Smoking Cessation Leadership Center

UCSF

University of California San Francisco

E-cigarettes and Novel Tobacco Products: Use and Cessation, co-hosted by ATTUD

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Michael Steinberg, MD, MPH, FACP

October 18, 2022

Moderator

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Smoking Cessation Leadership Center
University of California, San Francisco

A National Center of Excellence for Tobacco-Free Recovery

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Disclosures

This UCSF CME activity was planned and developed to uphold academic standards to ensure balance, independence, objectivity, and scientific rigor; adhere to requirements to protect health information under the Health Insurance Portability and Accountability Act of 1996 (HIPAA); and include a mechanism to inform learners when unapproved or unlabeled uses of therapeutic products or agents are discussed or referenced.

All speakers, planning committee members and reviewers have disclosed they have no relevant financial relationships to disclose with ineligible companies whose primary business is producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients.

Catherine Bonniot Saucedo, Anita Browning, Christine Cheng, Brian Clark, Pamela Ling, MPH, MD, Jennifer Matekuare, Ma Krisanta Pamatmat, MPH, Jessica Safier, MA, Michael Steinberg, MD, MPH, FACP, and Aria Yow, MA.

Thank you to our funders

truth initiative
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- For technical assistance please contact (877) 509-3786 or Jessica.Safier@ucsf.edu.
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Today's Presenter

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Professor of Medicine in the Division of General Internal Medicine and

Director of the Center for Tobacco Control Research and Education

University of California, San Francisco

Today's Presenter

Michael Steinberg, MD, MPH, FACP

Professor and Chief Division of General Internal Medicine and Vice-Chair for Clinical Research

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Medical Director

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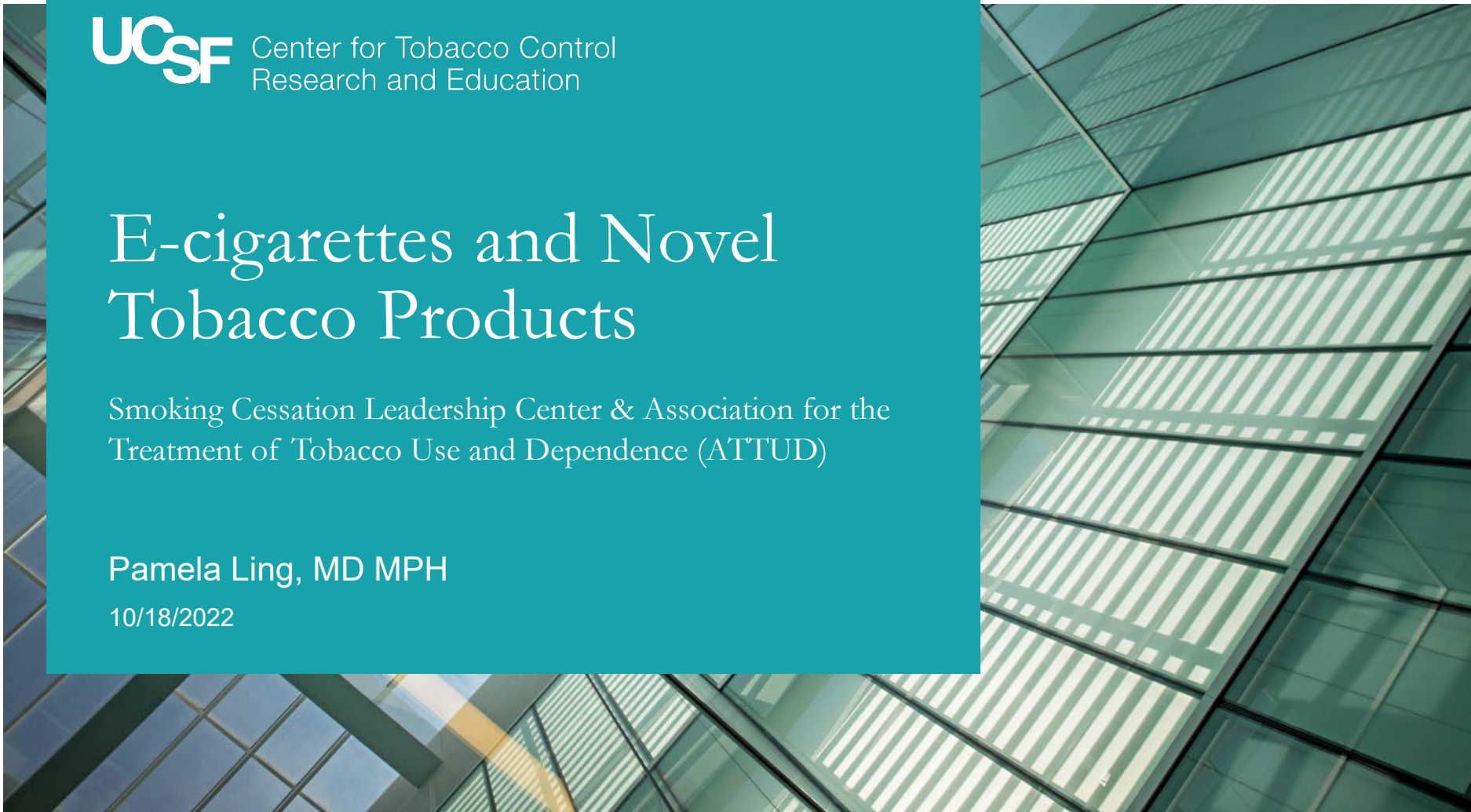

UCSF Center for Tobacco Control Research and Education

E-cigarettes and Novel Tobacco Products

Smoking Cessation Leadership Center & Association for the Treatment of Tobacco Use and Dependence (ATTUD)

Pamela Ling, MD MPH

10/18/2022

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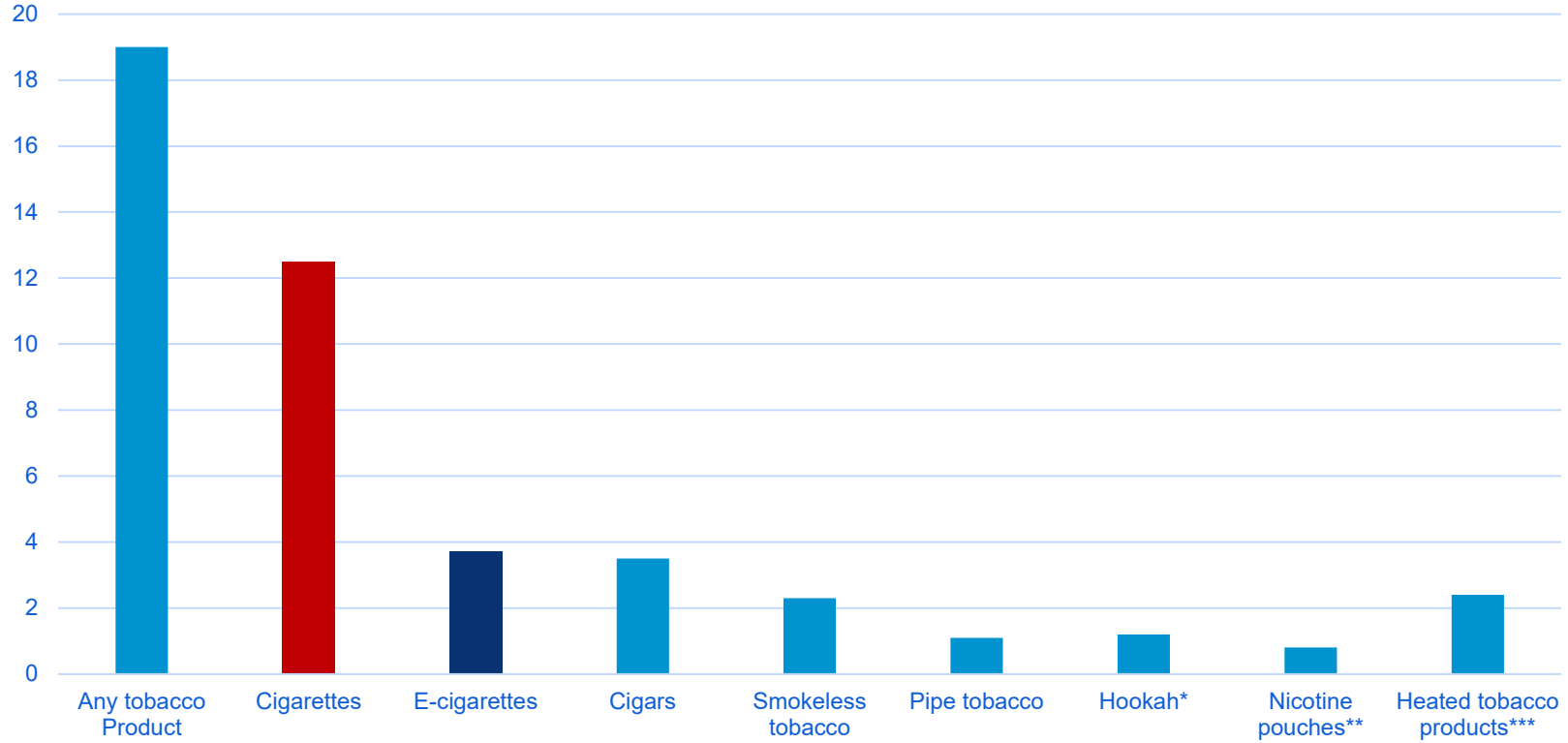
- Disclosures: none
- Funders: NIH, FDA, TRDRP

- Images of tobacco products shown for educational purposes
- I do not endorse use of these products

Learning Objectives

- Interpret understanding of the changing landscape of tobacco and nicotine products when assessing patients and be able to identify 3 novel tobacco and nicotine products
  - Next generation ENDS
  - Heated tobacco products
  - Nicotine pouch products and other oral nicotine
- Assess the latest evidence on e-cigarette safety, health impact and cessation efficacy

Current Tobacco Use, Adults



NHIS, 2020. Cornelius ME, et l. MMWR 2022;71:397–405. *PATH data 2016. **ITC data 2020 among smokers; ***CDC data 2018

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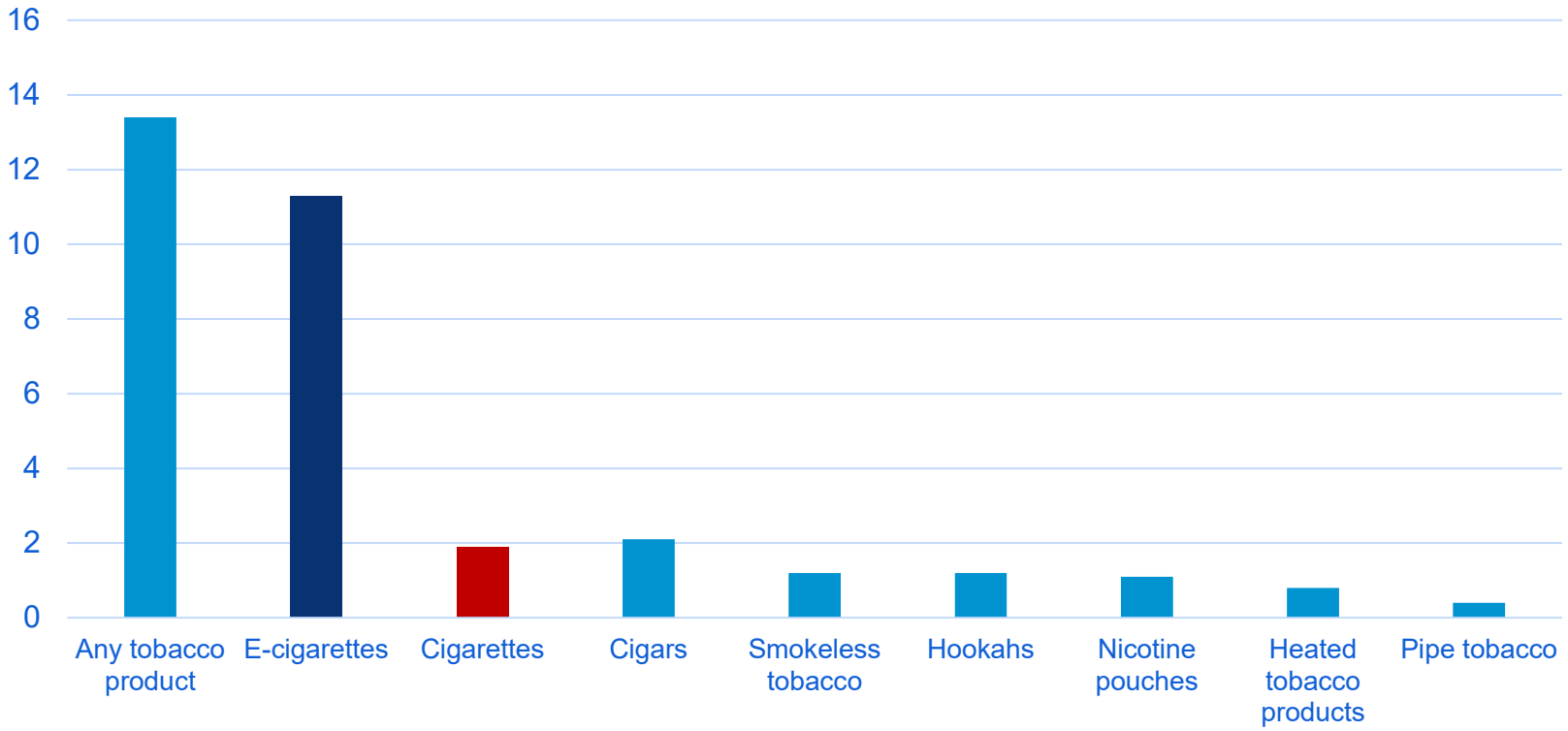
Current tobacco use, High School



National youth tobacco survey 2021, High School Students past 30-day use
Gentzke et al, MMWR 2022 71(SS-5):1-29

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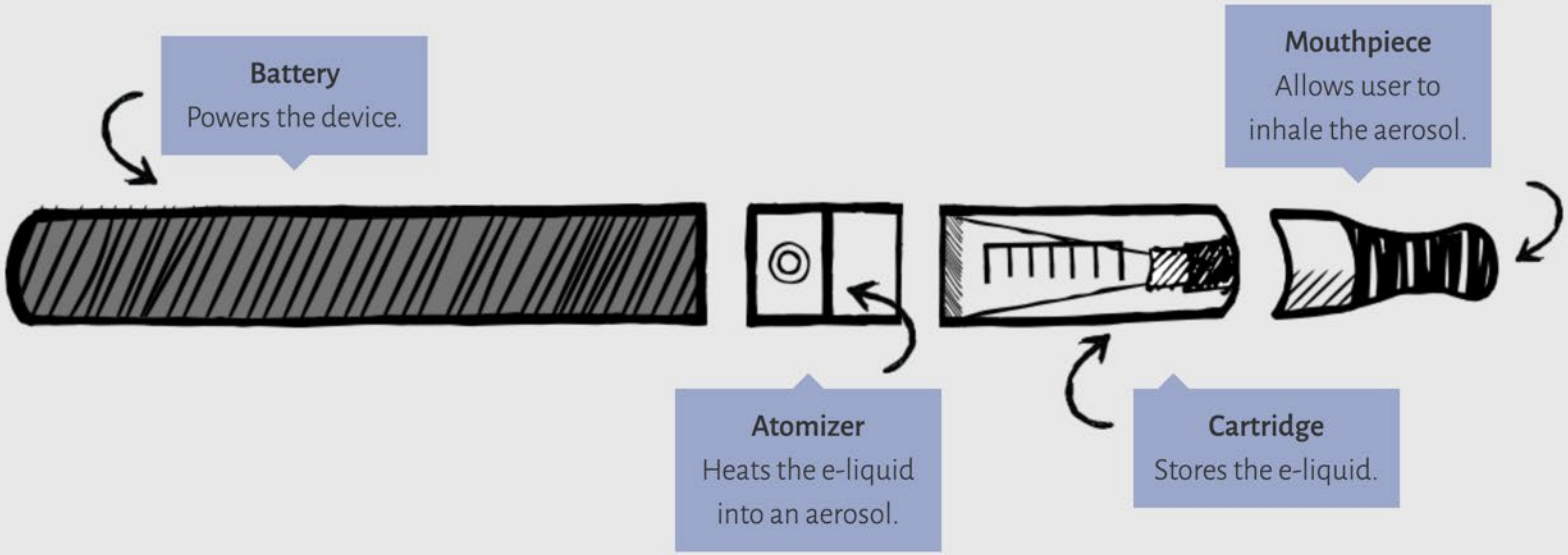
KNOW THE RISKS
E-CIGARETTES & YOUNG PEOPLE

get the facts | know the risks | take action | about | resources



https://e-cigarettes.surgeongeneral.gov/getthefacts.html

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What's an electronic cigarette?

E-cigarettes in 2022

$8

$9
+
$6

$17-23

$8-15

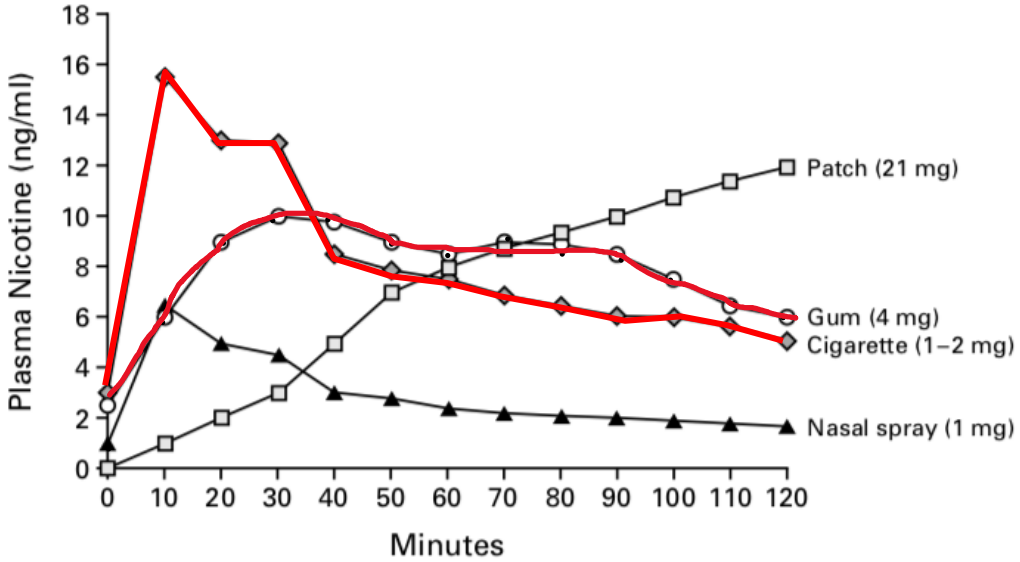

Figure 2. Plasma Nicotine Levels after a Smoker Has Smoked a Cigarette, Received Nicotine Nasal Spray, Begun Chewing Nicotine Gum, or Applied a Nicotine Patch.

The amount of nicotine in each product is given in parentheses. The pattern produced by the use of the nicotine inhaler (not shown) is similar to that for nicotine gum. Modified from Garrett et al.[12]

Nicotine salts

- Different acids added to liquids for e-cigarette devices
- Increase palatability and product appeal
- Perceived as innovative and higher quality
- Allow higher nicotine concentration
- Wick design can also increase nicotine delivery

Leventhal AM, et al, Effect of Exposure to e-Cigarettes With Salt vs Free-Base Nicotine on the Appeal and Sensory Experience of Vaping: A Randomized Clinical Trial. JAMA Netw Open. 2021 Jan 4;4(1):e2032757.
Harvanko AM, Havel CM, Jacob P, Benowitz NL. Characterization of Nicotine Salts in 23 Electronic Cigarette Refill Liquids. Nicotine Tob Res. 2020 Jun 12;22(7):1239-1243.

High nicotine delivery

1 pod = 200 puffs =
1 pack of cigarettes

1 unit = 3000 puffs =
15 pack of cigarettes

Barrington-Trimis & Leventhal, N Engl J Med 2018; 379:1099-1102

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Large volume vapes – 10,000 puffs

Addiction sneaks up on you

“It's not like a nonstop hitting it, but it's just like every lull in conversation or downtime in between doing something, I’m casually hitting the JUUL. There’s a point where you don't even realize - for me - that I was really using it or had it in my hands, anymore. It's just a natural extension of my body.”

Photo credit: Brogan Johnson

Vuse Solo, Ciro, Vibe Authorized by FDA but 95% sales Vuse Alto

What is IQOS?

"Heated Tobacco Products" or "Heat-not-burn" by Philip Morris/Altria

- Heating blade heats tobacco stick (branded Marlboro HeatSticks in US/Japan or HEETS in other markets) up to 350°C (=662°F)
- Leads global heated tobacco product market – in over 60 countries
- July 2020 FDA authorized marketing as "reduced exposure"
- Nov 2021 US sales put on hold due to patent lawsuit

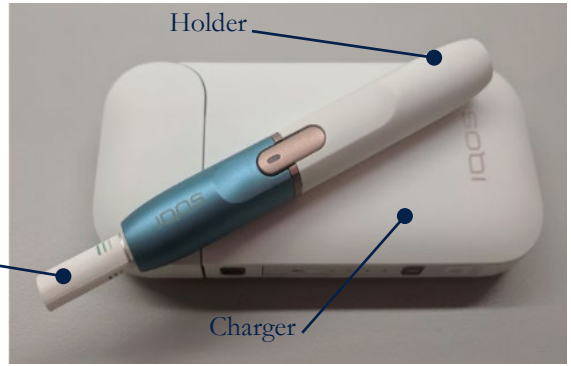


Image source: Left - Picture by Minji Kim; Right - http://kr.myiqos.com

Other heated tobacco products (1)

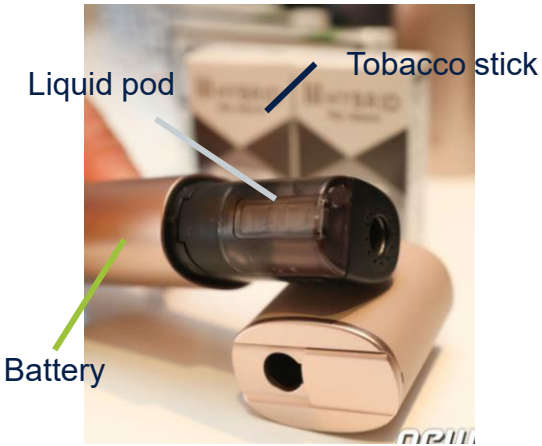
KT&G - lil BAT - glo

China Tobacco - MOK

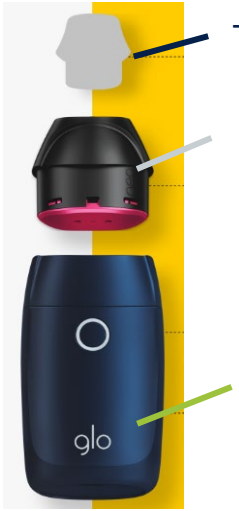
Image source: Left – picture by Minji Kim; Right: https://m.etnews.com/20190709000075

Other heated tobacco products (2)

"Hybrid" type – tobacco pod/stick and no-nicotine liquid pods



KT&G – lil Hybrid



BAT – Glo Sens

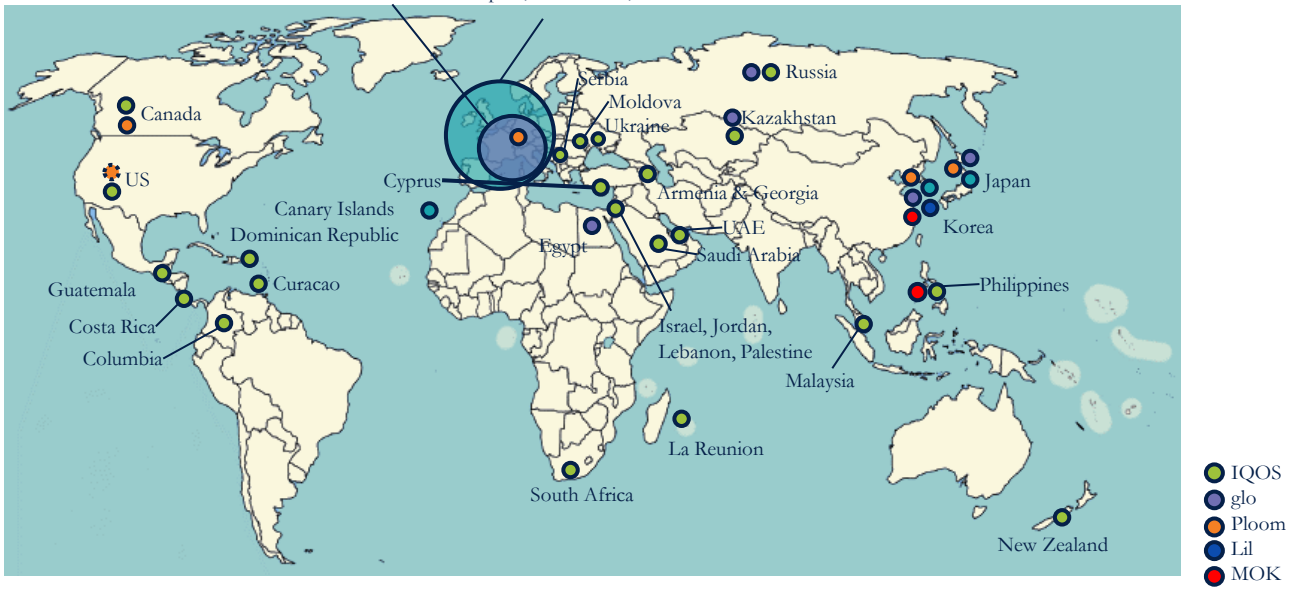
JTI – Ploom Tech / Vapeleaf

Image source: https://www.news1.kr/photos/details/?3405730; https://www.discoverglo.co.kr; http://tobacco.stanford.edu/tobacco_web/images/heat/ploom/ploomtech/medium/ploom_4.jpg

Where are they available now?

Glo in Europe: Azerbaijan, Croatia, Czech, Germany, Greece, Italy, North Cyprus, Poland, Romania, Serbia, Spain, Ukraine

IQOS in Europe: Albania, Andorra, Belarus, Bosnia, Bulgaria, Croatia, Czech Republic, Denmark, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Monaco, Montenegro, Netherlands, North Macedonia, Poland, Portugal, Romania, Slovakia, Slovenia, Slovenia, Spain, Switzerland, UK



Marketing IQOS

Kim, M. (2018) *Tobacco Contro*l.
Image – Top: PMI Investor Relations Material; Bottom: Churchill et al., (2020) *Tobacco Control.*

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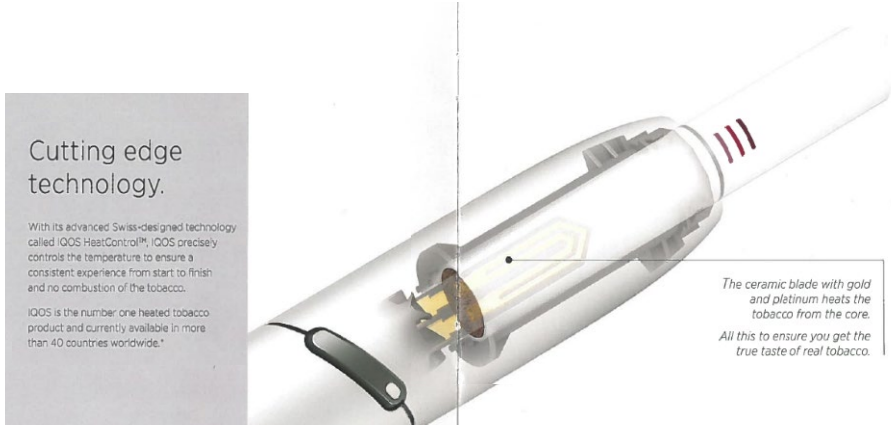
Combining novel electronic device and familiar tobacco leaf

"The packaging is beautiful.
It feels like I am opening up a new phone or – Oh my God, if you guys didn't tell me this was a tobacco product, I would not know. It seems too sleek and elegant. This is so cool. It's so fancy."

(Female, 30, White, cigarettes)



"I would describe it, like a PAX for tobacco. Because it's actual leaf. It's not an oil or a tincture or a gooey vape fluid."

(Female, 24, Multi-racial, cigarettes)

 Image source: Top left - Picture by Minji Kim; Top right – Shutterstock; Bottom – IQOS brochure (Canada)

Oral Nicotine Products

Swedish Match

Reynolds American/BAT

Altria

Swisher International

UCSF


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


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


WARNING: This product contains nicotine.
Nicotine is an addictive chemical.
UNDERAGE SALE PROHIBITED
NICOTINE POUCHES
VELO
NICOTINE POUCHES
NO TOBACCO LEAF.
LEARN MORE
WEBSITE RESTRICTED TO AGE 21+ TOBACCO CONSUMERS.
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ROGUE
NICOTINE ON DEMAND
TOBACCO FREE!
ROGUE
ROGUE
ROGUE
FULL LINE OF GREAT TASTING NICOTINE PRODUCTS!
TABLET
QUICK DISSOLVING
LOZENGE
SLOW RELEASE
GUM
LONG LASTING
POUCH
SPIT FREE
JOIN US AT NACS BOOTH #2211
For More Information Visit
RogueNicotine.com


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

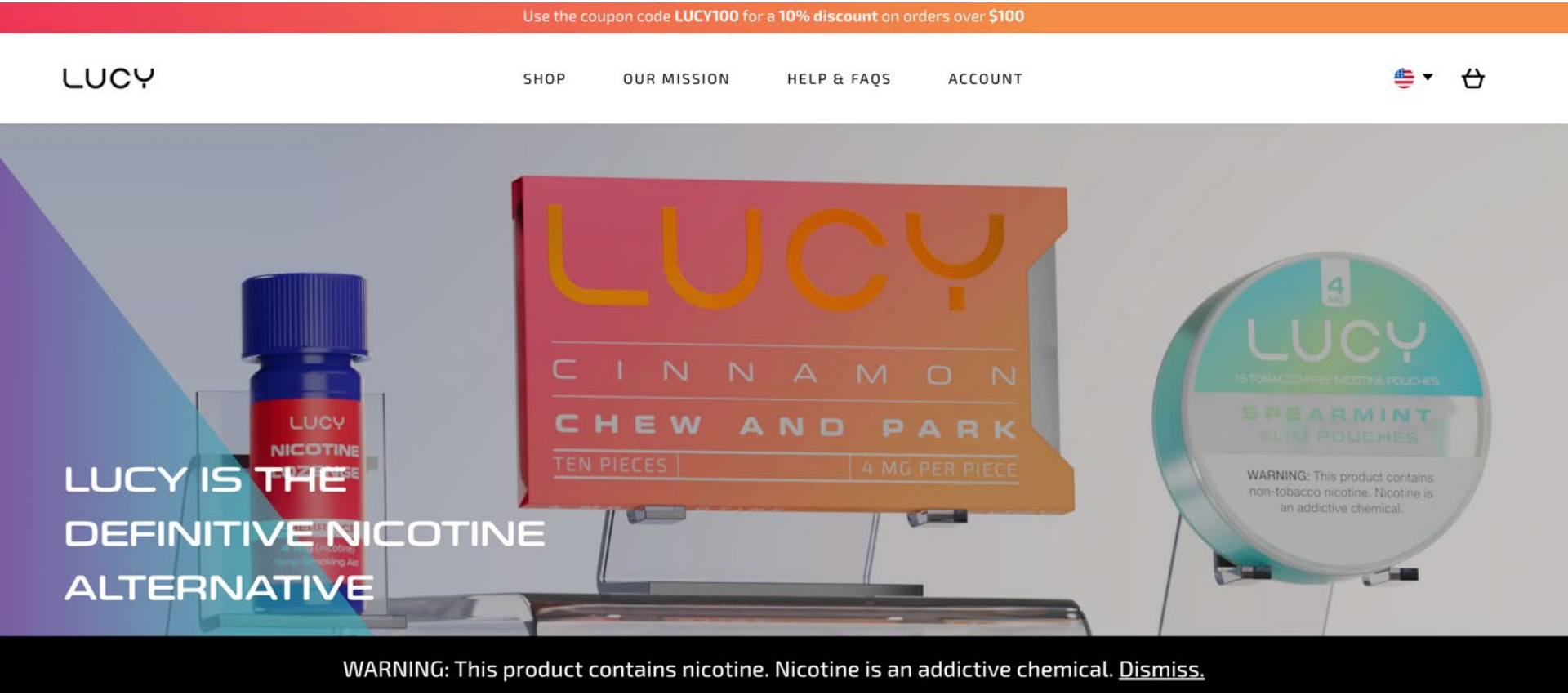

BOLD FLAVORS.
PURE SATISFACTION.
NO COMPROMISES.

FRESH
BERRIES
20 - 4MG POUCHES
WARNING:
THIS PRODUCT CONTAINS TOBACCO-FREE NICOTINE. NICOTINE IS AN ADDICTIVE CHEMICAL.


ztn
JUICE HEAD
POUCHES
6 MG
PEACH PINEAPPLE MINT
20 NICOTINE POUCHES
WARNING: This product contains tobacco-free nicotine. Nicotine is an addictive chemical.


MINTSANITY
RUSH
20 WHITE POUCHES
WINTER BLAST
CINNABUZZ
CITRUS CRUSH
3MG


MORE POWER IN EVERY POUCH
15MG MINT & WINTERGREEN
SHOP NOW
FRE
MINT
12 MG
WINTERGREEN
15 MG
HIGH IMPACT NICOTINE POUCHES
WARNING: This product contains nicotine. Nicotine is an addictive chemical.


Use the coupon code LUCY100 for a 10% discount on orders over $100
LUCY
SHOP
OUR MISSION
HELP & FAQS
ACCOUNT
LUCY IS THE DEFINITIVE NICOTINE ALTERNATIVE
LUCY
NICOTINE
LUCY
CINNAMON
CHEW AND PARK
TEN PIECES
4 MG PER PIECE
4 MG
LUCY
SPEARMINT
WARNING: This product contains non-tobacco nicotine. Nicotine is an addictive chemical.
WARNING: This product contains nicotine. Nicotine is an addictive chemical. Dismiss.

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LUCY

SHOP OUR MISSION HELP & FAQS ACCOUNT

GET STARTED

Tastes like
real **fruit** not
nicotine

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Lucy pouches, gum and lozenges in 2022

4, 8, 12 mg
not NRT

4, 8 mg
not NRT

2, 4, 6 mg
not NRT

4 mg NRT

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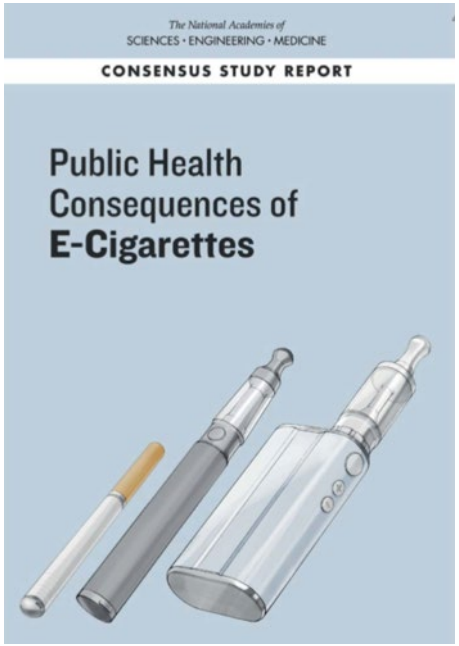
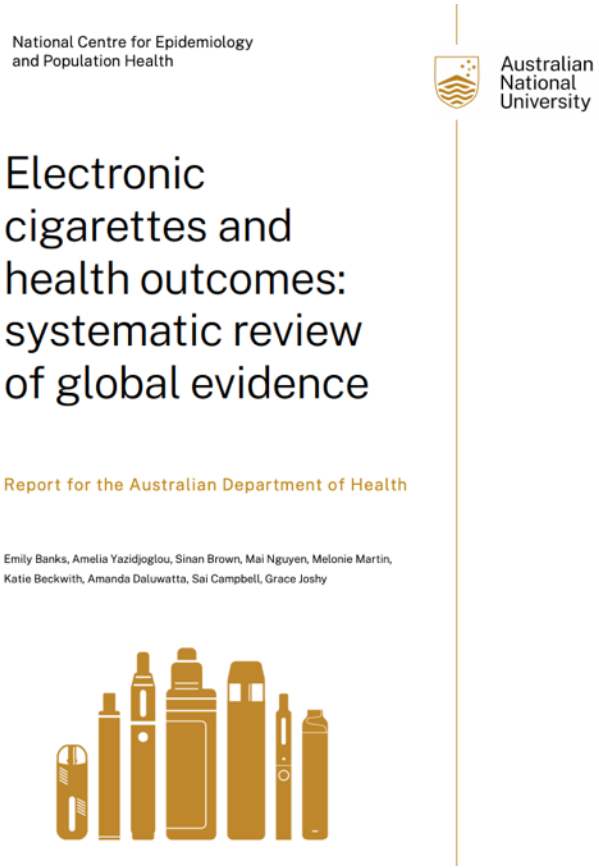
National Academy of Sciences Engineering and Medicine Report - 2018



- Comprehensive literature review
- Short and long term health effects



Published April, 2022

Worldwide systematic review

Update since 2018 NASEM report, other international reports

“Top up” review of new studies

Graded quality of evidence

UCSF

Health effects of e-cigarette use

- Conclusive evidence complete switching reduces exposure to toxicants
- No evidence on how e-cigarettes use affects CV outcomes (e.g. myocardial infarction, stroke or atherosclerosis)
  - In smokers, e-cigarettes increase blood pressure, arterial stiffness, impair endothelial function
  - Smokers switching completely long term decreases blood pressure
- Insufficient evidence on e-cigarette use and asthma, bronchitis or COPD in smokers, no evidence on nonsmokers
- No or insufficient evidence on effect on cancer, reproductive health, mental health, neurologic disease, sleep, oral health, wound healing

E-cigarettes and smoking cessation

- Not FDA approved for cessation or recommended by USPSTF
- The UK recommends them but most other countries do not
  - E-cigarettes sales are banned in 32 countries
- Increased smoking cessation under RCT conditions

  Modestly better than NRT
  - Most did not compare to varenicline
  - All smokers received counseling
- Don’t improve cessation when used as a consumer product

IDEAS AND OPINIONS

Annals of Internal Medicine

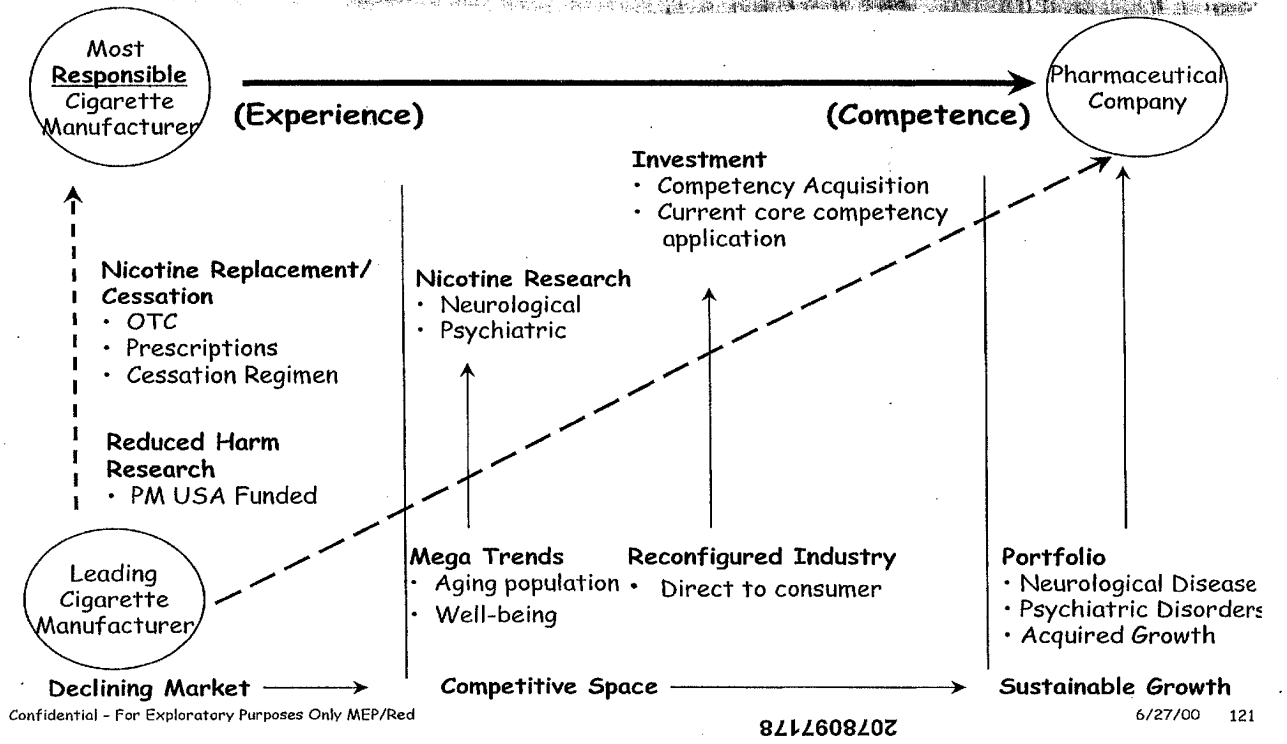
The Pharmaceuticalization of the Tobacco Industry

Yogi Hale Hendlin, PhD; Jesse Elias, MA; and Pamela M. Ling, MD, MPH

- Standardized dosing
- Sleek, medical design
- Government certification
- Renormalization

New Business Opportunities

Pharmaceutical Exploration



Source: http://industrydocuments.library.ucsf.edu/tobacco/docs/qskl0172

Philip Morris, 2000 tid:qskl0172; Hendlin and Ling, Annals of Int Med, 2017.

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Novel products and harm reduction discourse

- Products that look like medicines seem safer
- Vague claims
- Third-party vaping advocacy groups make vocal more extreme claims

BRITISH AMERICAN TOBACCO

Nicotine

Explained

September 2013

UCSF

At the levels found in cigarette smoke, e-cigarette vapours or the concentrations in nicotine replacement products, nicotine is likely to be no more risky for most people than regularly drinking coffee.

Source: "Nicotine Explained." British American Tobacco. 2013.

Summary

- Novel tobacco products continue to proliferate
- Increasing nicotine delivery through salts and size
- Many circumvent regulation of flavors
- Advertising on social media is more aggressive
- Multiple products under the same brand
  - Authorization becomes unclear (Vuse)
  - Status as NRT unclear (Lucy)
- Tobacco companies repositioning as nicotine pharmaceuticals
- Non-nicotine products on the horizon – vitamins, CBD

VITAMINVAPE

LOGIN

CONTACT US

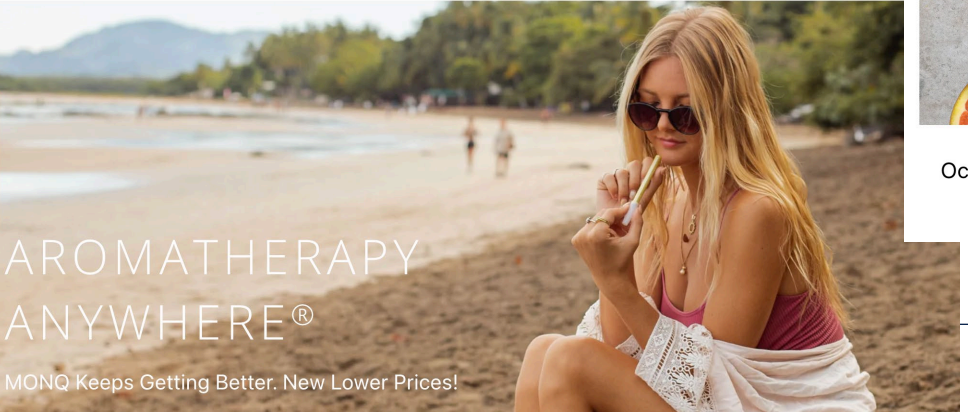
mona
aromatherapy

SHOP INFO

Ocean+CBD Original Diffuser

Eucalyptus | Lime | Tangerine

Price $27.00



RUTGERS

E-cigarettes and Novel Tobacco Products: Use and Cessation

Michael Steinberg, MD, MPH, FACP
Professor and Chief
Division of General Internal Medicine
Rutgers Robert Wood Johnson Medical School
Medical Director, Rutgers Center for Tobacco Studies

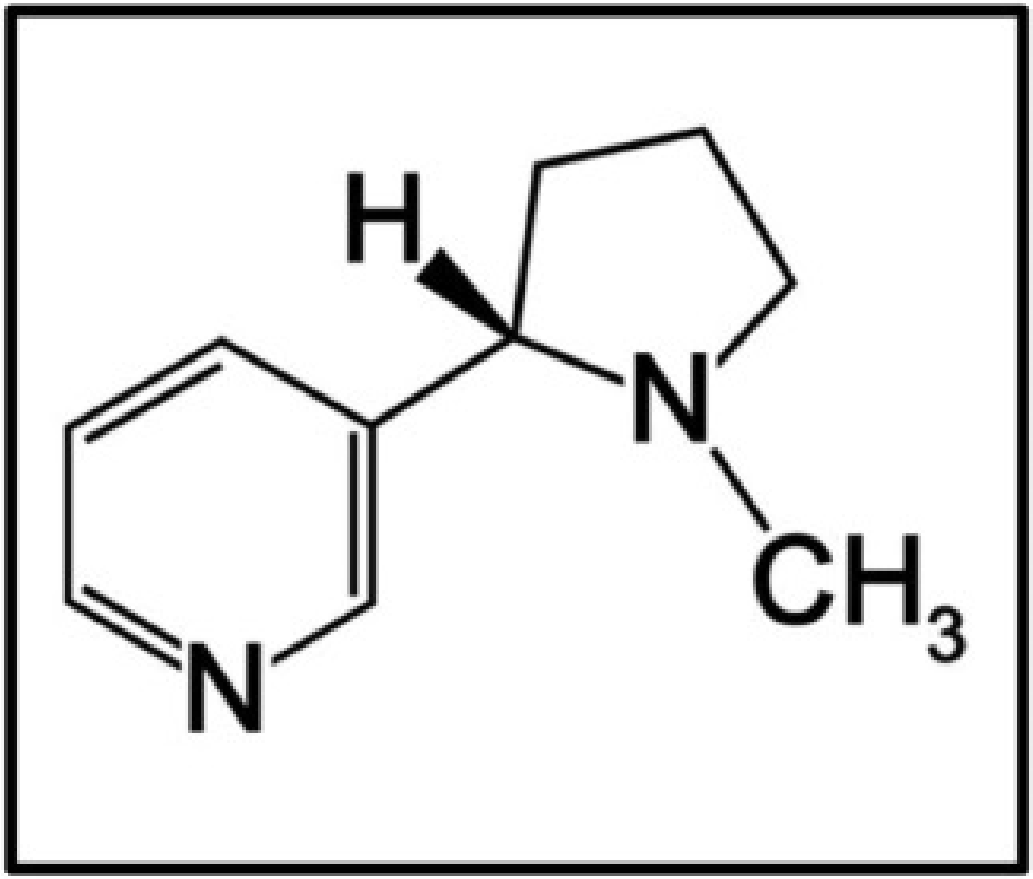
Objectives

- Describe the unique aspects in assessing use behaviors and nicotine dependence for ENDS users
- Develop evidence-based strategies to assist with cessation of ENDS themselves for dependent users

Disclosure

- No commercial disclosures

Nicotine – Key Component of FDA policy



FDA Faced a “challenging crossroads”

Highlights of Nov. 15, 2018 Statement, FDA Commissioner Scott Gottlieb MD:

- Despite progress, we find ourselves at a very challenging crossroads.
- ***We didn’t predict…an epidemic of e-cigarette use among teenagers.***
- …***nicotine isn’t a benign substance***…especially…when it comes to children, and the effects…on a developing brain.

Nicotine Perceptions

- Since Nicotine is a key component of FDA policy going forward, understanding how Nicotine is perceived is critical

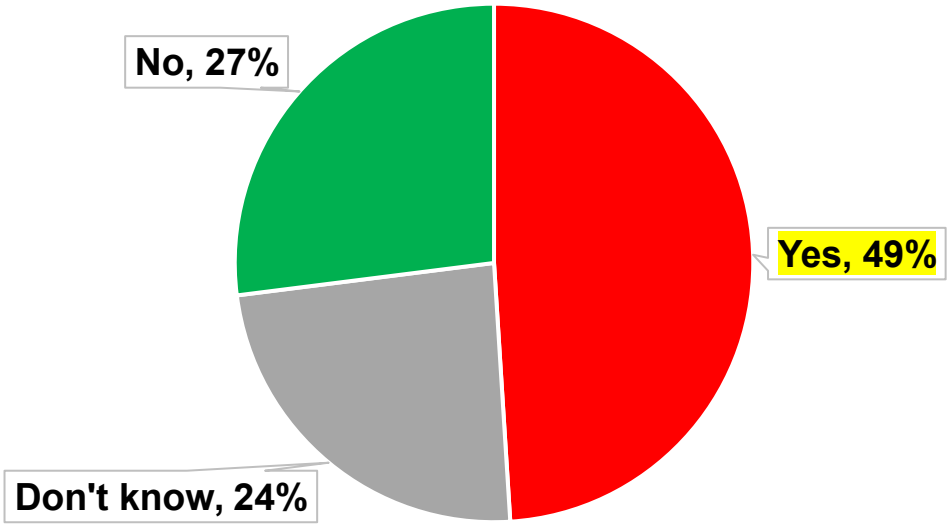
Truth Initiative Young Adult Cohort Study

- Participants aged 18-40 (n = 4,091) in Wave 10 (Fall 2016)
- 19 items on nicotine and nicotine product perceptions, including health harms of nicotine patch/gum and e-cigarettes compared to cigarettes.
- **66%** reported nicotine is responsible for a "relatively" or "very large" part of the **health risks** caused by smoking
- More than half of young adults (**55%**) believed that nicotine is a **cause of cancer**.
- Females, Blacks, Hispanics, and those with less than some college education
  - More likely to report true or "don't know" to "nicotine is a cause of cancer"
  - Higher odds of believing that nicotine was responsible for a "relatively" or "very large" part of the health risks of smoking and cancer caused by smoking

Villanti AC, Naud S, West JC, Pearson JL, Wackowski OA, Niaura RS, Hair E, Rath JM. Prevalence and correlates of nicotine and nicotine product perceptions in U.S. young adults, 2016. Addict Behav. 2019;98:106020.

HINTS - Health Information National Trends Survey

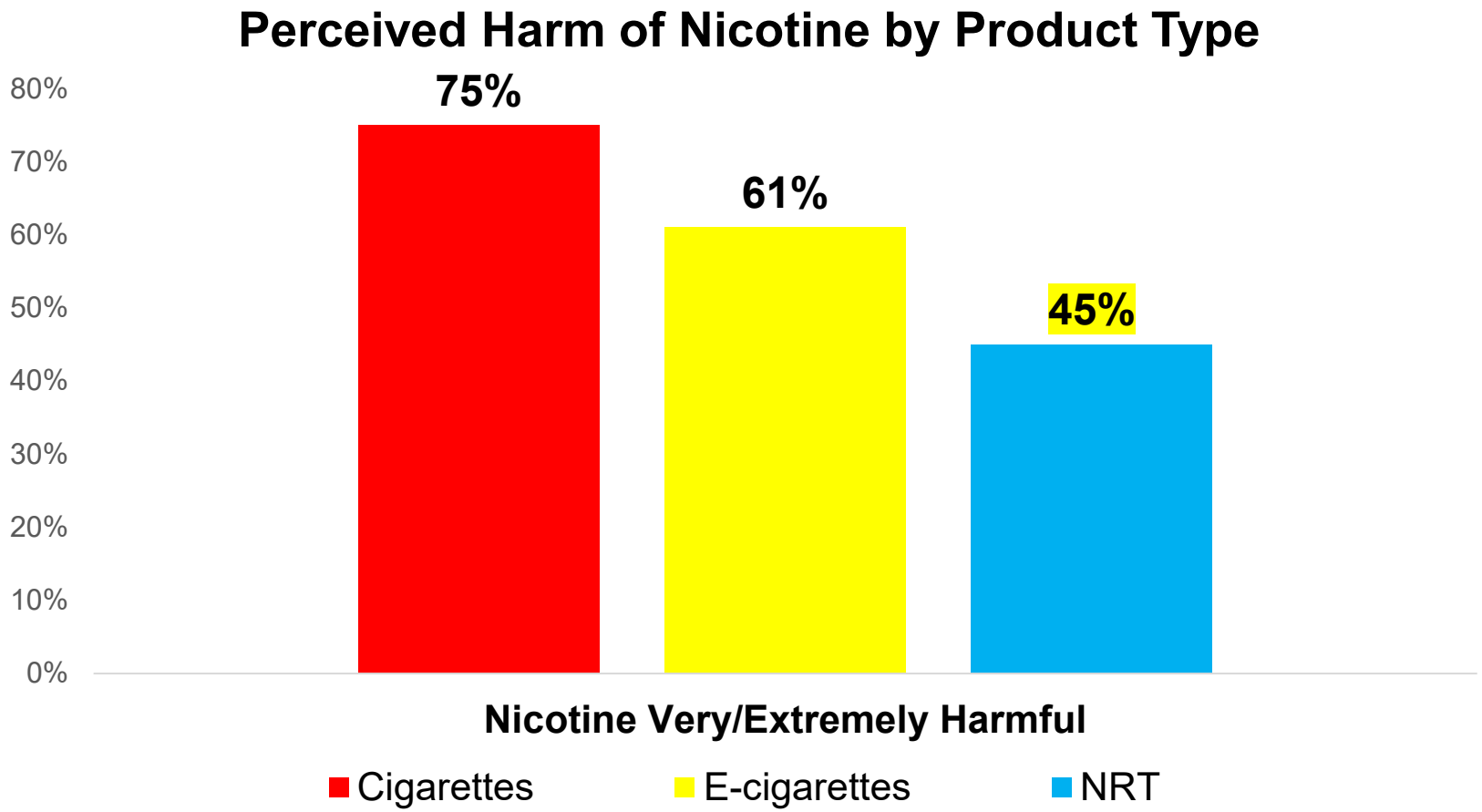
Nicotine Causes Cancer



N=3,738

O'Brien et.al., Prev Med; 2017

PATH

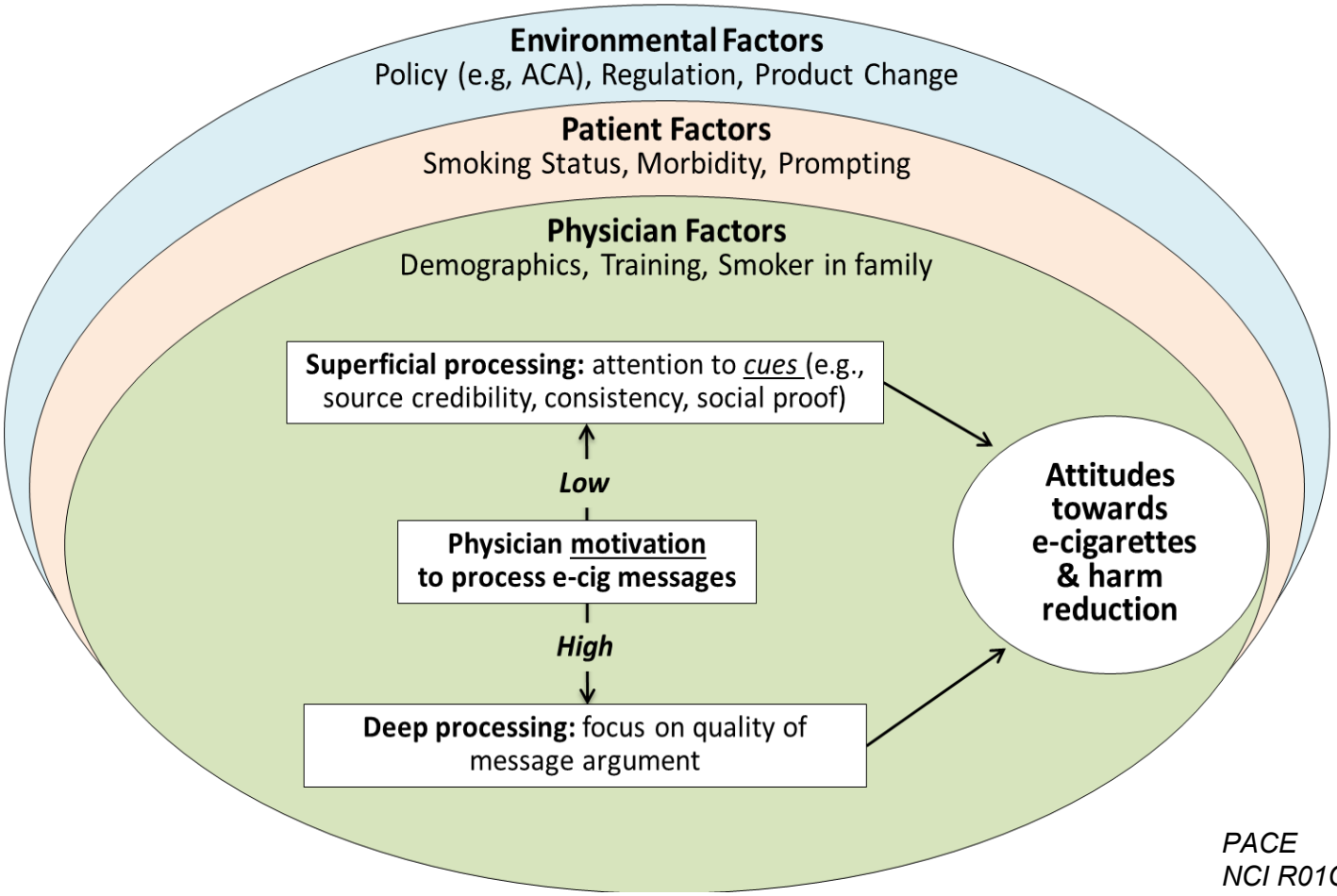

Perceived Harm of Nicotine by Product Type
80%
70%
60%
50%
40%
30%
20%
10%
0%
75%
61%
45%
Nicotine Very/Extremely Harmful
Cigarettes
E-cigarettes
NRT

General Public Perceptions - Summary

- Majority (66-75%) believe Nicotine is responsible for much of harm to health from nicotine containing products
- Approximately HALF believe Nicotine causes cancer
- Misperceptions more common among
  - Over age 65
  - Black, Hispanic, “other” race/ethnicity
  - Lower education
- Perceived harm of nicotine varies by product source
  - Even high for NRT… problem for utilization

What about physicians?

Conceptual Framework for e-cigarette discussion during patient encounter



PACE
NCI R01CA190444-01A1
PI: Delnevo/Steinberg

PACE – Response (Wave 1)

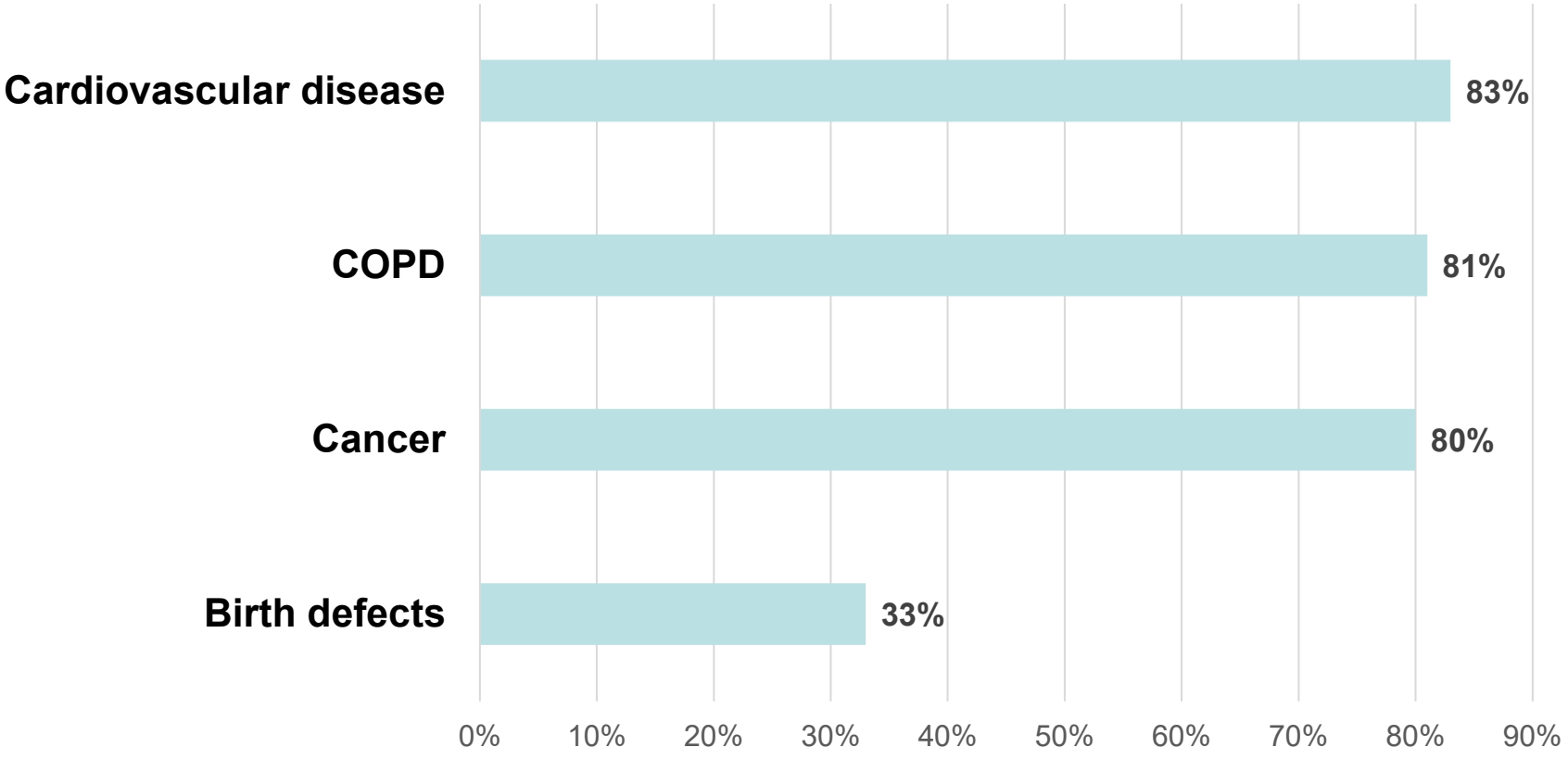
- N=1020 (51.8% response rate after ineligibles removed)
- Female 35%
- White 65%
- Age: mean 51.5 years
- 6 specialties
  - Cardiology
  - Family Medicine
  - Internal Medicine
  - Oncology
  - OB/GYN
  - Pulmonology

PACE – Nicotine item (Wave 1)

- Please indicate the extent to which you agree or disagree that nicotine **on its own** directly contributes to the development of the following health problems
  - Strongly agree/Somewhat agree/Somewhat disagree/Strongly disagree

PACE (Wave 1)

Strongly agree that nicotine contributes to…



Steinberg MB, et. al., *JGIM 2020*

Implications of Nicotine Misperceptions

- Misperceptions regarding nicotine are common both in the general population and among physicians
- These perceptions will impact the beliefs surrounding NRT as well as lowering nicotine-content in combusted products
  - Vital for physicians to be aware as they are sources of health information and prescribers of NRT
  - Potential misperception that “low-nicotine” cigarettes are less harmful

Approaching the Treatment of ENDS Use

Assessment of ENDS

- How are these products used
  - Nicotine delivery
    - Dose
    - Frequency
- Level of dependence
- Behavioral associations

D. E-CIGARETTE USE AND VAPING

The following questions are about e-cigarette use. E-cigarettes are battery-powered devices that usually contain a nicotine-based liquid that is vaporized and inhaled. You may know them as vape-pens, hookah-pens, e-hookahs, e-cigars, e-pipes, personal vaporizers, or mods. Brand examples include NJOY, JUUL, Blu, VUSE, MarkTen, Logic, Vapin Plus, eGo, and Halo.		
1. Have you ever used an e-cigarette such as NJOY, JUUL, Blu, VUSE, MarkTen, Logic, Vapin Plus, eGo, or Halo, even once or twice?	Yes	
	No	
2. How old were you when you first tried using an e-cigarette, even once or twice?	_____ years old	
3. How long have you used an e-cigarette?	Less than 6 months	
	6 months-1 year	
	1-2 years	
	More than 2 years	
	Never	
4. Do you use e-cigarettes as an alternative to quitting tobacco altogether?	Yes	
	No	
5. Do you use e-cigarettes at times when or in places where you could not smoke regular cigarettes?	Yes	
	No	
6. How many pods/cartridges do you use per day?		
7. How many e-cigarette puffs would you smoke in a day? For example, 200 puffs is equivalent to 1 pod / cartridge of JUUL use.	_____ Times per day	
8. What brands of e-cigarettes have you ever tried?		
9. What flavors of e-liquids have you used for your e-cigarette?		

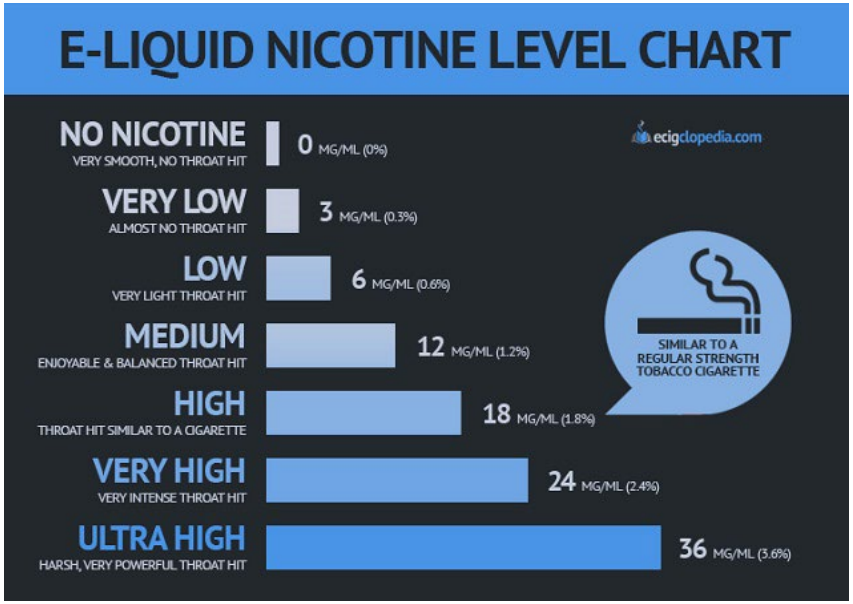
Nicotine from ENDS

- Nicotine content is highly variable
  - Clinical studies indicate that e-cigarettes deliver only modest nicotine concentrations to the **inexperienced** e-cigarette user
  - However, **experienced** e-cigarette users (especially with advanced tank systems or JUUL-type devices) are able to achieve systemic nicotine concentrations similar to those produced from traditional cigarettes

Schroeder, 2014 Wagener, 2016

Nicotine levels and Dependence

- Nicotine content on labeling is often inaccurate (Davis, 2015)
- Many young people unaware of the nicotine content of their ENDS (Morean, 2016)
- Self-reported use of products with higher nicotine concentration (e.g., nicotine-salt pod) was associated with significantly greater frequency of vaping, urges to vape, and perceived vaping addiction ($p<0.05$) (Hammond, 2021)



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PennState College of Medicine

Penn State Center for Research on Tobacco and Health

Penn State Electronic Cigarette Dependence Index

1. How many times per day do you usually use your electronic cigarette? (assume one "time" consists of around 15 puffs, or lasts around 10 minutes) _____ per day
2. On days that you can use your electronic cigarette freely, how soon after you wake up do you first use your electronic cigarette? _____ minutes
3. Do you sometimes awaken at night to use your electronic cigarette? ☐ Yes ☐ No
4. If yes, how many nights per week do you typically awaken to do so? _____ nights
5. Do you use an electronic cigarette now because it is really hard to quit (using e-cigs)? ☐ Yes ☐ No
6. Do you ever have strong cravings to use an electronic cigarette? ☐ Yes ☐ No
7. Over the past week, how strong have the urges to use an electronic cigarette been? (check one)
   - ☐ No urges
   - ☐ Slight
   - ☐ Moderate
   - ☐ Strong
   - ☐ Very strong
   - ☐ Extremely strong
8. Is it hard to keep from using an electronic cigarette in places where you are not supposed to? ☐ Yes ☐ No

When you have not used an electronic cigarette for a while, OR when you tried to stop using one:

9. Did you feel more irritable because you couldn't use an electronic cigarette? ☐ Yes ☐ No
10. Did you feel nervous, restless or anxious because you couldn't use an electronic cigarette? ☐ Yes ☐ No

Foulds J, Veldheer S, Yingst J, Hrabovsky S, Wilson SJ, et al. Development of a questionnaire for assessing dependence on electronic cigarettes among a large sample of ex-smoking E-cigarette users. Nicotine Tob Res. 2015 Feb;17(2):186-92. https://doi.org/10.1093/ntr/ntu204

PROMIS-E

- When I haven't been able to vape for a few hours, the craving gets intolerable.
- I find myself reaching for my e-cigarette without thinking about it.
- I drop everything to go out and buy e-cigarettes or e-juice.
- I vape more before going into a situation where vaping is not allowed.

PROMIS Short Form v1.0 – Smoking: Nicotine Dependence for Daily and Nondaily Smokers 4a

Smoking: Nicotine Dependence for Daily and Nondaily Smokers – Short Form 4a

Please respond to each question or statement by marking one box per row.

		Never	Rarely	Sometimes	Often	Always
SMKNDEP01	When I haven't been able to smoke for a few hours, the craving gets intolerable.....	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
SMKNDEP02	I find myself reaching for cigarettes without thinking about it.....	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
SMKNDEP03	I drop everything to go out and buy cigarettes.....	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
SMKNDEP04	I smoke more before going into a situation where smoking is not allowed.....	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

The RAND Smoking Assessment Toolkit was developed as part of the PROMIS® Smoking Initiative (NIDA R01DA026943) Maria Orlando Edelen, Principle Investigator

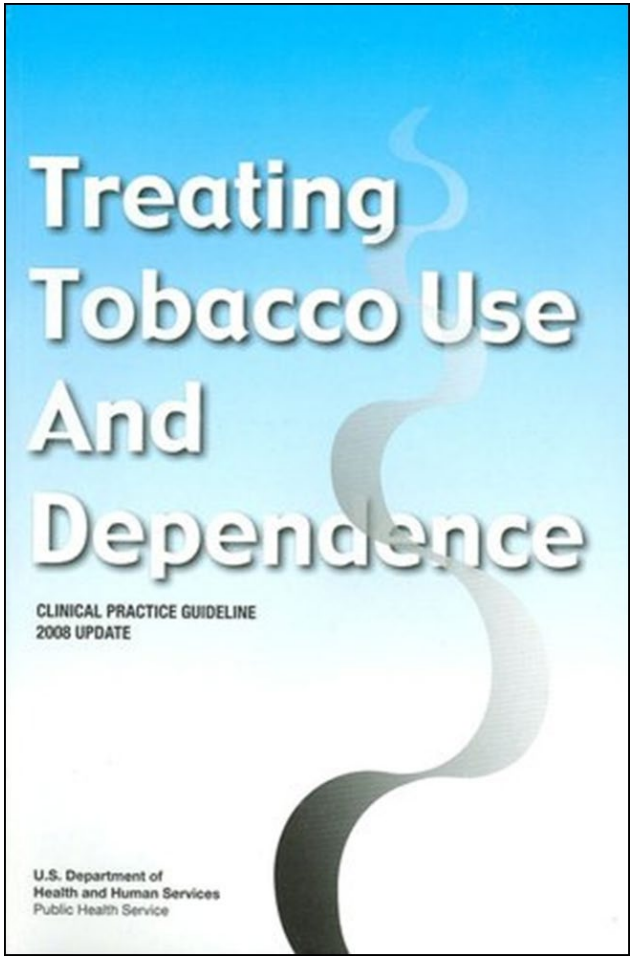
ENDS Assessment

- Psychometric analysis of **PROMIS-E** showed good internal consistency
- No established cut-off for dependence
- 55% reported some level of dependence (Morean, 2018)

- **E-cigarette Fagerstrom Test for Cigarette Dependence**
- **Penn State E-Cigarette Dependence Index**
- **E-cigarette Wisconsin Index of Smoking Dependence Motives**

- All three scales (e-FTCD, PS-ECDI, and e-WISDM) appear to be valid measures of a construct that leads to self-perceived addiction, heavy use, early use after overnight deprivation, and continued use over time (Piper, 2020)

Treatment

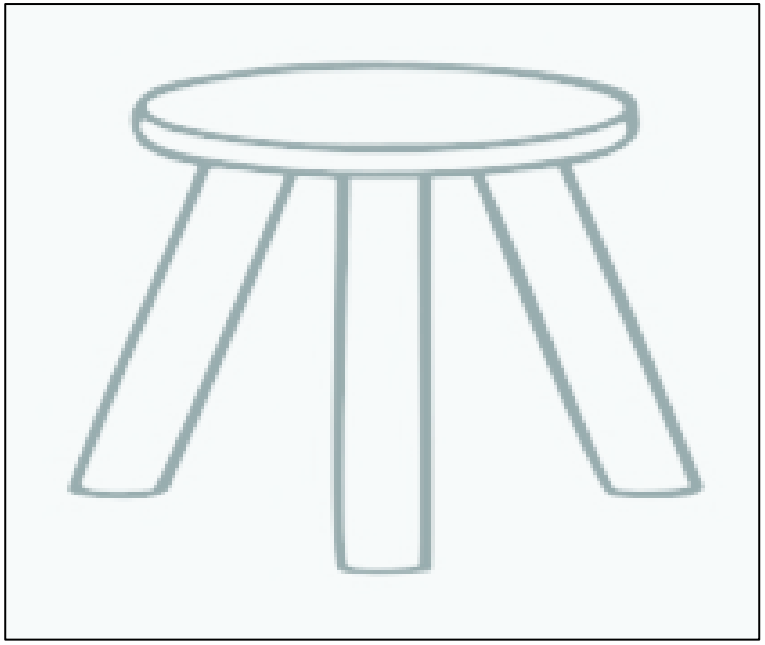


http://www.surgeongeneral.gov/tobacco

We Know What Works – Just need to apply it

- Effective, *comprehensive,* evidence-based treatment exists for tobacco dependence (Fiore, 2008)

Behavioral Counseling



Support/ Follow-up

Pharmacotherapy

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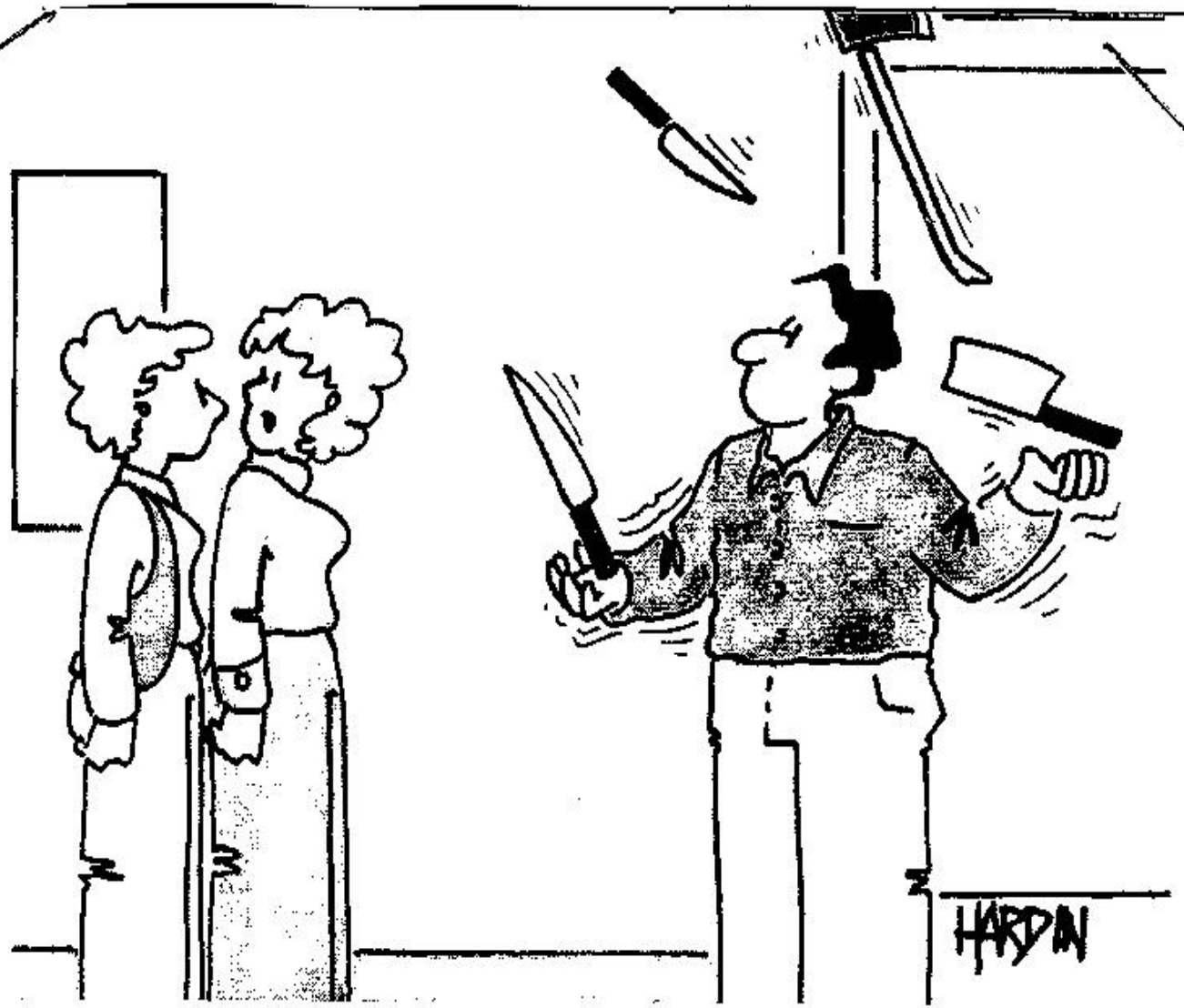
Intervention	Meta-Analysis	# of studies/patients	Efficacy for abstinence (95% CI)
NRT			
Any NRT vs. placebo	Hartmann-Boyce, 2018	133/64,640	RR 1.55 (1.49-1.61)
Gum vs. placebo	Hartmann-Boyce, 2018	56/22,581	RR 1.49 (1.40-1.60)
Patch vs. placebo	Hartmann-Boyce, 2018	51/25,754	RR 1.64 (1.53-1.75)
Lozenge vs. placebo	Hartmann-Boyce, 2018	8/4439	RR 1.52 (1.32-1.74)
Inhaler vs. placebo	Hartmann-Boyce, 2018	4/976	RR 1.90 (1.36-2.67)
Nasal Spray vs. placebo	Hartmann-Boyce, 2018	4/887	RR 2.02 (1.49-2.73)
Combination NRT vs. Single NRT	Lindson, 2019	14/11,356	RR 1.25 (1.15-1.36)
Combination NRT vs. Placebo	Cahill, 2013	2/NA	OR 2.73 (2.07-3.65)
Bupropion			
Bupropion vs. placebo	Howes, 2020	45/17,866	RR 1.64 (1.52-1.77)
Bupropion vs. NRT	Howes, 2020	10/8230	RR 0.99 (0.91-1.09)
Bupropion vs. Varenicline	Howes, 2020	6/6286	RR 0.71 (0.64-0.79)
Varenicline			
Varenicline vs. placebo	Cahill, 2016	27/12,625	RR 2.24 (2.06-2.43)
Varenicline vs. NRT	Cahill, 2016	8/6264	RR 1.25 (1.14-1.37)
Varenicline vs. Combination NRT	Cahill, 2013	NA/NA	OR 1.06 (0.75-1.48)
Combination Therapy			
Bupropion + NRT vs. NRT alone	Howes, 2020	12/3487	RR 1.19 (0.94-1.51)
Bupropion + Varenicline vs. Varenicline alone	Howes, 2020	3/1057	RR 1.21 (0.95-1.55)
Varenicline + NRT vs. Varenicline alone	Chang, 2015	2/787	OR 1.62 (1.18-2.23)

Patel et. al.; 2021; *Annals of Internal Medicine*



"The nicotine patch controls the cravings,
but he still needs to do something with his hands."

Tools of the Trade

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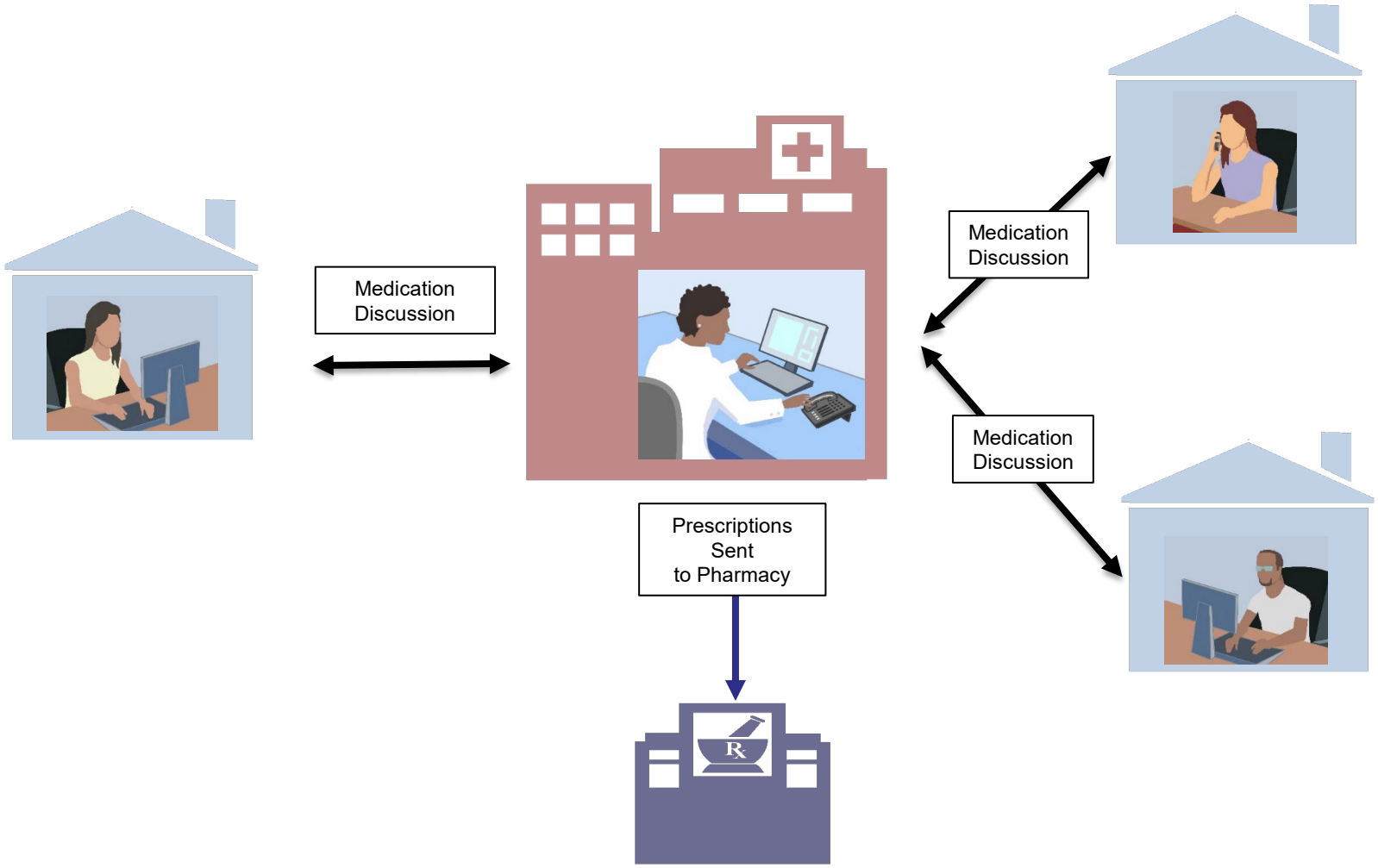
Telehealth:
Remote Access for Tobacco Cessation Assistance



ENDS Treatment

- Ask-Counsel-Treat model (American Academy of Pediatrics)
  - Universal tobacco screening starting at age 11
  - *(Physician can "look-up" devices online to estimate nicotine concentration)*
  - Behavioral treatment can be delivered by in-person, on-line, text
  - Consider off-label use of NRT for patients < 18 years for moderate or severe nicotine dependence
  - Varenicline mixed results – not effective age 12-19, but possibly age 17-19
  - No significant benefit for bupropion in less than age 17

Kaliamurthy, 2022

ENDS Treatment

School-based E-cigarette cessation programs: What do youth want?

- High school youth
- 8 focus groups (4-10 adolescents per group, total N = 62)
  - current and past e-cigarette users in different groups

- Qualitative themes: youth want a vaping cessation program to include:
  - Education about health effects of vaping
  - Relatable personal anecdotes from others
  - Rewards for quitting

- Most frequently endorsed skills - youth want to learn ways to deal with stress (92%), relaxation (60%), and deal with poor concentration (55%)

Bold, 2022

ENDS Treatment

Case report - Successful use of nicotine replacement therapy to quit e-cigarettes

- 24 year-old using tank e-cigarette (16 mg e-liquid)
- Fagerstrom scale for nicotine dependence = moderate
- **Recommended 14 mg patch + with 4 mg nicotine lozenges (approximately 8/day), with strategies for behavioral change**
- After the first week of using both, cut e-cigarette use in half.
- Discontinued the patch after 1 week because felt no control over its dosing
- Continued to use approximately 8 nicotine lozenges (4 mg) per day
- **Six weeks into the program, switched to 4 mg cinnamon nicotine gum, as cinnamon was his preferred e-cigarette flavor**
- **End of 12-week program, he had quit using e-cigarettes entirely**
- Used NRT intermittently for the next 6 months, at which time he discontinued

Silver, 2016

ENDS Treatment – Pilot Study

- Pharmacy-based (n=24); 6-month follow-up; self-report vape-free
- 3 arms – not statistically different abstinence (n=7-9)
  - Vape taper (reducing nicotine concentration and frequency) + Behavior support: **75%** vape-free at 6 months
  - NRT + Behavioral support: **43%** vape-free at 6 months
  - Self-guided (Control – no intervention): **44%** at 6 months

Sahr, 2021

ENDS Treatment

Effectiveness of a Vaping Cessation Text Message Program Among Young Adult e-Cigarette Users

- 2-group, RCT - 2019 to 2020
- 18 to 24 years - past 30-day e-cigarette use, interested in quitting
- Active **intervention** arm (n = 1304) “This is Quitting”, automated text message program for vaping cessation (social support; cognitive and behavioral skills training)
- Primary outcome = self-reported 30-day point prevalence abstinence at 7 months (intention-to-treat - non-responders as vaping)
- Abstinence rates were **24.1%** (95% CI, 21.8%-26.5%) intervention vs. **18.6%** (16.7%- 20.8%) control (**odds ratio, 1.39**; CI 1.15-1.68; p < .001).

Graham, 2021

ENDS Treatment

Pilot feasibility study of a behavioral intervention for nicotine vaping cessation among young adults delivered via telehealth

- Participants (N = 27; ages 17-21) vaping nicotine regularly across the US (2020- 2021)
- Randomized to DynamiCare Health's smartphone app for 4 weeks
  - Financial incentives (**contingency management**) were delivered contingent on abstinent cotinine samples vs. Control participants earned incentives for submitting cotinine, regardless of abstinence.
- CM participants submitted 112/220 (55%) abstinent cotinine samples vs. Monitoring group 4/50 (8%) negative samples.
  - There were no differences in abstinence between groups at end of treatment or follow-up.
- Pilot study demonstrated preliminary feasibility and acceptability.
- **CM for young adult vaping cessation is promising but requires powered trials to assess efficacy**.

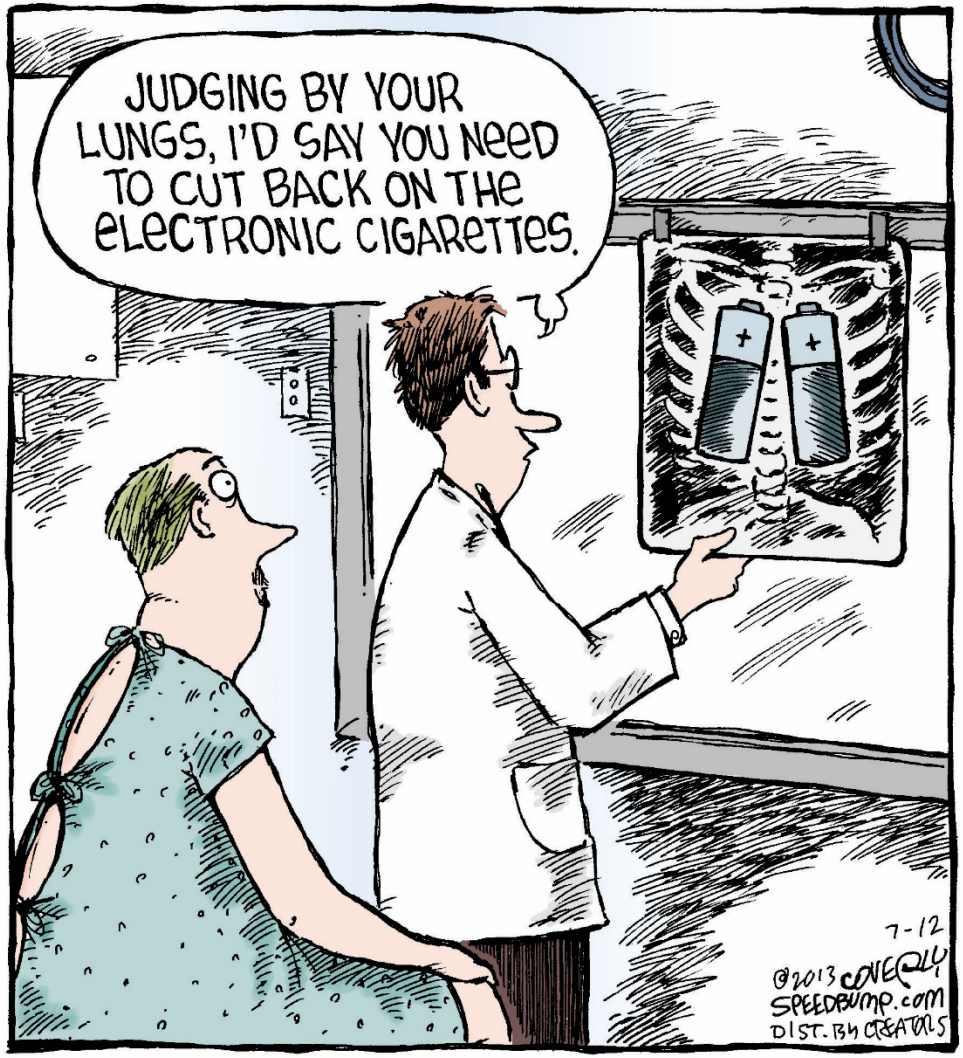
Palmer, 2022

Reasonable Approach

- Assess use patterns – quantity, triggers, associations
- Estimate level of dependence – instrument or clinically
- Tailored treatment plan
  - Initial pharmacotherapy plan
    - Short acting NRT provides flexibility
    - Patch good for baseline
    - Varenicline and bupropion reasonable – consider age of ENDS user
  - Unique behavioral/trigger/social considerations for ENDS
  - Adjunct treatment components
    - Text, Web-based, Telehealth, ? Group treatment, Contingency management
  - Follow-up

Conclusions

- Nicotine misperceptions are common and need to be corrected
- ENDS can deliver substantial levels of nicotine and produce significant dependence
- Long-term safety profile of ENDS is not yet established, but even if they are substantially less harmful than combusted tobacco, it is unlikely that their use is without health impact
- Limited data on most effective strategies for specifically treating ENDS use
- However, reasonable to apply the well-established, evidence-based methods for other tobacco products
  - Pharmacotherapy – NRT, ? Varenicline, ? Bupropion
  - Counseling/behavioral change
  - Support and follow-up


JUDGING BY YOUR LUNGS, I'D SAY YOU NEED TO CUT BACK ON THE ELECTRONIC CIGARETTES.
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Q&A

- Submit questions via the **‘Ask a Question’ box**

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For our California residents, SCLC offers regional trainings, online education opportunities, and technical assistance for behavioral health agencies, providers, and the clients they serve throughout the state of California.

For technical assistance please contact (877) 509-3786 or Jessica.Safier@ucsf.edu.

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  - ✓ Other resources as needed

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SCLC's next live webinar is entitled, "***Illuminating a path forward for Tobacco Nation: Projected impacts of recommended policies on geographic disparities***" with Emily Donovan, MPH, Truth Initiative and Michael Maciosek, PhD, HealthPartners Institute

- **Thursday, November 10, 2022, 1:00 – 2:00 pm EST**
- Registration is open

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