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MEDICINE

The Vaping Phenomenon: What it is, Why it happened, and What you can do about it

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Professor, Adolescent Med/Peds
Founder & Executive Director, TPT and CAPT



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Children's Hospital
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Special Thanks to Our Funders



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California Department of
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CASA – Los Gatos



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Other Disclosures

- I am retained as an expert witness in litigation against Juul and the vaping industry as a whole.

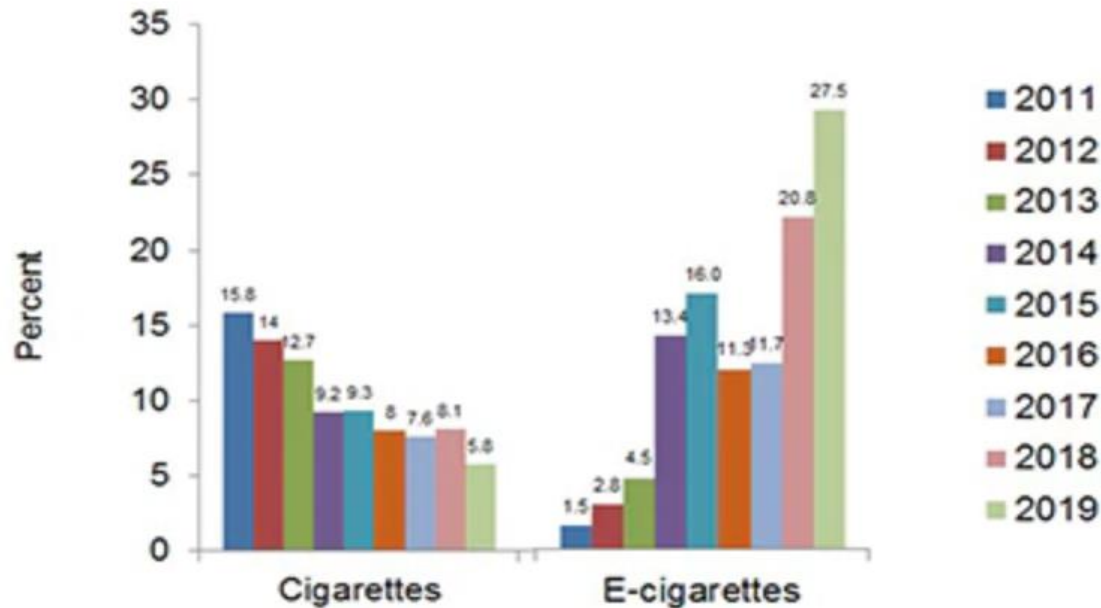
What I Will Cover

- National tobacco usage rates
- An introduction to e-cigs/vaping/Cannabis
 - What they are
 - How they work
 - What is in them
- Health effects
- Why youth are using vapes
- What you can do!



National 2019 Data

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



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



E-cigarette Products



WARNING: THIS PRODUCT CONTAINS NICOTINE. NICOTINE IS AN ADDICTIVE CHEMICAL.



JUUL



Product After Product



E-Cigarettes (Formal/Scientific)
Vapes (Colloquial)



E-Juice/E-Liquid



Product After Product



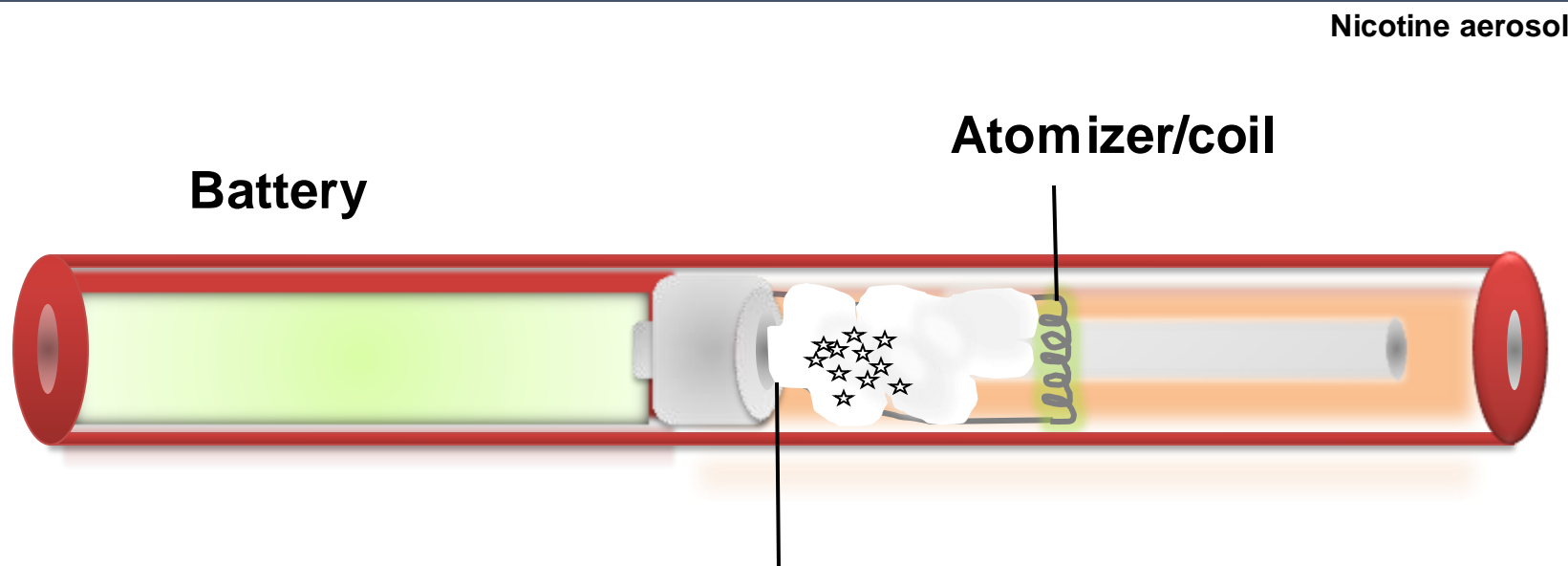
E-Cigarettes (Formal/Scientific)
Vapes (Colloquial)



Marijuana/Cannabis Products



What are E-Cigarettes?



Absorbent material/cotton:

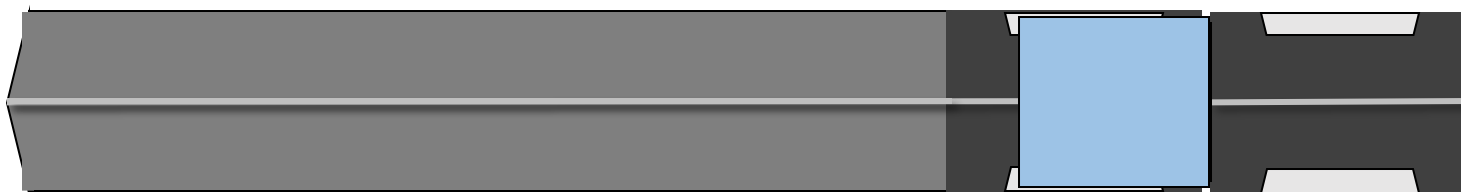
Nicotine
Propylene glycol
Vegetable glycerin
Flavorants



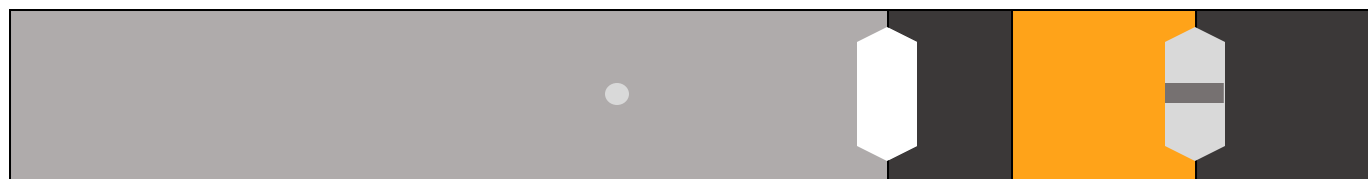
Anatomy of a Pod-Based E-Cig

These cartridges/pods do contain **NICOTINE!**

Cartridges/Pods



P
H
I
X



J
U
U
L



Devices with Rechargeable
Battery

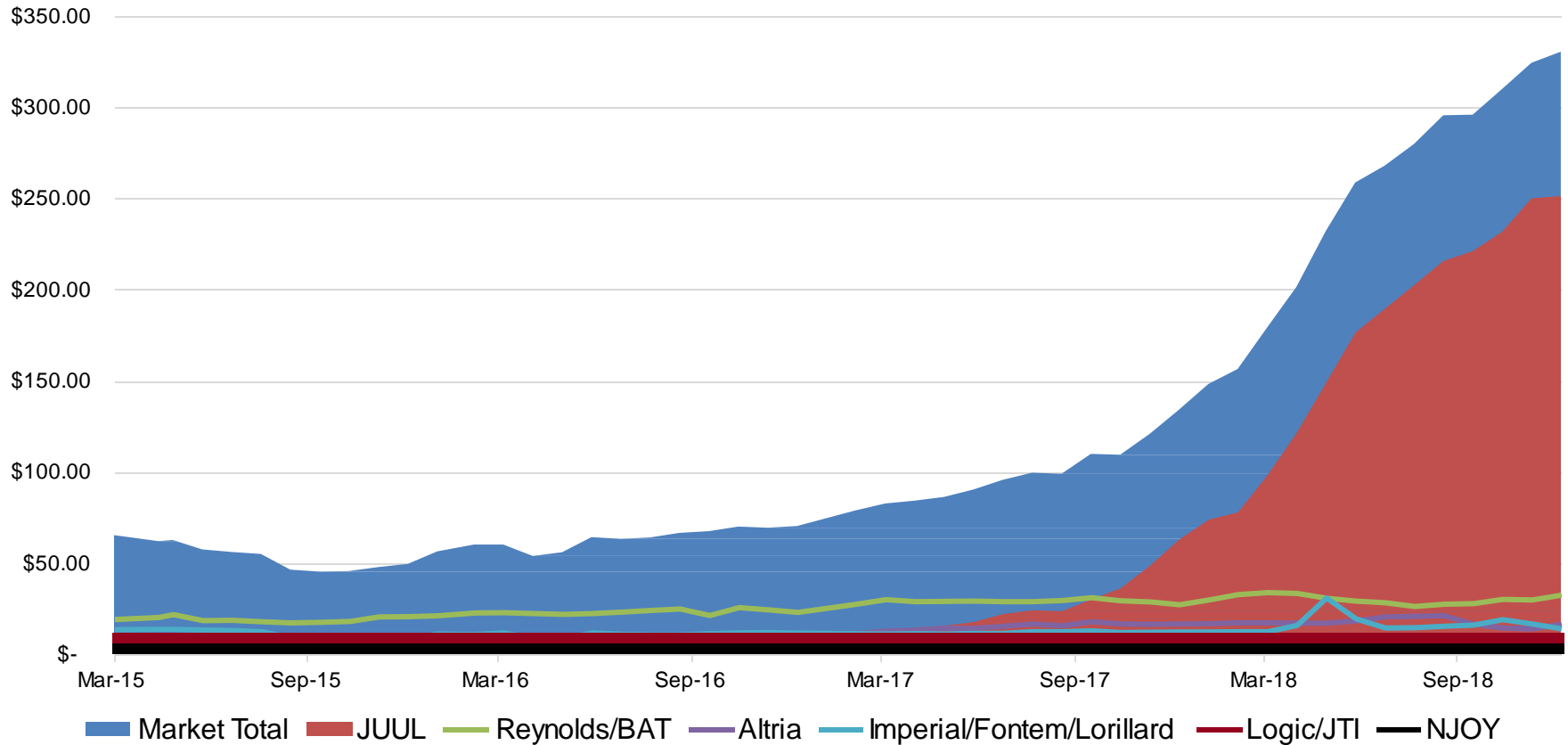


Covers



The Rise of Juul

Monthly E-Cigarette Sales



Pod-Based Market

5th Generation: Disposables







WARNING:
This product contains
nicotine. Nicotine is a
addictive chemical.

WARNING:
This product
contains nicotine.
Nicotine is
an addictive
chemical.

WARNING:
This product
contains nicotine.
Nicotine is
an addictive
chemical.

WARNING:
This product
contains nicotine.
Nicotine is
an addictive
chemical.

WARNING:
This product
contains nicotine.
Nicotine is
an addictive
chemical.

WARNING:
This product
contains nicotine.
Nicotine is
an addictive
chemical.

WARNING:
This product
contains nicotine.
Nicotine is
an addictive
chemical.

LUSH ICE 5%
PUFF BAR

CUCUMBER 5%
PUFF BAR

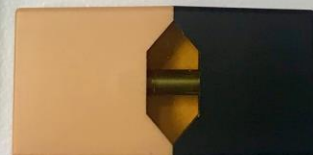
WARNING:
This product
contains nicotine.
Nicotine is
an addictive
chemical.

Hidden in Plain Sight



Hidden in Plain Sight





Stronger E-Cigarettes/Vapes

Salt-based nicotine

41.3-68
milligrams
of nicotine

Not
made to
be refilled



Freebase nicotine

25
milligrams
of nicotine

Refillable
tank



Cigs in a Pod



tobaccopreventiontoolkit.stanford.edu

1 Pack of Cigarettes
≈20 mg of nicotine

1 JUUL pod
≈41.3 mg of nicotine

1 Puff bar
≈50 mg of nicotine

1 Suorin pod
≈90 mg of nicotine

ALL PODS CONTAIN HIGH LEVELS OF NICOTINE

=20
CIGARETTES

≈41
CIGARETTES

≈50
CIGARETTES

≈90
CIGARETTES



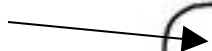
Which Chemicals Are Found in E-Cig/Pod-Based Aerosol?

<ul style="list-style-type: none"> • Propylene glycol • Glycerin • Flavorings (many) • Nicotine • NNN • NNK • NAB • NAT • Ethylbenzene • Benzene • Xylene • Toluene • Acetaldehyde • Formaldehyde • Naphthalene • Styrene • Benzo(b)fluoranthene 	<ul style="list-style-type: none"> • Chlorobenzene • Crotonaldehyde • Propionaldehyde • Benzaldehyde • Valeric acid • Hexanal • Fluorine 	<ul style="list-style-type: none"> • Benzo(ghi)perylene • Acetone • Acrolein • Silver • Nickel • Tin • Sodium 	<ul style="list-style-type: none"> • Cadmium • Silicon • Lithium • Lead • Magnesium • Manganese • Potassium • Titanium • Zinc • Zirconium • Calcium • Iron • Sulfur • Vanadium • Cobalt • Rubidium
<p>All of these have been found in e-cigarette/pod-based aerosol</p>			
<ul style="list-style-type: none"> • Fluoranthene • Benz(a)anthracene • Chrysene • Retene • Benzo(a)pyrene • Indeno(1,2,3-cd)pyrene 	<ul style="list-style-type: none"> • Boron • Copper • Selenium • Arsenic • Nitrosamines • Polycyclic aromatic hydrocarbons 		

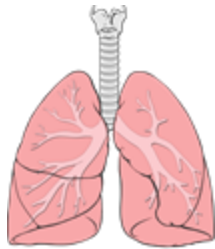
Compounds in orange are from FDA 2012, Harmful and Potentially Harmful Substances – Established List

The Body When Vaping

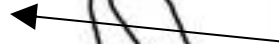
Rewires and changes the brain



Heart beats faster due to “fight or flight” response



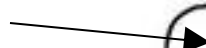
Trouble breathing & damage to lungs



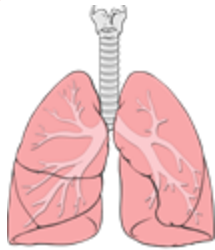
Increased acid reflux

The Body When Vaping

Rewires and changes the brain



Heart beats faster due to “fight or flight” response



Trouble breathing & damage to lungs

Increased acid reflux

Vaping-related Lung Illness



As of **December 20, 2019**:

- 2,561 cases of e-cigarette, or vaping, product use associated lung injury (EVALI)
- 55 deaths in 27 states and the District of Columbia
- THC in most devices
- Vitamin E acetate is of concern



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Secondhand Aerosol

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Nicotine

Heavy
Metals

Ultrafine
Particles

Cancerous
Chemicals

VOCs

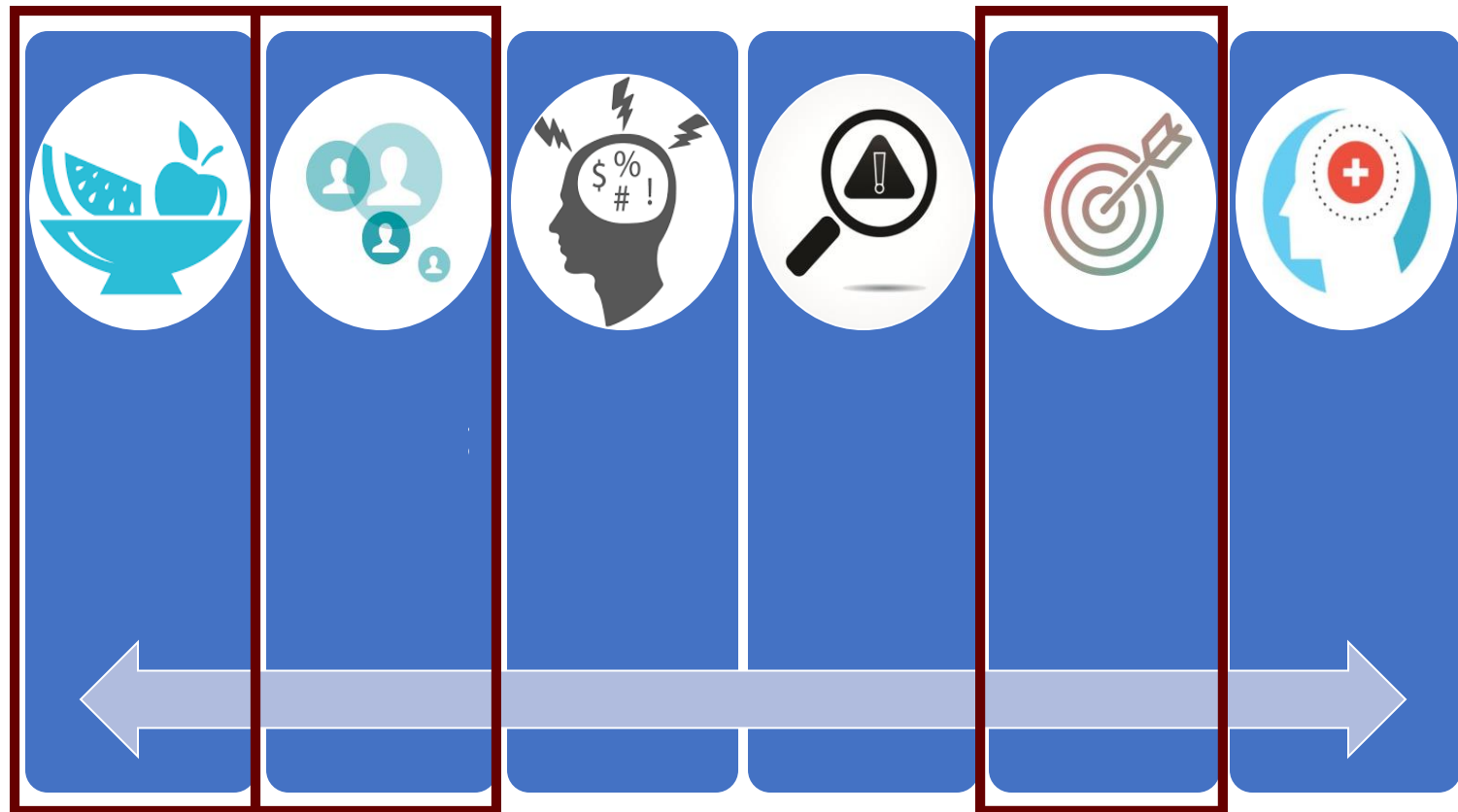
Thirdhand Aerosol

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Nicotine & other chemicals

Why Youth Use E-cigarettes...



Flavors



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Flavors of Vapes



15,500

tobacco flavors
and counting



NS, BOOGER SUGAR, BANANA BUTT, HONEY DOO DOO, BARNEY PEBBLES, DRAGON'S BLOOD, D



The Flavors

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Science News

from research organizations

Widely used e-cigarette flavoring impairs lung function

Date: May 23, 2018

Source: American Thoracic Society

Summa



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E-cigarette use, flavorings may increase heart disease risk, study finds

FULL STO

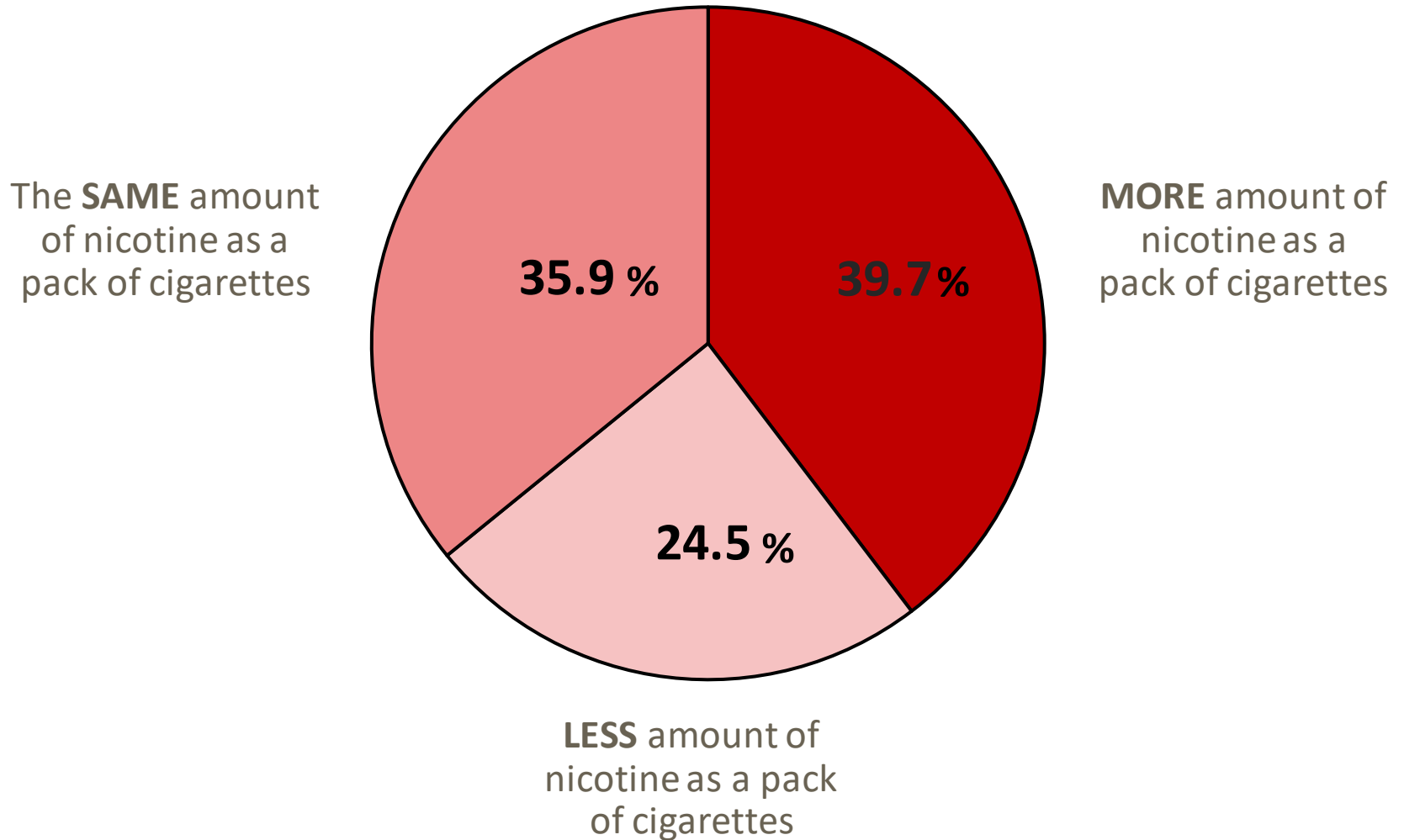
E-cigarette flavorings damage human blood vessel cells grown in the lab even in the absence of nicotine, Stanford researchers and their colleagues found. Cinnamon and menthol flavors were particularly harmful.

Marketing & Product Packaging

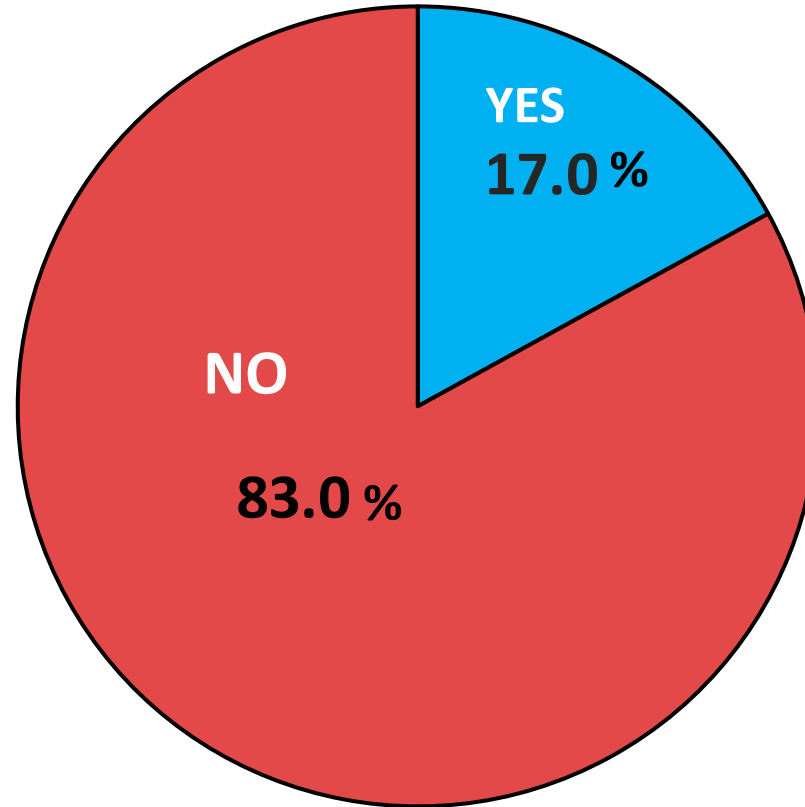


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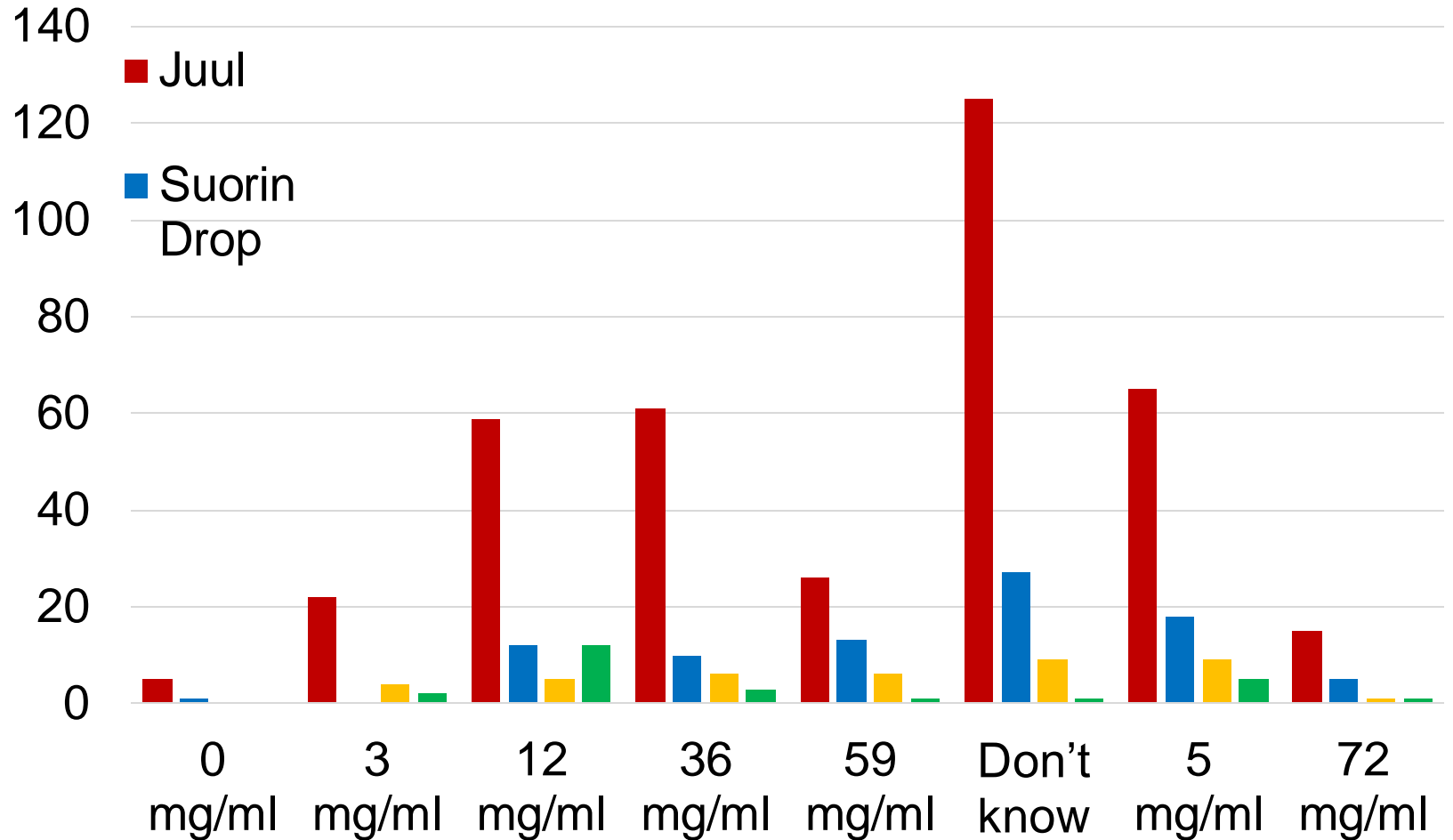
How much nicotine do JUULs have...



Have you ever used JUULs with marijuana?



How much nicotine do you think each product contains?



How Much is That?



JUUL[®]
JUUL device
USB charger

4 pod multipack
5% strength

They
want
you
to
be
confused!

Cool and Youth-Focused Ads




Cool and Youth-Focused Ads



JUUL

SHOP DEVICES SHOP PODS SUBSCRIBE & SAVE

YOU SAID IT
Read real reviews from actual JUUL users.



★★★★★

MANGO

LOVE, LOVE, LOVE The Mango Pods!!
I have tried others and nothing compares.

Melanie S.

SHOP ALL PODS

Social Media Targeting

tobaccopreventiontoolkit.stanford.edu

- Problematic memes and cartoons are also distributed via Twitter or Instagram, which give youth the impression that using is okay



Access

Access



JUUL

- JUUL Device: \$34.99; 4 JUULpods: \$15.99
- Cigarettes: \$9.55 per pack x 4 = \$38.20
- \$15.99 vs. \$38.20

JUULpods cost LESS than cigarettes!!!



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What you can do...



- Stay informed
- Talk to all youth
- Be an advocate



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Starting the Conversation

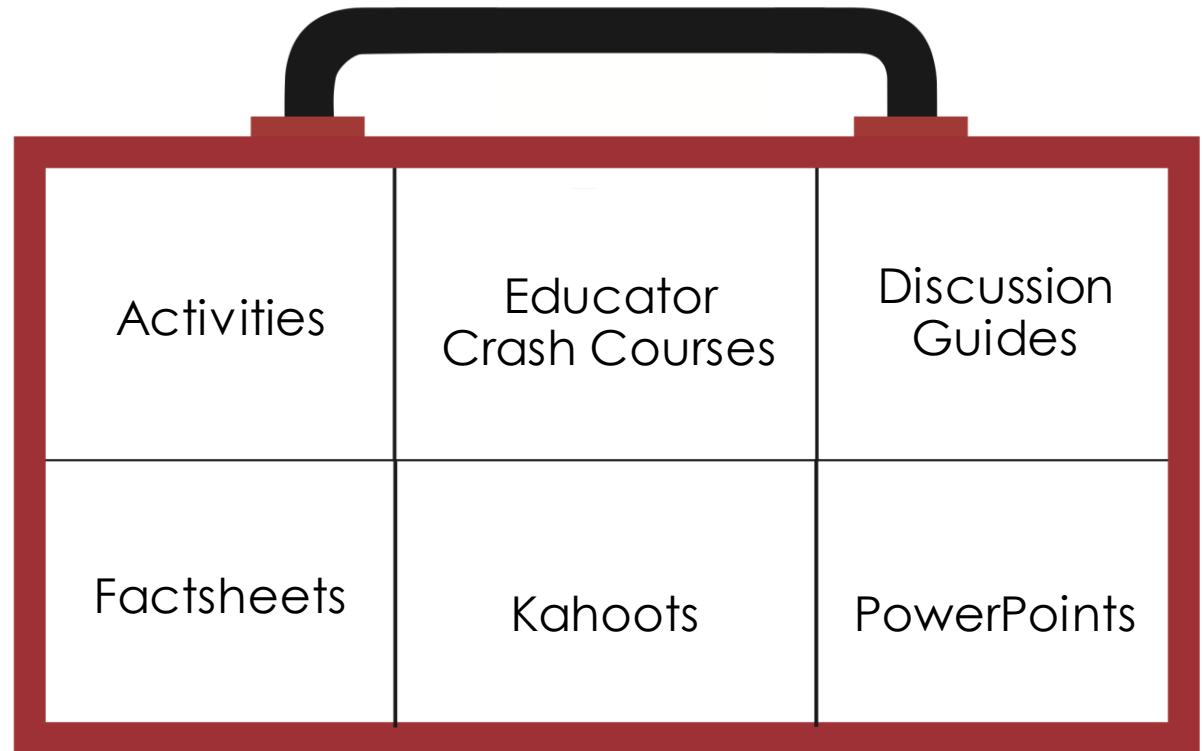


- Goal: to have a conversation, not a lecture
 - Find the “right time”
 - Be patient and ready to listen
 - Avoid criticism and encourage open dialogue
- Avoid “we need to talk,” instead “What do you think about...”
- Avoid “you don’t vape, right...”
- Use the right words! (vaping, Juuling)
- Continue the conversation
 - In-person, or via text/email, etc.
 - Sharing articles is a great way to stay engaged

Tobacco Prevention Toolkit

Tobaccopreventiontoolkit.Stanford.edu

Interactive
Online
Free



Curriculum Table of Contents

Everything Tobacco

Unit 1

- A Little History to Set the Stage
- Athlete Before and After Activity
- BB Activity
- Smoking Health Map
- Tobacco Ad Analysis
- Recipe of a Cigarette
- Myths of Tobacco
- Factsheet Fill-in Activity
- Tobacco Factsheet
- Cigarette Factsheet
- Increasing Cigarette Addictiveness Factsheet
- Hookah & Smokeless Tobacco Factsheet
- Tobacco Module Kahoot
- Tobacco Discussion Guide

Unit 2

- Targeting African Americans: The Menthol Plan
- Would You Believe?
- Big Tobacco and Our Communities
- Unit 2 Kahoot

E-Cigarettes & Vape Pens

Unit 1

- A Little History to Set the Stage
- E-Cig/Vape Pens 101
- What Do You Know? What Do You Want to Know?
- E-Cigarette and Vape Pen Components
- Unit 1 Kahoot
- Unit 1 Discussion Guide

Unit 2

- What's in E-Cigarettes/Vape Pens?
- What's in E-Cigarette/Vape Pen Aerosol?
- It's Just Water Vapor, Right?
- Vapor or Aerosol? Does it Really Matter?
- The Generations of E-Cigarettes and Vape Pens
- Unit 2 Kahoot
- Unit 2 Discussion Guide

Unit 3

- Health Effects of E-Cigarettes and Vape Pens
- Risks of E-Cigarettes Factsheet
- Unit 3 Kahoot
- Unit 3 Discussion Guide

E-Cigarettes & Vape Pens Continued

Unit 4

- Flavors, Manipulation, and Targeting
- What is the Appeal of E-Cig/Vape Pens?
- Deconstructing and Reconstructing Ads
- De/Reconst. Ads Worksheet
- Unit 4 Kahoot
- Unit 4 Discussion Guide

Unit 5

- Two Truths and a Myth
- Creative Ways to Say No to E-Cigarettes/Vape Pens
- PhotoVoice Project
- Unit 5 Kahoot
- Unit 5 Discussion Guide

Unit 6

- Pod-Based 101 PPT
- What Do You Know? What Do You Want to Know?
- Too Cool for JUUL: Deconstructing Ads
- The 'Real'fusal Skills Act.
- Pod-Based Crash Course
- Unit 6 Kahoot
- Unit 6 Discussion Guide

Hookah

Unit 1

- Hookah 101
- What Do You Know? What Do You Want to Know?
- HookahTellMe
- Hookah Mythbusters
- The Wheel of Refusal
- Hookah Factsheet
- Hookah Crash Course
- Hookah Module Kahoot
- Hookah Discussion Guide

Smokeless Tobacco

Unit 1

- Smokeless 101
- The Cost
- Warning Labels
- Smokeless Tobacco Myths
- Smokeless Tobacco and Sports
- The Lico'risk' Activity
- Smokeless Factsheet
- Smokeless Module Kahoot
- Smokeless Discussion Guide

Nicotine Addiction

Unit 1

- The Brain 101
- Unit 1 Kahoot
- Unit 1 Discussion Guide
- Brain Crash Course

Unit 2

- Addiction 101
- Wants, Needs, and Addiction
- Cell Phone Deprivation
- Unit 2 Kahoot
- Unit 2 Discussion Guide
- Addiction Crash Course

Unit 3

- Nicotine Addiction 101
- Letter to Your Representative
- Spectrum of Addiction
- Unit 3 Kahoot
- Unit 3 Discussion Guide
- Nicotine Addiction Crash Course

Key

Activity Discussion Guide Factsheet
Crash Course Kahoot PowerPoint

**TOBACCO
PREVENTION
TOOLKIT**

Healthy Futures



Healthy Futures: An Alternative-to-Suspension Curriculum

We know that many youth are being caught at school vaping and we have heard from many educators throughout the country that they are trying to work with these students to provide some education and secondary prevention. Thus, in response to numerous requests we have created an alternative to suspension curriculum called Healthy Futures.

1-Hour Healthy Futures Curriculum

This page lists activities for the 1-hour Healthy Futures curriculum. This can be used in a one-on-one format or in a group setting.

[1-Hour Healthy Futures Curriculum >](#)



ATS Goals



- ✓ Provide awareness/education to students caught vaping
- ✓ If students are interested in changing habits, provide referrals for future support

Tobacco Prevention Toolkit

Over 1 Million
students reached!



Cannabis Awareness
& PREVENTION
TOOLKIT

<https://med.stanford.edu/cannabispreventiontoolkit.html>

CAPT Curriculum Overview



Cannabis: The Basics

Cannabis/Marijuana 101 PPT

"What Have You Heard? What Do You Want to Know?" Brainstorm

Opinions and Facts Activity

Harm Hill Activity

Unit 1 Kahoot

Unit 1 Discussion Guide

Health Effects

CBD vs. THC 101 PPT

Methods of Use Activity

Smoking Cannabis: Joints & Blunts

"Vaping" Cannabis

Pipes & Bongs

Edibles

Dabbing

Tinctures, Sprays, Etc.

Unit 1 Kahoot

Unit 1 Discussion Guide

Refusal Skills & Social Norms

Defining Your Dopamine PPT

Cannabis in the News Activity

Key

Activity
Discussion Guide

Factsheet

Crash Course

Kahoot

PowerPoint



THC & the Brain

Finding Your Dopamine: Ralph Videos

Passion and Pruning Activity

Unit 1 Kahoot

Unit 1 Discussion Guide

Social Media

Follow us on Social Media!



@TobaccoPrevToolkit
@CanPrevToolkit



@StanfordTPT
@StanfordCAPT



Social Media – 2019 Highlight



Hearing from [@Stanford](#) Dr. Halpern-Felsher about their tobacco toolkit- a very useful resource for educators who want to learn more about tobacco prevention and cessation! Please share! [@BetsyDeVosED](#)
[@SenatorDurbin](#)

med.stanford.edu/tobaccoprevent...

10:14 AM · Sep 9, 2019 · [Twitter for iPhone](#)

10 Retweets 21 Likes



U.S. Surgeon General ✓ @Surgeon_General · Sep 9
Replying to [@Surgeon_General](#)
This resource includes sample scripts to start a conversation with youth, and curriculum as well as games to engage youth and educators.

E-Cigarettes and Vape Pens

→ **Unit 1 - Where did E-Cigarettes
and Vape Pens Come From?**

4 8 18

Evaluation of the Tobacco Prevention Toolkit



Advocacy across the US

- FDA/White House
- City/County
- State

Testifying in Rhode Island



Testifying in California



Testifying in Congress



Evidence-Based Quitting Resources

This is Quitting:

- a mobile app designed by Truth Initiative to help young people quit with inspiration from others like them

BecomeAnEX:

- a free, digital quit-smoking plan and community created by Truth Initiative in collaboration with Mayo Clinic

EX Program:

- an enterprise quit-smoking program designed for employers, health systems and health plans to offer to their employees and members



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Interested in Helping?

Let me know...

The Usual Suspects



Big Vape?

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FACT:
JUUL Labs is
Big Tobacco.

The makers of Marlboro cigarettes have invested \$12.8 billion in JUUL Labs.

Message originally from JUUL Labs

ne
th

att
arn

ies
act



F. MARTIN RAMIN/THE WALL STREET JOURNAL



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M E D I C I N E

Thank you!

Bonnie.halpernfelscher@Stanford.edu



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