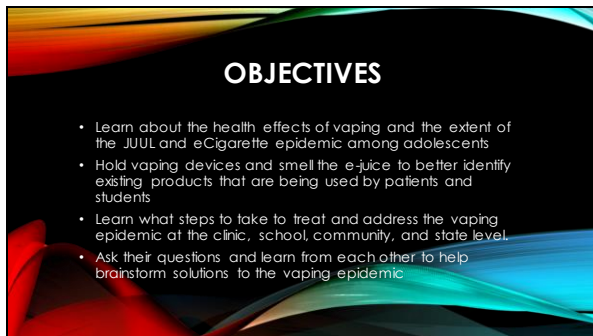


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OBJECTIVES

- Learn about the health effects of vaping and the extent of the JUUL and eCigarette epidemic among adolescents
- Hold vaping devices and smell the e-juice to better identify existing products that are being used by patients and students
- Learn what steps to take to treat and address the vaping epidemic at the clinic, school, community, and state level.
- Ask their questions and learn from each other to help brainstorm solutions to the vaping epidemic

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[illegible][illegible]

TOBACCO USE IS A PEDIATRIC DISEASE

"Nicotine addiction begins when most tobacco users are teenagers, so let's call this what it really is: **a pediatric disease.**"

David A. Kessler, MD
Commissioner of FDA, 1995



NICOTINE AND THE DEVELOPING ADOLESCENT BRAIN

Prefrontal cortex still developing through age 25

- Decision making, impulse control, executive functioning

Adolescent brain uniquely vulnerable to nicotine addiction

- Become addicted more quickly, at lower levels of use

Early use of nicotine associated with:

- Earlier addiction
- Greater risk of progressing to daily smoking
- Harder to quit

95% of U.S. adult users
start before age 21. (CDC, 2015)



People who
have not
used tobacco
by age 21 are
unlikely to
ever start.

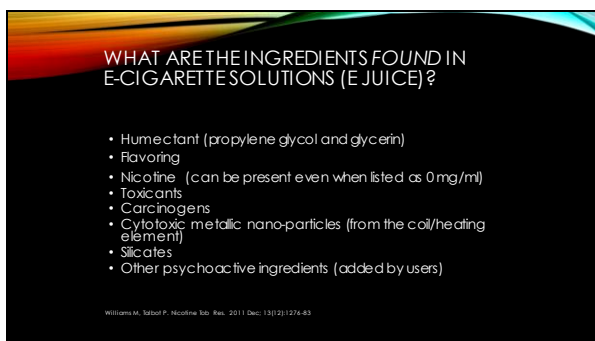


Many Different Vape Systems: Some are Meant to Deceive









TWO MAJOR REPORTS ON ECIGS: KEY CONCLUSIONS FOR YOUTH

- Nicotine exposure during adolescence can cause addiction, structurally alter the developing adolescent brain, cause mood disorders and attention problems.
- Most eCigarette products contain and emit numerous toxic substances in addition to nicotine
- Biologic plausibility that long-term exposure to eCigarettes could increase risk of cancer and adversely affect reproductive outcomes

1. E-cigarette Use Among Youth and Young Adults: A Report of the Surgeon General 2016 2. Public Health Consequences of E-cigarettes: A Report of the National Academies of Sciences 2017

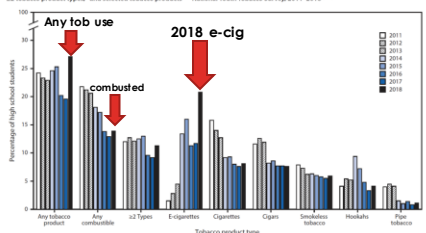
KEY CONCLUSIONS FOR YOUTH (CONTINUED)

- E-Cigarette use increases asthma attacks
- E-Cigarette use greatly increases the odds of subsequent combusted tobacco cigarette use

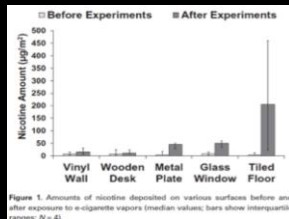
1. E-cigarette Use Among Youth and Young Adults: A Report of the Surgeon General 2016 2. Public Health Consequences of E-cigarettes: A Report of the National Academies of Sciences 2017

2018 DATA SHOW E-CIG SURGE

FIGURE 2. Estimated percentage of high school students who currently use any tobacco product,* any combustible tobacco product,*
all tobacco product types,[§] and selected tobacco products – National Youth Tobacco Survey, 2011–2018^{§¶¶¶}



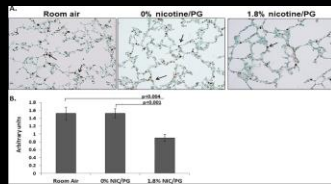
SURFACE CONTAMINATION WITH NICOTINE



Nicotine, which combines with indoor substances such as ozone and nitrous oxide to make irritants and carcinogens (TSNAs), collects on surfaces from eCigarette use.

WHAT ARE THE HARM S TO LUNGS?

Alveolar growth is impaired in healthy newborn mice exposed to nicotine-containing e-cigarette emissions



ATHLETIC PERFORMANCE?

Vaping causes Asthma and affects cardiovascular health:

Ultrafine particles in the lung may affect athletic performance



BEHAVIORAL EFFECTS

- Mice exposed to e-cigarette aerosol neonatally:
 - More head dips (anxiety)
 - Higher levels of rearing and locomotor activity (ADHD)



Smith, et al PLOS One 2015

THE NEW LOOK OF NICOTINE ADDICTION

THE AMOUNT OF NICOTINE IN 1 JUUL POD = 1 PACK OF CIGARETTES



JUUL pod



1 pack contains 20 cigarettes.

2009 FDA BANS FLAVORED CIGARETTES

The New York Times

Flavors Banned From Cigarettes to Deter Youths

By GARDNER HARRIS SEPT. 22, 2009

The ban was intended to end the sale of tobacco products with chocolate, vanilla, clove and other flavorings that lure children and teenagers into smoking.



JUUL

The 2009 Federal Ban on flavors does not include e-cigs
The majority of e-cigarette users now use JUUL.

The PIVOT: The 2009 Ban does not cover e-Cigarettes

A 2009 federal law banned fruit- and candy-flavored cigarettes, but many e-cigarette companies gleefully pitch similar flavors ...



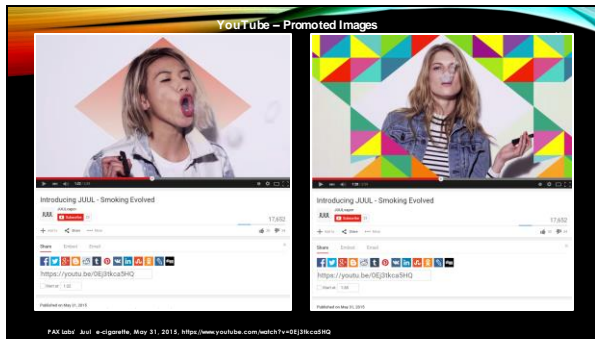
FLAVORS ARE MARKETING TO TEENS

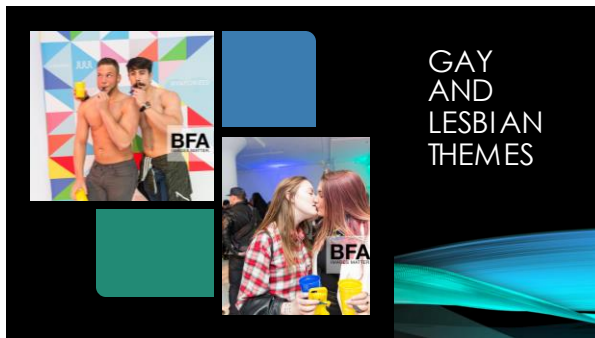
There are over 8,000 vaping flavors!

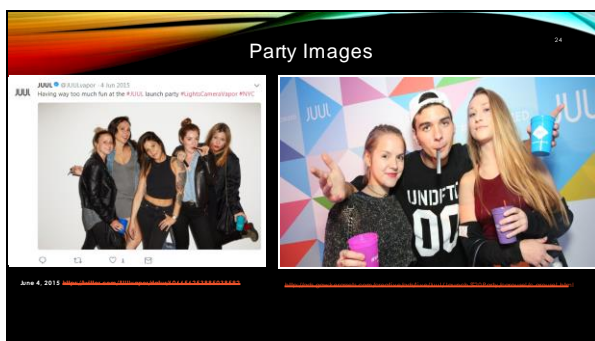


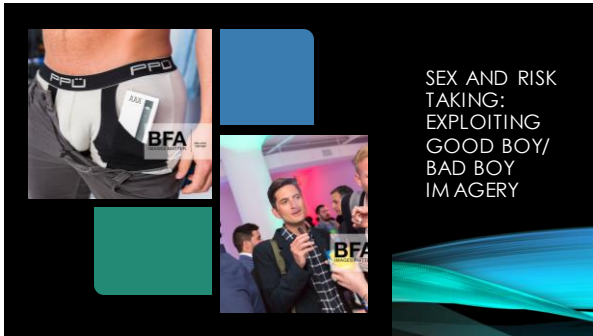
85.1% of current Youth eCig users said they used e-cigarettes "because they come in flavors I like."







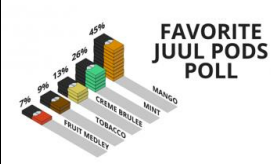




SEX AND RISK
TAKING:
EXPLOITING
GOOD BOY/
BAD BOY
IMAGERY

FAVORITE JUUL POD FLAVORS

Coincidence... who's using these...




FAVORITE JUUL PODS POLL


Flavor	Percentage
Mango	45%
Creme Brulee	20%
Mint	15%
Fruit Medley	10%
Tobacco	5%
Fruit	5%

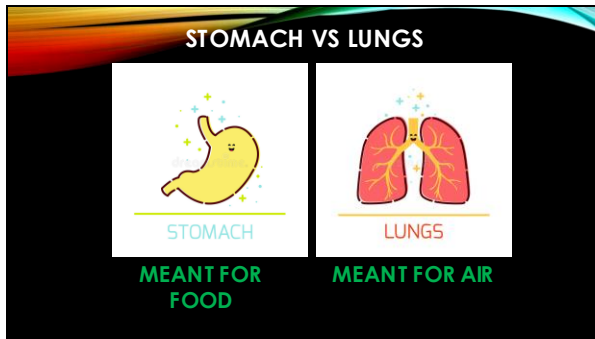
STOMACH FUNCTION VS LUNG FUNCTION

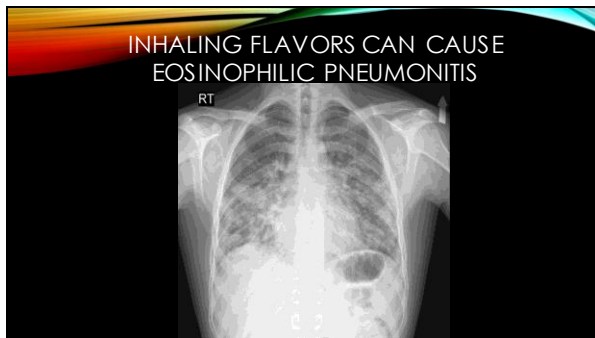
Eating Mango: Natural!



Inhaling Mango: Not Natural.







EPIDEMIC OF E-CIG/VAPING-ASSOCIATED LUNG INJURY (EVALI)

- As of October 29, 2019, 1,888 cases of lung injury in 49 states and 37 associated with the use of e-cigarette or vaping products.¹
- All have reported e-cigarette or vaping product use within the past 90 days.¹
- 37 deaths (More deaths are under investigation.)¹
- 34% reported exclusive using THC-vape products & 11% reported exclusive use of nicotine-vape products.¹
- 79% of cases are under 35 years old; with 14% under 18 years old.¹
- 70% of cases are male.¹

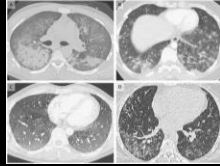
"No one compound or ingredient has emerged as the cause of these illnesses to date; and it may be that there is more than one cause of this outbreak. Many different substances and product sources are still under investigation."¹

1. U.S. Centers for Disease Control and Prevention, Office of Surveillance and Epidemiology, National Center for Chronic Disease Prevention and Control Press Release October 29, 2019.
2. U.S. Centers for Disease Control and Prevention, Office of Surveillance and Epidemiology, National Center for Chronic Disease Prevention and Control Press Release October 29, 2019.

IMAGING OF VAPING-ASSOCIATED LUNG DISEASE

4 imaging patterns correlated with pathological findings attributable to vaping:

1. **Acute eosinophilic pneumonia** – rapidly developing acute lung injury
2. **Diffuse alveolar damage** – rapidly developing acute lung injury
3. **Organizing pneumonia** – develops subacutely over days to weeks. A pre-antibiotic interstitial pneumonia was observed and correlated with hard metals in ENDS that developed over a period of 6 months.
4. **Lipoid pneumonia** – an inflammatory response to the presence of lipids within the alveolar space and typically results from aspiration of hydrocarbons or oil-based products.



Henry N, Kaine P, Kligman S. Imaging of Vaping-Associated Lung Disease. *N Engl J Med*. September 2018.

PULMONARY LIPID-LADEN MACROPHAGES

"A notable and consistent feature... is the presence of lipid-laden macrophages seen with oil red O staining in bronchoalveolar lavage samples that are not attributable to aspiration of exogenous lipid material."¹¹

Symptoms that may be attributable to oil and/or white blood cells in lungs:

- Rapid onset of coughing
- Difficulty breathing
- Weight loss
- Nausea and vomiting
- Diarrhea

L. Madsen MD, Chouli MM, Calam S, et al. Pulmonary Lipid-Laden Macrophages and Vaping. *N Engl J Med*. September 2018.

SMOKE AND MIRRORS



- The Juul is the heroin of e-cigarettes.
- Nicotine causes the release of dopamine in the nucleus accumbens, creating a positive feedback loop

TEEN NICOTINE ADDICTION

- Dependence is more severe if use begins in adolescence
- Those who begin as teens are more likely to become dependent, use for more years, and use more heavily
- Increased vulnerability may be due to still-developing brain
- Teens in Massachusetts are 9 times more likely to use eCigarettes than adults
- Among never tobacco users, rates of teens use are over 20 times higher than adults.



YOUTH ADDICTION IS THEIR GOAL



Like combusted tobacco of the 20th century, the intent of JUUL and similar devices is to maximize profits by addicting youth



Big Tobacco, which owns most e-cigarette companies now hides under the claim that these are cessation devices, but they are more accurately described as:

Teen nicotine addiction initiation devices

ADDICTION PROGRESSES FAST:
HALF A JUUL POD COULD DO IT

Experimentation



**Nicotine dependence, as indicated
by craving, starts BEFORE daily or
regular use**



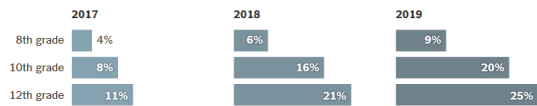
Regular Use

Interventions may be delivered at any stage

Difranza, 2007

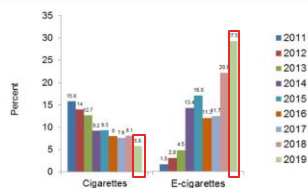
Teenage Vaping Rises Sharply Again This Year

2019 Monitoring the Future Survey
E-cigarette use in the past 30 days



New England Journal of Medicine, 9/18/19

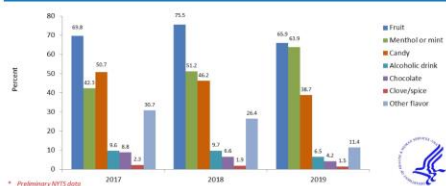
NATIONAL YOUTH TOBACCO SURVEY*: YOUTH USE OF E-CIGARETTES CONTINUES TO CLIMB



* Preliminary data
* Reported use within 30 days preceding administration of survey



FLAVORS POPULAR AMONG HIGH SCHOOL USERS OF E-CIGARETTES*



* Preliminary NYTS data



WHAT WORKS FOR TEEN NICOTINE ADDICTION?

- Evidence reviews of smoking prevention and cessation show limited evidence for effectiveness of... anything...
- Primary Prevention is thus most critical... BUT

CLINICAL TREATMENT STRATEGIES

- Asking the right questions—Do any of your friends JUUL? Have you ever tried taking a hit? Do you plan to try it?
- Experimenting with Vaping is NOT a right of passage, Experimentation should be treated as a clinical emergency
- The recognition of addiction; prove you are not experiencing withdrawal by taking a one month holiday and see how you feel—concept of latency
- Counseling HAS been shown to be effective in adolescents
 - Almost doubles the chances of quitting
 - Free Txt messaging programs: TEXT QUIT to 202-804-9884
 - In my clinic, I've been using nicotine gum and patch to get teens off of JUUL with some success

SCHOOL-BASED STRATEGIES



The middle school and HS health curriculum should match the extent of the epidemic—teach about latency, teach about developing brain, inside disorder/anxiety/depression, vaping, tongue, graphic disease pictures, financial implications of vaping, consequences, addiction, stress and more.



Tobacco and Vape free zones



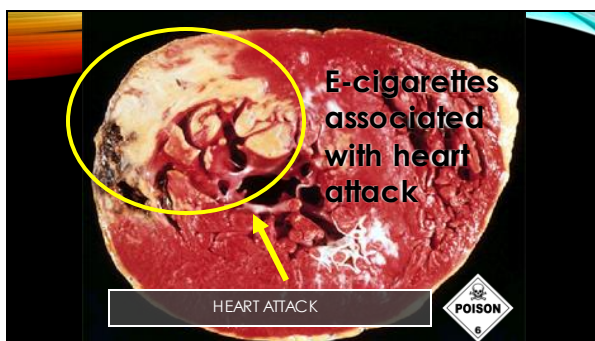
Zero tolerance policies combined with treatment options for nicotine addiction

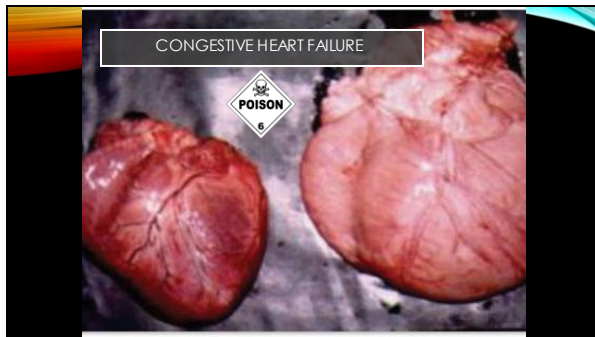


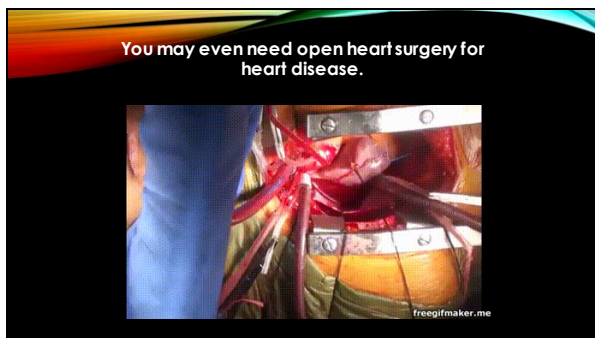
[Brainstorm/things to try: Amnesty day; help a friend destroy her JUUL; Refer a friend for help day; Surveys asking if you would like to Quit—and then getting those kids help]

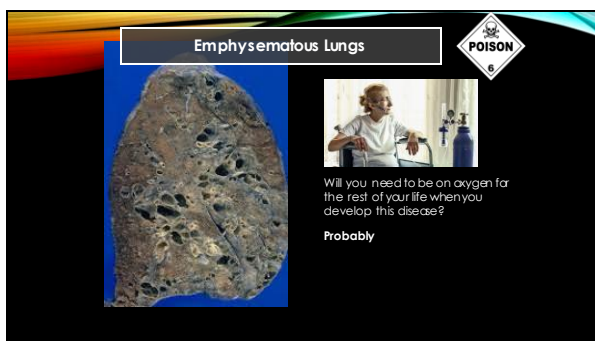














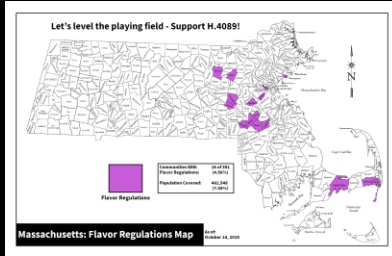
PARENTAL STRATEGIES

1. Talk about it early
2. Set clear expectations and consequences for breaking your rules
3. Kids should not keep a lot of cash at home—put it in the bank
4. Be careful with money— a JUUL pod costs \$4/day; "Dad, can I have money to go out and have lunch with my friends"...by handing them a \$20, you just bought them three JUUL pods and an \$8 snack
5. Get help early, at the first sign of any use OR if friends are vaping

E-CIG COMMUNITY AND STATE ADVOCACY STRATEGIES

- If you suspect any store is selling tobacco products to youth under 21, report them to the AG's office 617-727-8400
- Encourage local Boards of Health to increase enforcement for selling to those under 21; revoke and retire license to sell
- Enact a tobacco and vape-free zone around all schools
- Urge local Boards of health to ban all flavored tobacco products including mint and menthol State level...support H4089 (An Act Regulating Flavored Tobacco Products)

STUDENTS ARE ONLY AS SAFE AS THE COMMUNITIES
WHERE THEY LIVE—WHITE SPACE WILL ALL FILL-IN IF THE
STATE BILL H4089 TO BAN FLAVORS PASSES



TAKE OUT YOUR PHONES: CALL YOUR LEGISLATORS



Find your legislators and their contact info here:
<https://pxylegislator.gov/Security/FindMyLegislator>

FOR YOUR REP: I'm calling to ask that Representative _____ support House Bill 4089, Representative Danielle Gregoire's Act Regulating Flavored Tobacco Products as it stands now. To protect our kids, we must ban ALL flavored tobacco products, including menthol cigarettes, flavored cigars and chewing tobacco.

FOR YOUR SENATOR: I'm calling to ask that Senator _____ support Senate Bill 2357, Senator John Keenan's Act Regulating Flavored Tobacco Products as it stands now. To protect our kids, we must ban ALL flavored tobacco products, including menthol cigarettes, flavored cigars and chewing tobacco.

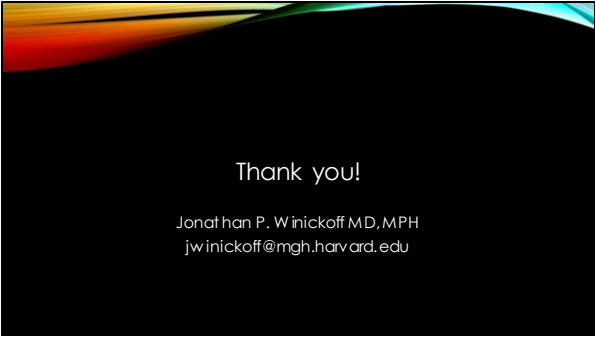
Speaker Deleo: 617-722-2500

Ways and Means Chair Michlewitz: 617-722-2990

ELECTRONIC CIGARETTES: SUMMARY

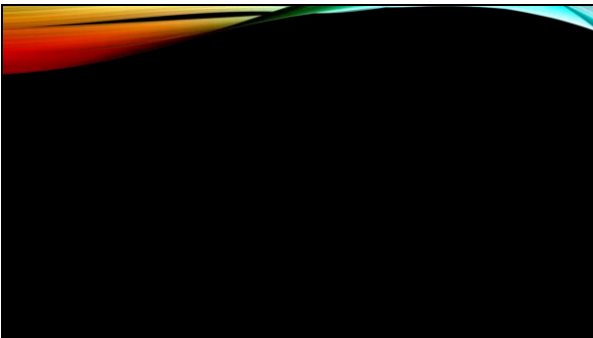
Youth should not be
exposed to eCigs, eCig
aerosol, eCig solution, or
eCig advertising.

You can fight back
against the tobacco
industry



Thank you!

Jonathan P. Winickoff MD, MPH
jwinickoff@mgh.harvard.edu





MOTIVATIONAL INTERVIEWING

- Promoting change by collaborating with students/families
- Guide them by helping them to find their own motivation, resolve ambivalence
- Guide them in setting goals and a plan



MOTIVATIONAL INTERVIEWING

- Patient-focused
 - Ask open-ended questions
 - Find common ground
- Non-judgmental
 - Express empathy
- Define motivation, confidence and commitment for change

HISTORY IS REPEATING ITSELF

SMOKING TO VAPING TO JUULING



Audrey Hepburn

Died of smoking related cancer:
1920-1993 - Age 73



Katy Perry

TBD
1984 - 1984

THE REALITY

- JUUL sells products with nicotine contents of 3-5%. Five percent content of nicotine is equivalent to smoking a pack of cigarettes.
- Why is this dangerous?
 - Hazardous carcinogens and toxic chemicals found in e-cigarettes:
 - Formaldehyde (carcinogenic)
 - Benzene (carcinogenic)
 - Acrolein (can damage DNA)
 - Nicotine in e-cigarettes is associated with damage to lung endothelial cells, which can lead to inflammation.⁴
 - JUUL uses "nicotine salts" that more closely resemble the natural structure of nicotine found in tobacco leaves. The nicotine is more readily absorbed into the bloodstream.⁵
 - Nicotine and these toxic chemicals may harm adolescents' brain development.⁶
 - Nicotine is highly addictive – vaping may serve as a "gateway" to regular cigarette use.
 - Younger age of initiation is associated with higher likelihood of becoming addicted (9 out of 10 smokers started before age 18)⁷

1. Kozlowski, R. T., & West, R. J. (2006). Nicotine addiction: how can it develop? How can it be cured? *Current Directions in Psychological Science*, 15(1), 69-73. <https://doi.org/10.1177/0963426906285555>
 2. Kozlowski, R. T., & West, R. J. (2006). Nicotine addiction: how can it develop? How can it be cured? *Current Directions in Psychological Science*, 15(1), 69-73. <https://doi.org/10.1177/0963426906285555>
 3. Kozlowski, R. T., & West, R. J. (2006). Nicotine addiction: how can it develop? How can it be cured? *Current Directions in Psychological Science*, 15(1), 69-73. <https://doi.org/10.1177/0963426906285555>
 4. Kozlowski, R. T., & West, R. J. (2006). Nicotine addiction: how can it develop? How can it be cured? *Current Directions in Psychological Science*, 15(1), 69-73. <https://doi.org/10.1177/0963426906285555>
 5. Kozlowski, R. T., & West, R. J. (2006). Nicotine addiction: how can it develop? How can it be cured? *Current Directions in Psychological Science*, 15(1), 69-73. <https://doi.org/10.1177/0963426906285555>
 6. Kozlowski, R. T., & West, R. J. (2006). Nicotine addiction: how can it develop? How can it be cured? *Current Directions in Psychological Science*, 15(1), 69-73. <https://doi.org/10.1177/0963426906285555>
 7. Kozlowski, R. T., & West, R. J. (2006). Nicotine addiction: how can it develop? How can it be cured? *Current Directions in Psychological Science*, 15(1), 69-73. <https://doi.org/10.1177/0963426906285555>
