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Today's cigarette and e-cigarette landscape

Richard C. Wender, MD
Thomas Jefferson University

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Today's cigarette and e-cigarette landscape

Richard C. Wender, MD
Professor of Family and Community Medicine
Thomas Jefferson University

 @RichWender

E-cigarettes are one of the most difficult and complex public health issues most of us have confronted.

Most anti-tobacco experts and advocates line up on a spectrum from embracing e-cigarettes as a promising way to reduce the harm of tobacco products all the way to being the greatest threat to progress in our 60 year war on big tobacco.

What Do You Believe?

- E-cigarettes are a gateway to smoking.
- After years of decline, smoking rates are going up in teens.
- E-cigarettes are a little less harmful than smoking.
- Many middle and high schoolers think e-cigarettes are completely safe.
- E-cigarettes cause some cases of acute lung injury resulting in deaths in some cases
- E-cigarettes help some people completely quit smoking.

What Do You Believe?

- Banning flavors in e-cigarettes is a very smart policy.
- Raising the legal purchase age to 21 is opposed by all tobacco product companies.
- Sale of e-cigarettes and vaps should be banned.
- IQOS is going to become an increasing issue.

The tobacco product landscape today.

Cigarette smoking
is at an all-time low.



Smoking among US adults



**Cigarette and e-Cigarette use are closely
linked to/correlated with social
determinants of health**

Smoking and Education

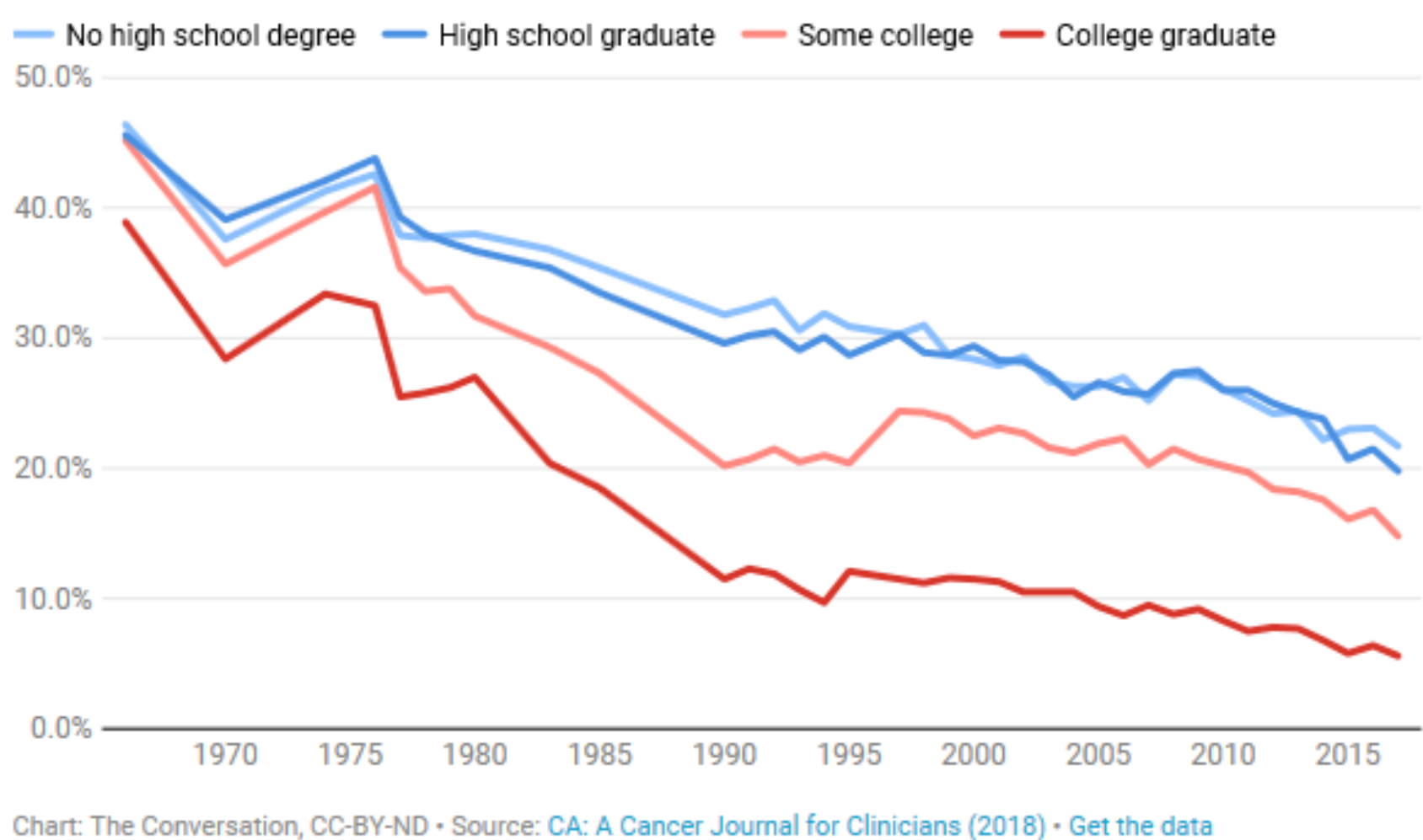
40.6%

of US adults
with a GED
smoke

4.5%

of US adults with a
graduate degree
smoke

Smoking Rates by Education Level



Tobacco use remains the leading cause of preventable death in US

- About half of all Americans who keep smoking will die because of the habit.
- In 2018, 16% of US adults were current smokers, compared to 42.4% in 1965.

Cigarettes and Death

- More than 480,000 people will die from smoking related problems in the US every year
 - 278,544 deaths in men
 - 201,773 deaths in women
- 46,802 opioid-related deaths in US in 2018

Source: [cdc.gov](https://www.cdc.gov)

Smoking and Poverty

25.3%

of US adults
living below the
poverty level smoke

14.3%

of US adults living
at or above the
poverty level smoke

Cigarette smoking is down, but about
34 MILLION
American adults still smoke

Cigarette smoking remains high among certain groups



Men



Adults 25-64
years old



Lower education



Below
poverty level



Midwest
and South



Uninsured
or Medicaid



Disabled



Serious
psychological
distress



American Indians,
Alaska Natives and
Multiracial



Lesbians, gays,
and bisexuals

Strategies essential to continue reducing cigarette smoking overall



Implement
smoke-free laws



Run mass
media campaigns



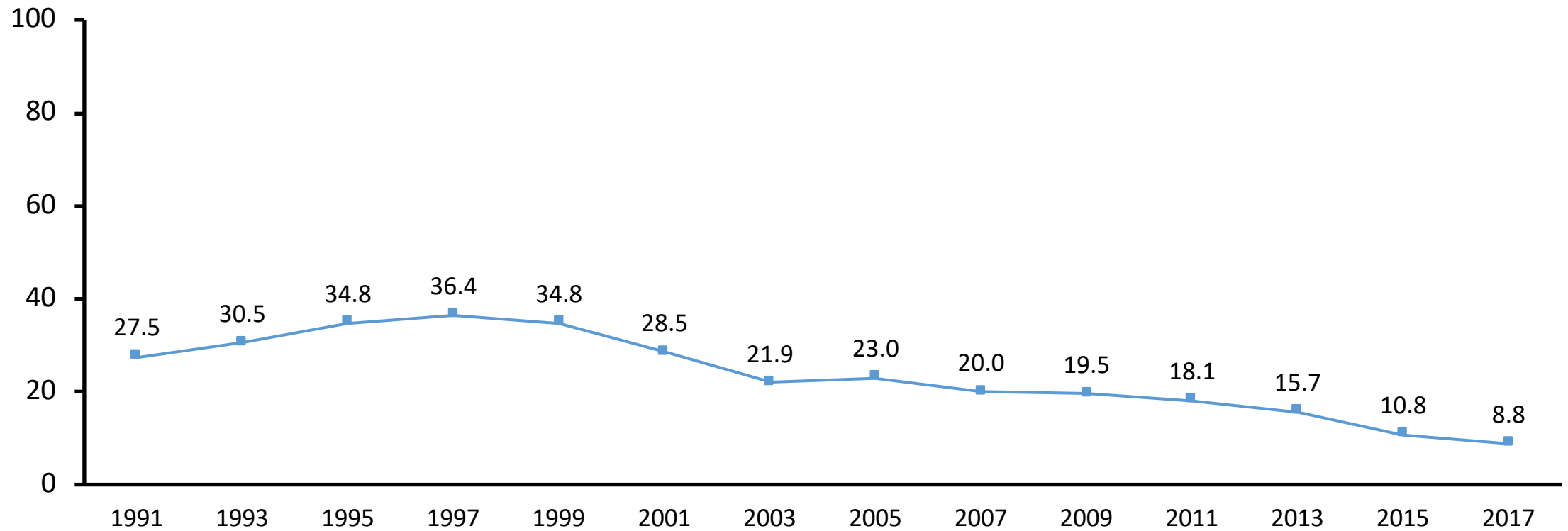
Raise
tobacco prices



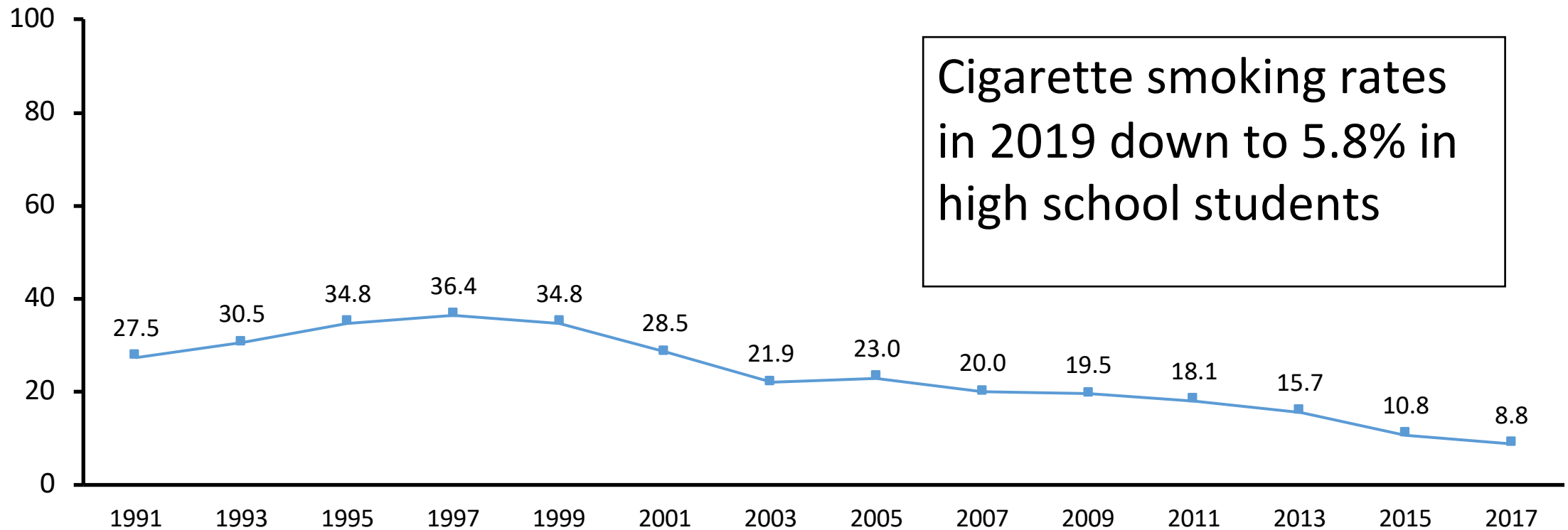
Make quit help
easy to access

Teen cigarette smoking is
at an all-time low.

Smoking among high schoolers



Smoking among high schoolers



**But there are new threats in our battle
against tobacco**

What are E-cigarettes?

- An electronic cigarette is an electronic device that simulates tobacco smoking. It consists of an atomizer, a power source such as a battery, and a container such as a cartridge, tank, or pod. Instead of cigarette smoke, the user inhales vapor, so using an e-cigarette is called "vaping"
- Virtually all e-cigarettes are flavored. Even "tobacco flavor" is a flavoring.

Why are E-cigs Classified as Tobacco Products?

- The nicotine in eliquid is the same as that used in pharmaceutical NRT. It is extracted from a member of the tobacco family but not the same plant as used for smoking tobacco as that has much less nicotine in the leaves than the rustica type of tobacco plant. Rustica has much more nicotine in each leaf so is not suitable for smoking unless you have a high tolerance.

Classifying E-Cigarettes, or Vaping, Products

How to Classify the User's E-Cigarette, or Vaping, Product

For an accessible explanation of schematic below on how to classify e-cigarettes, go to [Appendix, page 25](#).

Important notes:

1. E-liquids can contain nicotine, THC, CBD, flavors, or other solvents.
2. Marijuana herb, hash oil, dab wax are used with vaporizers.

QUESTION 1:
Is the e-liquid contained in a disposable e-cigarette, cartridge, tank, or pod?

Disposable e-cigarette
(no cartridge, tank or pod)

1st
GENERATION
(Cigalike)



Cartridge
(Prefilled or refillable)

QUESTION 2:
Is the cartridge also called a pod cartridge or contains nicotine salts?

NO

2nd
GENERATION
(Battery Pen)



YES



Tank/ Sub-Ohm
(Refillable)

3rd
GENERATION
(Modifiable—allows variable voltage/watts)



Pod
(Prefilled or refillable)

4th
GENERATION
(Pod Mod)

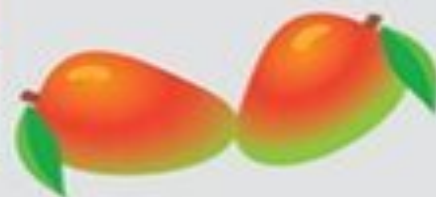


Marijuana herb, oil, dab wax

Vaporizer, Dab rig, Dab pen



JUUL PODS & FLAVORS



NICOTINE LEVELS

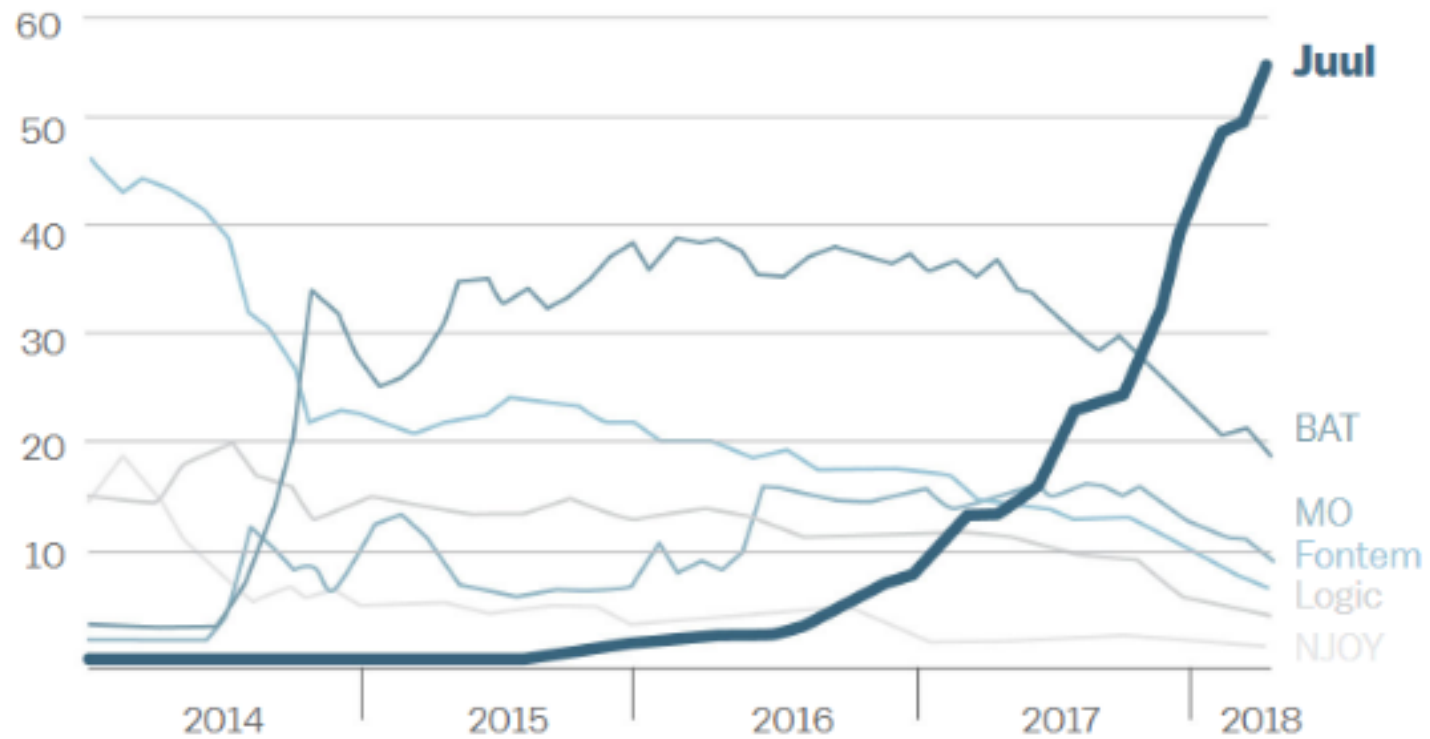


1 JUUL Pod = 1 Cigarette Pack

Source: Gentzke AS, Creamer M, Cullen KA, et al. Vital signs: Tobacco product use among middle and high school students - United States, 2011-2018. *MMWR Morb Mortal Wkly Rep.* 2019 Feb;68(6):157-64. PMID: 30763302

Juul Sales are Booming

Dollar share percentage of the e-cigarette traditional retail market, as of March 2018



Source: Nielsen Total US xAOC/Convenience Database and Wells Fargo Securities, LLC

Vox

Adolescents' and Young Adults' Use and Perceptions of Pod-Based Electronic Cigarettes

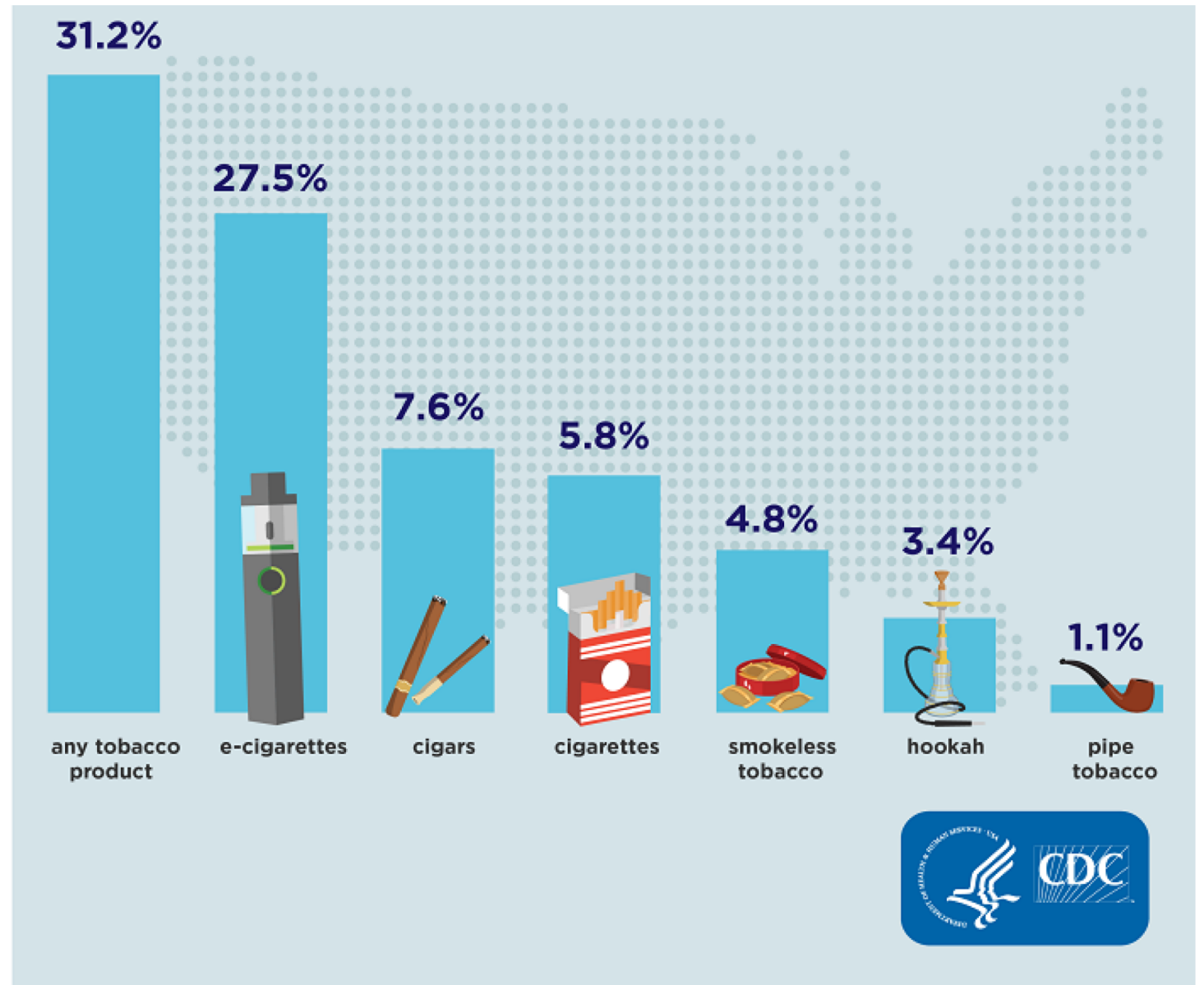
This survey study of 445 adolescents and young adults revealed similar chances (40%) of experiencing negative health and social consequences from using pod-based and/or other types of e-cigarettes.

Among 34 adolescents and young adults reporting any loss of autonomy from nicotine, there was no difference in mean Hooked On Nicotine Checklist scores between those using pod-based and other e-cigarettes

Use the Right Language

- Ask every middle school and high school age patient about vaping exposure and use.
- Language varies
 - Vaping more common language than e-cig
 - “Juuling” was used as a generic term for all vaping but is varying to some extent now.

Tobacco Product Use Among High School Students



Vaping Threatens Progress on Tobacco, Nicotine

	Daily cigarette smoking	Daily nicotine vaping
8th	0.8%	1.9%
10th	1.3%	6.9%
12th	2.4%	11.7%

Significant 5-year declines in cigarette smoking (lifetime use)

	2014	2019	% decline
8th	13.5%	10.0%	26%
10th	22.6%	14.2%	37%
12th	34.4%	22.3%	35%

Harms of E-cigs and Vapes

- Growing consensus that use by adults of **current-generation ENDS** is likely to be less harmful than smoking conventional cigarettes or other combusted tobacco products.
- Currently, ENDS contain and produce substantially lower levels of toxicants than combustible tobacco products.
- They are likely to have physical risks.
- **Potential as a pathway to combustible use.**

Estimating the Harms of ENDS

- **Estimating the population health impact of recently introduced modified risk tobacco products: a comparison of different approaches**

Peter N Lee, MA, David Abrams, PhD, Annette Bachand, PhD et.al.

Nicotine & Tobacco Research

<https://doi.org/10.1093/ntr/ntaa102>

Results of Models

- Despite methodological differences, most modelers have assumed that the increase in risk of mortality from MRTP use, relative to that from cigarette smoking, is very low and have concluded that MRTP introduction is likely to have a beneficial impact.

But Individual Studies Suggest That Risks May Be Substantial

- Cardiovascular disease may be the greatest risk – but far from certain.
- Pulmonary disease is possible.
- A few studies suggest that vapor may include some carcinogens but cancer risk likely to be substantially lower than smoking.

Association of Electronic Cigarette Use With Subsequent Initiation of Tobacco Cigarettes in US Youths

Kaitlyn M. Berry, MPH; Jessica L. Fetterman, PhD; Emelia J. Benjamin, MD, ScM; Aruni Bhatnagar, PhD; Jessica L. Barrington-Trimis, PhD; Adam M. Leventhal, PhD; Andrew Stokes, PhD

Abstract

IMPORTANCE The use of electronic cigarettes (e-cigarettes) and other noncigarette tobacco products may increase the odds of cigarette initiation, even among low-risk youths.

OBJECTIVE To evaluate the associations of prior e-cigarette use and other tobacco product use with subsequent cigarette initiation within 2 years of follow-up.

DESIGN, SETTING, AND PARTICIPANTS In this prospective cohort study, data from waves 1 through 3 of the Population Assessment of Tobacco and Health Study (2013-2016) were used to assess youths aged 12 to 15 years who had never used cigarettes, e-cigarettes, or other tobacco products at wave 1. This was a nationally representative study of the US population. Data analysis was

Key Points

Question Is electronic cigarette (e-cigarette) use among tobacco-naive youths associated with subsequent risk of cigarette initiation?

Findings In this cohort study using data from the Population Assessment of Tobacco and Health Study (2013-2016), youths whose first tobacco product was an e-cigarette were more likely to initiate cigarettes over 2 years of

E-Cigarettes as a Gateway to Smoking

- Cigarette smoking was much higher, 20.5%, in prior e-cigarette users vs. adolescents without prior tobacco product use, 3.8%.
- E-cigarette users were 4 times as likely to try smoking and 3 times more likely to become a regular smoker than non-users.
- **The association with prior e-cigarette use and smoking initiation was higher for low-risk youth than high-risk. This is a pattern not previously seen.**

Taking on the e-cigarette Epidemic



"We're beyond speculating that this could all be very experimental use by kids. The data is in, and it's showing that between 800,000 and 900,000 kids who use these e-cigarette products are using them regularly -- 20 days out of a 30-day month," Henigan said. "That's not experimental. That suggests mass addiction."

<https://www.webmd.com/smoking-cessation/news/20190131/what-works-to-help-teens-quit-vaping#1>

Summary of E-cig/Vaping Recommendations for Youth

- E-cigarettes are not safe.
- **Most contain nicotine and are addictive.**
- The best strategy is to not use any type of vap or e-cigarette.
- If you're vaping now, give serious thought to quitting.
- If you want to quit, help is available.
- Smoking is even more dangerous than vaping. Don't smoke and vap and don't substitute smoking for vaping.

ARE E-CIGARETTES LESS HARMFUL THAN REGULAR CIGARETTES?



VS

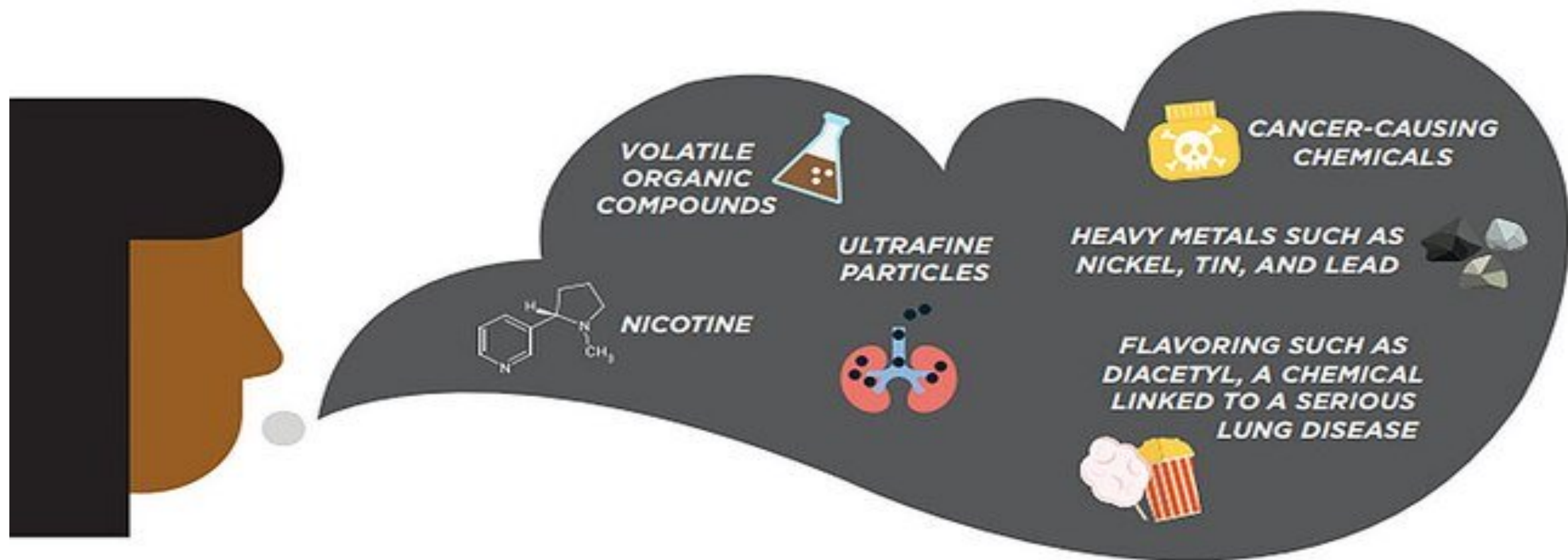


YES, but that doesn't mean e-cigarettes are safe.

E-cigarette aerosol generally contains fewer toxic chemicals than the deadly mix of 7,000 chemicals in smoke from regular cigarettes. However, e-cigarette aerosol is not harmless. It can contain harmful and potentially harmful substances, including nicotine, heavy metals like lead, volatile organic compounds, and cancer-causing agents.

WHAT IS IN E-CIGARETTE AEROSOL?

THE E-CIGARETTE AEROSOL THAT USERS BREATHE FROM THE DEVICE AND EXHALE CAN CONTAIN HARMFUL AND POTENTIALLY HARMFUL SUBSTANCES:



How to Quit Vaping



First Day Without Vaping

1. Do not vape
2. Stay busy
3. Avoid vaping triggers
4. Ask for help
5. Reward yourself

Deal with Vape Cravings

- **Do something else.** When a craving hits, stop what you're doing and do something different. Sometimes, just changing your routine helps you shake off a craving.
- **Get active.** Take a quick walk or go up and down the stairs a few times. Physical activity, even in short bursts, can help boost your energy and beat a craving.
- **Stop and breathe.** Breathe in slowly through your nose and breathe out slowly through your mouth. Repeat this 10 times to help you relax until the craving passes.
- **Text with or talk to someone.** Supportive people in your life can help you stay strong in moments when the urges are tough to handle.
- **Play a game on your phone.** Keep your phone handy! Games can be a good distraction when you're having a craving.
- **Call or chat with an expert.**

Other CDC Modules

3. Dealing with vaping triggers
4. Vaping addiction and nicotine withdrawal
5. Anxiety, stress, and vaping
6. Depression and vaping

Can Adolescents Use NRT

- Not FDA approved
- Mixed efficacy in studies
- No evidence of serious harm
- AAP recommends consideration of off label use of NRT

Reducing E-cigarette Use

- Empower (or force) FDA to exercise its full authority.
 - Reduce nicotine content in all tobacco products.
 - Demand testing of new products and validation of modified risk claims.
 - Encourage testing and approval of new cessation aids.
- Raise the price of legal purchase to 21.
- Ban all added flavors, including menthol.
- Find messages that works with parents and kids.

E-cigarettes in Adult Smokers

- Do e-cigarettes help smokers completely quit smoking?
- Are e-cigarettes a useful pathway to end all tobacco use, including e-cigs?
- Is it possible to support use of e-cig use in adult smokers while discouraging use in all teens?
- What will happen as we ban flavors?

Harm reduction has been shown to be effective for numerous risky adolescent and adult behaviors and is fully embraced for opiod addiction.

More people die from nicotine addiction each year than from opiod addiction.

Why Won't We Embrace Harm Reduction in Tobacco Use?

- **Lack of trust.** The tobacco industry has made huge investments in Electronic Nicotine Delivery Systems, (ENDS)
- Altria owns more than 50% of Juul
- Phillip Morris has made a huge investment in IQOS – heat not burn tobacco



The NEW ENGLAND
JOURNAL of MEDICINE

A Randomized Trial of E-Cigarettes versus Nicotine-Replacement Therapy

Peter Hajek, Ph.D., Anna Phillips-Waller, B.Sc., Dunja Przulj, Ph.D., Francesca Pesola, Ph.D., Katie Myers Smith, D.Psych., Natalie Bisal, M.Sc., Jinshuo Li, M.Phil., Steve Parrott, M.Sc., Peter Sasieni, Ph.D., Lynne Dawkins, Ph.D., Louise Ross, Maciej Goniewicz, Ph.D., Pharm.D., [et al.](#)

[Article](#) [Figures/Media](#)

[Metrics](#)

January 30, 2019

DOI: 10.1056/NEJMoa1808779

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Abstract

BACKGROUND E-cigarettes are commonly used in attempts to stop smoking, but evidence is limited regarding their effectiveness as compared with that of nicotine products approved as smoking-cessation treatments.

METHODS We randomly assigned adults attending U.K. National Health Service stop-smoking services

E-cigarettes Are the Preferred Quitting Aid for Adults – and May Be More Effective Than Approved NRT

- Hajek et. al. randomly assigned 886 smokers to either 3 months of NRT or an e-cigarette vape products.
- The e-cig group was then instructed to use the e-cig strength and flavor of their choice
- At 1 year, 18.0% were abstinent in the e-cig group vs. 9.9% in the NRT group

Banning Flavors – Effect on Adult Smokers

- There are NO flavors that appeal to adults but not kids. Teens and adults like the same flavors
- This includes menthol and mint – (which are derived from identical sources).
- Allowing “tobacco” flavor unlikely to do much to protect kids
 - There is no one tobacco flavor! Companies will find a way to make tobacco flavor appealing to youth

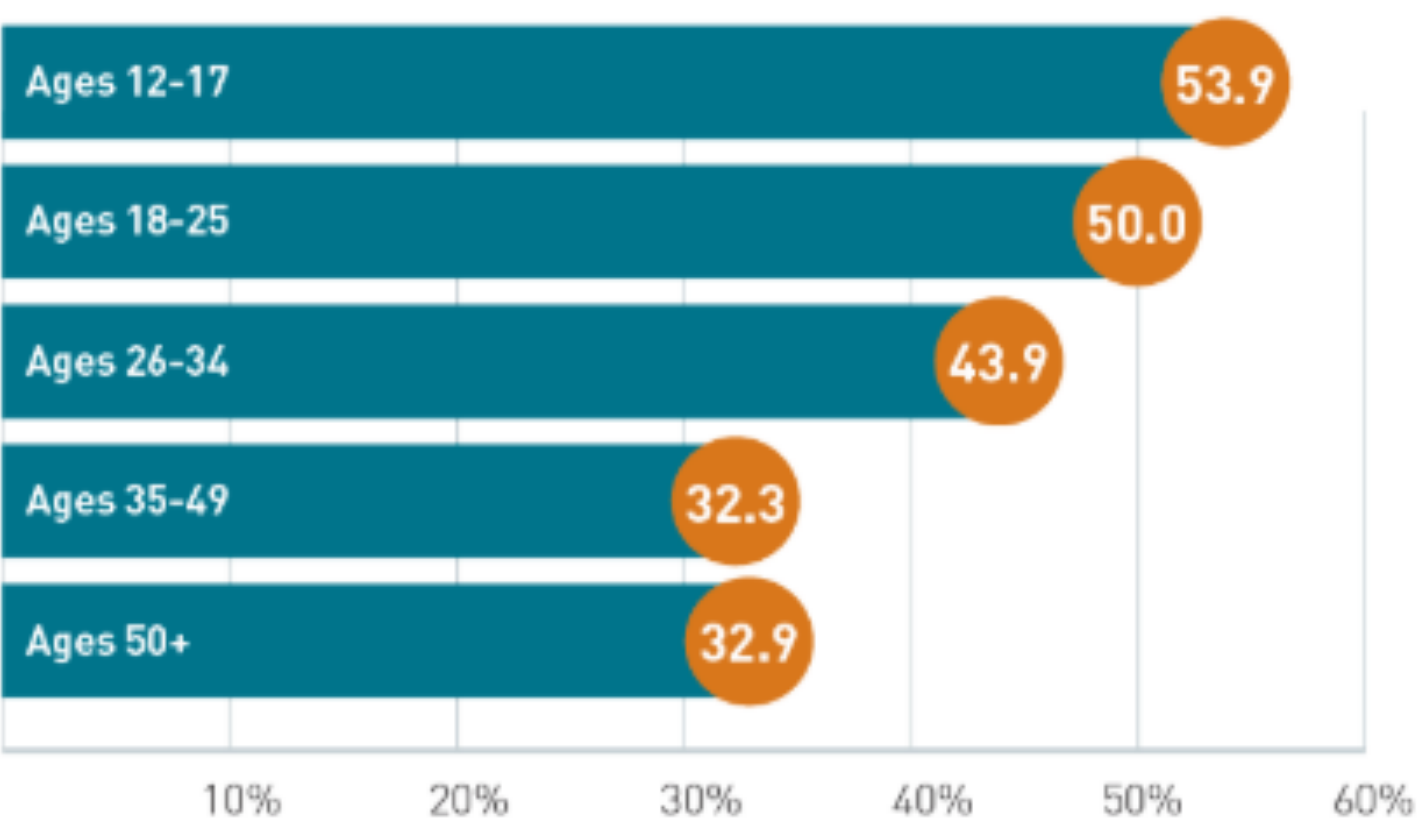
Dangers of Menthol Cigarettes

- Menthol makes cigarettes easier to smoke and harder to quit.
 - Creates a cooling effect
 - Reduces the harshness of cigarette smoke
 - Suppresses coughing

Menthol Cigarettes and Youth

- Research shows menthol cigarettes are more likely to addict youth.
- Initiation with menthol cigarettes facilitates progression to established cigarette use among young smokers.
- The youngest smokers use menthol cigarettes at the highest rates.

Menthol Cigarette Use Among Current Smokers in the US by Age, 2012-2014



Source: Tobacco control



@RichWender

<https://truthinitiative.org/news/menthol->

Menthol Cigarettes and Minority Groups

- Nearly 9 in 10 African-American smokers aged 12 and older use menthol cigarettes.
- From 2008 to 2010, 94.9 percent of African-American youth smokers used menthol cigarettes.
 - Compared to 51.3% of white youth smokers.
- Tobacco industry has a history of marketing menthol brands to African Americans.

Ban on Menthol Cigarettes?

- Only 1.71% of the US is covered by a menthol cigarette ban.
- If menthol cigarettes were banned:
 - 38.9% of all menthol smokers would try to quit.
 - 44.5% of African American menthol smokers would try to quit.
- If a menthol cigarette ban had gone into effect in 2011, an estimated 320,000 smoking-attributable deaths would be averted by 2050, almost a third of them among African Americans.

IQOS – A New Addition to the Tobacco Landscape

- IQOS is a Phillip Morris product that heats tobacco.
- The user inhales the vapor coming from the device.
- Already in use in Europe.



Phillip Morris will Attempt to Get FDA Approval as a Modified Risk Product

- Phillip Morris' own data show that IQOS significantly reduces emissions and exposure to several harmful and potentially harmful constituents compared with combustible cigarettes.
- However PM's data also show that IQOS emissions contain higher levels of many other substances compared to combustible cigarettes.
- The impact of these substances on IQOS toxicity and harm are not known.

IQOS and Risk to Health

- Great concern about the health risks of IQOS but we know frighteningly little today.
- Strongly suspected that IQOS is substantially more harmful than e-cigs.
- The health risks are likely to be different than smoking cigarettes – unknown if net health effects will be the same or less.

The US launch of IQOS occurred at the Lenox Square Mall ...



in Atlanta, Ga., ...



... home of the
American Cancer
Society and the CDC.



 @RichWender

Anyone think this is a coincidence??



 @RichWender

Discourage Use of IQOS!

- As if Juul were not enough of a challenge, now we have to cope with IQOS.
- **Discourage use!**
- If a smoker wants to try an electronic nicotine device instead of smoking, direct them to a traditional cannister like vape product with options to decrease nicotine content over time.

Lung Injury Associated with Vaping or E-cigarette Use



EVALI Cases Have Sharply Declined

- “Emergency department (ED) visits related to e-cigarette, or vaping, products continue to decline, after sharply increasing in August 2019 and peaking in September 2019”

From CDC Final Report on EVALI

“Vitamin E acetate is strongly linked to the EVALI outbreak. Vitamin E acetate has been found in product samples tested by FDA and state laboratories and in patient lung fluid samples tested by CDC from geographically diverse states. Vitamin E acetate has not been found in the lung fluid of people that do not have EVALI.”

We Believe We've Found the Cause of EVALI

- Since removal of Vitamin E acetate from vaping pods of any kind, EVALI has largely disappeared.
- The emergence of EVALI was used by anti-e-cigarette advocates to suggest that e-cigs might be the cause of acute lung injury.
- **They're not**



Thank you