# Consequences of E-Cigarette and Vaping Use

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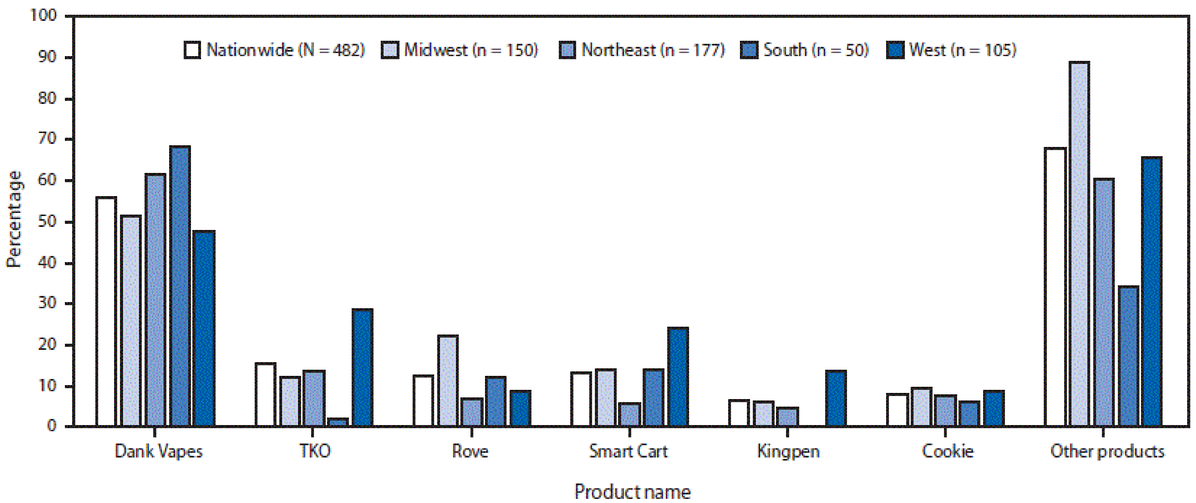
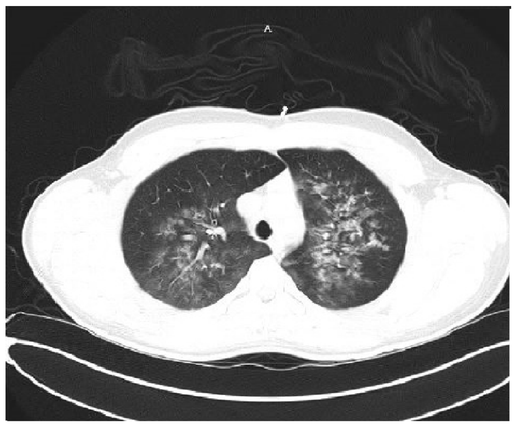
E-cigarette and Vaping Associated Lung Injury (EVALI) is a pulmonary disease which is associated with e-cigarette and such like products. The symptoms are potentially life-threatening and may include: shortness of breath, hypoxia, fever, cough, and diarrhea. The cause of injury is due to aerosol inhalation from electronic cigarettes and/or vaping causing acute lung injury. EVALI is a diagnosis of exclusion and is usually made when there has been no response to antibiotic therapy and the patient's history coincides. Many cases have exhibited increased respiratory failure within 48 hours of admission to the hospital and after administration of empiric antibiotic therapy [1].

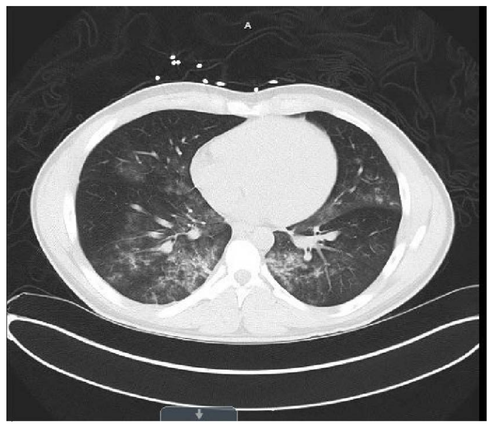
An 18-year-old male with past medical history of ADHD, depression with anxiety, polysubstance abuse and daily THC-infused vaping presented to the ED after an unintentional overdose of synthetic heroine. Prior to arrival, the patient ingested an unknown amount of white powder which he mistook for crushed oxycontin tablets and he was found unresponsive by his parents. The patient revived after receiving an administration of 2 mg of Narcan upon arrival to the ED. The patient's vitals indicated he was hypoxic with O2 saturation of 68% on room air and was placed on BiPAP ventilation after which his hypoxia resolved.

**Physical Exam:**

- Vitals:
  - Temperature: 98.1 °F
  - Heart rate: 93
  - Respiratory rate: 14
  - BP: 114/79 mmHg
  - O2 Saturation: 68%
- CARDIOVASCULAR: Regular rate and rhythm. No murmurs, rubs, or gallops
- RESPIRATORY: Diffuse crackles on auscultation bilaterally. Normal chest expansion
- ABDOMEN: Nontender. Nonrigid. No rebound tenderness. Good bowel sounds
- NEURO/PSYCH: Alert and oriented x3. No neurological deficits. Grips equal face symmetric at the time of examination





EVALI is a diagnosis of exclusion as there are no specific tests or markers for definitive diagnosis. The CDC has published guidelines for managing EVALI and the recommendations include;
1) Asking patients with respiratory, gastrointestinal, or constitutional symptoms about the use of e-cigarette, or vaping, products;
2) Evaluating those suspected to have EVALI with pulse oximetry and obtaining chest imaging as clinically indicated;
3) Considering outpatient management for clinically stable EVALI patients who meet certain criteria;
4) Testing patients for influenza, particularly during influenza season, and administering antimicrobials, including antivirals, in accordance with established guidelines;
5) Using caution when considering prescribing corticosteroids for outpatients, (because this treatment modality has not been well studied among outpatients, corticosteroids could worsen respiratory infections)
6) Recommending evidence-based treatment strategies, including behavioral counseling to encourage patients to discontinue using e-cigarette, or vaping, products; and
7) Emphasizing the importance of annual influenza vaccination for all persons aged ≥6 months, including patients who use e-cigarette, or vaping products. [4]

The long term risks and prognosis for patients with diagnosis of EVALI is not yet known. Although some patients respond well to corticosteroid treatment, some may relapse during corticosteroid taper or with resumed use of e-cigarettes and vaping products. These patients require close monitoring and follow up to prevent further e-cigarette or vaping abuse. If the patients needs oxygen to prevent hypoxia, they must follow up with a pulmonologist. Patients who utilize high corticosteroid should also receive an endocrinology referral to prevent adrenal dysfunction.

As of January 21, 2020, 2,711 cases of EVALI have been reported to the CDC with 60 confirmed deaths. The CDC has reported that 70% of these cases have been male. The median age is 24 years with ranges from 13 to 75 years. 79% of cases are under 35. [2]

- As of October 15, 2019, in 867 cases e-cigarettes or vaping was used within 3 months of symptom onset. 745 (86%) of those patients used THC-based products (34% reported use of THC-based products only). 554 (64%) patients reported using nicotine-containing products (only 11% of the 867 patients reported using only nicotine-based products) [2]

1. Davidson, Kevin; Brancato, Alison; Heetderks, Peter; Mansour, Wissam; Matheis, Edward; Nario, Myra; Rajagopalan, Shrinivas; Underhill, Bailey; Wininger, Jeremy; Fox, Daniel (September 13, 2019). "Outbreak of Electronic-Cigarette–Associated Acute Lipoid Pneumonia — North Carolina, July–August 2019". MMWR. Morbidity and Mortality Weekly Report. 68(36): 784–786. doi:10.15585/mmwr.mm6836e1. ISSN 0149-2195. PMC 6755817. PMID 31513559.

2. "Outbreak of Lung Injury Associated with E-Cigarette Use, or Vaping". Centers for Disease Control and Prevention(CDC). January 28, 2020

3. Lozier MJ, Wallace B, Anderson K, et al. Update: Demographic, Product, and Substance-Use Characteristics of Hospitalized Patients in a Nationwide Outbreak of E-cigarette, or Vaping, Product Use–Associated Lung Injuries — United States, December 2019. MMWR Morb Mortal Wkly Rep 2019;68:1142–1148. DOI: http://dx.doi.org/10.15585/mmwr.mm6849e1external icon

4. Jatlaoui TC, Wiltz JL, Kabbani S, et al. 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. MMWR Morb Mortal Wkly Rep 2019;68:1081-1086. DOI: http://dx.doi.org/10.15585/mmwr.mm6846e2external icon