

December 18, 2019



CTS INSPIRATIONS

CTS NEWS

President's Message

Dear members and friends of the California Thoracic Society,

First, I hope to see many of you in Monterey on January 17-18. Dr Michelle Cao and the planning committee have organized another great educational conference, highlighting Pulmonary Hypertension, COPD, Oxygen delivery, Ethics, and many other hot topics in Pulmonary and Critical Care Medicine. Please check out our website for more information and to register:

<https://calthoracic.org/events/2020-annual-educational-conference>

Second, I would like to call to your attention to [CTS' Policy Statement and Resource Guide on Vaping and E-Cigarettes](#) which is being published in its entirety in this issue. The policy initiative was led by Dr. Asha Devereaux, chair of our Clinical Practice committee, with primary author Dr. Laura Crotty-Alexander as well as other experts in the field. It takes a strong stand against the use of aerosolized, addictive substances such as nicotine and THC. This is critical given the pulmonary injuries that we now are recognizing. We hope that you will use these resources to help to educate the people in your communities and to optimize the care of your patients.

I hope that you will take a moment before the end of the year to renew your membership to show your support for CTS and the work that we have been doing to promote lung health and disease prevention while enabling members to meet and reconnect with colleagues statewide. It is easy – just click here: [https://calthoracic.org/membership/!](https://calthoracic.org/membership/)

Finally, as we approach the end of the year, I would like to thank you for allowing me to serve as the President of this society. It has been an honor and a privilege. I am grateful to the other members and leaders who have played an important and supporting role in helping to build the educational resources, to enhance our career development initiatives, and support the growth of our chapter. I know that the society will continue on an excellent trajectory under the leadership of our next President Laren Tan, MD from Loma Linda University and the other members of our leadership team including our next President-elect Vipul Jain, MD from UCSF Fresno and Secretary Michelle Cao, MD from Stanford. I am pleased to announce the results of our most recent election - George Su, MD from UCSF has been elected to serve as the next Treasurer of our society. We will have a very short business meeting on Saturday, January 18 in Monterey to install these new officers. Please join us and share your thoughts about the future of our society.

Warmest holiday wishes,

Lorriana Leard, MD
President, California Thoracic Society
Lorriana.Leard@ucsf.edu



Editor's Note:

Did you know that “*the active ingredients and other chemicals in e-liquids can penetrate the skin*”? or that “*a baby, child or adult who touches a surface such as a countertop that is below where someone has been vaping can absorb drugs and chemicals into their body*”? CTS' Policy Statement and Resource Guide on Vaping and E-cigarettes exemplifies our society's commitment to protecting our patients' health. Although the media furor has decreased, [vaping of THC and nicotine continues to rise among among teens](#) resulting in severe lung injury and deaths. Here in San Diego, a 19 year old is on ECMO after vaping. As healthcare professionals, we must continue to speak up and out, and continue to educate not just the public but our colleagues about this epidemic and public health disaster which as Dr. Balmes' [recent editorial in AJRCM](#) points out, could have been prevented.

As always, we include the table of contents to the Southwestern Journal of Pulmonary and Critical Care which features interesting cases and thought provoking editorials. We are grateful to its editor, Dr. Rick Robbins for his generosity in sharing the journal with our readers.

California Thoracic Society (CTS) Policy Statement and Resource Guide on Vaping / E-cigarettes November 15, 2019

Written by: Laura E. Crotty Alexander MD, UCSD.

Submitted by: CTS Clinical Practice Committee

Approved by: CTS Board of Directors

Summary:

1. As of 12/3/2019, over 2291 cases and 48 deaths due to E-Cigarette or Vaping Associated Pulmonary Illness EVALI/VAPI have been [reported](#).
2. The specific causes of the VAPI epidemic are not yet known. Vaping of THC may be responsible. All EVALI patients have reported to have a history of using e-cigarettes, or vaping products. At this point, vaping THC is considered to be extremely dangerous.
3. No e-cigarette or vaping product has been proven to be safe.
4. Vaping of nicotine is not an approved smoking cessation tool and should not be recommended as such.
5. It is imperative that the public be educated about the potential for acute life threatening disease due to [vaping](#). In particular, parents and families must be educated about the importance of not vaping around children, and not vaping in an area where children will come into contact with the surfaces [exposed](#) to vaping (houses and cars in particular).

California Thoracic Society (CTS) recommendations:

The CTS does not support the use of any tobacco products, including e-cigarettes, due to their potential to cause acute and chronic diseases affecting the lungs and other organs.

While the CTS does not support the use of any recreational vaping devices, we recognize that these devices may continue to be available; therefore, we recommend:

1. Banning the sale of flavored e-liquids used in vaping. In particular, fruit-flavored, sweet and/or mint flavors should be banned as they specifically target children, teenagers, young adults, women and certain ethnicities.
2. Banning the use of e-cigarettes in all public areas consistent with the existing ban on smoking in public areas.
3. E-liquid concentrations of nicotine or nicotinic salts should be limited to < 10 mg/mL (JUUL pods contain 59 mg/mL nicotinic salts and thus are potentially extremely addictive. Australia does not allow nicotine within e-liquids, while the U.K. limits nicotine to < 20 mg/mL).
4. Banning the sale of all e-cigarette products to individuals under 21 years of age, consistent with the existing ban on tobacco cigarettes in this population.
5. All aerosols (vapor) from e-cigarette devices should undergo in-depth safety and toxicology testing prior to entering the market, to limit systemic toxicity or long-term adverse health consequences.

E-cigarettes have been available in California for over 12 years, with usage rates substantially increasing during this time. E-cigarette vaping in children, teenagers and young adults has spiked recently, with an estimate of > 20% of high school age adolescents using e-cigarettes¹. Although the majority of those who vape use nicotine based e-cigarettes alone, vaping and dabbing of cannabinoids such as THC is now extremely common in all age groups.

Prior to 2019, the few reported cases of vaping-related lung illnesses included lipoid pneumonia^{2,3}, eosinophilic pneumonia⁴⁻⁶, hypersensitivity pneumonitis⁷ and diffuse alveolar hemorrhage⁸. This year, however, hundreds have developed Vaping Associated Pulmonary Illnesses (VAPI), more recently named E-Cigarette or Vaping Associated Lung Injury (EVALI) with 26 deaths reported as of 10/14/19 and over 1200 cases in 48 states as defined by the CDC. Approximately 70% of patients are males, 79% are younger than 35 years of age, and 14% younger than age 18. The median age is 24 years and ranges from 13-75 years old. These cases are most similar to chemical inhalation injuries, and the diagnosis is one of exclusion⁹.

What causes EVALI/VAPI?

The base ingredients of all e-liquids are propylene glycol and glycerin. Nicotine and THC are the main active chemicals used in e-devices. Greater than 99% of e-devices are used with either nicotine or THC.

The total number of chemicals in e-liquids ranges from 60-113, with a total number of chemicals in e-cigarette vapor being higher due to chemical reactions which occur in the presence of heat, oxygen and water in the air^{10,11}.

Approximately 86% of those affected with VAPI/EVALI have admitted to vaping THC, with the majority concomitantly vaping nicotine. However, all chemicals in e-liquids have the potential to cause lung injury or other adverse effects on health, including the base chemicals propylene glycol and glycerin. None of the chemicals used in e-devices have undergone safety testing for inhalation injury. Moreover, several additives have already been identified as either toxic or potentially toxic, and the FDA is working to regulate these chemicals in particular.^{12,13}

What needs to be done to protect public health during this crisis

Because the core chemicals, additives, contaminants and metals driving these toxic lung effects are as yet unknown and no specific e-cigarette or vaping product / brand has been associated with VAPI/EVALI, it is safest to avoid all e-cigarette use. At the very least, all e-cigarette users should avoid vaping or dabbing THC.

Nicotine is a highly addictive substance and the developing brain is particularly vulnerable to addictive chemicals. Because brain development continues into the third decade of life^{14,15}, children, teenagers and young adults are more susceptible to nicotine addiction relative to older adults. Addiction experts estimate that it takes a young person only a few vaping sessions to become addicted. Hence, it is imperative that meaningful measures are taken to prevent further expansion of the vaping epidemic in children, teenagers and young adults. All fruit flavors and sweet flavors should be included in this ban,^{16,17} Additionally, vaping shops should not be permitted to operate in close proximity to schools.

Over 99% of e-liquids are flavored. While some cities and states have implemented a full ban of flavored e-cigarettes, others are considering allowing the sale of tobacco and mint or menthol flavored devices. However, tobacco and mint or menthol flavors have not undergone safety testing. In addition, certain ethnicities are known to prefer mint or menthol flavors and will be placed at increased risk if these flavors are allowed to be produced and sold¹⁸.

What about second and third-hand exposure?

Second- and third-hand exposure to e-cigarette vapor are worrisome as it has been shown that a person in the same room as someone actively vaping an e-device inhales the same chemicals, just to a lesser degree. In fact, someone standing near a user of a nicotine e-cigarette will develop detectable levels of nicotine metabolites in their blood^{19,20}. Because e-cigarette vapor is an aerosol made up of chemical droplets in the air that are heavy and sink due to gravity, children are at increased risk from being in an environment where someone is vaping as they are smaller and shorter and will be exposed to more aerosol as a result.

Are there other ways to be exposed to vaping chemicals?

The active ingredients and other chemicals in e-liquids can penetrate the skin. Since droplets from vaping aerosol drift downwards, a baby, child or adult who touches a surface that is below where someone has been vaping can absorb drugs and chemicals into their body.

CTS thanks John Balmes MD for his expert content review and input on this statement.

RESOURCES

For Healthcare Professionals:

Clinicians who identify suspected cases of EVALI/VAPI are asked to report the cases to their local health department. Local health departments should report new cases or direct any inquiries to the CDPH Duty Officer dutyofficer@cdph.ca.gov or (916) 328-3605. Please also contact the CDPH Duty Officer when any vaping devices or supplies have been collected from a patient and can be turned over to CDPH for testing.

RESOURCES

For Healthcare Professionals:

Clinicians who identify suspected cases of EVALI/VAPI are asked to report the cases to their local health department. Local health departments should report new cases or direct any inquiries to the CDPH Duty Officer dutyofficer@cdph.ca.gov or (916) 328-3605. Please also contact the CDPH Duty Officer when any vaping devices or supplies have been collected from a patient and can be turned over to CDPH for testing.

1. [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](#)
2. MMWR Early Release: [Characteristics of Patients in a National Outbreak of E-cigarette, or Vaping product use - Associated Lung Injury](#)
3. [CDC Smoking and Tobacco Portal](#)
4. [NEJM E-cigarette and Vaping Portal](#)
5. [ATS Clinician Information](#)
6. [California Department of Public Health](#)
7. [California Smoker's Hotline](#)

For Patients:

1. [ATS Patient Information on Vaping/electronic Nicotine Delivery Systems](#)
2. [California Smoker's Hotline](#)

References:

1. Vital Signs: Tobacco Product Use Among Middle and High School Students - United States, 2011-2018. 68(06) ed2019.
2. Dicipinigitis PV, Trachuk P, Fakier F, Teka M, Suhrland MJ. Vaping-Associated Acute Respiratory Failure Due to Acute Lipoid Pneumonia. Lung 2019.
3. Viswam D, Trotter S, Burge PS, Walters GI. Respiratory failure caused by lipoid pneumonia from vaping e-cigarettes. BMJ Case Rep 2018;2018.\
4. Chung MK, Lee SJ, Kim MY, et al. Acute eosinophilic pneumonia following secondhand cigarette smoke exposure. Tuberc Respir Dis (Seoul) 2014;76:188-91.
5. Arter ZL, Wiggins A, Hudspath C, Kisling A, Hostler DC, Hostler JM. Acute eosinophilic pneumonia following electronic cigarette use. Respir Med Case Rep 2019;27:100825.
6. Thota D, Latham E. Case Report of Electronic Cigarettes Possibly Associated with Eosinophilic Pneumonitis in a Previously Healthy Active-duty Sailor. J Emerg Med 2014;47:15-7.
7. Sommerfeld CG, Weiner DJ, Nowalk A, Larkin A. Hypersensitivity Pneumonitis and Acute Respiratory Distress Syndrome From E-Cigarette Use. Pediatrics 2018;141.
8. Agustin M, Yamamoto M, Cabrera F, Eusebio R. Diffuse Alveolar Hemorrhage Induced by Vaping. Case Rep Pulmonol 2018;2018:9724530.
9. Layden JE, Ghinai I, Pray I, et al. Pulmonary Illness Related to E-Cigarette Use in Illinois and Wisconsin - Preliminary Report. N Engl J Med 2019.
10. Herrington JS, Myers C. Electronic cigarette solutions and resultant aerosol profiles. J Chromatogr A 2015;1418:192-9.
11. Kucharska M, Wesolowski W, Czerczak S, Socko R. [Testing of the composition of e-cigarette liquids - Manufacturer-declared vs. true contents in a selected series of products]. Med Pr 2016;67:239-53.
12. Dwivedi AM, Upadhyay S, Johanson G, Ernstgard L, Palmberg L. Inflammatory effects of acrolein, crotonaldehyde and hexanal vapors on human primary bronchial epithelial cells cultured at air-liquid interface. Toxicol In Vitro 2018;46:219-28.
13. Jensen RP, Luo W, Pankow JF, Strongin RM, Peyton DH. Hidden formaldehyde in e-cigarette aerosols. N Engl J Med 2015;372:392-4.
14. Johnson SB, Blum RW, Giedd JN. Adolescent maturity and the brain: the promise and pitfalls of neuroscience research in adolescent health policy. J Adolesc Health 2009;45:216-21.

15. Benes FM, Turtle M, Khan Y, Farol P. Myelination of a key relay zone in the hippocampal formation occurs in the human brain during childhood, adolescence, and adulthood. *Arch Gen Psychiatry* 1994;51:477-84.
16. Soneji SS, Knutzen KE, Villanti AC. Use of Flavored E-Cigarettes Among Adolescents, Young Adults, and Older Adults: Findings From the Population Assessment for Tobacco and Health Study. *Public Health Rep* 2019;134:282-92.
17. Landry RL, Groom AL, Vu TT, et al. The role of flavors in vaping initiation and satisfaction among U.S. adults. *Addict Behav* 2019;99:106077.
18. Webb Hooper M, Baker EA, McNutt MD. Racial/Ethnic differences among smokers: revisited and expanded to help seekers. *Nicotine Tob Res* 2014;16:621-5.
19. Czogala J, Goniewicz ML, Fidelus B, Zielinska-Danch W, Travers MJ, Sobczak A. Secondhand exposure to vapors from electronic cigarettes. *Nicotine Tob Res* 2014;16:655-62.
20. Melstrom P, Sosnoff C, Koszowski B, et al. Systemic absorption of nicotine following acute secondhand exposure to electronic cigarette aerosol in a realistic social setting. *Int J Hyg Environ Health* 2018;221:816-22.

California Thoracic Society

18 Bartol St. #1054 | San Francisco, CA, 94133 | 415-536-0287

Connect with CTS at <https://calthoracic.org/>

CTS Editors:

Angela Wang, MD
Chris Garvey, NP

Laren Tan, MD
Sachin Gupta, MD

