Game of Ohms: What's the Word on E-cigarettes and Vaping?

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Attendance Code

To obtain CPE credit for this activity, you are required to actively participate in this session. You will need this attendance code in order to access the evaluation and CPE form for this activity. Your CPE must be filed by **11 November 2020** in order to receive credit.

CPE Information and Disclosures

I, Miranda Smith, “declare no conflicts of interest, real or apparent, and no financial interests in any company, product, or service mentioned in this program, including grants, employment, gifts, stock holdings, and honoraria.”

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CPE Information

Target Audience: Pharmacists and Pharmacy Technicians

ACPE#:

0575-0000-20-099-L04-P

0575-0000-20-099-L04-T

Activity Type: Knowledge

Objectives

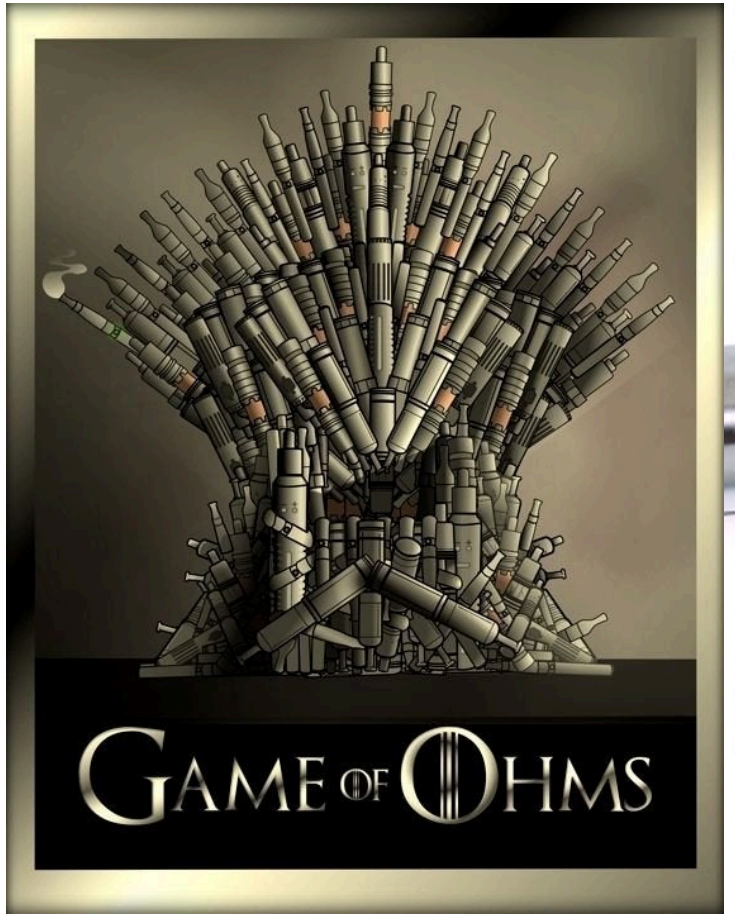
Pharmacists:

1. Describe E-cigarette or vaping-associated lung injury (EVALI) and suspected causes.
2. Discuss current CDC recommendations around vaping.
3. List the nicotine delivery method of various types of e-cigarettes.
4. Formulate a quit plan for a patient who uses e-cigarettes or vapes.

Technicians:

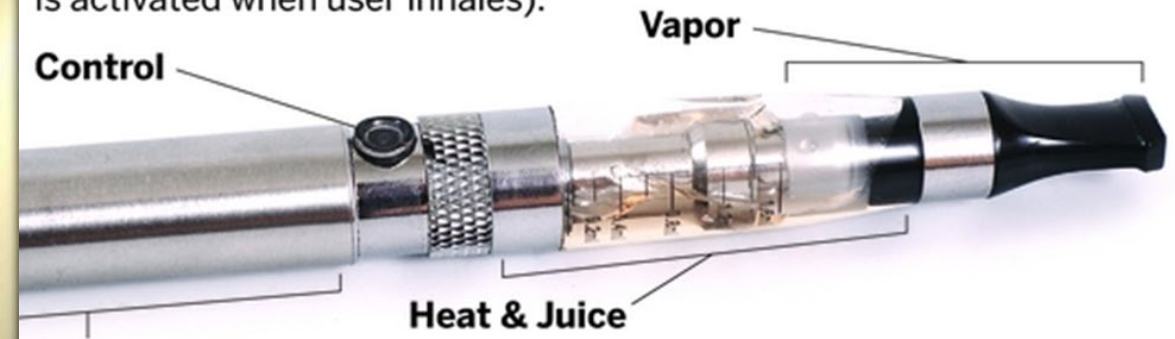
1. Describe E-cigarette or vaping-associated lung injury (EVALI) and suspected causes.
2. Discuss current CDC recommendations around vaping.
3. List the nicotine delivery method of various types of e-cigarettes.
4. Understand how to support implementation of a quit plan for a patient using e-cigarettes.

What is ‘Vaping’?



To smoke, user pushes a button to activate an electronic controller (in other models, such as disposable e-cigarettes, this is activated when user inhales).

User inhales vapor through the mouthpiece and exhales a cloud that appears smoky, thanks to glycerol or propylene glycol.

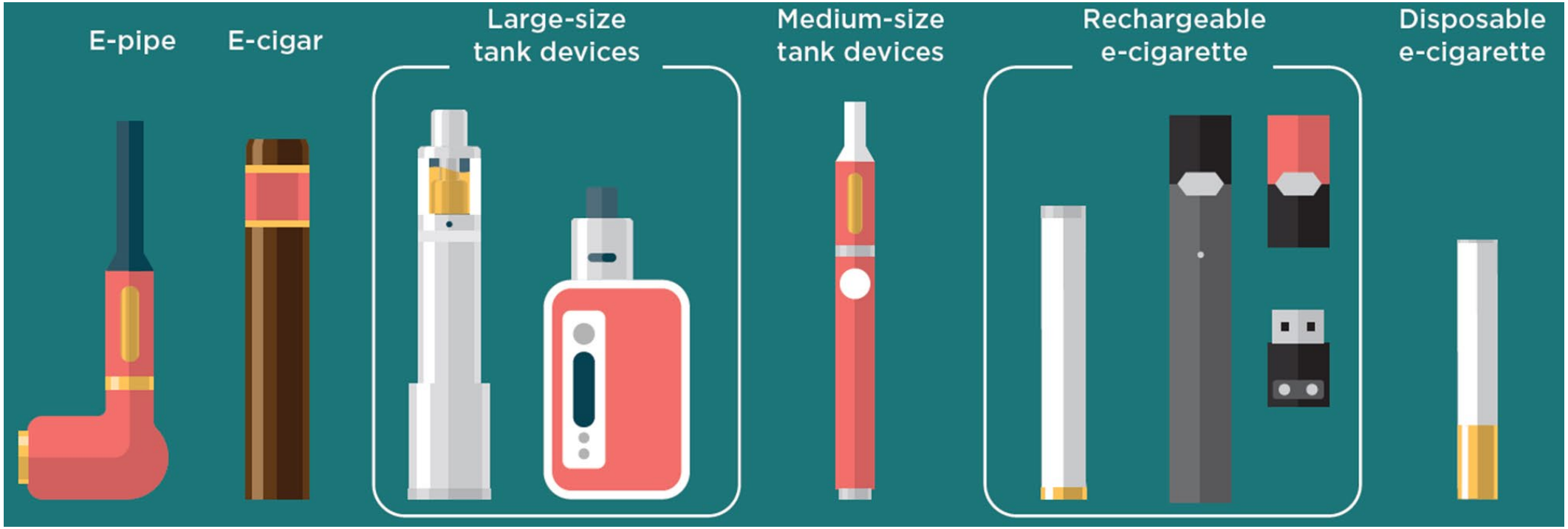


Power

Rechargeable lithium-ion battery powers the e-cigarette.

Heat & Juice

Heating element, called an atomizer, vaporizes e-liquid, an aqueous solution of glycerol or propylene glycol, flavoring, and optional nicotine. This reusable e-cigarette has a refillable cartridge with an atomizer, wicks, and e-liquid known as clearomizer or cartomizer.


E-pipe
E-cigar
Large-size tank devices
Medium-size tank devices
Rechargeable e-cigarette
Disposable e-cigarette

Why Do We Care?

2015 HRBS

- 11.1% of service members said they were daily e-cigarette users
- 12.4% had vaped within the last month
- In the junior enlisted ranks, nearly 20% are current e-cigarette smokers
- Five-fold increase in service members who said they have tried vaping compared with 2011 HRBS

EVALI

EVALI - E-cigarette or Vaping-Associated Lung Injury

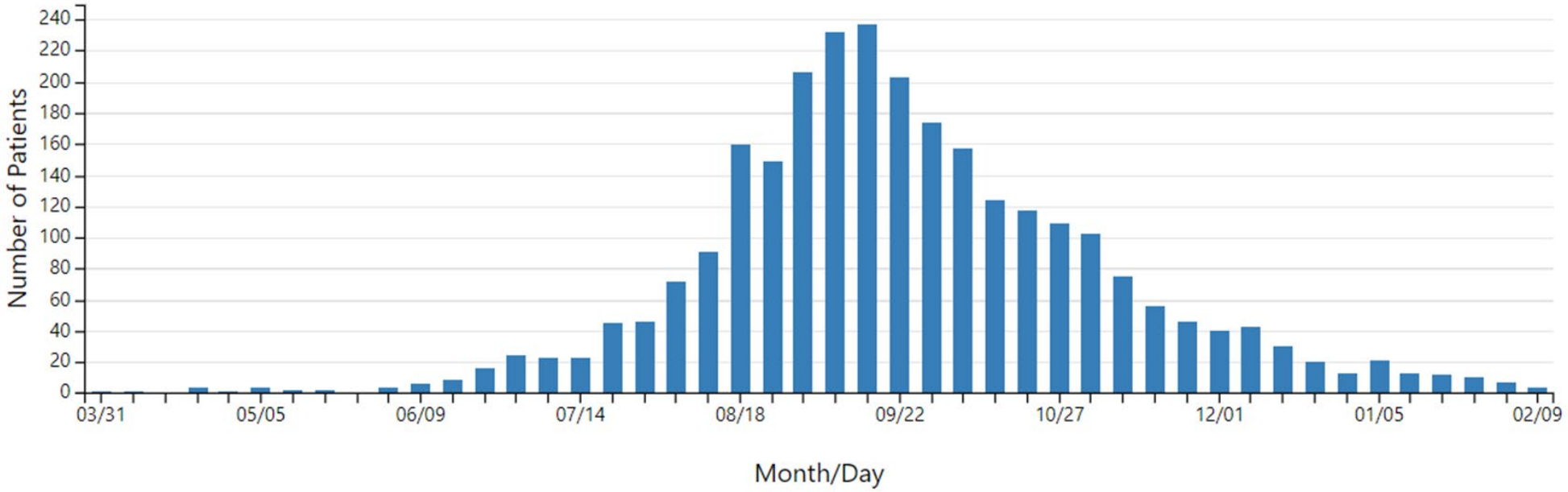
First recognized by CDC in Aug 2019; *diagnosis of exclusion*

Cases of severe/fatal lung infections in otherwise healthy individuals

- Shortness of breath
- Cough
- Chest pain
- Fever and chills
- Diarrhea, nausea, and vomiting
- Tachycardia
- Tachypnea

EVALI

Dates of symptom onset and hospital admission for patients with lung injury associated with e-cigarette use, or vaping — United States, March 31, 2019–February 15, 2020



REFERENCES

EVALI

As of February 18, 2020

- 2,807 hospitalized EVALI cases or deaths have been reported to CDC from all 50 states, the District of Columbia, and two U.S. territories (Puerto Rico and U.S. Virgin Islands)
- 68 deaths have been confirmed in 29 states and the District of Columbia

EVALI – Resolution?

Laboratory data show that vitamin E acetate (VEA) is strongly linked to the EVALI outbreak.

- 51 EVALI cases analyzed from 16 states vs. comparison group of samples from 99 individuals without EVALI
- Looked for VEA, plant oils, medium chain triglyceride (MCT) oil, coconut oil, petroleum distillates, and diluent terpenes
- VEA was identified in bronchoalveolar lavage (BAL) fluid samples from 48/51 EVALI patients, but not in the BAL fluid from the healthy comparison group
- No other toxicants were found in BAL fluid from either group, except for coconut oil and limonene (1 EVALI patient each)

VEA

VEA is used as an additive, most notably in THC-containing e-cigarette, or vaping, products

Found in many foods → vegetable oils, cereals, meat, fruits, and vegetables. Also a dietary supplement and in many cosmetic products

VEA usually does not cause harm when ingested as a vitamin supplement or applied to the skin. However, previous research suggests that when vitamin E acetate is *inhaled*, it may interfere with normal lung functioning

CDC Recommendations

Do not use THC-containing e-cigarette, or vaping, products, particularly from informal sources like friends, family, or in-person or online dealers.

VEA (or any other substances) should not be added to any e-cigarette, or vaping, products.

Adults using nicotine-containing e-cigarette, or vaping, products as an alternative to cigarettes should not go back to smoking; they should weigh all available information and consider using FDA-approved smoking cessation medications.

- If they choose to use e-cigarettes as an alternative to cigarettes, they should completely switch from cigarettes to e-cigarettes. Do not dual use!

CDC Recommendations

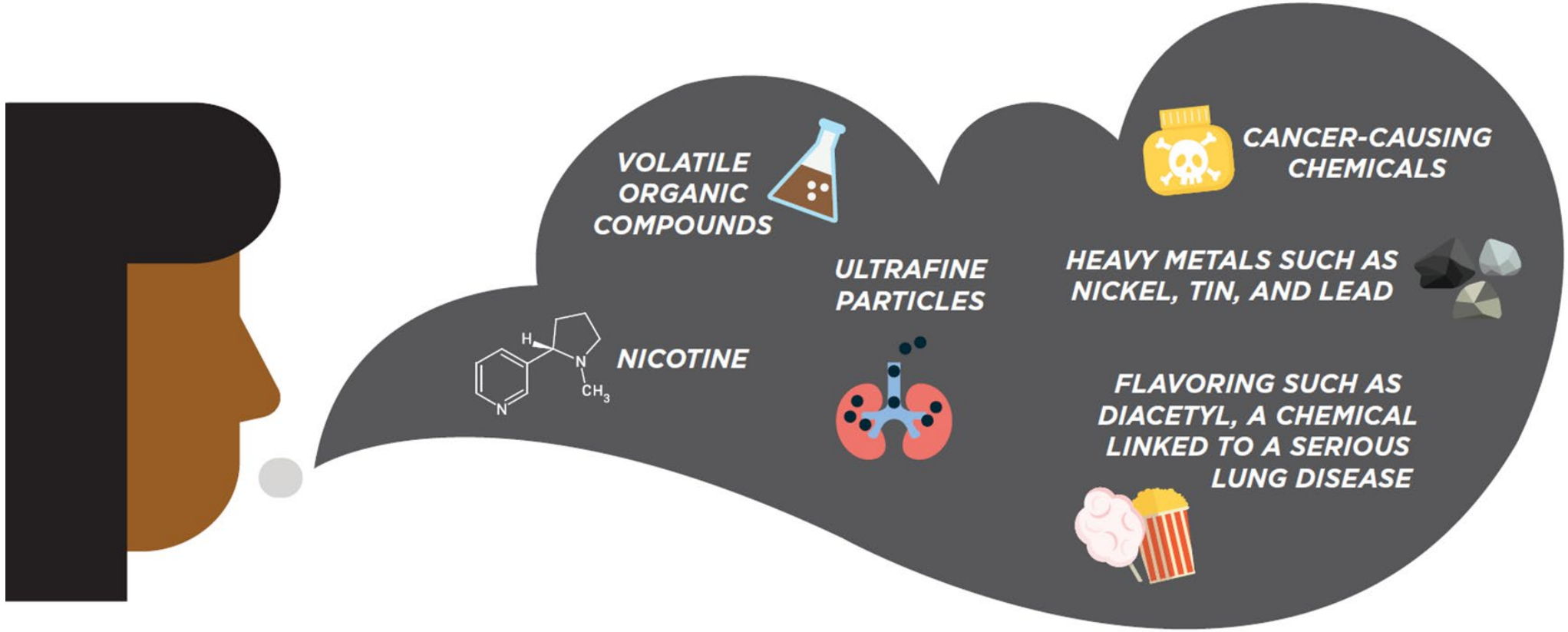
E-cigarette, or vaping, products (nicotine- or THC-containing) should never be used by youths, young adults, or women who are pregnant.

Adults who do not currently use tobacco products should not start using e-cigarette, or vaping, products.

THC use has been associated with a wide range of health effects, particularly with prolonged frequent use. The best way to avoid potentially harmful effects is to not use THC-containing e-cigarette, or vaping, products.

Persons engaging in ongoing cannabis use that leads to significant impairment or distress should seek evidence-based treatment by a healthcare professional.


JUST
eJUICE
Strawberry Lemonade
JUST
eJUICE
Banana Pudding
JUST
eJUICE
Strawberry Marshmallow
JUST
eJUICE
Strawberry Pineapple
Coconut
JUST
eJUICE
JUST
eJUICE
Peach Strawberry
Orange Cream


VOLATILE ORGANIC COMPOUNDS
CANCER-CAUSING CHEMICALS
ULTRAFINE PARTICLES
HEAVY METALS SUCH AS NICKEL, TIN, AND LEAD
NICOTINE
FLAVORING SUCH AS DIACETYL, A CHEMICAL LINKED TO A SERIOUS LUNG DISEASE

Some pulmonary toxicants are in e-cigarette aerosol at higher levels than combusted cigarettes, including:

- propylene glycol
- diacetyl (butter flavor)
- cinnamaldehyde (cinnamon)
- benzaldehyde (cherry)
- metals

Long-Term Vaping Study

N = 32,320

Current e-cigarette use elevated the odds of developing incident respiratory disease by a factor of 1.29 (95% CI=1.03, 1.61).

Former e-cigarette use (AOR=1.31, 95% CI=1.07, 1.60).

Risk of respiratory disease is independent of, and in addition to, the risks associated with current combustible tobacco smoking (AOR=2.56, 95% CI=1.92, 3.41)

Study Conclusions

Current use of e-cigarettes appears to be an independent risk factor for respiratory disease in addition to all combustible tobacco smoking.

Switching from combustible tobacco, including cigarettes, to e-cigarettes theoretically could reduce the risk of developing respiratory disease.

Current evidence indicates a high prevalence of dual use, which is associated with increased risk beyond combustible tobacco use.

For most smokers, using an e-cigarette is associated with **lower odds of successfully quitting smoking**.

REFERENCES

Case

JR is a 26 yr old M who presents to the pharmacy for smoking cessation counseling. He was previously a cigarette smoker, but has switched to exclusively vaping for the past year.

Case cont'd

JR's vape details:

Tank holds 8mL

Uses 6mg/mL nicotine juice

Vapes 3 tanks/day, up to 5 tanks/day on the weekend

Total amount of nicotine/day = $\frac{6mg}{mL}\ x\ 8mL = 48mg$; $\frac{48mg}{tank} * 3\ tanks =$ 144mg/day

$\frac{48mg}{tank} * 5\ tanks =$ 240mg/day

Case cont'd

JR would like to try nicotine patches.

Which strength patch to start with?

- >10 cigarettes a day: Use 21mg patch for 6 weeks, 14mg patch for 2 weeks then 7mg patch for 2 weeks.
- ≤10 or fewer cigarettes a day: Use 14mg for 6 weeks, then 7mg patch for 2 weeks.

How much nicotine in 1 cigarette?

- 10.2mg nicotine on average – roughly 1mg of actual intake

Does this compare to vaping? *Nicotine is nicotine, right?*

- 144mg nicotine in vape juice would equal 14 cigarettes → 21mg patch?

Case cont’d

REFERENCES

Formulating a Quit Plan

1. Determine type of e-cigarette/vape
2. Determine nicotine strength
3. Determine daily use amount
4. Compare total daily nicotine amount to traditional nicotine use

Weight benefits/risks of various cessation products

- Oral/hand fixation
- Flavor/taste

Key Takeaways

EVALI – likely culprit: VEA. CDC no longer updating numbers d/t decline of cases

Significant recommendations from CDC: no THC or VEA products; no dual usage

There are significant toxicants in vape juice; vaping has been associated with development of respiratory disease

Quit Plan will be highly individualized; may require more time/more research than average

References

CDC About E-Cigarettes: https://www.cdc.gov/tobacco/basic_information/e-cigarettes/about-e-cigarettes.html

MHS Health Related Behavior Study: https://www.health.mil/Military-Health-Topics/Access-Cost-Quality-and-Safety/Health-Care-Program-Evaluation/Survey-of-Health-Related-Behaviors/2015-Health-Related-Behavior-Survey-Active-Duty

CDC EVALI Information: https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease.html

Association of E-Cigarette Use With Respiratory Disease Among Adults: A Longitudinal Analysis: https://www.sciencedirect.com/science/article/pii/S0749379719303915

Questions?

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