



LETTING THE SMOKE CLEAR: VAPING

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DISCLOSURE

Dr. Antley has no personal or financial conflicts of interest to disclose.

OBJECTIVES



Recognize the importance & relevance of vaping and e-cigarette related injuries.



Explain the dangers of using e-cigarettes and vaping products.



Discuss how pharmacy technicians can play a role in educating others about vaping.



Recall recent legislation related to vaping and e-cigarette products.

The background features several flowing, wavy bands of color. At the top, a thick, vibrant red band curves across the frame. Below it, a thinner, more translucent yellow band flows. At the bottom, another thick red band curves upwards, overlapping with a yellow band that flows from the right side towards the center. The overall effect is one of dynamic movement and energy.

WHY IS THIS IMPORTANT?

SMOKING STATISTICS

- Smoking harms nearly every organ of the body
 - Causes cancer, heart disease, stroke, lung disease, diabetes, and COPD
 - Known to cause erectile dysfunction in men
- Smoking is the leading cause of preventable death
 - Worldwide, tobacco causes more than 7 million deaths per year
 - In the United States, smoking kills more than 480,000 people a year
 - This is ~1,300 deaths every day

SMOKING STATISTICS

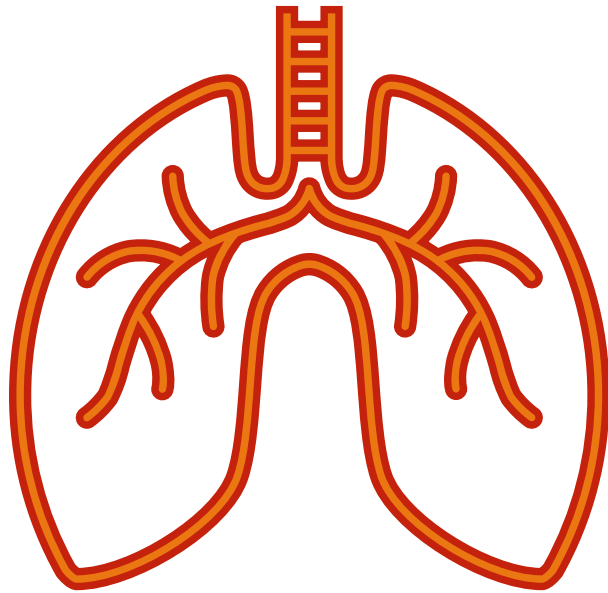
- In 2018, 13.7% of adults (34.2 million people) currently smoked cigarettes
- Thousands of young people start smoking every day
 - Every day, over 300 kids younger than 18 years old become daily cigarette smokers



E-CIGARETTE, OR VAPING, PRODUCT USE-ASSOCIATED LUNG INJURY

- Also known as EVALI
- The first & largest outbreak in adolescent pediatric patients was in the Midwest
- Vitamin E acetate, an additive in some THC-containing e-cigarette, or vaping products is strongly linked to the EVALI outbreak
- Most reports come from products acquired from informal sources such as friends, family or online dealers

E-CIGARETTE, OR VAPING, PRODUCT USE-ASSOCIATED LUNG INJURY



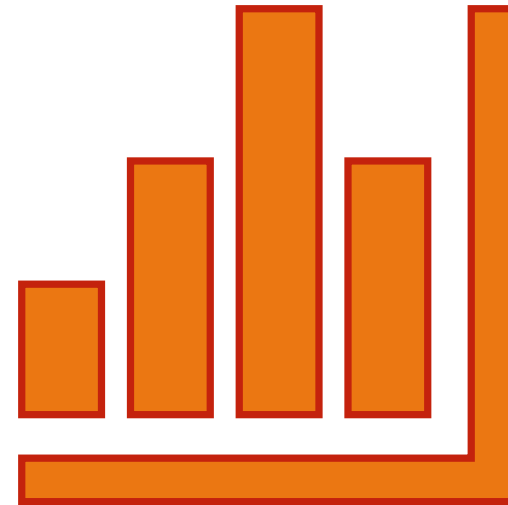
- Symptoms range from mild dyspnea to acute hypoxemic respiratory failure
- Difficult to diagnose with only a vaping history and respiratory illness
- No current evidenced-based approach to diagnosing and managing patients with possible EVALI

VAPING STATISTICS

- As of January 14th, 2020, a total of 2668 hospitalized EVALI cases or deaths
 - 66% are male
 - Ages range from 13 to 85 years old
- 60 deaths have been confirmed
 - Deceased patients ranged from 15 to 75 years old
 - More deaths are still under investigation
 - Missouri has had deaths occurred

VAPING STATISTICS

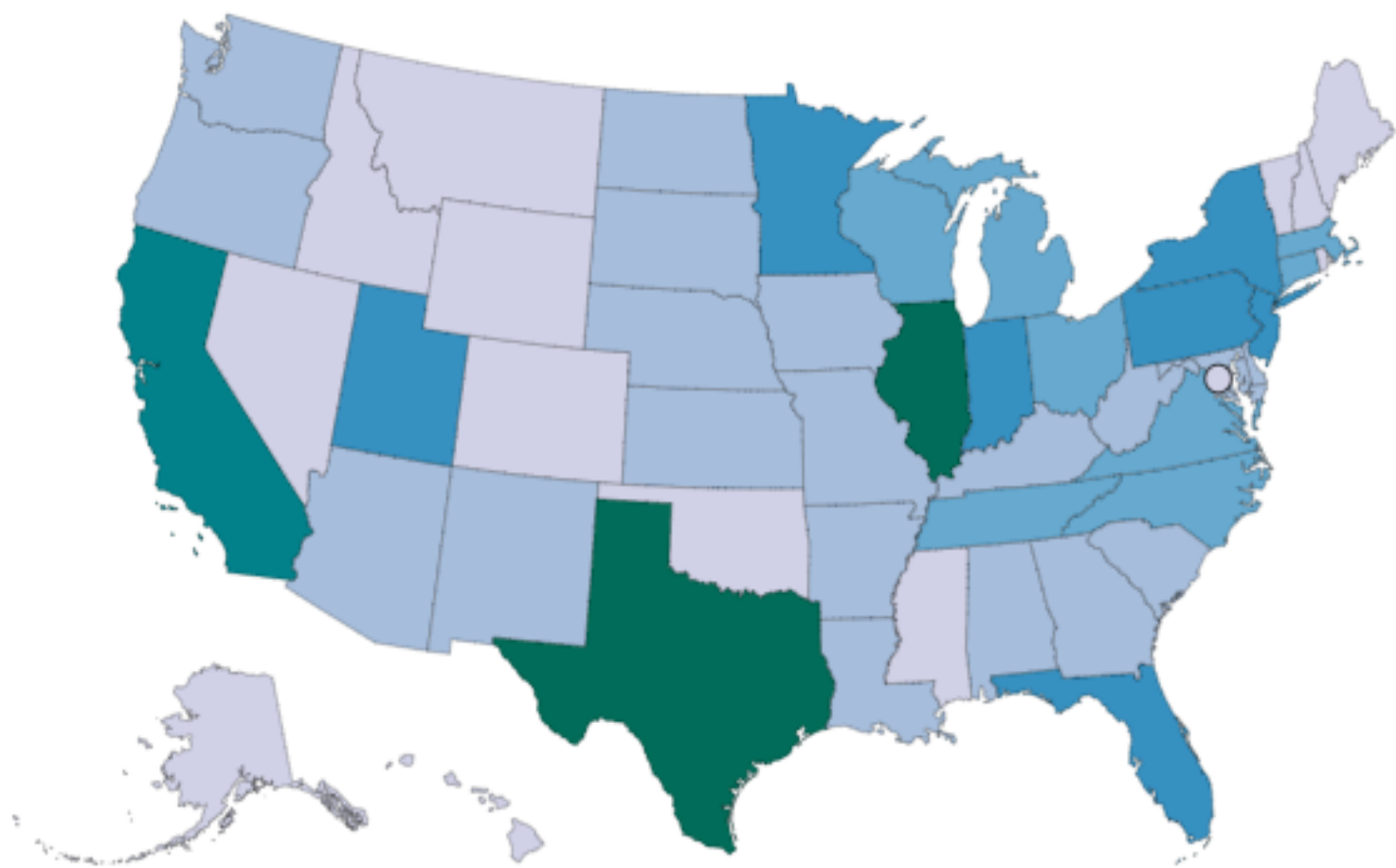
- 82% of users reported using THC-containing products
- 94% of 13 to 17-year olds acquired THC-containing products from family, friends, dealers or online



EFFECTS OF NICOTINE

- Most e-cigarettes contain nicotine
 - 99% in a study done by the CDC
- Even when products claim to be nicotine free, they were found to contain nicotine
- Nicotine has negative effects on the developing brain
 - The brain develops until around 25 years old
 - Affects learning, attention, mood and impulse control
- It's possible that using nicotine as an adolescent can increase risk for future addiction to other drugs
- Long term effects are still unknown

Number of Hospitalized EVALI Cases or Deaths Reported to CDC as of January 14, 2020



Legend

Number of hospitalized EVALI cases or deaths per state

- 0 cases
- 1-9 cases
- 10-49 cases
- 50-99 cases
- 100-149 cases
- 150-199 cases
- 200-249 cases

Territories AS GU MH FM PW PR VI



EVALI: e-cigarette, or vaping, product use-associated lung injury; CDC: centers for disease control and prevention

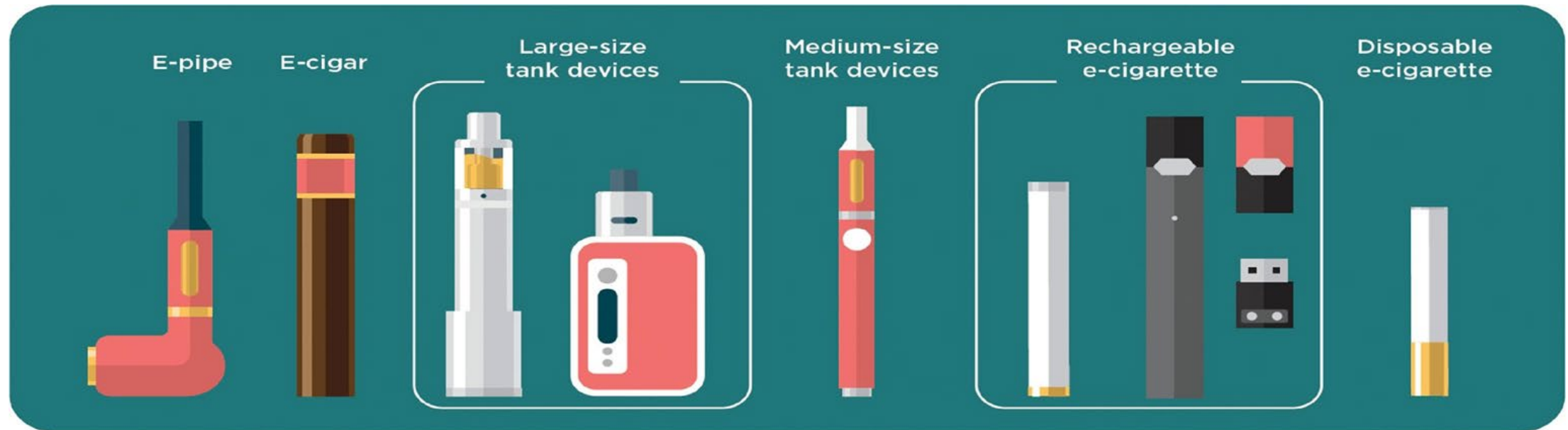
The background features a dynamic, abstract design with flowing, wavy bands of color. The top band is a vibrant red that transitions into a bright yellow. Below this, there are more complex, layered waves in shades of red, orange, and yellow, creating a sense of movement and depth. The overall aesthetic is modern and energetic.

ELECTRONIC CIGARETTES & VAPING

E-CIGARETTES

- Electronic devices that heat liquid to form small particles in the air, or aerosolization
- They come in all shapes and sizes, but most contain a battery, a heating element, and a liquid storage
- E-cigarettes can look like regular cigarettes, cigars, pipes, flash drives, pens or other everyday items
- Also known as e-cigs, e-hookahs, mods, vape pens, vapes, tank systems, and electronic nicotine delivery systems (ENDS)
- Using an e-cigarette is typically called vaping or JUUL™ ing

TYPES OF E-CIGARETTES



<https://www.drugabuse.gov/publications/drugfacts/vaping-devices-electronic-cigarettes>

HOW DO E-CIGARETTES WORK?

- Produce an aerosol by heating a liquid that usually contains nicotine, flavors, and other chemicals
- The liquid in the e-cigarettes is often called e-juice, e-liquid, vape juice or vape liquid
- Users inhale the aerosol into their lungs
 - Bystanders can also breathe in the aerosol when it is exhaled into the air
- E-cigarette devices can also be used to deliver marijuana or other drugs

JUUL™

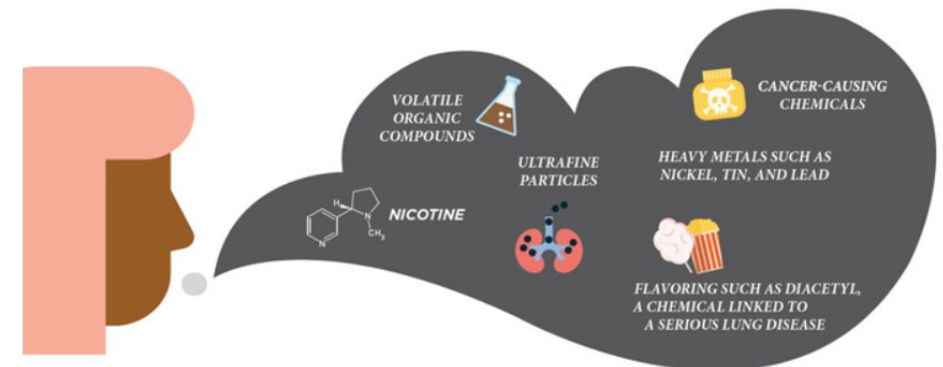
- JUUL™ is a brand of e-cigarettes shaped like a USB flash drive
- Have high levels of nicotine
 - A single JUUL™ pod has as much nicotine as a pack of 20 cigarettes
- JUUL™ is one of a few e-cigarettes that uses nicotine salts. This allows high levels of nicotine to be inhaled more easily with less irritation than regular nicotine
- Currently the top-selling brand of e-cigarette in the United States



<https://2ndwife-vape.com/products/juul-device-kit-device-only>

E-CIGARETTE AEROSOL

- Aerosol is not just harmless water vapor
- E-cigarettes contain harmful and potentially harmful substances including:
 - Nicotine
 - Ultrafine particles inhaled deep into the lungs
 - Volatile organic compounds
 - Flavorings like diacetyl, a chemical linked to serious lung disease
 - Cancer-causing chemicals
 - Heavy metals such as nickel, tin and lead



VITAMIN E ACETATE

- An additive, mostly in THC-containing e-cigarette or vaping products
- Found in many foods, including vegetable oils, cereals, meat, fruits, and vegetables
- Also in dietary supplements and cosmetic products such as skin creams
- Usually does not cause harm when ingested or applied to the skin
 - Research is now suggesting that when inhaled, it can interfere with normal lung functioning

IN SUMMARY...



CDC RECOMMENDATIONS

- Avoid THC-containing e-cigarettes or vaping products, especially those from informal sources
- Vitamin E acetate should not be added to any vaping products
 - People should not add any substances not intended by the manufacturer
- Adults using e-cigarettes or vaping products should not go back to smoking cigarettes

CDC RECOMMENDATIONS

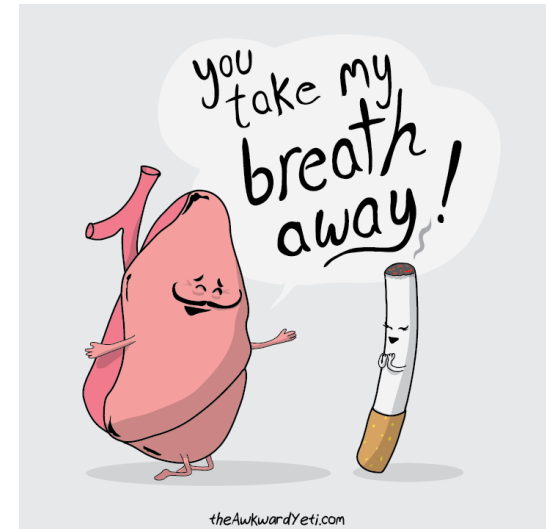
- Youth, young adults or pregnant women should avoid these products
- Prolonged THC use has been associated with negative health effects and should be avoided
- People engaged in frequent cannabis use that leads to significant impair should consult a healthcare professional



E-CIGARETTE, OR VAPING,
PRODUCT USE-ASSOCIATED
LUNG INJURY (EVALI)

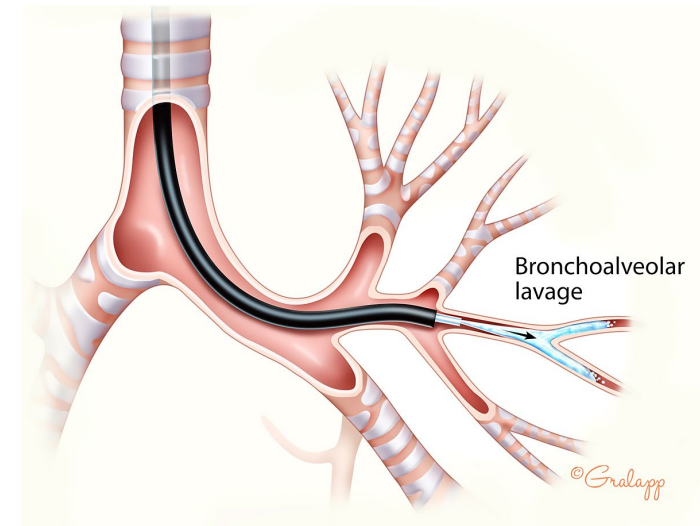
SUBJECTIVE SYMPTOMS

- Fevers
- Chills
- Night sweats
- Fatigue
- Unintentional weight loss
- Difficulty breathing (dyspnea)
- Nausea or vomiting
- Cough
- Chest pain
- Abdominal pain



OBJECTIVE SYMPTOMS

- Breathing fast (tachypneic)
- Elevated WBC (leukocytosis)
- Elevated LDH
- Elevated CRP/ESR
- Elevated procalcitonin
- Increase in neutrophils on BAL
- Radiology reports show lung ground-glass opacities and nodules



<https://psnet.ahrq.gov/web-mm/one-bronchoscopy-two-errors>

ONSET OF SYMPTOMS

- CDC recommends to report lung injury cases if the patient has a history of vaping within the past 90 days
- One study stated to screen patients that have vaped in the last 30 days
- Symptoms can be delayed
 - Reports of EVALI in adolescents 2 weeks up to 5 months after stopping vaping

DIAGNOSIS

- EVALI is a diagnosis of exclusion
- Need to rule out other possible lung diseases
 - Influenza
 - Community-acquired pneumonia
 - COPD
 - Asthma
- This can be difficult because you can have EVALI on top of a lung infection such as the flu or pneumonia

DETERMINING TREATMENT

- Can the patient be managed as outpatient?
 - Inpatient admission is recommended if the patient has influenza and suspected EVALI
 - Consider outpatient management if the patient:
 - Oxygen saturation >95% on room air
 - No respiratory distress
 - No health issues that affect the lungs
 - Easy access to healthcare
 - Capability to follow up within 24 to 48 hours

TREATMENT

- Perform influenza testing if within flu season
 - People with suspected flu who are at high risk for complications should receive antivirals right away
 - Antivirals can also be considered in previously healthy patients if treatment is started within 48 hours of symptom onset
- Start empiric antibiotics right away
 - Choose antibiotics based off current guidelines

STEROID USE

- Steroids may be helpful in treatment
- In hospitalized patients, most patients that received steroids had rapid improvement
- However, if there is suspicion that the patient may have a disease that would worsen with steroids, then hold off on treatment with steroids
- Currently, using steroids as outpatient treatment is not recommended
 - Steroids can worsen infections typically treated in the outpatient setting
- Patients still have shown improvement without steroids, especially if they stopped vaping

STOPPING VAPING

- It is strongly recommended to stop vaping
- Continuing vaping can slow recovery, cause symptoms to reoccur, or further lung injury
- Remind patients that returning to smoking cigarettes is not recommended
 - Providers should offer patients with resources to help quit smoking

FOLLOW UP

- Once patients are discharged from the hospital, they should follow up within 1 to 2 weeks
- Monitor oxygenation, consider repeating a chest x-ray
- In 1 to 2 months after discharge, spirometry testing and chest x-ray is recommended
- Long term effects of EVALI are unknown
 - May need chronic pulmonary follow up
 - If any symptoms return, patients should follow up immediately

WHAT CAN I DO WITH THIS
INFORMATION?



The image features a stylized illustration in shades of orange and red. At the top, there are flowing, ribbon-like shapes in yellow, orange, and red. In the center, a large whiteboard with a thick orange border contains the word "EDUCATE!" in bold, black, uppercase letters. To the left of the whiteboard, a large orange stick figure stands with its right arm raised, pointing a long orange pointer towards the text on the board. Below the whiteboard, three smaller orange stick figures are arranged in a row, representing an audience or students. The entire scene is set against a plain white background.

EDUCATE!

EDUCATION

- Using vaping products can cause a serious lung injury called EVALI which can cause serious illness and even death
- Acquiring vaping products from friends, family or online dealers has the highest risk of developing EVALI
- Almost all products have nicotine in them even when they say they do not
- Vaping is not just inhaling water vapor
 - There are many toxins such as nicotine, volatile substances, heavy metals, etc

EDUCATION

- Diagnosing EVALI is difficult and we do not have specific treatment options for the disease
- We are unsure of what the long-term effects of vaping or having EVALI will be
- If anyone has further questions about vaping or EVALI, the CDC has a user-friendly website with the most up to date information

IN THE NEWS...



MISSOURI SENATE BILL 829

- Introduced January 8th, 2020
- Proposed legislature in Missouri to tax vaping products as tobacco products
 - Missouri currently taxes tobacco 17 cents per package of 20, which is the lowest in the nation
- Proposed to make anyone selling vaping products with THC, or any controlled substance a misdemeanor
- The bill would also ban vaping statewide in public places, public schools, daycares and other designated areas
- Raises the age to 21 years old to purchase tobacco, alternative nicotine, or vapor products

FOOD & DRUG ADMINISTRATION

- FDA raised the legal age to buy tobacco products to 21
- FDA made a stance against fruit and mint flavored vaping products
 - These products are targeted to children
- Does not apply to menthol and tobacco flavored products
- Vape shops can still sell flavors in stores that are for tank-based systems
 - These systems allow people to mix their own nicotine and vaping juice
- The problem is that vape shops will sell to minors anyways
 - One study showed that 45% of vape shops in California sold to minors

IN CONCLUSION...



TYING IT ALL TOGETHER

- Vaping is not a safe alternative to smoking cigarettes
- There are many different types of vaping and e-cigarette products
 - Products that do not come from the manufacturer should especially be avoided
- EVALI can be deadly and it is hard to diagnose
- Long term effects of using these products is unknown
- Long term effects of having EVALI is unknown
- Legislators are making an effort to restrict availability of these products

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ASSESSMENT QUESTIONS

QUESTION 1

- Why is vaping harmful to the lungs?
 - A. Most vaping products contain nicotine
 - B. Vaping products contain harmful products such as heavy metals
 - C. Vitamin E acetate has been shown to be a cause to EVALI
 - D. All of the above

QUESTION 2

- The dangers of using e-cigarettes and vaping products include:
 - A. Developing EVALI
 - B. Inhaling toxic substances into your lungs
 - C. There are no dangers
 - D. Both A and B

QUESTION 3

- As a pharmacy technician I can educate others about:
 - A. The incorrect information provided by the Centers for Disease Control & Prevention
 - B. Vaping is safe because it is just water vapor
 - C. The dangers of vaping and how it can lead to EVALI and even death
 - D. There is a cure to EVALI

QUESTION 4

- Current proposed legislature in Missouri includes:
 - A. Making the legal age to buy tobacco products 21 years old
 - B. Make possession of a vaping product a felony
 - C. Prohibits using vaping products in ALL public areas
 - D. Decrease the tax on vaping products

Evaluation

- To receive continuing education credit for this activity, complete the evaluation survey at :

<https://www.surveymonkey.com/r/H9Y9QTC>

Password: 5h01t

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