Still Blowing Smoke: The Truth Behind Vaping

Cheryl Abel, PharmD
Professor of Pharmacy Practice
Massachusetts College of Pharmacy and Health Sciences-Worcester/Manchester
cheryl.abel@mcphs.edu
Learning Objectives

At the completion of this activity, participants will be able to:

1. Discuss the current trends in use of electronic nicotine delivery devices (vapes)
2. Examine the known health consequences of vaping
3. Summarize efforts to change this growing trend including federal and state regulations
Draw or type 2 things you already know about e-cigarettes:
Some e-cigarettes are safe for use by teenagers.
WHO IS USING E-CIGARETTES?

E-CIGARETTES ARE THE MOST COMMONLY USED TOBACCO PRODUCT AMONG YOUTH.

In 2018, more than 3.6 MILLION U.S. middle and high school students used e-cigarettes in the past 30 days, including:

- 4.9% MIDDLE SCHOOL STUDENTS
- 20.8% HIGH SCHOOL STUDENTS

IN THE U.S., YOUTH ARE MORE LIKELY THAN ADULTS TO USE E-CIGARETTE

AMONG CURRENT E-CIGARETTE USERS AGED 45 YEARS AND OLDER in 2015, most were either current or former regular cigarette smokers, and 1.3% had never been cigarette smokers.

IN CONTRAST, AMONG CURRENT E-CIGARETTE USERS AGED 18-24 YEARS, 40.0% had NEVER BEEN regular cigarette smokers

IN 2015, AMONG ADULT E-CIGARETTE USERS OVERALL:

- 29.8% were former regular cigarette smokers
- 58.8% were current regular cigarette smokers
- 11.4% had never been regular cigarette smokers

ADULTS

In 2017, 2.8% of U.S. adults were current e-cigarette users

CDC Electronic Cigarettes Read Facts Sheet https://www.cdc.gov/tobacco/basic_information/e-cigarettes/index.htm (Accessed April 14, 2022)
E-cigarettes

- Electronic nicotine delivery devices (ENDS)
  - vapes, vape pens
  - mods,
  - pods-mods (Juul)
  - e-cigars
  - e-hookah
  - dab pens
- Use is called “vaping”, “juuling” or “dabbing”

https://www.cdc.gov/tobacco/basic_information/e-cigarettes/about-e-cigarettes.html

E-cigarettes

- Devices heat liquid to create an aerosolized vapor
- Deliver nicotine, cannabis, flavorings, chemicals and other substances.
  - e-juice
  - e-liquid
  - wax
  - salts
  - herbs

[Image of aerosolized vapor and harmful substances]

https://www.cdc.gov/tobacco/basic_information/e-cigarettes/about-e-cigarettes.html
Alternative uses of e-cigarettes

• Dripping
• Smoke tricks
• Dabbing


https://www.gq.com/story/vape-god
Camouflaged vaping devices

- Vape watch
- Vaporizer hoodie
- Vape Backpack

https://vapewearlabs.com/
https://cannabisvapereviews.com/vaprwear-vape-tech-gear-review/
https://unicun.com/product/vaporizer-hoodie/
https://vapewearlabs.com/
E-cigarettes-Chemicals

- Chemicals found in e-cigarettes
  - propylene glycol
  - glycerin
  - diethylene glycol
  - acrolein
  - diacetyl
  - formaldehyde
  - ethanol
  - Vitamin E acetate

- Amount of chemicals released varies

- Higher heat=more chemicals released
E-cigarettes-Nicotine

- salts vs. “free-base” nicotine
  - “aversive user experience”
- addiction
- alters brain development

# E-cigarettes-Nicotine

<table>
<thead>
<tr>
<th>Level of Nicotine</th>
<th>Nicotine content (mg)</th>
<th>Example Products (nicotine content/pod)</th>
<th>Cigarette Equivalency</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0</td>
<td>Halo 0 mg, Jam Monster 0 mg, Naked 0 mg</td>
<td>One JUUL pod 5%, contains approximately 40 mg of nicotine. This is considered to be equivalent to smoking about 20 combustible tobacco cigarettes.</td>
</tr>
<tr>
<td>Very Low/Ultra-Light</td>
<td>~3 to 4</td>
<td>Halo 3 mg, Jam Monster 3 mg, Naked 3 mg</td>
<td></td>
</tr>
<tr>
<td>Low/Light</td>
<td>~6 to 8</td>
<td>Halo 6 mg, Jam Monster 6 mg, Naked 6 mg</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>~11 to 12</td>
<td>Halo 12 mg, Naked 12 mg</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>~16 to 18</td>
<td>Blu 1.2%, Halo 18 mg</td>
<td></td>
</tr>
<tr>
<td>Very High/Extra Strength</td>
<td>~24</td>
<td>JUUL 3%, Halo 24 mg, Jam Monster 24 mg</td>
<td></td>
</tr>
<tr>
<td>Ultra-High/Very Strong</td>
<td>≥36</td>
<td>JUUL 5%, Blu 2.4%, Jam Monster 48 mg</td>
<td></td>
</tr>
</tbody>
</table>
What are the health risks associated with vaping?
Health Risks

- mild respiratory symptoms
- acute lipoid pneumonia
- hypersensitivity pneumonitis
- “popcorn lung”-bronchiolitis obliterans
- E-cigarette of Vaping Use-Associated Lung Injury (EVALI)
  - severe lung disease
    - linked to vitamin E acetate
    - symptoms: cough, shortness of breath, chest pain, nausea, vomiting, diarrhea, fatigue, fever, weight loss

Health Risks

TIME The Teenager Who Needed a Double Lung Transplant Because He Vaped Has Something to Say
Health Risks

- Poisonings due to ingestion, absorption or inhalation of nicotine
  - Symptoms of nicotine toxicity:
    - nausea
    - vomiting
    - diarrhea
    - salivation
    - weakness
    - hypertension
    - tachycardia

As of March 31, 2022, poison control centers have managed 1,372 exposure cases about e-cigarette devices and liquid nicotine in 2022.


E-cigarettes for smoking cessation

- Not approved in US
  - Very little evidence
  - Not approved by the FDA
- Royal College of Physicians in the UK-support use for smoking cessation

Vaping Cessation

Determine amount of nicotine:
- “Which products are you vaping?”
- “How much are you vaping?”

Consider medications:
- Nicotine replacement therapy
- bupropion
- varenicline

Counseling points:
- quit date
- support system
- cognitive behavioral therapy
Regulations

- FDA and Health Canada
  - regulate packaging, promotion, banning of ingredients, etc.
- Minimum age for purchase
  - USA: 21
  - Canada: 18
- FDA Authorization to market: *Vuse Solo* (tobacco flavored)
Education

https://www.scholastic.com/youthvapingrisks/index.html
https://www.thetruth.com/article/safer-safe
https://www.fda.gov/tobacco-products/public-health-education-campaigns/real-cost-campaign
Make connections
How are these two things connected?

E-cigarettes

What connects these concepts?

Tobacco Cigarettes
I wonder...