

## 0404 Concerns and Controversies of Vaping

Vaping has rapidly become popular and prevalent in adults and teens. Vaping of nicotine and marijuana is common, is being considered for medication administration, and is in the news for use in smoking cessation as a safer alternative to cigarette smoke. Meanwhile, the evidence for health risks is emerging. This session will utilize the format of NPR's popular "Car Talk" and discuss questions, concerns and controversies our AAAAA membership and allergists might encounter regarding this topic

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## Learning Objectives

- Discuss the potential of E-cigarettes and vaping to cause nicotine addiction and be a gateway to cigarette smoking and other drugs
- Discuss how E-cigarettes and vaping may be more/less safe than cigarette smoking

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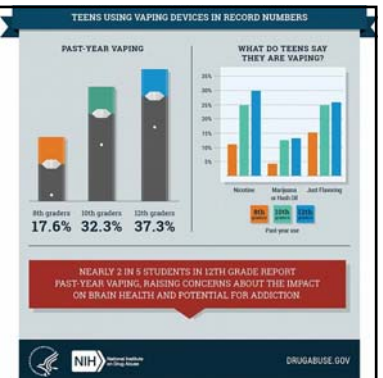
## Disclosures

- No relevant conflicts to disclose

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## Vaping Stats

- More than 40 million people worldwide vape, up from 7 million less than a decade ago
- Roughly 1 in 5 high school kids vape in the US



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## History

- Tobacco plant has been smoked or chewed for 2000 years- often related to religious or cultural ceremonies.
- European explorers brought it home in the 1600s. Demand skyrocketed.
- Early American economy involved tobacco. Even used as currency.
- Nicotine is not the most harmful part of tobacco.
  - Contain benzene, ammonia, arsenic, lead
- 70% of adult smokers say that they want to quit smoking

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## History

- In 1950s, 45% of adult Americans said they smoked
  - Cigarette ads were on TV
  - "More doctors smoke Camels than any other brand"
  - Smoking was seen as good and cool
- Eventually, scientific evidence emerged (often suppressed by tobacco companies)
  - Smoking found to increase the risk of cancer, heart disease, stroke and other bad outcomes

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## Smoking

- 76% of adult men in Indonesia, 59% in Russia, 47% in China smoke cigarettes. (WHO)
- In the US and UK only 20% of adult males now smoke. Why?
  - Initial fall was due to accurate information- primarily among the well educated and more slowly among less educated
  - Regulations led to higher prices and taxes- primarily among younger people
- In 1990s, more than 35% of American high schoolers smoked
  - Today less than 10% smoke

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## Smoking Stats

- In the US, smoking remains the most common cause of preventable death.
- 1 in 5 deaths or ½ million deaths per year or 1,300 deaths per day are attributable to smoking in the US (CDC)
- The number of deaths from alcohol, illegal drugs, car accidents, suicide and murder are still less than deaths due to cigarettes

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## Nicotine

- Harms
  - Increased risk of heart disease
  - Highly addictive
  - Affects fetus
- Benefits (these are controversial)
  - Improves cognition
  - Improves attention
  - Useful for memory loss
  - Alzheimer's
  - ADHD
  - Tourette's
  - Anxiety
  - Depression

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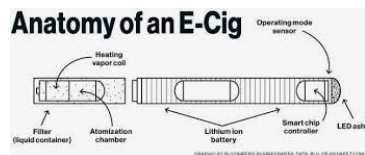
## Switch smokers from cigarettes to less harmful products

- Nicotine replacement
  - Nicotine gum, patches, nose sprays
  - not very effective: only 14-17% of smokers can quit with these
  - Unappealing- no sensory experience
- Vaccines vs nicotine
  - Large clinical trial was negative

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## E-cigarettes

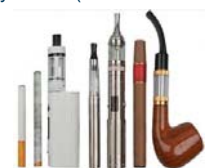
- First introduced in 2007
- Initial suspicion: tobacco company ploy. They were not involved until 2011
- Initially was safer and helped people quit smoking
- Initial product had poor battery life, inconsistent nicotine
- More recent products are better and have various flavors



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## E-cigarettes

- E-cigarettes are battery-operated devices that people use to inhale an aerosol which typically contains nicotine, flavorings and other chemicals.
- They can resemble traditional cigarettes, cigars, pipes or even other everyday items like pens, USB memory sticks. (National Institute of Drug Abuse)
- Have proven to be very popular
  - Physical stimulus
  - Social stimulus
  - Vaping offers an identity ("vapers")



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## JUUL labs

- Founded in 2015 in San Francisco
- Comes in flavors such as mango, cucumber, mint
- By 2017 JUUL sold 1 in 3 e-cigarettes
- By 2018 was worth \$38 billion. 35% stake bought by Altria (Phillip Morris)
- Nicotine formulation
  - Nicotine salt more rapidly absorbed into the blood than nicotine delivered by cigarettes

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## Toxicity (vaping vs smoking)



- E-cigarettes are far less toxic
- Generally no detectable chemicals other than nicotine vs 7000 chemicals in cigarettes
- Occasionally some chemicals detected if the device is not properly made
- Smokers who switch to vaping have improved respiratory function
  - Subjectively
  - Spirometry
- No long-term data, the product hasn't been around long enough

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## EVALI

(E-cigarette or Vaping products use-Associated Lung Injury)

- People have been vaping for years, however, deaths are new
  - One Detroit patient got a double lung transplant after vaping
  - Media covers it with something between alarm and panic
- Response:
  - US is actively trying to reduce vaping
  - UK has embraced vaping as a harm-reduction strategy
  - No cases of EVALI reported in the UK. How can that be?

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## 2 public health strategies

- Abstinence
  - Seems logical and the best plan
  - For smoking it doesn't work
- Harm reduction
  - Recognize that some people are going to continue risky behavior
  - It would help if they could substitute a less risky behavior
    - needle exchanges for heroine addicts instead of prison
    - condoms for teenagers instead of unwanted pregnancy and STDs
    - seatbelts rather than banning cars
    - E-cigarettes rather than smoking tobacco

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## FDA Response

- FDA was only granted jurisdiction over tobacco products in 2009
- E-cigarettes were classified as drug-delivery devices
  - Stronger restrictions than tobacco products
  - FDA declared e-cigarettes illegal
  - The sale was essentially banned
- E-cigarette companies sued and won (could have sought approval as drug delivery devices)
  - FDA reclassified as tobacco products
  - This lifted the ban on sales but they cannot be promoted as smoking cessation devices

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## Response by companies

- If they can't market as smoking cessation, who can they to market to?
- "JUULing" has become popular among youth
- Vaping in the US today is highest among 18-24 year olds
- 20% of high schoolers vape regularly- more than double the number who smoke cigarettes
- Many didn't smoke before vaping
- Kids are becoming addicted
- Vape of choice = JUUL

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### Why is JUUL so popular among adolescents who didn't smoke?

- Early advertisement was youth oriented
  - Spread by social media, hash tags
- Sales of JUUL skyrocketed

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### 2 groups who use e-cigarettes

- Older adults who are trying to quit smoking
  - Vaping to quit smoking is a public health victory
- Young adults and adolescents, many of whom never smoked
  - Vaping in this group is a public health disaster
  - No evidence that vaping prevents future smoking (surgeon general)
  - Quality control is poor due to lack of oversight and regulation

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### UK experience

- Took harm reduction approach
- Promoted e-cigarettes for cessation.
- Limited amount of nicotine in e-cigarettes to 20mg/mL.
  - JUUL put 54mg/mL in the US. Makes it more addictive
  - JUUL in the UK has 17mg/mL- no epidemic of vaping in the UK
- Tobacco-related health care costs are decreasing
- Regulating the product helped

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### Why the difference?

- In the US
  - Stigma attached to smoking
  - Smokers have less political power
- In the UK
  - Stigma is not as great
  - More concern about improving their health
  - Rates of youth vaping in the UK is <2% (vs 20% in the US)
  - No vaping in youth who don't smoke!

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### UK vs US

- In the UK
  - Maximize use of vaping for smoking cessation
  - Minimize use of vaping in youth
- In the US
  - Attempt at a ban led to murky regulations without goals
  - JUUL free to make and market high nicotine vaping

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### Deaths from Vaping

- 42 deaths and 2000 injuries in every state in the US linked to vaping as of December 2019
- EVALI
  - Chest pain, SOB, vomiting
  - Mostly among young people (8 in 10 under 35 years old)
  - Initially no single device was identified so all were lumped together
  - Created a panic
- Massachusetts and San Francisco banned all vaping products
  - Other states banned flavored vaping products

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## Does Banning Vaping Help?

- No deaths of cases of EVALI in the UK
  - Can't be traditional e-cigarettes
- US has black market for THC products.
  - CDC reported that 89% of EVALI cases were related to THC or black market
  - 11% did not admit to using THC- how accurate?
- Nicotine vs cannabis devices
  - Nicotine uses liquid water or alcohol-based devices
  - THC liquids are oils

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## Consequences

- No evidence that store-bought liquids are involved in EVALI
- If vaping is banned, ex-smokers will resume smoking
- JUUL labs stopped all flavorings except for menthol and tobacco
  - Ex-smokers don't want to be reminded of tobacco
  - This will lead to black market sources
  - Youth will transition to THC oils on the black market

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## Deaths

- Not driven by e-cigarette use
- Testing of cartridges revealed vitamin E acetate
  - Mostly in black market THC products from China
  - Is most likely the cause of EVALI
- None was found in nicotine liquid

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## Politics

- Politically is easy to ban flavored e-cigarettes even if it doesn't help
- Politicians don't want to touch cigarettes
- Looks like a strong stance
- Public health:
  - Many politicians take direction from the CDC
  - Many were always against e-cigarettes from the beginning- they look like cigarettes

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## What to do?

- Limit youth access
  - Restrict sales of tobacco products to only >21 years old
  - Direct regulations of e-cigarettes
    - limit nicotine concentrations
  - Disclose vaping as designed for smoking cessation
    - currently not allowed in the United States

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Thank you for inviting me to  
speak and stay safe

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