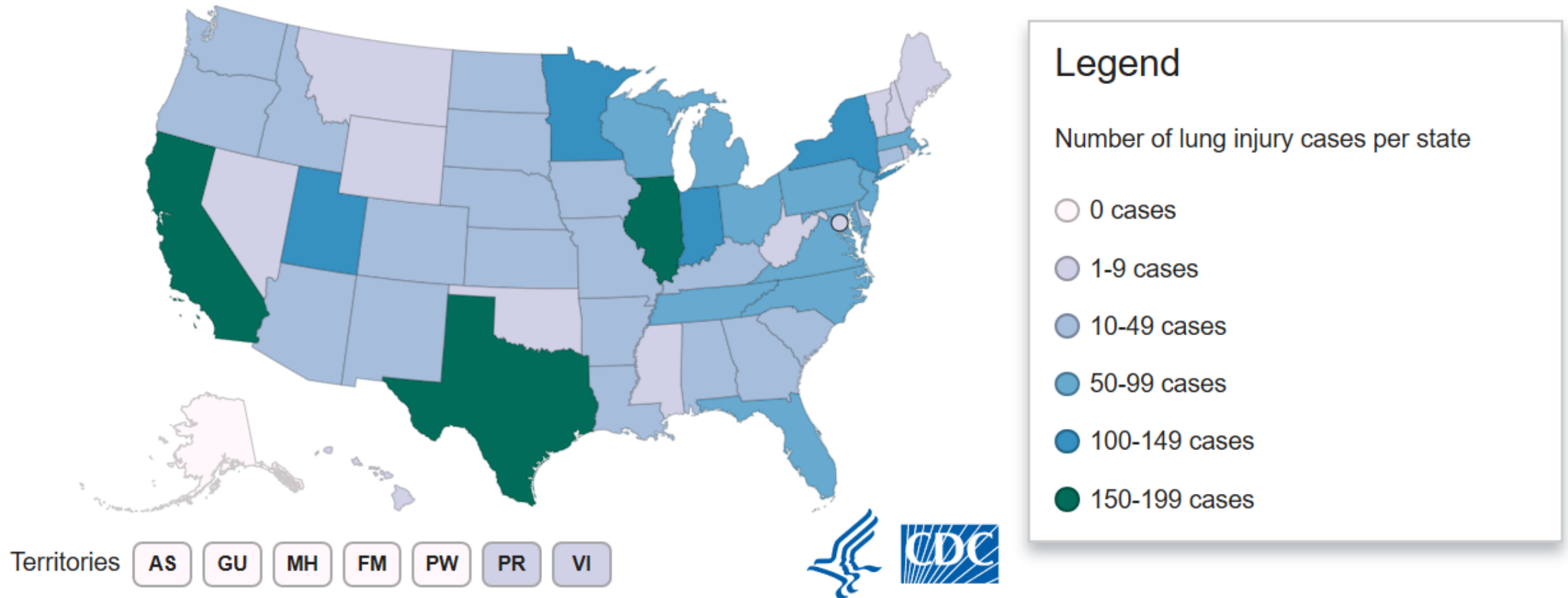


# EVALI Cases Reported to CDC



- **2,290** lung injury cases associated with the use of e-cigarette, or vaping, products reported *(as of November 20, 2019)*
  - 49 states, DC, Puerto Rico, and US Virgin Islands reported cases
- 47 deaths in 25 states and DC
- All patients have reported a history of using e-cigarette, or vaping, products

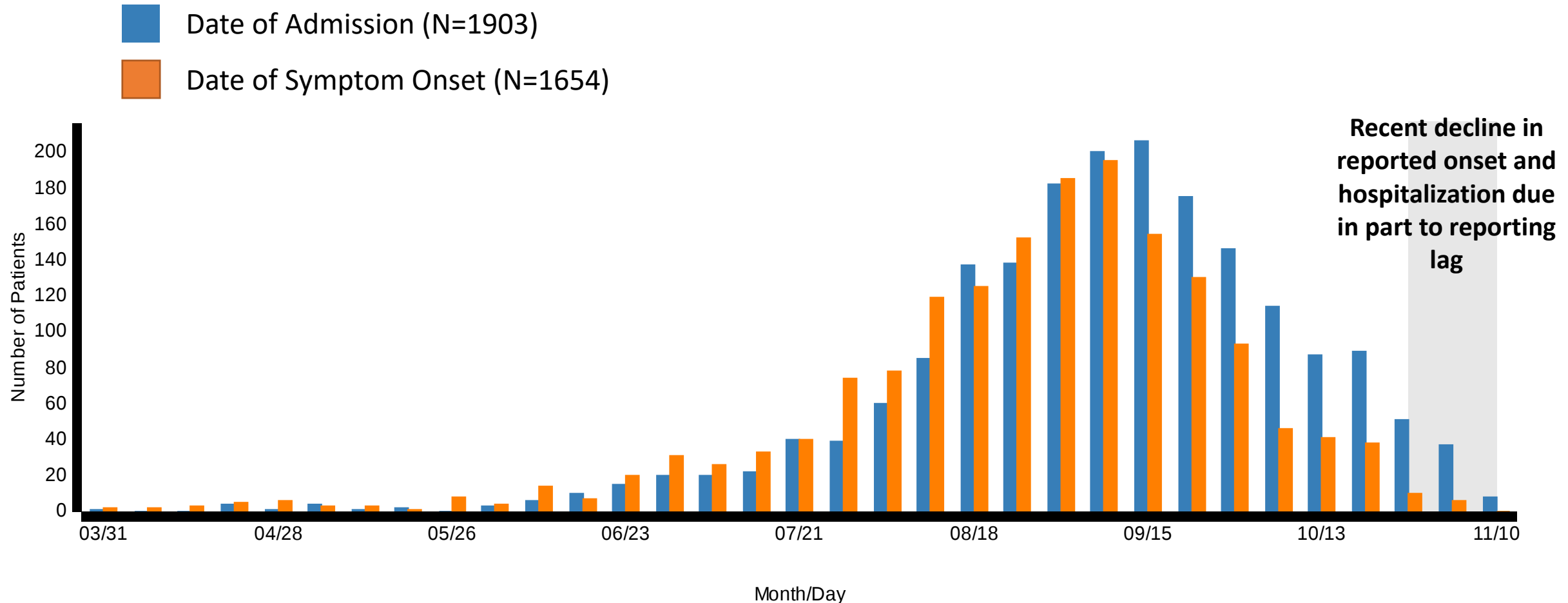
# EVALI Cases Reported to CDC



*as of November 19, 2019*

# Symptom Onset and Hospital Admission Dates

## Patients with Lung Injury Associated with E-Cigarette Use, or Vaping



# EVALI Cases Reported to CDC, by Hospitalization Status, Sex, and Age



- Among 2,016 cases with data on hospitalization status
  - 95% hospitalized, 5% not hospitalized
- Among patients with data on sex
  - 68% male
- Among patients with data on age
  - 77% <35 years old
  - Median age: 24 years
  - Age range: 13-78 years



*As of November 5, 2019*

# EVALI Cases Reported to CDC, by Hospitalization Status, Sex, and Age Cont'd



- Among patients with data on age
  - 15% of patients were <18 years
  - 38% of patients were 18-24 years
  - 24% of patients were 25-34 years
  - 23% of patients were 35 years or older



*As of November 5, 2019*

# Cases Reported to CDC, by Substances Used in E-cigarette, or Vaping Products, in 3 months prior to symptom onset



- Among 1,184 patients with data on substances used 3 months prior to symptom onset:
  - 83% reported using THC-containing products
    - 35% exclusive use of THC-containing products
  - 61% reported using nicotine-containing products
    - 13% exclusive use of nicotine-containing products
  - 48% reported both THC- and nicotine-containing products
  - 4% reported no THC- or nicotine-containing product use



*As of November 5, 2019*

# What We Know



- Most patients report history of using products containing THC
- National findings suggest products containing THC are linked to most of the cases

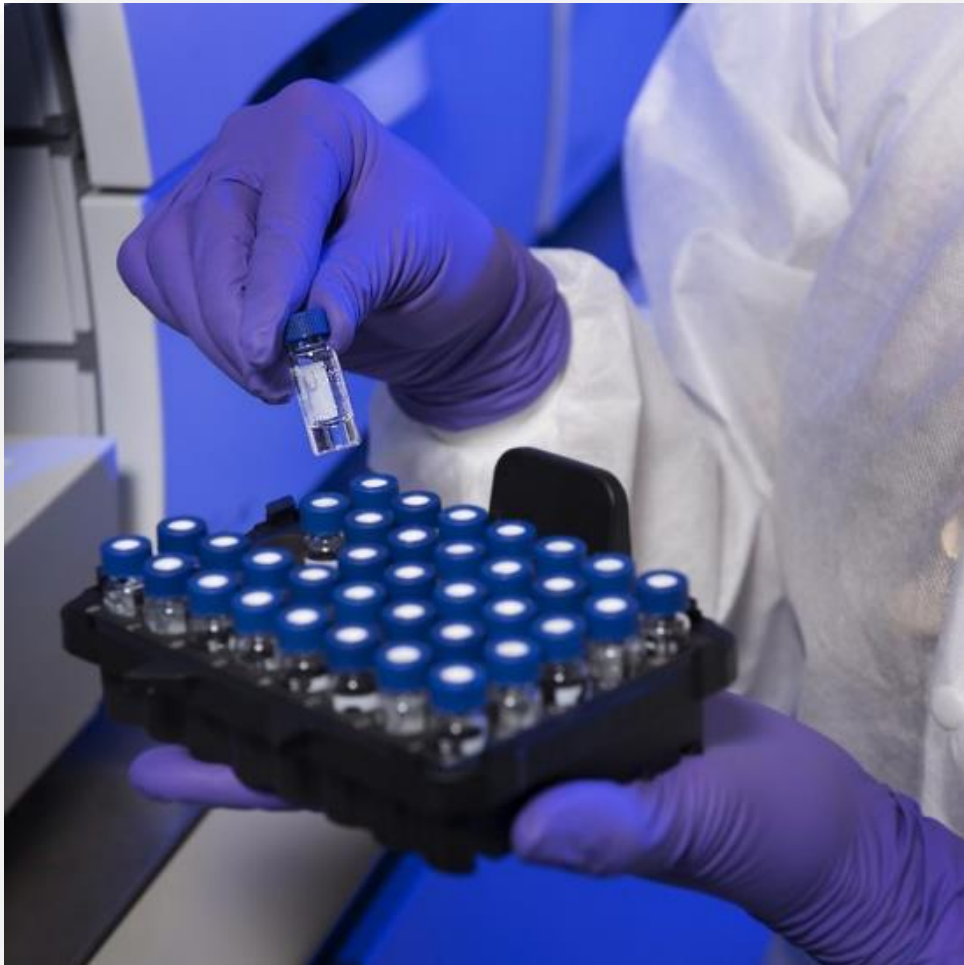


# Laboratory Testing

- CDC offering laboratory testing of:
  - Bronchoalveolar lavage (BAL) fluid samples
  - Pathologic specimens associated with patients
  - Aerosol emissions of case-associated product samples
- Results may provide insight into the nature of the chemical exposure(s) contributing to this outbreak



# What We Know: Laboratory Findings



- Test results of bronchoalveolar lavage (BAL) samples from 29 patients from 10 states detected vitamin E acetate in **all** samples
- Vitamin E acetate: known additive in e-cigarette, or vaping products
- **First time CDC detected a potential chemical of concern in biologic samples from patients with these lung injuries**

# Key Facts about Vitamin E Acetate



- Might be used as an additive, most notably as a thickening agent in THC-containing e-cigarette, or vaping, products
- Found in many foods, including vegetable oils, cereals, meat, fruits, and vegetables; also available as a dietary supplement and in many cosmetic products
- Usually does not cause harm when ingested as a vitamin supplement or applied to the skin
- However, previous research suggests when vitamin E acetate is inhaled, it may interfere with normal lung functioning



# What We Don't Know



- While it appears that Vitamin E acetate is associated with EVALI, evidence is not yet sufficient to rule out contributions of other chemicals of concern to EVALI.
- Many different substances and product sources under investigation, and it may be that there is more than one cause of this outbreak.

# Recommendations for Healthcare Providers



If use of e-cigarette, or vaping, product is suspected as possible cause for a patient's lung injury, obtain a detailed history of:

- Substance(s) used
- Substance source(s)
- Duration and frequency of use
- Device(s) used
- Where products were purchased
- Method of substance use

# Recommendations for Healthcare Providers



- Consider all possible causes in patients reporting respiratory and gastrointestinal symptoms
- Patients with suspected lung injury should be admitted if decreased oxygen (O<sub>2</sub>) saturation (<95%)
- Long-term effects and recurrence risk unknown



# Recommendations for Healthcare Providers



- Close follow-up needed for these patients
  - After discharge: Ensure follow-up no later than 1-2 weeks
  - Outpatient: Follow-up within 24-48 hours
- Hospital admission should be strongly considered for patients with concurrent illness such as influenza and potential EVAL
- Emphasize the importance of annual influenza vaccination for all persons aged  $\geq 6$  months, including patients who use e-cigarette, or vaping products



# Recommendations for Healthcare Providers



- Advise patients to discontinue use of e-cigarette, or vaping, products
- Encourage evidence-based cessation strategies
- Effective treatments are available for cannabis use disorder



# Recommendations for Health Departments



- Promptly notify CDC about possible cases of e-cigarette- or vaping-associated lung injury at: [eocevent101@cdc.gov](mailto:eocevent101@cdc.gov)
- CDC provides:
  - Updated case definitions
  - Reporting guidelines
  - Case investigation forms
  - Technical assistance



[www.cdc.gov/lunginjury](http://www.cdc.gov/lunginjury)

# Recommendations for Health Departments



- Starting Tuesday, November 26, states are asked to only report hospitalized EVALI cases to CDC. Further collection of data on nonhospitalized cases will be at the discretion of individual STLT health departments.
- Patients with EVALI may have similar symptoms to flu or other respiratory illness
- Finding and reporting could become more difficult given potential for large numbers of respiratory illness during emerging flu season



# Recommendations for the Public



- CDC recommends people should:
  - **Not** use THC-containing e-cigarette, or, vaping products
  - **Not** buy these products from informal sources, such as friends, family, or online or in-person dealers
  - **Not** modify or add any substances to these products



# Recommendations for the Public



- While it appears that vitamin E acetate is associated with EVALI, evidence is not yet sufficient to rule out contribution of other chemicals of concern to EVALI.
- Many different substances and product sources are still under investigation, and it may be that there is more than one cause of this outbreak.
  - Only way to assure that you are not at risk is to consider refraining from **all** e-cigarette, or vaping products



# Recommendations for the Public



- If you continue to use an e-cigarette, or vaping, product and you have symptoms of lung injury, **see a healthcare provider and report your e-cigarette, or vaping, product use.**
- Adults using e-cigarettes to quit smoking should not go back to smoking. They should weigh all risks and benefits and consider utilizing **FDA-approved medications.**
- Youth, young adults, and women who are pregnant should not use e-cigarette, or vaping, products.

# Recommendations for the Public



- If you are an adult who has ongoing problematic marijuana use leading to impairment and distress:
  - Effective treatments are available. A number of therapy-based treatments have been shown to help people who are addicted to marijuana
  - Recovery is possible
  - Visit the [Substance Abuse and Mental Health Services Administration's treatment locator](#) to find treatment in your area, or call **1-800-662-HELP (4357)**

# Stay Connected with CDC



- **Twitter**  
@CDCgov  
@CDCDirector



- **Facebook**  
CDC



- **LinkedIn**  
Centers for Disease Control  
and Prevention



- **Instagram**  
@cdcgov



# More Information



- For information about collection and submission of e-cigarette, or vaping, products and e-liquids associated with confirmed or probable cases for **possible testing by FDA**, contact [FDAVapingSampleInquiries@fda.hhs.gov](mailto:FDAVapingSampleInquiries@fda.hhs.gov)
- For information about collection of e-cigarette, or vaping, products, including e-liquids, associated with confirmed or probably cases for **possible aerosol emissions testing by CDC**, contact [IncidentResponse@cdc.gov](mailto:IncidentResponse@cdc.gov)
- Clinicians and health officials who have questions about this outbreak can contact [LungDiseaseOutbreak@cdc.gov](mailto:LungDiseaseOutbreak@cdc.gov)
- If you have questions about this outbreak, contact CDC-INFO at 800-232-4636, or visit <https://wwwn.cdc.gov/dcs/ContactUs/Form>

# Examples of CDC Publications on EVALI



## *Morbidity and Mortality Weekly Report (MMWR)*

- [Characteristics of E-cigarette, or Vaping, Products Used by Patients with Associated Lung Injury and Products Seized by Law Enforcement — Minnesota, 2018 and 2019](#)
- [Update: Interim Guidance for Health Care Providers for Managing Patients with Suspected E-cigarette, or Vaping, Product Use-Associated Lung Injury — United States, November 2019](#)
- [Characteristics of Hospitalized and Nonhospitalized Patients in a National Outbreak of E-cigarette, or Vaping, Product Use-Associated Lung Injury — United States, November 2019](#)
- [Evaluation of Bronchoalveolar Lavage Fluid from Patients in an Outbreak of E-cigarette, or Vaping, Product Use-Associated Lung Injury — 10 states, August–October 2019](#)
- [Risk Factors for E-Cigarette, or Vaping, Product Use Associated Lung Injury \(EVALI\) Among Adults Who Use E-Cigarette, or Vaping, Products — Illinois, July–October 2019](#)
- [Update: Characteristics of Patients in a National Outbreak of E-cigarette, or Vaping, Products Use-Associated Lung Injuries — United States, October 2019](#)
- [E-cigarette Use, or Vaping, Practices and Characteristics Among Persons with Associated Lung Injury — Utah, April–October 2019](#)
- [Update: Interim Guidance for Health Care Providers Evaluating and Caring for Patients with Suspected E-cigarette, or Vaping, Product Use Associated Lung Injury — United States, October 2019](#)
- [Characteristics of a Multistate Outbreak of Lung Injury Associated with E-cigarette Use, or Vaping — United States, 2019](#)
- [E-cigarette Product Use or Vaping Among Persons with Associated Lung Injury — Illinois and Wisconsin, April–September 2019](#)
- [Severe Pulmonary Disease Associated with Electronic-Cigarette–Product Use — Interim Guidance](#)

## *New England Journal of Medicine*

- [Pulmonary Illness Related to E-Cigarette Use in Illinois and Wisconsin — Preliminary Report](#) 

## Morbidity and Mortality Weekly Report (MMWR)

CDC



## CDC'S LUNG INJURY RESPONSE

[READ ALL THE REPORTS](#)

# CDC Updates on EVALI



Up-to-date information available on CDC's website

**[www.cdc.gov/lunginjury](http://www.cdc.gov/lunginjury)**

For more information, contact CDC  
1-800-CDC-INFO (232-4636)  
TTY: 1-888-232-6348 [www.cdc.gov](http://www.cdc.gov)