

Health Update:

Severe Lung Disease Associated with Vaping

September 12, 2019

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Health Alerts convey information of the highest level of importance which warrants immediate action or attention from Missouri health providers, emergency responders, public health agencies, and/or the public.

Health Advisories provide important information for a specific incident or situation, including that impacting neighboring states; may not require immediate action.

Health Guidances contain comprehensive information pertaining to a particular disease or condition, and include recommendations, guidelines, etc. endorsed by DHSS.

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SUBJECT: Severe Lung Disease Associated with Using E-Cigarette Products

*****Missouri healthcare providers with questions should contact the Tobacco Prevention and Control Program at 573-522-2824, or 800-392-0272 (24/7)*****

Summary

The Missouri Department of Health and Senior Services (DHSS) 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 Update also provides recommendations for clinicians and the public based on currently available information.

General Background

The Centers for Disease Control and Prevention (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 severe pulmonary disease associated with e-cigarette product (devices, liquids, refill pods, and/or cartridges) use. This investigation is ongoing and has not identified a cause, but all reported cases have a history of using e-cigarette products.

E-cigarettes are devices that deliver an aerosol to the user by heating a liquid that usually contains nicotine, flavorings, and other chemicals. E-cigarettes can also be used to deliver marijuana or other substances.

E-cigarettes can contain harmful or potentially harmful ingredients, 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.

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 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 September 6, 2019, 450 possible cases of lung illness associated with the use of e-cigarette products have been reported from 33 states and the U.S. Virgin Islands, and additional reports of pulmonary illness are under investigation. To date, six individuals (from Illinois, Wisconsin, Oregon, Indiana, Minnesota, and Kansas) have died from severe pulmonary disease. Nine cases have been reported in Missouri, two have been confirmed and seven are under investigation. One of the Missouri cases had a positive finding for lipid-laden macrophages from a bronchoalveolar lavage (BAL) specimen.

No evidence of infectious diseases has been identified; therefore, lung illnesses are likely associated with a chemical exposure. Initial published reports from the investigation point to clinical similarities among cases. Patients report e-cigarette use and similar symptoms and clinical findings including:

- cough, shortness of breath, or chest pain
- nausea, vomiting, or diarrhea
- fatigue, fever, or weight loss
- elevated heart rate

Some patients have reported that their symptoms developed over a few days, while others have reported that their symptoms developed over several weeks. A pulmonary infection does not appear to be causing the symptoms, which have generally not improved with antibiotic treatment alone.

The investigation has not identified any specific substance or e-cigarette product that is linked to all cases. Many patients report using e-cigarette products with liquids that contain cannabinoid products, such as tetrahydrocannabinol (THC).

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. Antibiotic 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 have been diagnosed with lipoid pneumonia based on clinical presentation and detection of lipids within bronchoalveolar lavage samples stained specifically to detect oil.

Recommendations for Clinicians

1. Missouri providers should report cases of severe pulmonary disease of unclear etiology and a history of e-cigarette product use within the past 90 days to DHSS or their local public health agency (LPHA). Reporting of cases will ensure prompt follow-up and help determine the cause of these pulmonary illnesses.
 - a. These cases are currently being classified as “vaping-associated pulmonary illness,” or VAPI. **Missouri considers instances of VAPI to be immediately reportable under 19 CSR 20-20.020 1(c).** (<https://www.sos.mo.gov/cmsimages/adrules/csr/current/19csr/19c20-20.pdf>) **Immediately reportable diseases should be reported immediately upon knowledge or suspicion by telephone, FAX, or other rapid communication to the LPHA, or to DHSS at 800-392-0272.**
 - b. Information on VAPI cases should be provided using a Missouri Disease Case Report, form MO 580-0779. (<https://health.mo.gov/living/healthcondiseases/communicable/communicabledisease/cdmanual/pdf/CD-1.pdf>)

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 DHSS or your LPHA.
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.
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. 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.
8. 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 Medical Examiner, Coroner's Office or Other Pathologists

1. Report possible cases, especially those without an alternative, likely diagnosis explaining lung injury, to DHSS' Tobacco Prevention and Control Program at 573-522-2824. 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 LPHA or DHSS. 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.

Recommendations for the Public

1. While this investigation is ongoing, consider refraining from using e-cigarette products.
2. If you do use e-cigarette products and you experience symptoms like those reported in this outbreak, seek medical care promptly. DHSS will continue to alert the public throughout this investigation.
3. Regardless of the ongoing investigation:
 - Youth and young adults should not use e-cigarette products.
 - Women who are pregnant should not use e-cigarette products.
4. Adults who do not currently use tobacco products should not start using e-cigarette products.
5. If you do use e-cigarette products, you should not buy these products off the street (for example, e-cigarette products with THC or other cannabinoids).
6. You should not modify e-cigarette products or add any substances to these products that are not intended by the manufacturer.
7. Adult smokers who are attempting to quit should use evidence-based treatments, including counseling and FDA-approved medications. If you need help quitting tobacco products, including e-cigarettes, contact your doctor or other medical provider, or call the Missouri Tobacco Quitline at 1-800-QUIT-NOW (1-800-784-8669).
8. For information on the text-based e-cigarette quit program from Truth Initiative, visit truthinitiative.org/quitecigarettes or text “DITCHJUUL” to 88709.
9. If you are concerned about your health after using an e-cigarette product, you can also call the Missouri Poison Center at 1-800-222-1222.
10. We encourage the public to submit detailed reports of any unexpected health or product issues related to tobacco or e-cigarette products to the FDA via the online Safety Reporting Portal: <https://www.safetyreporting.hhs.gov>.

For More Information

- Call the DHSS’ Tobacco Prevention and Control Program at 573-522-2824.
- For assistance with managing patients suspected of illness related to recreational, illicit, or other drugs, call the Missouri Poison Center at: 1-800-222-1222.
- Information on electronic cigarettes and similar devices: <https://www.cdc.gov/e-cigarettes>

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