Clearing the Haze

Adolescent Vaping and Associated Lung Injuries

March 26, 2020

0910-1010
Presenter(s)

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Harshita J. Saxena, MD

Harshita J. Saxena, MD is an Adolescent Medicine Board certified Pediatrician who has been serving military families in the Adolescent and Young Adult Medicine Clinic at Walter Reed National Military Medical Center since 2012. She completed her Fellowship training at Children’s National Medical Center in Washington, DC, providing care to teens of underserved communities and has co-edited a textbook: “Basics in Adolescent Medicine: A Practical Manual for Signs, Symptoms and Solutions” for the general practitioner published in 2014. She is a 2nd generation Adolescent Medicine physician, inspired to follow in her mother's footsteps having grown up listening to stories of teen resilience in the face of adversity and strife and being profoundly impressed by the potential to impact a teen's life by taking the time to listen to them.
COL Michael McCown completed his pediatric residency at the National Capital Consortium in Bethesda, MD and his fellowship in Pediatric Pulmonary Medicine at Boston Children’s Hospital in Boston, MA. He has been active in clinic pulmonology and hospital pediatrics. COL McCown is an active contributor to multiple national organizations, serving as the Vice Chair of the Pediatric Core in the American Thoracic Society, and on committees developing Clinical Practice Guidelines for the Cystic Fibrosis Foundation.
Disclosures

• COL McCown and Dr. Saxena have no relevant financial or non-financial relationships to disclose relating to the content of this activity.

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• Commercial support was not received for this activity.
Learning Objectives

1. Identify the available devices, mechanics of use, and common ingredients of an E-cigarette.
2. Explain the historic and current use trends of e-cigarettes among adolescents.
3. Discuss the ongoing legislative efforts to curb the sales and use of e-cigarettes in teen patients.
4. Select strategies to screen for use, educate teens and families and provide counsel on e-cigarette use cessation.
5. Describe the pathophysiology of E-cigarette or Vaping product use-Associated Lung Injury (EVALI).
6. Review the Center for Disease Control and Prevention (CDC) guidelines for treatment of lung diseases suspected to be caused by e-cigarettes.
E-Cigarettes

Electronic Nicotine Delivery Systems (ENDS)

Electronic cigarette (E-cigarettes)

Vaping
Juuling
Dripping
Dabbing

Vapes
E-cigs
Vape Pens
Vape Sticks
Vapers
Pods
Mods
Juul
Vape Tanks
In 1963, Herbert A. Gilbert filed a patent for “a safe and harmless means for and method of smoking.” (U.S. Pat. No. 3,200,819)
30 Day Prevalence of Daily Use of Cigarettes, by Grade, 1976-2018

"The electronic cigarette is not a proven nicotine replacement therapy," said Dr Ala Alwan, Assistant Director-General of WHO's Noncommunicable Diseases and Mental Health Cluster. "WHO has no scientific evidence to confirm the product's safety and efficacy. Its marketers should immediately remove from their web sites and other informational materials any suggestion that WHO considers it to be a safe and effective smoking cessation aid."


The Family Smoking Prevention and Tobacco Control Act of 2009

Summary and Review for Informed Decision Making at the State and Local Level

"A cigarette is the only consumer product which when used as directed kills its consumer."—Dr. Geo Harlem Brundtland

On June 22, 2009, President Barack Obama signed into law the Family Smoking Prevention and Tobacco Control Act. The legislation provided the Federal Food and Drug Administration (FDA) with the authority to regulate tobacco products.

https://www.slideshare.net/HPPofME/fda-tobacco-control-act-06-10
Evolution of E-Cigarettes

“Cig-a-likes” Disposable/reusable cartridges

“Vapes“ or Vape Pens
Refillable reservoir for e-liquid

“Mods” or Tank Systems
Wattage and voltage are modifiable

Drawing by Harshita J. Saxena
Oxford dictionary’s word of the year, used as both a noun as in an “electronic cigarette or similar device” or a verb as in one would “inhale and exhale the vapor produced by an electronic cigarette or similar device,” beating out serious contenders such as *Bae, even* and *salty.*

cdc.gov
2015

4th Generation: JUUL, Suorin, SMPO

http://cuatower.com/2018/10/vaping-is-it-good-or-bad/
Drawing by Sarah Ajai, used with permission.

cdc.gov
2018

Surgeon General’s Report

Growth in E-Cigarette Use

Teen vaping is surging
Trends in use of cigarettes and vape devices in the past 30 days among 12th-graders

Source: National Youth Tobacco Survey 2011–2018
Notes: In 2014, changes were made to the e-cigarette measure to enhance its accuracy.

Source: "National Adolescent Drug Trends in 2018," NEJM

Sept 11, 2019

Former FDA Commissioner Dr. Scott Gottlieb:

“E-cigs have become an almost ubiquitous – and dangerous – trend among teens. The disturbing and accelerating trajectory of use we’re seeing in youth, and the resulting path to addiction, must end...The FDA won’t tolerate a whole generation of young people becoming addicted to nicotine as a tradeoff for enabling adults to have unfettered access to these same products.”

House Approves Bill To Ban The Sale Of Flavored E-Cigarettes

The White House said in a statement that President Donald Trump’s administration opposes the bill.

By Associated Press, News Partner
May 5, 2020 12:39 pm ET

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

February 27, 2020
(Reps. Pallone, D-NJ, and 126 co-sponsors)

STATEMENT OF ADMINISTRATION POLICY
H.R. 2339 – Reversing the Youth Tobacco Epidemic Act of 2019

The Administration opposes H.R. 2339. The Administration is encouraged by legislative efforts to protect American youth from the harms of addiction and unsafe tobacco products, and it also acknowledges that H.R. 2339 exempts premium cigars, which have comparatively lower youth usage rates, from certain regulatory burdens. Unfortunately, however, this bill contains provisions that are unsupported by the available evidence regarding harm reduction and American tobacco use habits and another provision that raises constitutional concerns. Accordingly, the Administration cannot support H.R. 2339 in its current form.

The Administration cannot support H.R. 2339’s counterproductive efforts to restrict access to products that may provide a less harmful alternative to millions of adults who smoke combustible cigarettes. This includes the bill’s prohibition of menthol e-liquids, which available evidence indicates are used relatively rarely by youth. It also includes the bill’s approach to remote retail sales. At this time, problems surrounding such sales should be addressed through the application of age verification technologies rather than, as this bill would do, prohibiting such sales entirely.

The Administration is also concerned about the constitutionality of a provision in the bill that prohibits certain advertising practices with respect to electronic nicotine delivery system (ENDS) products. The bill would prohibit marketing and advertising that “appeals to an individual under 21 years of age.” This standard may not satisfy the stringent vagueness test applied to regulations of speech under the Constitution’s Due Process Clause.
As of September 2019, not all states:

Define E-Cigarettes
Tax E-cigarettes
Have product packaging laws
Require licensure for retail sales
E-Cigarette Elements

- Mouthpiece
- Reservoir or Tank
- Heating Coil or Atomizer
- Sensor/User Actuated Button
- Battery
Classification

Classifying E-Cigarettes, or Vaping, Products

How to Classify the User’s E-Cigarette, or Vaping, Product

For an accessible explanation of schematic below on how to classify e-cigarettes, go to "Appendix, section 25"

Important notes:
1. E-liquids can contain nicotine, THC, CBD, flavors, or other solvents.
2. Marijuana herb, hash oil, dab wax are used with vaporizers.

QUESTION 1:
Is the e-liquid contained in a disposable e-cigarette, cartridge, tank, or pod?

1st GENERATION
(Cigarette)

Disposable e-cigarette
(no cartridge, tank or pod)

QUESTION 2:
Is the cartridge also called a pod cartridge or contains nicotine salts?

2nd GENERATION
(Battery Pen)

Cartridge (Prefilled or refillable)

NO

YES

QUESTION 3:
Is the cartridge also called a pod cartridge or contains nicotine salts?

3rd GENERATION
(Medifiable—allows variable voltage/watts)

Tank/Sub-Ohm (Refillable)

QUESTION 4:
Is the cartridge is called a pod cartridge or contains nicotine salts?

4th GENERATION
(Pod Mod)

Pod (Prefilled or refillable)

Marijuana herb, oil, dab wax

Vaporizer, Dab rig, Dab pen

cdc.gov
E-Liquids/Pods

Picture taken by Harshita J. Saxena

Drawing by Harshita J. Saxena
7 in 10 teens were exposed to e-cigarette advertisements in 2016 (Marynak K et al, 2018)

- 68% retail stores
- 40% online

Social Media

- Vaping Tricks (Kong G et al, 2019)
  - 80% Male
  - 51.5% White
  - 85% 18-24 Years
  - 35% set to electronic/hip hop music

- Competitive Vaping
  - Cloud Chasing/Cloud Gazer

- Normalization of tobacco product use
RISKS

• “Dual use”

  Adolescents who use e-cigarettes are 3.5 times more likely to initiate conventional cigarette smoking. (Soneji S et al, 2017 & 2018)

• Substance use: alcohol, marijuana and amphetamines

• Other problematic behaviors:

  Violence: fighting and attempting suicide
  Sexual risk behaviors
  School-related problems: truancy, lower Grade Point Average (GPA)
Health Harms of E-cigarettes

- Known short and long term health risks associated with nicotine in conventional products
- Effects on developing brain
- Cardiovascular effects: increased heart rate and blood pressure
- Respiratory effects
- Carcinogenic potential: oxidative stress, chemicals that can cause DNA damage and mutagenesis
- Symptoms of dependence
- ADDICTION
- Long term effects? Unknowns?
- Unintended Injuries and Poisonings
Screening Tools

- Brief Screener for Tobacco, Alcohol and other Drugs
- Screening to Brief Intervention

**S2BI:**

<table>
<thead>
<tr>
<th>In the PAST YEAR, how many times have you used:</th>
<th>Never</th>
<th>Once or twice</th>
<th>Monthly</th>
<th>Weekly</th>
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</thead>
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<tr>
<td>Tobacco:</td>
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</tr>
<tr>
<td>Alcohol:</td>
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</tr>
<tr>
<td>Marijuana:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FRIENDS’ USE**
- Do you have friends who smoked cigarettes or used other tobacco products in the past year? □ No □ Yes
- Do you have friends who drank beer, wine, or any drink containing alcohol in the past year? □ No □ Yes
- Do you have friends who in the past year:
  - sniffed or “buffed” anything;
  - took illegal drugs like marijuana (weed, blunts), cocaine, etc;
  - took prescription medications that were not prescribed for them; or
  - took prescription or over-the-counter medications and took more than they were supposed to take? □ No □ Yes

**PERSONAL USE**
- In the past year, have you smoked cigarettes or used other tobacco products? □ No □ Yes
- In the past year, have you had more than a few sips of beer, wine, or any drink containing alcohol? □ No □ Yes
- In the past year, have you:
  - sniffed or “buffed” anything;
  - taken illegal drugs like marijuana (weed, blunts), cocaine, etc;
  - taken prescription medications that were not prescribed for you; or
  - taken prescription or over-the-counter medications and took more than you were supposed to take? □ No □ Yes

**IF DRUGS ARE ENDOURED IN THE PERSONAL USE QUESTION, ASK THE FOLLOWING:**
Which of the following substances have you used in the past year? (check all that apply)
- Marijuana or Hashish
- Cocaine or crack
- Heroin
- Amphetamines or methamphetamine (nonpharmaceutical)
- Hallucinogens (e.g., Mushrooms, LSD)
- Inhalants

Which of the following medications have you used in the past year that were not prescribed for you or which you took more than you were supposed to take? (check all that apply)
- Prescription pain relievers (e.g., Morphine, Percocet, Vicodin, Oxycodone, Dilaudid, Methadone, Hydrocodone)
- Prescription sedatives (e.g., Valium, Xanax, Klonopin, Ativan)
- Prescription stimulants (e.g., Adderall, Ritalin)
- Over-the-Counter Medications (e.g., Nyquil, Benadryl, cough medicine, sleeping pills)

**IF EACH SUBSTANCE WHERE USE WAS ENDORSED, ASK:**
In the past 90 days, on how many days have you...
- smoked cigarettes or used other tobacco products/used alcohol/used [SUBSTANCE]□□ days
- smoked cigarettes or used other tobacco products/used alcohol/used [SUBSTANCE]□□ days
- smoked cigarettes or used other tobacco products/used alcohol/used [SUBSTANCE]□□ days
- smoked cigarettes or used other tobacco products/used alcohol/used [SUBSTANCE]□□ days
Motivational Interviewing

Important to establish confidential and non-judgmental care

Stages of Change

- Precontemplation
- Contemplation
- Preparation
- Action
- Maintenance
## Motivational Interviewing

<table>
<thead>
<tr>
<th>Basic Principles</th>
<th>Express Empathy</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Develop Discrepancy</td>
</tr>
<tr>
<td></td>
<td>Roll with Resistance</td>
</tr>
<tr>
<td></td>
<td>Support Self-efficacy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Techniques</th>
<th>Open-Ended Questions</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Reflective Listening</td>
</tr>
<tr>
<td></td>
<td>Affirmations</td>
</tr>
<tr>
<td></td>
<td>Summary Statements</td>
</tr>
</tbody>
</table>
Counseling

• 5 Step algorithm: 5As/(6As)
  – *Anticipate* the risk of initiating smoking or vaping
  – *Ask* what? how often? why? pros and cons of use?
  – *Advise* using simple and youth tailored language
  – *Assess* motivations and readiness to quit
  – *Assist* resources for the patient and family. Therapy? Pharmacotherapy?
  – *Arrange* ongoing follow up
1. The FDA should act immediately to regulate e-cigarettes and ban the sale of the products to people under 21 years old.

2. Internet sales of e-cigarettes and e-cigarette solution should be banned.

3. Efforts should be made to reduce youth demand, by banning characterizing flavors, including menthol in e-cigarettes.

4. Advertising and promotion of e-cigarettes that are accessible to youth should be banned.

5. E-cigarettes should be incorporated into current tobacco-free laws and ordinances where children and adolescents live, learn, play, work and visit.

6. Pediatricians should screen for e-cigarette use, counsel about health effects and should not recommend e-cigarettes as a treatment option for tobacco cessation.
1. Advocate for policies and regulations to prevent marketing and sales of electronic cigarette (e-cigarette) products to youth.

2. Support public health-led education campaigns and educational curricula for schools, community programs, and health providers warning about the health risks of e-cigarette use by adolescent and young adults (AYAs).

3. Increase research to develop evidence-based guidelines for e-cigarette prevention and cessation for AYAs.

4. Support training for health providers to integrate screening for e-cigarette use into routine health visits for AYAs and increase the availability of evidence-based counseling and treatment resources for e-cigarette use cessation.
Resources

• **Integrated Health, Internal Medicine WRNMMC**
  – Smoking Cessation Program, 18 and older
  – America Building 2nd Floor, 301-295-8773

• **Smoking cessation resources**
  – https://teen.smokefree.gov/quit-vaping
  – BeTobaccoFree.gov (HHS.gov)
  – https://www.ycq2.org/ (DOD sponsored for military)

• **Websites**
  – American Academy of Pediatrics: www.aap.org
  – Society of Adolescent Health and Medicine: adolescenthealth.org
  – U.S. Food and Drug Administration (FDA): www.fda.gov
  – CDC: https://www.cdc.gov/tobacco/basic_information/e-cigarettes/
    • E-Cigarette Use Among Youth and Young Adults
Pulmonary Effects of Vaping
### Table 1. Constituents of Liquids and Aerosols in E-Cigarettes.

#### Liquids<sup>30-32</sup>
- Listed ingredients
  - Glycerol
  - Propylene glycol
  - Nicotine
- Other compounds detected
  - Acetone
  - Acrolein
  - 1,3-Butadiene
  - Cyclohexane
  - Diethylene glycol
  - Ethylene glycol
  - Ethanol
  - Formaldehyde
- Tobacco alkaloids (nor nicotine, myosmine, and anabasine have been detected in some products, although tobacco was not listed as an ingredient)

#### Aerosols<sup>33-37</sup>
- Listed ingredients
  - Glycerol
  - Propylene glycol
  - Nicotine
- Other compounds detected
  - Acetaldehyde
  - Acetone
  - Acrolein
  - Formaldehyde
  - N’-nitrosonornicotine (NNN)
  - 4-(MethylNitrosamino)-1-(3-pyridyl)-1-butanone (NNK)
  - Metals (cadmium, lead, nickel, tin, copper
  - Toluene
Pulmonary Effects - Animal Data

- Associated with increased inflammation
  - Increased cytokines
  - Increased capillary leak
  - Endothelial Dysfunction
- Increase in airway hyperreactivity
Pulmonary Effects – Human Data

- Before 2019, primary focus was vaping vs. smoking
  - NO LONG TERM DATA
  - Less impact on some variables than cigarettes when vaping replaces cigarettes
  - Increased pulmonary symptoms reported
  - Many potential exposures
- Studies generally did not account for products with Tetrahydrocannabinol (THC)
- Use in smoking cessation
Emergence of EVALI

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
Cases

- As of February: 2,758 hospitalized cases
  - 66% male
  - Median age 24 years (13-85 years)
    - 15% < 18 years
    - 37% 18 to 24 years
    - 24% 25 to 34 years
    - 24% 35 or older
  - 64 deaths
    - Median age of deceased patients 51 years
TABLE. (Continued) Demographic characteristics, substances used, and product sources among hospitalized* cases of e-cigarette, or vaping, product use–associated lung injury (EVALI) reported to CDC — United States, August 2019–January 2020†

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>THC source</th>
<th>Nicotine source</th>
<th>All cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Any THC (N = 1,620)</td>
<td>Exclusive THC§ (N = 665)</td>
<td>Any nicotine (N = 1,128)</td>
</tr>
<tr>
<td>THC source</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Pop-up shop</td>
<td>20/783 (3)</td>
<td>6/423 (1)</td>
<td>20/783 (3)</td>
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<tr>
<td>Recreational dispensary</td>
<td>67/783 (8)</td>
<td>26/277 (9)</td>
<td>63/783 (8)</td>
</tr>
<tr>
<td>Medical dispensary</td>
<td>27/783 (3)</td>
<td>10/277 (4)</td>
<td>27/783 (3)</td>
</tr>
<tr>
<td>Vape or smoke shop</td>
<td>44/783 (6)</td>
<td>15/277 (5)</td>
<td>44/783 (6)</td>
</tr>
<tr>
<td>Store</td>
<td>17/783 (2)</td>
<td>15/277 (5)</td>
<td>15/783 (2)</td>
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<tr>
<td>Family or friend</td>
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<td>174/423 (41)</td>
<td>294/783 (38)</td>
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<tr>
<td>Dealer</td>
<td>240/783 (31)</td>
<td>140/423 (33)</td>
<td>240/783 (31)</td>
</tr>
<tr>
<td>Online</td>
<td>43/783 (5)</td>
<td>19/423 (4)</td>
<td>43/783 (5)</td>
</tr>
<tr>
<td>Other</td>
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<td>86/423 (20)</td>
<td>177/783 (23)</td>
</tr>
<tr>
<td>Only commercial sources</td>
<td>131/809 (16)</td>
<td>61/436 (14)</td>
<td>131/809 (16)</td>
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<tr>
<td>Only informal sources</td>
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<td>352/436 (81)</td>
<td>627/809 (78)</td>
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<tr>
<td>Nicotine source</td>
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<td></td>
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<tr>
<td>Pop-up Shop</td>
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<td>2/595 (0)</td>
<td>2/430 (0)</td>
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<tr>
<td>Vape or smoke shop</td>
<td>197/430 (46)</td>
<td>287/595 (48)</td>
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<tr>
<td>Store</td>
<td>188/430 (44)</td>
<td>253/595 (43)</td>
<td>253/430 (44)</td>
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<tr>
<td>Family or friend</td>
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<td>Other</td>
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<td>421/613 (69)</td>
<td>429/442 (65)</td>
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<tr>
<td>Only informal sources</td>
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<td>103/613 (17)</td>
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<table>
<thead>
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<th>Characteristic</th>
<th>Substance used No./Total no. (%)</th>
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<td>Any nicotine (N = 1,128)</td>
<td>Exclusive nicotine (N = 264)</td>
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<td>9/277 (3)</td>
<td>6/423 (1)</td>
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<tr>
<td>Recreational dispensary</td>
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<td>10/277 (4)</td>
<td>14/423 (3)</td>
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<td>Dealer</td>
<td>240/783 (31)</td>
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<td>140/423 (33)</td>
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<td>216/285 (76)</td>
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<td>23/436 (5)</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Cases

- Data on substance use available on 2,022 patients
  - 82% reported use of THC-containing products
  - 33% reported exclusive use of THC-containing products
  - 57% reported use of nicotine-containing products
  - 14% reported exclusive use of nicotine-containing products
FIGURE 1. Number of patients (N = 2,398) with e-cigarette, or vaping, product use–associated lung injury (EVALI) by hospital admission — United States, February 10, 2019—January 14, 2020

Update: Characteristics of a Nationwide Outbreak of E-Cigarette, or Vaping, Product Use-Associated Lung Injury – United States, August 2019-January 2020: https://www.cdc.gov/mmwr/volumes/69/wr/mm6903e2.htm?s_cid=mm6903e2_w
1. Presenting Symptoms

- **RESPIRATORY**
  - Chest pain
  - Cough
  - Dyspnea
  - Hemoptysis

- **SYSTEMIC**
  - Fevers
  - Chills
  - Weight Loss
  - Fatigue/malaise

- **GI**
  - Nausea
  - Abdominal Pain
  - Vomiting
  - Diarrhea
2. Vaping History

• History of vaping or dabbing in past 90 days
• Approach to history:
  • Nonjudgmental and private questioning
  • Repeat questioning may be needed
  • Types of products/substances
  • Where were they obtained
  • Duration, frequency, and last use
3. Radiographic Findings

Kligerman S, Raptis C, et al.. Radiology. 2020; 00 : 1-15
4. Rule Out Other Etiologies

- Infections:
  - Influenza testing highly recommended
  - Community-acquired pneumonia
  - Others as appropriate
- Pulmonary manifestations of other disease
  - Autoimmune, cardiac, neoplastic, etc
Diagnosis

Confirmed:

- Use of E-Cigarette/Dabbing within 90 days
- Radiographic abnormalities on CXR or CT
- Absence of pulmonary infections on initial work-up
- No evidence of alternative plausible condition
Diagnosis

Probable:

- Use of E-Cigarette/Dabbing within 90 days
- Radiographic abnormalities on CXR or CT
- Infection identified by culture or PCR but clinical team feels it isn’t sole cause of disease process OR testing not completed and team feels infection isn’t sole cause of disease
- No evidence of alternative plausible condition
Bronchoscopy

- Generally for progressive or severe symptoms
- Evaluation of infections
- No confirmatory testing for EVALI
  - Neutrophil predominance
  - Lipid Laden-Macrophages
- Relatively high complication rate reported
Pathology

- Various histologic findings noted
- No confirmatory diagnostic finding
- Consistent with inhalational injury
Vitamin E Acetate

- Added to THC-Containing vaping liquids
- Can disrupt surfactant function
- Can generate pulmonary irritants when heated
Vitamin E Acetate
• Found in 48 or 51 EVALI patients on BAL fluid
• Began to appear in THC products in 2019
Other Potential Causes
• Other oils, THC, Nicotine, unidentified agent
Disposition

- Vast majority of patients require admission
- Can consider outpatient management if:
  - Oxygen saturation >95%
  - No respiratory distress
  - No comorbid conditions
  - Able to follow-up as needed
- CDC encourages continued reporting to local or state health departments
Treatment

• Supportive treatment as needed
  • Supplemental oxygen
  • 50% require ICU care
    • NIV
    • Intubation (25%)
    • ECMO
• Empiric antimicrobials
• Corticosteroids
Treatment

• Empiric antimicrobials
  • Majority of patients started on therapy
  • Duration dictated by course and infectious work-up

• Corticosteroids
  • No formal studies
  • Threshold to begin varies
  • 0.5 to 1 mg/kg per day for 5-10 days
  • May have flare after stopping
Discharge Criteria

• Clinically stable for 24 – 48 hours
• Follow up within 48 hours
• Pulmonary follow up 2-4 weeks
• Screening for mental health disorders
• Cessation plan
Outcomes

• Around 3% required re-admission
• Long term effects unknown
  • Monitoring pulmonary function testing
  • Monitoring symptoms
• Patients should completely stop vaping
Key Takeaways

- The use of E-cigarettes is on the rise in adolescents despite public health efforts to curb teen/young adult tobacco use
- Vaping is not a valid smoking cessation tool
- EVALI is a life-threatening complication of vaping and the diagnosis can be challenging. Maintaining an index of suspicion is required when seeing potential cases
- Smoking and vaping will aggravate co-morbid pulmonary conditions
Questions?
References (Saxena):

AAP Policy Statement: E-Cigarettes Need Stronger Regulations to Prevent Youth Access and Use. (2019, Jan 28). AAP.


References (Saxena):


References (McCown):

Blount B., Karwowski M., Shields P., Morel-Espinosa M., Valentin-Blasini L., Gardner M., Braselton M., Brosius C.R., Caron K.T., Chambers D., Corstvet J., Cowan E., De Jesus V.R., Espinosa P.,


References (McCown):


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