



Smoking & Tobacco Use

Outbreak of Lung Injury Associated with the Use of E-Cigarette, or Vaping, Products



CDC, the U.S. Food and Drug Administration (FDA), state and local health departments, and other clinical and public health partners are investigating a multistate outbreak of e-cigarette, or vaping, product use associated lung injury (EVALI).

For the Public

For Healthcare Providers

For Health Departments

Resources

Digital Press Kit



Updated November 21, 2019, at 1:00 PM EST

What is New

CDC has identified vitamin E acetate as a chemical of concern among people with e-cigarette, or vaping, product use associated lung injury (EVALI). Recent CDC laboratory testing of bronchoalveolar lavage (BAL) fluid samples (fluid samples collected from the lungs) from 29 patients with EVALI submitted to CDC from 10 states found vitamin E acetate in all of the samples. Vitamin E acetate is used as an additive, most notably as a thickening agent in THC-containing e-cigarette, or vaping, products.

CDC recommends that people should not use THC-containing e-cigarette, or vaping, products, particularly from informal sources like friends, or family, or in-person or online dealers. While this investigation is ongoing, vitamin E acetate should not be added to e-cigarette, or vaping, products.

In addition, people should not add any substance to e-cigarette or vaping products that are not intended by the

In addition, people should not use any substance to e-cigarette or vaping products that are not intended by the manufacturer, including products purchased through retail establishments. CDC will continue to update guidance, as appropriate, as new data become available from this outbreak investigation.

What We Know

New Laboratory Findings:

- Analyses of bronchoalveolar lavage (BAL) fluid samples (fluid samples collected from the lungs) of patients with e-cigarette, or vaping, product use associated lung injury (EVALI) identified **vitamin E acetate**, an additive in some THC-containing e-cigarette, or vaping, products.
- Recent CDC laboratory test results of BAL fluid samples from 29 patients submitted to CDC from 10 states found vitamin E acetate in **all** of the samples.
 - THC was identified in 82% of the samples and nicotine was identified in 62% of the samples.
 - CDC tested for a range of other chemicals that might be found in e-cigarette, or vaping, products, including plant oils, petroleum distillates like mineral oil, MCT oil, and terpenes (which are compounds found in or added to THC products). None of these chemicals of concern were detected in the BAL fluid samples tested.
- This is the first time that we have detected a chemical of concern in biologic samples from patients with these lung injuries. These findings provide direct evidence of vitamin E acetate at the primary site of injury within the lungs.
- These findings complement the [ongoing work of FDA](#) and some state public health laboratories to characterize e-liquid exposures and inform the ongoing multistate outbreak.

About the Outbreak:

- As of **November 20, 2019**, 2,290* cases of e-cigarette, or vaping, product use associated lung injury (EVALI) have been reported to CDC from 49 states (all except Alaska), the District of Columbia, and 2 U.S. territories (Puerto Rico and U.S. Virgin Islands).
 - Forty-seven deaths have been confirmed in 25 states and the District of Columbia (**as of November 20, 2019**).
 - Due to the Thanksgiving holiday, latest outbreak information will be reported on December 5, 2019.** Case counts and deaths reported will include data collected between November 17th and November 30th and *only hospitalized EVALI cases*. See [Public Health Reporting](#) for more information.
 - CDC continues to work closely with FDA, states, public health partners, and clinicians on this investigation.

About Patient Exposure:

- All EVALI patients have reported a history of using e-cigarette, or vaping, products.
 - Vitamin E acetate has been identified as a chemical of concern among people with e-cigarette, or vaping, product use associated lung injury (EVALI).
 - THC is present in most of the samples tested by FDA to date, and most patients report a history of using THC-containing e-cigarette, or vaping, products.
 - The latest national and state findings suggest THC-containing e-cigarette, or vaping, products, particularly from informal sources like friends, or family, or in-person or online dealers, are linked to most of the cases and play a major role in the outbreak.

* The increase in lung injury cases from last week represents both new patients and recent reporting of previously-identified patients to CDC.

What We Don't Know

- 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.

What CDC Recommends

- CDC recommends that people do not use THC-containing e-cigarette, or vaping, products.
- CDC also recommends that people should **not**:
 - Buy any type of e-cigarette, or vaping, products, particularly those containing THC from informal sources like friends, or family, or in-person or online dealers.
 - Modify or add any substances to e-cigarette, or vaping, products that are not intended by the manufacturer, including products purchased through retail establishments.
- 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.
 - The only way to assure that you are not at risk while the investigation continues is to consider refraining from use of all e-cigarette, or vaping, products.
- 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 nicotine replacement therapies [\[link\]](#).
- Adults who continue to use an e-cigarette, or vaping, product, should carefully monitor themselves for symptoms and see a healthcare provider immediately if they develop **symptoms** like those reported in this outbreak.
- Irrespective of the ongoing investigation:
 - E-cigarette, or vaping, products should never be used by youths, young adults, or women who are pregnant.
 - Adults who do not currently use tobacco products should not start using e-cigarette, or vaping, products. There is no safe tobacco product. All tobacco products, including e-cigarettes, carry a risk.
 - THC use has been associated with a wide range of health effects, particularly with prolonged frequent use. The best way to avoid potentially harmful effects is to not use THC-containing e-cigarette, or vaping, products. Persons with marijuana use disorder should seek evidence-based treatment by a health care provider.
- People who have significant impairment or distress from ongoing problematic use of THC-containing e-cigarette, or vaping, products should seek evidence-based behavioral treatment and recovery services for cannabis use disorder.

Key Facts about Use of E-Cigarette, or Vaping, Products

- Electronic cigarettes — or 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, and other substances and additives. THC is the psychoactive mind-altering compound of marijuana that produces the “high”.

Key Facts about Vitamin E Acetate

- Vitamin E acetate is used as an additive, most notably as a thickening agent in THC-containing e-cigarette, or vaping, products.
- Vitamin E is a vitamin found in many foods, including vegetable oils, cereals, meat, fruits, and vegetables. It is also

available as a dietary supplement and in many cosmetic products, like skin creams.

- Vitamin E acetate 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.

If you have questions about CDC's investigation into the lung injuries associated with use of e-cigarette, or vaping, products, contact CDC-INFO or call 1-800-232-4636.

Latest Outbreak Information

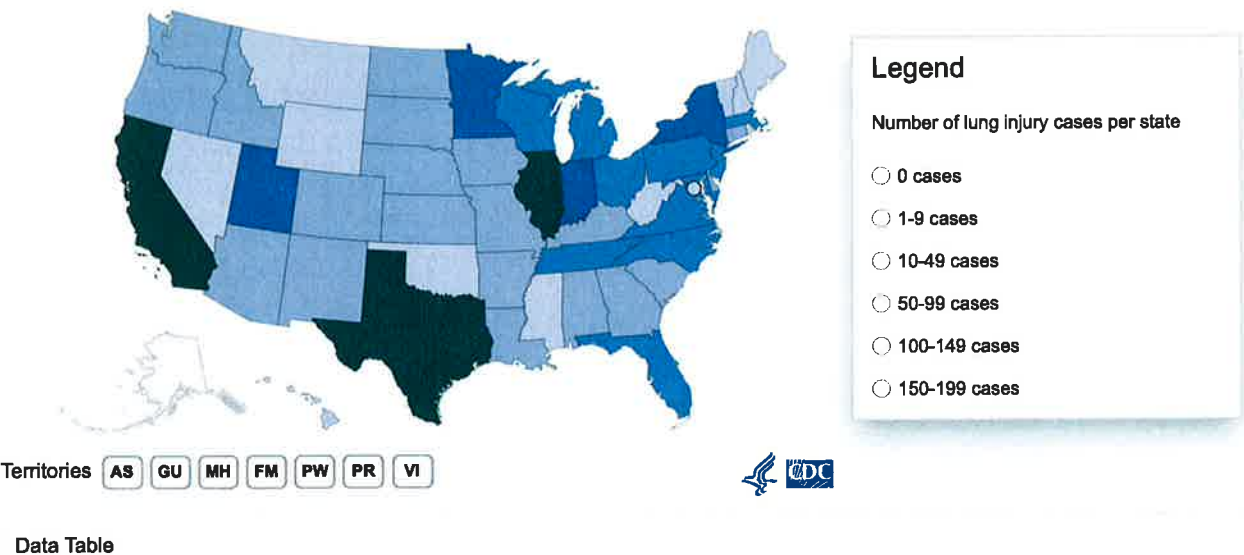
Due to the Thanksgiving holiday, latest outbreak information will be reported on December 5, 2019. Case counts and deaths reported will include data collected between November 17th and November 30th and *only hospitalized EVALI cases*. See [Public Health Reporting](#) for more information.

- This complex investigation spans almost all states, involves over 2,000 patients, and a wide variety of brands and substances and e-cigarette, or vaping, products.
- As of **November 20, 2019**, 2,290* cases of e-cigarette, or vaping, product use associated lung injury (EVALI) have been reported to CDC from 49 states (all except Alaska), the District of Columbia, and 2 U.S. territories (Puerto Rico and U.S. Virgin Islands).
- Forty-seven deaths have been confirmed in 25 states and the District of Columbia (**as of November 20, 2019**):
 - Alabama, California (4), Connecticut, Delaware, District of Columbia, Florida, Georgia (3), Illinois (5), Indiana (4), Kansas (2), Louisiana, Massachusetts (3), Michigan, Minnesota (3), Mississippi, Missouri (2), Montana, Nebraska, New Jersey, New York (2), Oregon (2), Pennsylvania, Tennessee (2), Texas, Utah, and Virginia
 - The median age of deceased patients was 53 years and ranged from 17 to 75 years (**as of November 20, 2019**).
 - More deaths are under investigation.
- Among the 2,016 cases of e-cigarette, or vaping, product use associated lung injury (EVALI) reported to CDC with available data on hospitalization status (**as of November 5, 2019**):
 - 95% were hospitalized, and 5% were not hospitalized.
 - 68% were male (among 1,905 patients with data on sex)
 - 77% were under 35 years old, with a median age of 24 years and age range from 13 to 78 years (among 1,906 patients with data on age)
 - By age group category:
 - 15% of patients were under 18 years old;
 - 38% of patients were 18 to 24 years old;
 - 24% of patients were 25 to 34 years old; and
 - 23% of patients were 35 years or older.
- 1,184 patients had complete information** on substances used in e-cigarette, or vaping, products in the 3 months prior to symptom onset, of whom (**as of November 5, 2019**):
 - 83% reported using THC-containing products; 35% reported exclusive use of THC-containing products.
 - 61% reported using nicotine-containing products; 13% reported exclusive use of nicotine-containing products.
 - 48% reported both THC- and nicotine-containing product use.

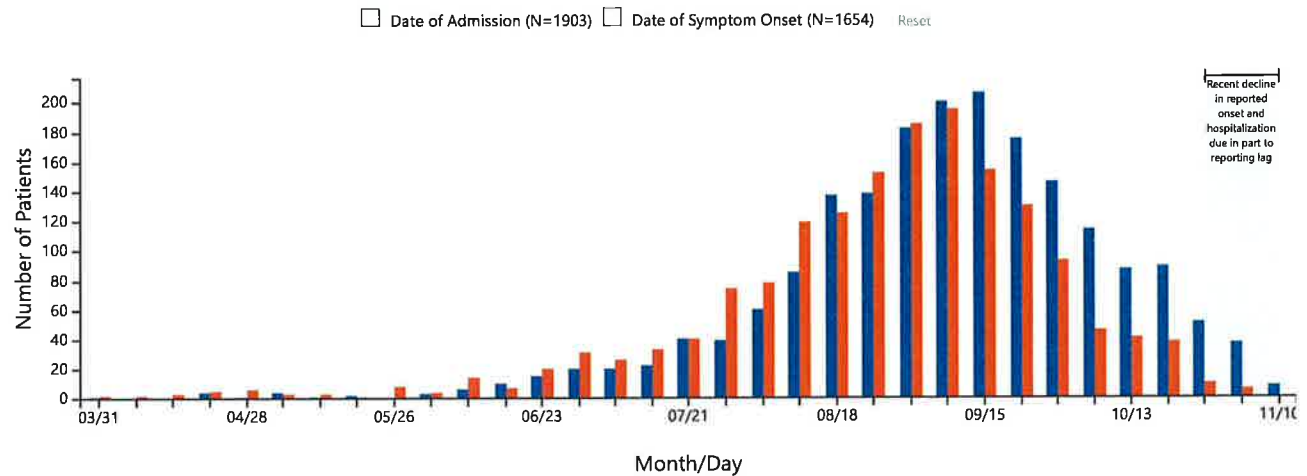
* The increase in lung injury cases from last week represents both new patients and recent reporting of previously-identified patients to CDC.

** Based on complete reports received.

Number of Lung Injury Cases Reported to CDC as of November 19, 2019



Dates of symptom onset and hospital admission for patients with lung injury associated with e-cigarette use, or vaping — United States, March 31–November 16, 2019



Data Table

	03/31/2019	04/07/2019	04/14/2019	04/21/2019	04/28/2019	05/05/2019	05/12/2019	05/19/2019
Date of Admission (N=1903)	1	0	0	4	1	4	1	
Date of Symptom Onset (N=1654)	2	2	3	5	6	3	3	

Scroll for additional info

Region Name	Start Date	End Date
Recent decline in reported onset and hospitalization due in part to reporting lag	10/27/2019	11/10/2019

What CDC is Doing

Public Health Response:

- CDC's Lung Injury response efforts are committed to:
 - Identify and define the risk factors and the source for lung disease associated with e-cigarette product use, or vaping.
 - Detect and track confirmed and probable cases in the US.
 - Communicate actionable recommendations to state, local, and clinical audiences.
 - Establish lab procedures that can assist with the public health investigation and patient care.

Partnerships:

- CDC is working 24/7 to identify the cause or causes of this outbreak.
- CDC continues to work closely with FDA, states, public health partners, and clinicians on this investigation by providing consultation and technical assistance to states on communication, health alerts, public outreach, and surveillance.
- CDC has activated the Emergency Operations Center (EOC) to coordinate activities and provide assistance to states, public health partners and clinicians around the nation.
- CDC worked with states to create **case definitions** to classify confirmed and probable cases in a consistent way. States are in the process of classifying patients.
 - CDC will report numbers of confirmed and probable lung injury cases once states have finalized their classification of cases.
- By invitation, CDC has deployed Epidemic Intelligence Service (EIS) officers and other CDC staff to support states.

Media and Communication:

- CDC is maintaining an [outbreak webpage](#) with key messages and weekly updates on case counts, deaths, and resources.
- CDC is holding congressional briefings, media telebriefings, and regular calls with health departments, clinicians to provide timely updates.

Laboratory Testing:

- CDC is currently testing bronchoalveolar lavage (BAL) fluid samples and other samples.
- CDC is testing pathologic specimens, including lung biopsy or autopsy specimens, associated with patients.
- CDC is offering [aerosol emission testing](#) of case-associated product samples from e-cigarette, or vaping, products and e-liquids. Analysis of aerosol emissions will augment FDA's ongoing work to characterize e-liquid and will improve our understanding of exposure among case-patients associated with the Lung Injury outbreak. CDC is coordinating e-cigarette, or vaping, product analysis with FDA.
- Results may provide insight into the nature of the chemical exposure(s) contributing to this outbreak.
- CDC developed [guidance documents](#) to assist public health laboratories, healthcare providers, pathologists, and others with specimen collection, storage, and submission to CDC for testing.
- For more information and resources visit [For the Public](#), [For Healthcare Providers](#) and [For State and Local Health Departments](#) as well as our [Publications and Resources](#) page.

Page last reviewed: November 26, 2019



Emergency Preparedness and Response

Severe Pulmonary Disease Associated with Using E-Cigarette Products



Distributed via the CDC Health Alert Network
August 30, 2019, 0935 AM ET (9:35 AM ET)
CDCHAN-00421

Summary

The Centers for Disease Control and Prevention (CDC) is providing: 1) background information on the forms of e-cigarette products, 2) information on the multistate outbreak of severe pulmonary disease associated with using e-cigarette products (devices, liquids, refill pods, and cartridges), and 3) clinical features of patients with severe pulmonary disease. This health advisory also provides recommendations for clinicians, public health officials, and the public based on currently available information.

General Background

E-cigarettes typically contain nicotine, most also contain flavorings and other chemicals, and some may contain marijuana or other substances. They are known by many different names and come in many shapes, sizes and device types. Devices may be referred to as "e-cigs," "vapes," "e-hookahs," "vape pens," "mods," tanks, or electronic nicotine delivery systems (ENDS). Some e-cigarette devices resemble other tobacco products such as cigarettes; some resemble ordinary household items such as USB flash drives, pens, and flashlights; and others have unique shapes. Use of e-cigarettes is sometimes referred to as "vaping" or "juuling." E-cigarettes used for dabbing are sometimes called "dab" pens.

E-cigarettes can contain harmful or potentially harmful substances, including nicotine, heavy metals (e.g., lead), volatile organic compounds, and cancer-causing chemicals. Additionally, some e-cigarette products are used to deliver illicit substances; may be acquired from unknown or unauthorized (i.e., "street") sources; and may be modified for uses that could increase their potential for harm to the user. For example, some e-cigarette pods or cartridges marketed for single use can be refilled with illicit or unknown substances. In addition, some e-cigarette products are used for "dripping" or "dabbing." Dripping involves dropping e-cigarette liquid directly onto the hot coils of an e-cigarette which can result in high concentrations of compounds (e.g., tetrahydrocannabinol [THC] and cannabinoid compounds). Dabbing involves superheating substances such as "budder", butane hash oil (BHO), and "710" that contain high concentrations of THC and other plant compounds (e.g., cannabidiol [CBD]).

Youth, young adults, pregnant women, as well as adults who do not currently use tobacco products should not use e-cigarettes. E-cigarettes containing nicotine have the potential to help some individual adult smokers reduce their use of and transition away from cigarettes. However, e-cigarettes are not currently approved by the Food and Drug Administration (FDA) as a quit smoking aid, and the available science is inconclusive on whether e-cigarettes are effective for quitting smoking.

Outbreak Background

As of August 27, 2019, 215 possible cases have been reported from 25 states and additional reports of pulmonary illness are under investigation. One patient (in Illinois) with a history of recent e-cigarette use was hospitalized with severe pulmonary disease and subsequently died. Although the etiology of e-cigarette-associated pulmonary disease is undetermined, epidemiologic investigations in affected states are ongoing to better characterize the exposures, demographic, clinical, and laboratory features and behaviors of patients. All patients have reported using e-cigarette products. The exact number is currently unknown, but many patients have reported using e-cigarettes containing cannabinoid products such as THC or CBD.

Based on reports from several states, patients have experienced respiratory symptoms (cough, shortness of breath, or chest pain), and some have also experienced gastrointestinal symptoms (nausea, vomiting, or diarrhea) or non-specific constitutional symptoms (fatigue, fever, or weight loss). Symptoms typically develop over a period of days but sometimes can manifest over several weeks. Gastrointestinal symptoms sometimes preceded respiratory symptoms. Fever, tachycardia, and elevated white blood cell count have been reported in the absence of an identifiable infectious disease. Many patients have sought initial care in ambulatory settings, some with several visits, before hospital admission.

Radiologic findings have varied and are not present in all patients upon initial presentation. Bilateral pulmonary infiltrates and diffuse ground-glass opacities have been reported. Many patients required supplemental oxygen, some required assisted ventilation and oxygenation, and some were intubated. Some patients have been treated with corticosteroids with demonstrated improvement. Antimicrobial therapy alone has not consistently been associated with clinical improvement. Assessment for infectious etiologies has been completed in many patients without an identified infectious cause. Several patients from one state have been diagnosed with lipid pneumonia based on clinical presentation and detection of lipids within bronchoalveolar lavage samples stained specifically to detect oil.

All patients have reported using e-cigarette products and the symptom onset has ranged from a few days to several weeks after e-cigarette use. Within two states, recent inhalation of cannabinoid products, THC or cannabidiol, have been reported in many of the patients. To date, no single substance or e-cigarette product has been consistently associated with illness. CDC is working closely with state health departments to facilitate collecting product specimens for testing at the U.S. FDA Forensic Chemistry Center.

Recommendations for Clinicians

1. Report cases of severe pulmonary disease of unclear etiology and a history of e-cigarette product use within the past 90 days to your state or local health department. Reporting of cases may help CDC and state health departments determine the cause or causes of these pulmonary illnesses.
2. Ask all patients who report e-cigarette product use within the last 90 days about signs and symptoms of pulmonary illness.
3. If e-cigarette product use is suspected as a possible etiology of a patient's severe pulmonary disease, obtain detailed history regarding:
 - Substance(s) used: nicotine, cannabinoids (e.g., marijuana, THC, THC concentrates, CBD, CBD oil, synthetic cannabinoids [e.g., K2 or spice], hash oil, Dank vapes), flavors, or other substances
 - Substance source(s): commercially available liquids (i.e., bottles, cartridges, or pods), homemade liquids, and re-use of old cartridges or pods with homemade or commercially bought liquids
 - Device(s) used: manufacturer; brand name; product name; model; serial number of the product, device, or e-liquid; if the device can be customized by the user; and any product modifications by the user (e.g., exposure of the atomizer or heating coil)
 - Where the product(s) were purchased
 - Method of substance use: aerosolization, dabbing, or dripping
 - Other potential cases: sharing e-cigarette products (devices, liquids, refill pods, or cartridges) with others
4. Determine if any remaining product, including devices and liquids, are available for testing. Testing can be coordinated with the local or state health departments.
5. Consider all possible causes of illness in patients reporting respiratory and gastrointestinal symptoms and of e-cigarette product use. Evaluate and treat for other possible causes of illness (e.g., infectious, rheumatologic, neoplastic) as clinically indicated. Consider consultation with specialists (pulmonary, infectious disease, critical care, medical toxicology) as appropriate.


medical toxicology) as appropriate.

6. Clinical improvement of patients with severe pulmonary disease associated with e-cigarette use has been reported with the use of corticosteroids. The decision to use corticosteroids should be made on a case-by-case basis based on risks and benefits and the likelihood of other etiologies.
7. Lipoid pneumonia associated with inhalation of lipids in aerosols generated by e-cigarettes has been reported based on the detection of lipid-laden alveolar macrophages obtained by bronchoalveolar lavage (BAL) and lipid staining (e.g., oil red O). The decision about whether to perform a BAL should be based on individual clinical circumstances.
8. Lung biopsies have been performed on some patients. If a lung biopsy is obtained, lipid staining may be considered during pathologic examination, and is best performed on fresh tissue. Routine pathology tissue processing (including formalin-fixation and paraffin-embedding) can remove lipids. Conducting routine tissue processing and histopathologic evaluation is still important. Consider consultation with specialists in pulmonary medicine and pathology to help inform any evaluation plan.
9. Patients who have received treatment for severe pulmonary disease related to e-cigarette product use should undergo follow-up evaluation as clinically indicated to monitor pulmonary function.

Recommendations for Public Health Officials

1. State public health officials should promptly notify CDC about possible cases via VapingAssocIllness@cdc.gov.
2. Contact CDC at VapingAssocIllness@cdc.gov for case classification criteria, reporting guidelines, case investigation forms, and questions about this outbreak.
3. Consider conducting case-finding activities that use existing data sources (e.g., local poison control center, coroner and medical examiner's office, and other applicable surveillance systems including syndromic surveillance). CDC has developed two working syndromic surveillance definitions (one version with specific symptoms and a second focused on e-cigarette product use). CDC will be programming these definitions in CDC's National Syndromic Surveillance Program's BioSense/ESSENCE platform for case-finding within the platform.
4. Consider asking the medical examiner or coroner's office and other pathologists to report possible cases, especially those without an alternative, likely diagnosis. If individuals are identified after death or at autopsy who showed signs of severe pulmonary disease as described above, medical examiners and coroners are encouraged to report the cases to their local or state health department. Thorough sampling of trachea, bronchi, and lung parenchyma with collection of fresh lung tissue for staining of lipids (e.g., oil red O) and submission of formalin-fixed, paraffin-embedded tissues for routine histopathology are recommended. For further consultation, public health officials can contact CDC's Infectious Diseases Pathology Branch at pathology@cdc.gov.
5. State health department officials seeking technical assistance with an epidemiologic investigation can contact CDC at VapingAssocIllness@cdc.gov. State health department officials seeking technical assistance with laboratory testing can discuss with their state health department laboratories or contact CDC at VapingAssocIllness@cdc.gov.

Recommendations for the Public

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.
5. If you are concerned about harmful effects from e-cigarette products, call your local poison control center at: 1-800-222-1222.
6. We encourage the public to submit detailed reports of any unexpected tobacco or e-cigarette-related health or product issues to the FDA via the online Safety Reporting Portal: <https://www.safetyreporting.hhs.gov> .


For More Information


- For assistance with managing patients suspected of illness related to recreational, illicit, or other drugs, call your local poison control center at: 1-800-222-1222.
- Information on electronic cigarettes and similar devices: <https://www.cdc.gov/e-cigarettes>
- CDC Press Statement: <https://www.cdc.gov/media/releases/2019/s0821-cdc-fda-states-e-cigarettes.html>
- CDC Clinical Outreach and Communication Activity announcement: <https://emergency.cdc.gov/newsletters/coca/081619.htm>
- CDC's National Syndromic Surveillance Program's BioSense/ESSENCE: <https://www.cdc.gov/nssp/index.html>
- For more information, visit CDC Info: <https://www.cdc.gov/cdc-info/index.html>

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The Centers for Disease Control and Prevention (CDC) protects people's health and safety by preventing and controlling diseases and injuries; enhances health decisions by providing credible information on critical health issues; and promotes healthy living through strong partnerships with local, national and international organizations.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

HAN Message Types

- **Health Alert:** Conveys the highest level of importance; warrants immediate action or attention.
- **Health Advisory:** Provides important information for a specific incident or situation; may not require immediate action.
- **Health Update:** Provides updated information regarding an incident or situation; unlikely to require immediate action.
- **Info Service:** Provides general information that is not necessarily considered to be of an emergent nature.

###

This message was distributed to state and local health officers, state and local epidemiologists, state and local laboratory directors, public information officers, HAN coordinators, and clinician organizations.

###

Lung Illnesses Associated with Use of Vaping Products

Information for the Public, FDA Actions, and Recommendations



Español (</news-events/public-health-focus/enfermedades-pulmonares-vinculadas-con-el-uso-de-cigarrillos-electronicos>)

FDA Statement on consumer warning to stop using THC vaping products amid ongoing investigation into lung illnesses (</news-events/press-announcements/statement-consumer-warning-stop-using-thc-vaping-products-amid-ongoing-investigation-lung-illnesses>) - October 4, 2019

Background



FDA-CDC Statement on Investigating
Lung Illnesses (</news-events/press-announcements/statement-federal-and-state-collaboration-investigate-respiratory-illnesses-reported-after-use-e>)

Both the U.S. Food and Drug Administration and the U.S. Centers for Disease Control and Prevention are working tirelessly to investigate the distressing incidents of severe respiratory illness associated with use of vaping products. The FDA and CDC are working closely with state and local health officials to investigate these incidents as quickly as possible, and we are committed to taking appropriate actions as a clearer picture of the facts emerges.

While the work by federal and state health officials to identify more information about the products used, where they were obtained and what substances they contain is ongoing, the FDA is providing consumers with some information to help protect themselves.

- Incident Overview
- FDA Actions
- FDA Preliminary Lab Analysis
- Information & Resources for Consumers
- Information for Healthcare Providers
- Information for State Health Departments
- FDA Resources
- CDC Resources

Incident Overview



- The Centers for Disease Control and Prevention (CDC) is working with states to determine if cases are confirmed or probable after examining the medical records of suspected cases.
- Please see the CDC's website (https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease.html#latest-outbreak-information) for updated cases. These numbers may change frequently.
- While some cases in each of the states are similar and appear to be linked to vaping product use, more information is needed to determine what is causing the respiratory illnesses.
- In many cases, patients reported a gradual start of symptoms, including breathing difficulty, shortness of breath, and/or chest pain before hospitalization. Some cases reported mild to moderate gastrointestinal illness including vomiting and diarrhea, or other symptoms such as fevers or fatigue.
- In many cases, patients told healthcare personnel or health department staff of recent use of vaping products containing tetrahydrocannabinol (THC, a psychoactive component of the marijuana plant).
- Even though cases appear similar, it is not clear if they have a common cause or if they involve different diseases with similar presentations, which is an issue central to our investigation.

- CDC and the FDA are providing consultation to state health departments and are working closely with them to gather information on any products or substances used.
- For example, our agencies are working to standardize information collection at the state level to help build a more comprehensive picture of these incidents. This includes investigating the brand, manufacturer and types of vaping products, whether any of them are products that would fall within the FDA's regulatory authority, as well as where they were obtained.

FDA Actions



Former Acting FDA Commissioner Ned Sharpless, M.D. takes a tour of the FDA's Forensic Chemistry Center. The Center serves as the FDA's premier national laboratory and is playing a critical role in fact-gathering and analysis for the ongoing incidents of lung illnesses following vaping product use.

FDA Sample Collection Criteria
and Information for Vaping Related Incidents ([/federal-state-local-tribal-and-territorial-officials/news-events/fda-sample-collection-criteria-and-information-vaping-related-incidents](https://www.fda.gov/news-events/public-health-focus/lung-illnesses-associated-use-vaping-products))

- The FDA remains deeply concerned about these respiratory illnesses and deaths and is working closely with the CDC, as well as state and local public health partners, to investigate them as quickly as possible.
- To help gather and analyze as much information as possible, the FDA's laboratory is working closely with our federal and state partners to identify the products or substances that may be causing the illnesses.
- The FDA is analyzing samples submitted by a number of states for the presence of a broad range of chemicals, including nicotine, THC and other cannabinoids, along with cutting agents/diluents and other additives, pesticides, opioids, poisons, heavy metals and toxins.

- No one substance has been identified in all of the samples tested. Importantly, identifying any compounds that are present in the samples will be one piece of the puzzle but will not necessarily answer questions about what is causing these illnesses.
- Federal and state partners are following any potential leads, and the FDA is committed to taking appropriate actions as the facts emerge and keeping the public informed as we have more information to share.

FDA Preliminary Lab Analysis

- As of Nov. 27, 2019, the FDA has received over 1,100 samples from 25 states with roughly 908 of these samples connected to patients. These samples have been collected directly from consumers, hospitals, and state offices. They have included vaping devices and products containing varied levels of liquid as well as packaging and other documentation. Many samples have contained little to no liquid, which limits the number and types of tests that are able to be conducted on each submission. The FDA has not found one product or substance that is involved in all of the cases; however, we do know that THC is present in most of the samples being tested.
- Overall, 699 of the samples connected to patients have undergone some level of testing.
 - 448 samples have been found to contain THC
 - 49% of these THC products have been found to contain vitamin E acetate as a diluent. The concentration of vitamin E acetate determined in a smaller number of these samples has ranged from 23% to 88%
 - 24% of these THC products have been found to contain another diluent such as medium chain triglycerides
- As of Nov. 27, 2019, approximately 545 samples are directly linked to 74 patients with CDC case numbers and samples from 70 of these patients have been analyzed.
 - 79% of these 70 patients include links to THC products
 - Of these:
 - 76% of cases included products with vitamin E acetate as a diluent
 - 33% included products with aliphatic esters as diluent (e.g., triglycerides)
 - 5% included products with polyethylene glycol as diluent
- It is important to stress that identifying any compounds present in the samples linked to patient cases is but one piece of the puzzle and will not necessarily answer questions about causality, which makes ongoing work critical at both the state and federal levels. Every day the FDA and partners are gathering more information and seek to use that information to better understand the relationship between any specific products or substances and the reported illnesses. Importantly, the variations of use patterns, products or substances reportedly used and the samples being tested may mean there are multiple causes of these injuries.

Information & Resources for Consumers



Vaping Illness Update:
 FDA Warns Public to Stop Using
 Tetrahydrocannabinol (THC)-Containing
 Vaping Products and Any Vaping Products
 Obtained Off the Street (/consumers/consumer-updates/vaping-illness-update-fda-warns-public-stop-using-tetrahydrocannabinol-thc-containing-vaping)

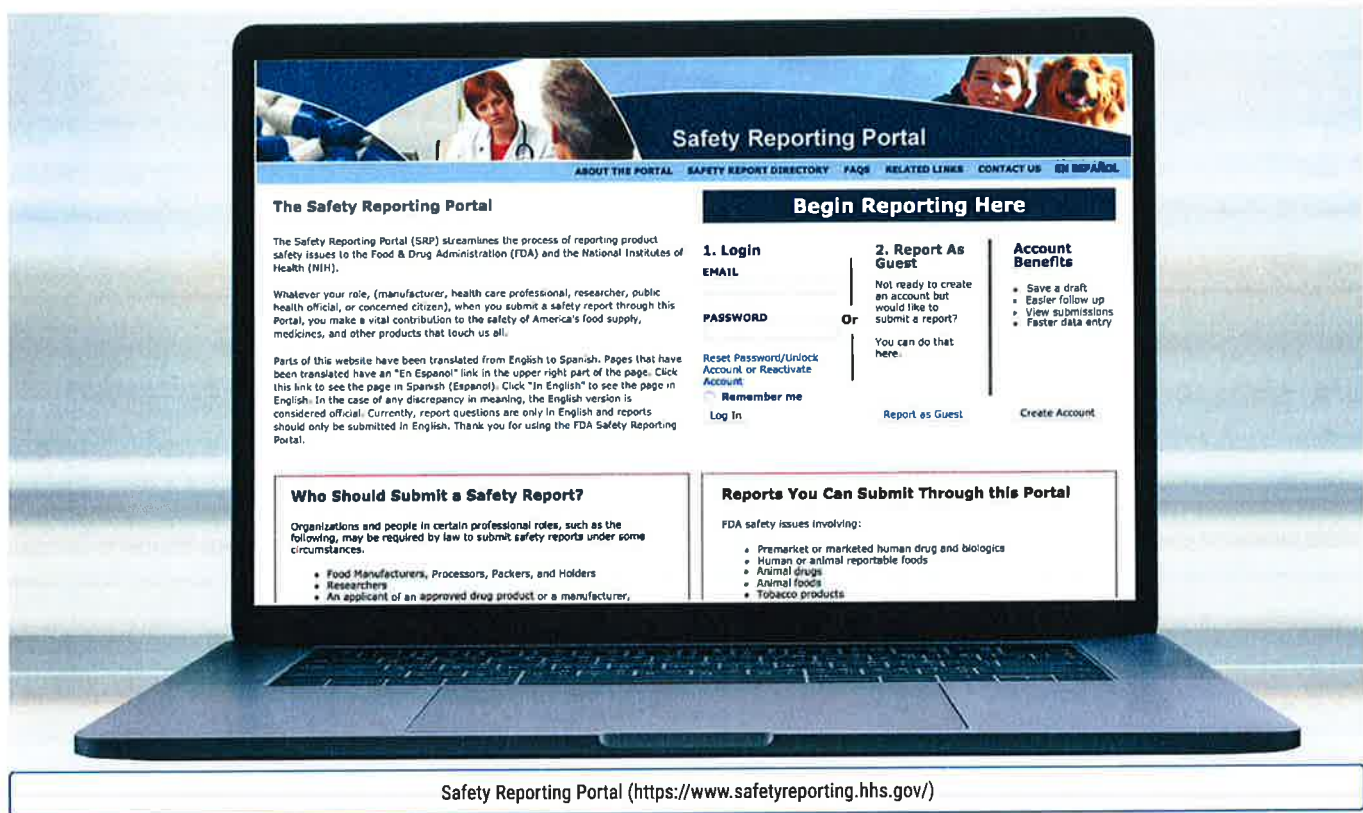
- At this time, FDA and CDC have not identified the cause or causes of the lung injuries in these cases, and the only commonality among all cases is that patients report the use of vaping products, including e-cigarettes. No one compound or ingredient has emerged as the cause of these illnesses to date; and it may be that there is more than one cause of this outbreak. We do know that THC is present in most of the samples tested to date, and most patients report a history of THC-containing products. The latest national and state findings suggest products containing THC, particularly those obtained off the street or from other informal sources (e.g. friends, family members, illicit dealers), are linked to most of the cases and play a major role in the outbreak.
- As such, we recommend that you do not use e-cigarette or vaping products that contain THC. And since the specific cause or causes of lung injury are not yet known, the only way to assure that you are not at risk while the investigation continues is to consider refraining from use of all e-cigarette and vaping products. Adults addicted to nicotine using e-cigarettes should weigh all risks and benefits, and consider utilizing FDA-approved nicotine replacement therapies. They should not turn to or resume using combustible tobacco. There is no safe tobacco product. All tobacco products, including e-cigarettes, carry a risk.
- For more information on the outbreak and recommendations, please see the FDA's consumer update (/consumers/consumer-updates/vaping-illness-update-fda-warns-public-stop-using-tetrahydrocannabinol-thc-containing-vaping) on vaping illnesses.
- A majority of the samples tested by states or by the FDA as part of this ongoing investigation have been identified as vaping products containing THC.
- Through this investigation, we have also found most of the patients impacted by these illnesses reported using THC-containing products, suggesting THC vaping products play a role in the outbreak.
- If you continue to use these THC-containing vaping 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.
- If you are concerned about your health after using a vaping product, contact your health care provider, or you can also call your local poison control center at 1-800-222-1222[®].
- If you experience vaping-associated respiratory illness, the FDA also encourages you to report this information, including providing any associated product, to your state or local health departments. Reporting to your state or health departments is crucial as federal and state partners work together to have accurate case identification and reported case counts. For more information regarding state and local health department directories, please refer to:

<https://www.cdc.gov/publichealthgateway/healthdirectories/index.html>
(<https://www.cdc.gov/publichealthgateway/healthdirectories/index.html>)

If you experience a problem with any tobacco product, such as an unexpected health or safety issue, report it online using the Safety Reporting Portal (<https://www.safetyreporting.hhs.gov/>). You may submit reports about any tobacco product, including cigarettes, roll-your-own cigarettes, cigars, smokeless tobacco, electronic cigarettes and waterpipe tobacco. You can also report problems with the components and parts of tobacco products. The FDA website has more information on what to include in a report (<https://www.fda.gov/tobacco-products/tobacco-science-research/safety-reporting-portal-tobacco-products#information>).

- See here (</tobacco-products/products-ingredients-components/vaporizers-e-cigarettes-and-other-electronic-nicotine-delivery-systems-ends>) for general FDA information on vaporizers, e-cigarettes and other electronic nicotine delivery systems.

Information for Healthcare Providers

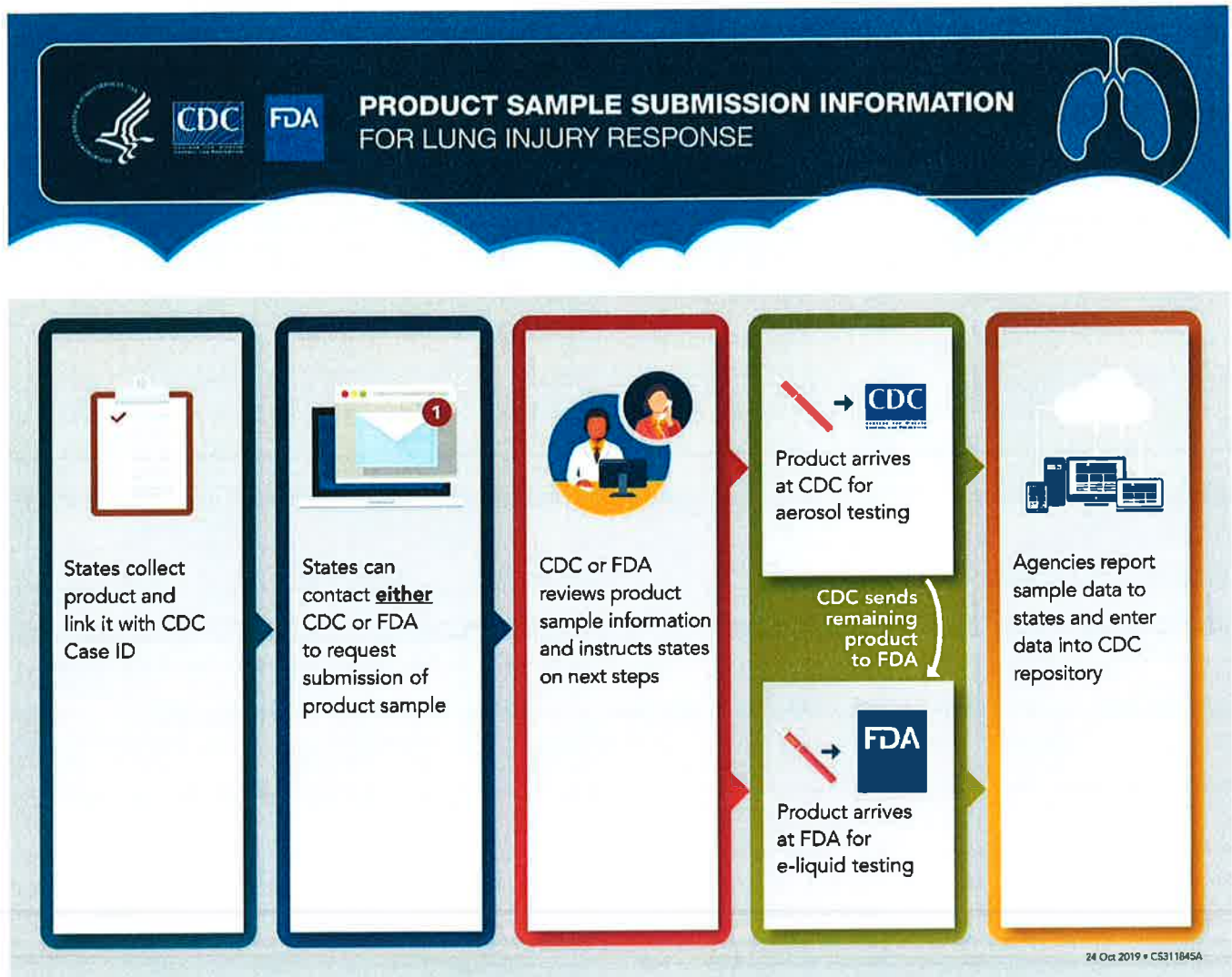


Safety Reporting Portal (<https://www.safetyreporting.hhs.gov/>)

- As this investigation continues, CDC and the FDA encourage clinicians to report possible cases of vaping-associated respiratory illness to their local or state health department for further investigation. Reporting to your state or health departments is crucial as federal and state partners work together to have accurate case identification and reported case counts.
- If vaping product use is suspected as a possible cause for a patient's lung illness, a detailed history of the substances used, the sources, and the devices used should be obtained, as outlined in the CDC Health Advisory (<https://emergency.cdc.gov/han/han00421.asp>), and efforts should be made to determine if any remaining product, devices, and liquids are available for testing. Health care providers also can contact their local poison control center.
- Product-specific information related to possible cases may be submitted to the FDA online using the Safety Reporting Portal (<https://www.safetyreporting.hhs.gov/SRP2/en/Home.aspx>). The FDA website also has more information on what to include in a report to the SRP (</tobacco-products/tobacco-science-research/safety-reporting-portal-tobacco-products>).

Information for State Health Departments

- FDA would like to thank all State Departments of Health (and other partners) for their ongoing efforts, collaboration and communications on the recent respiratory illnesses associated with e-cigarettes and vaping products.
- CDC and FDA are working together to coordinate analysis of vaping products, including e-cigarettes, to provide insight into the nature of the chemical exposure(s) contributing to the Lung Injury outbreak. FDA is analyzing e-liquids for the presence of a broad range of chemicals. When sufficient liquid product is available, CDC will conduct aerosol emissions testing of the e-cigarette or other vaping product. The graphic below outlines the process for states to submit product samples to FDA and CDC for testing.
- Analysis of both e-liquid and aerosol emissions will complement each other, and together will help improve our understanding of exposure among case patients associated with the Lung Injury outbreak.



- States can request to submit product to either CDC or FDA. Product(s) must be linked to a confirmed or probable case and have a CDC case ID.
 - For information about collection and submission of e-cigarette or other vaping products, including 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 and submission of e-cigarette or other vaping products' e-liquids associated with confirmed or probable cases for possible aerosol emissions testing by CDC, contact IncidentResponse@cdc.gov (mailto:IncidentResponse@cdc.gov).

FDA Resources



- [FDA Statement on Clearing Market of Unauthorized, Non-Tobacco-Flavored E-Cigarette Products \(/news-events/press-announcements/trump-administration-combating-epidemic-youth-e-cigarette-use-plan-clear-market-unauthorized-non\)](#)
- [Statement on federal and state collaboration to investigate respiratory illnesses reported after use of e-cigarette products \(/news-events/press-announcements/statement-federal-and-state-collaboration-investigate-respiratory-illnesses-reported-after-use-e\)](#)
- [FDA Consumer Update on Vaping Illnesses: Consumers can Help Protect Themselves by Avoiding Tetrahydrocannabinol \(THC\)-Containing Vaping Products \(/consumers/consumer-updates/vaping-illness-update-fda-warns-public-stop-using-tetrahydrocannabinol-thc-containing-vaping\)](#)
- [FDA Information on Vaporizers, E-Cigarettes, and other Electronic Nicotine Delivery Systems \(ENDS\) \(/tobacco-products/products-ingredients-components/vaporizers-e-cigarettes-and-other-electronic-nicotine-delivery-systems-ends\)](#)
- [FDA Sample Collection Criteria and Information for Vaping Related Incidents \(/federal-state-local-tribal-and-territorial-officials/news-events/fda-sample-collection-criteria-and-information-vaping-related-incidents\)](#)
- [FDA Safety Reporting Portal \(https://www.safetyreporting.hhs.gov/SRP2/en/Home.aspx\)](https://www.safetyreporting.hhs.gov/SRP2/en/Home.aspx)
- [Information to Include in Tobacco Product Problem Report \(/tobacco-products/tobacco-science-research/safety-reporting-portal-tobacco-products\)](#)
- [Remarks prepared for testimony before a U.S. House Energy and Commerce Subcommittee on FDA Regulation of Electronic Nicotine Delivery Systems and Investigation of Vaping Illnesses \(/news-events/press-announcements/remarks-prepared-testimony-us-house-energy-and-commerce-subcommittee-fda-regulation-electronic\)](#)
- [FDA's Forensic Chemistry Center Playing Critical Role in Vaping Illness Investigation \(/consumers/consumer-updates/fdas-forensic-chemistry-center-playing-critical-role-vaping-illness-investigation\)](#)
- [FDA In Brief: Readout of Acting FDA Commissioner Ned Sharpless, M.D., Visit to FDA's Forensic Chemistry Center \(/news-events/fda-brief/fda-brief-readout-acting-fda-commissioner-ned-sharpless-md-visit-fdas-forensic-chemistry-center\)](#)
- [FDA In Brief: FDA encourages continued submission of reports related to seizures following e-cigarette use \(/news-events/fda-brief/fda-brief-fda-encourages-continued-submission-reports-related-seizures-following-e-cigarette-use\)](#)
- [FDA Lung Injury Update: FDA Warns Public to Stop Using Tetrahydrocannabinol \(THC\)-Containing Vaping Products and Any Vaping Products Obtained Off the Street \(/safety/medical-product-safety-information/lung-injury-update-fda-warns-public-stop-using-tetrahydrocannabinol-thc-containing-vaping-products\)](#)
- [Statement on consumer warning to stop using THC vaping products amid ongoing investigation into lung illnesses \(/news-events/press-announcements/statement-consumer-warning-stop-using-thc-vaping-products-amid-ongoing-investigation-lung-](#)

illnesses)

CDC Resources

- CDC Outbreak Information (https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease.html#investigation-details)
- CDC Health Alert on Pulmonary Disease Associated with Using Vaping Products (<https://emergency.cdc.gov/han/han00421.asp>)
- Transcript of Telebriefing: Update on Lung Injury Associated with E-cigarette Use, or Vaping – Oct. 11, 2019 (<https://www.cdc.gov/media/releases/2019/t1011-lung-injury-investigation.html>)
- Transcript of Telebriefing: Lung Injury Investigation – Oct. 3, 2019 (<https://www.cdc.gov/media/releases/2019/t1003-lung-injury-investigation.html>)
- Transcript of Telebriefing: CDC Update on Pulmonary Illnesses – Sept. 27, 2019 (<https://www.cdc.gov/media/releases/2019/t0927-update-pulmonary-illnesses.html>)
- Transcript of Telebriefing: Update on Lung Injury Associated with E-cigarette Product Use, or Vaping - Sept. 19, 2019 (<https://www.cdc.gov/media/releases/2019/t0919-lung-injury-vaping.html>)
- Transcript of Telebriefing: Investigation of Pulmonary Disease Among People Who Use E-cigarettes - Sept. 6, 2019 (https://www.cdc.gov/media/releases/2019/t0906_telebriefing_investigation_pulmonary_disease_e-cigarettes.html)
- Transcript of Telebriefing: Severe Pulmonary Disease Associated with Use of E-cigarettes - Aug. 23, 2019 (<https://www.cdc.gov/media/releases/2019/t0823-telebriefing-severe-pulmonary-disease-e-cigarettes.html>)

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American Lung Association: Do Not Use E-Cigarettes

Nation's leading lung health organization warns of irreversible lung damage and disease associated with e-cigarette use

(September 10, 2019) - CHICAGO For more information please contact:

Allison MacMunn

Media@Lung.org

312-801-7628

American Lung Association National President and CEO Harold Wimmer issued the following statement in response to an increase in reported vaping-related illnesses and deaths:

"E-cigarettes are not safe and can cause irreversible lung damage and lung disease. No one should use e-cigarettes or any other tobacco product. This message is even more urgent today following the increasing reports of vaping-related illnesses and deaths nationwide.

"E-cigarettes contain chemicals harmful to lung health such as heavy metals, carcinogens, vegetable glycerin and propylene glycol. The developing lungs of youth may be more at risk, making what the Surgeon General refers to as a youth e-cigarette epidemic even more alarming.

"The Centers for Disease Control and Prevention (CDC) and state and local health departments are conducting an ongoing investigation of the current cluster of vaping-related illnesses. There have been six confirmed vaping-related deaths, and as of Friday, September 6, there have been more than 450 possible cases of adults and youth experiencing vaping-related illness across 33 states.

"The Lung Association recommends anyone who has recently used e-cigarette products to seek immediate medical care if they experience any adverse health effects, particularly coughing, shortness of breath or chest pain. The Lung Association also calls on physicians to make sure their patients are aware of the health risks associated with e-cigarettes, and swiftly report any suspected cases of vaping-related illness to their state or local health department. If people are seeking to quit

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the appeal of e-cigarette products to youth.

"With the aim to save lives and reduce tobacco-related disease, the American Lung Association will continue to educate the public and advocate for more public health protections and proven effective

policies to help prevent and reduce tobacco use, including e-cigarettes."

Learn more about e-cigarettes and lung health at [Lung.org/ecigs](https://lung.org/ecigs). For media interested in speaking with a medical or policy expert about lung health, tobacco use or the youth e-cigarette epidemic, contact Allison MacMunn the American Lung Association at Media@Lung.org or 312-801-7628.

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About the American Lung Association

The American Lung Association is the leading organization working to save lives by improving lung health and preventing lung disease, through research, education and advocacy. The work of the American Lung Association is focused on four strategic imperatives: to defeat lung cancer; to improve the air we breathe; to reduce the burden of lung disease on individuals and their families; and to eliminate tobacco use and tobacco-related diseases. For more information about the American Lung Association, a holder of the coveted 4-star rating from Charity Navigator and a Gold-Level GuideStar Member, or to support the work it does, call 1-800-LUNGUSA (1-800-586-4872) or visit: Lung.org.

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What is LUNG FORCE?

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