

Welcome to DH Learning Collaborative

- *As you join you will be promoted to presenter.*
- *You will be muted.*
- *Please unmute yourself by clicking on the microphone icon for asking questions and participation in discussions.*
- *You may also put your questions and comments in the Chat box.*
- *We encourage active participation!*

Monthly Webinars

- ***Virtual CO MAT Learning Forum***

1st Thursday 12:30pm-1:30pm

[REGISTER](#)

- ***Induction Basics: Tips from the Trenches****

2nd Tuesday 7:30am-8:30am

[REGISTER](#)

*
same topic each month

- ***Denver Health Learning Collaborative***

3rd Wednesday 12:15pm-1:15pm

[REGISTER](#)

Denver Health Addiction Journal Club

Scheduled dates for 2020

- *Every fourth Tuesday January-October MARCH CANCELLED*
- *November 10th*
- *December 8th*

Time; noon to 1 pm

To join; email ITMATTTRs2@UCDENVER.EDU

- See our website for previous presentations & resources as well as upcoming topics
 - <https://www.practiceinnovationco.org/opioids/mat-forum/>

Vaping

The New Tobacco Crisis

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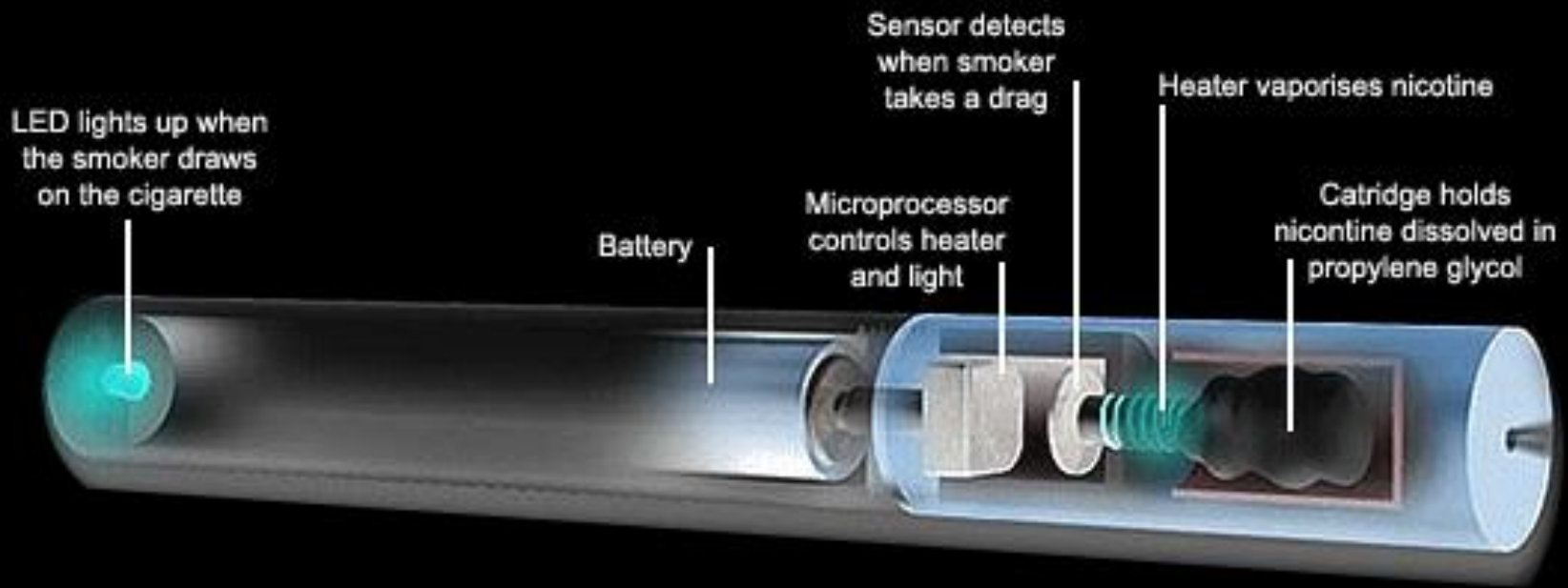


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Overview of talk

- Basics of e-cigarettes
- The rise of e-cigarettes use in youth and its consequences
- Emerging Health consequences of vaping
- Vaping in Adults
- The role of electronic cigarettes in smoking cessation
- Electronic cigarettes and marijuana

Electronic cigarettes –Electronic Nicotine Delivery Systems (ENDS)



Juul Closed Tank (pod) System – nicotine prepackaged with flavoring



Open tank systems (starter kits)

- Open tank systems can be filled with any oil-based substance (e-juice) including marijuana oil
 - 1/3 of adolescents who vape have used marijuana in the E-cigarettes



Several thousand types of flavored e-juice available for purchase

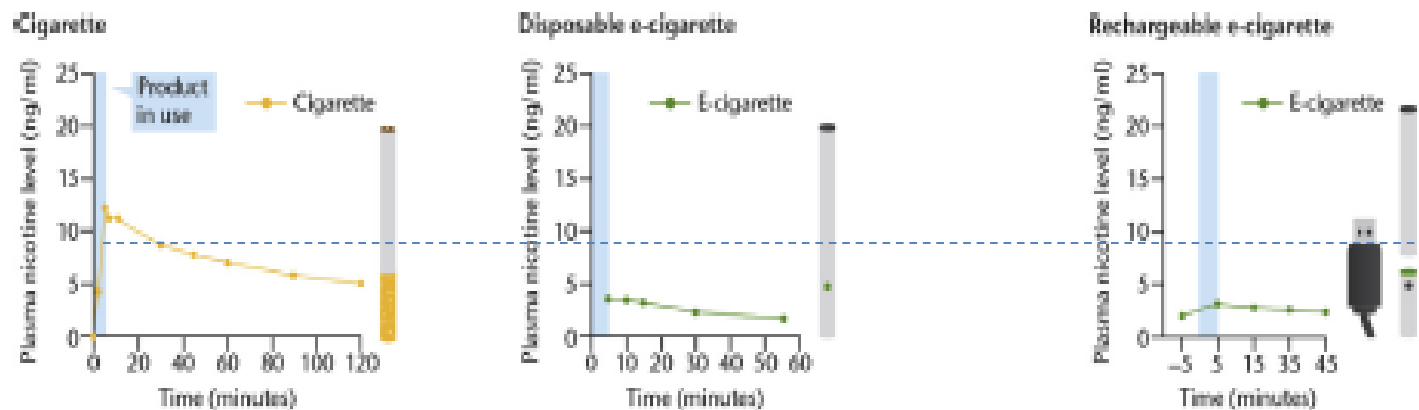


Box Modulator systems (Vap Mods, Box Mods)

- Open tank systems
- Use large batteries
- Control heat
 - Higher heat means finer vapor particles, greater vapor intake and absorption



1st generation E-cigarettes (2007 – 2013) resulted in much lower nicotine plasma levels compared to cigarettes



No market for product with little nicotine content

Current generation E-cigarettes (2013 – current) associated have higher levels of nicotine in blood compared to cigarettes

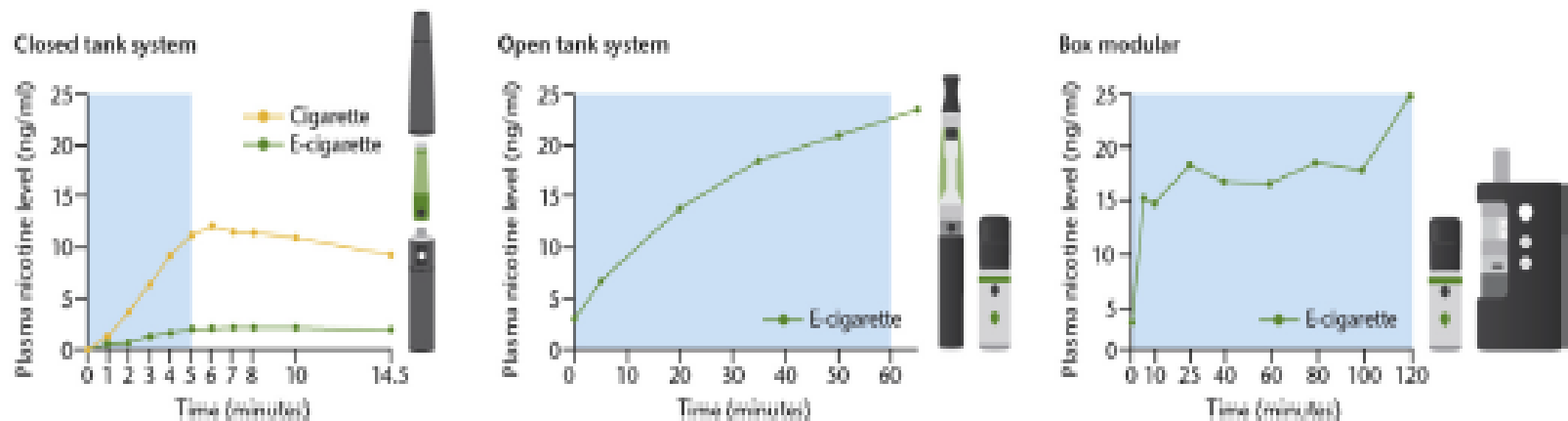
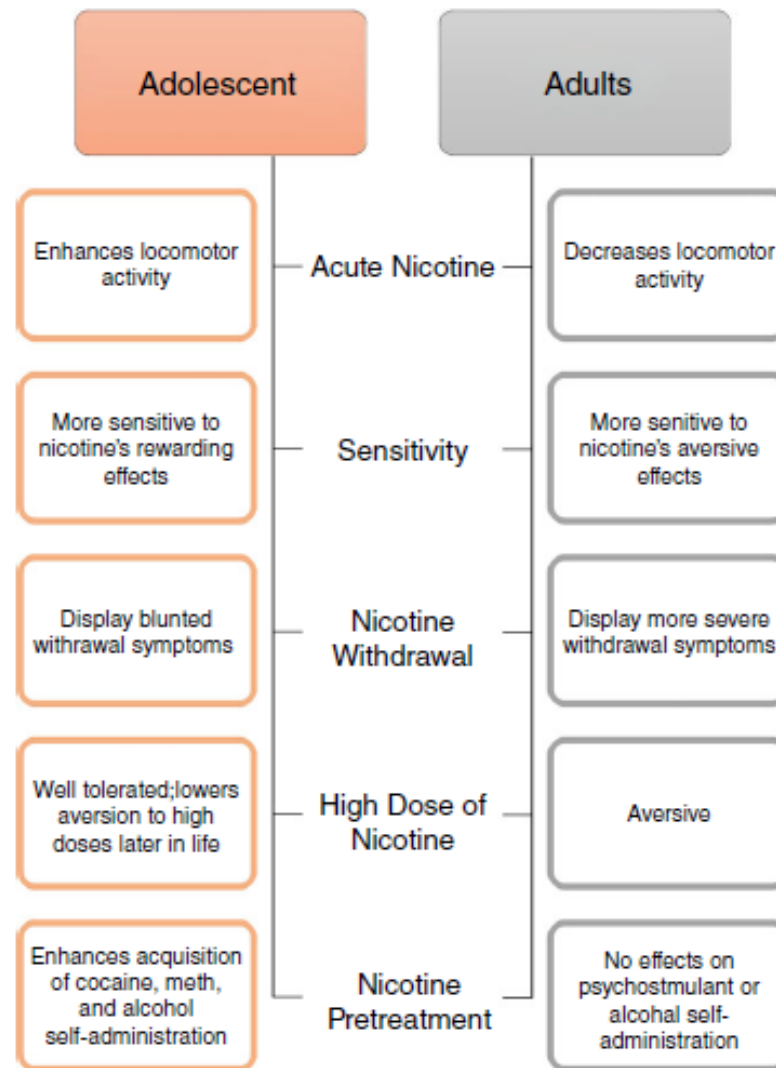
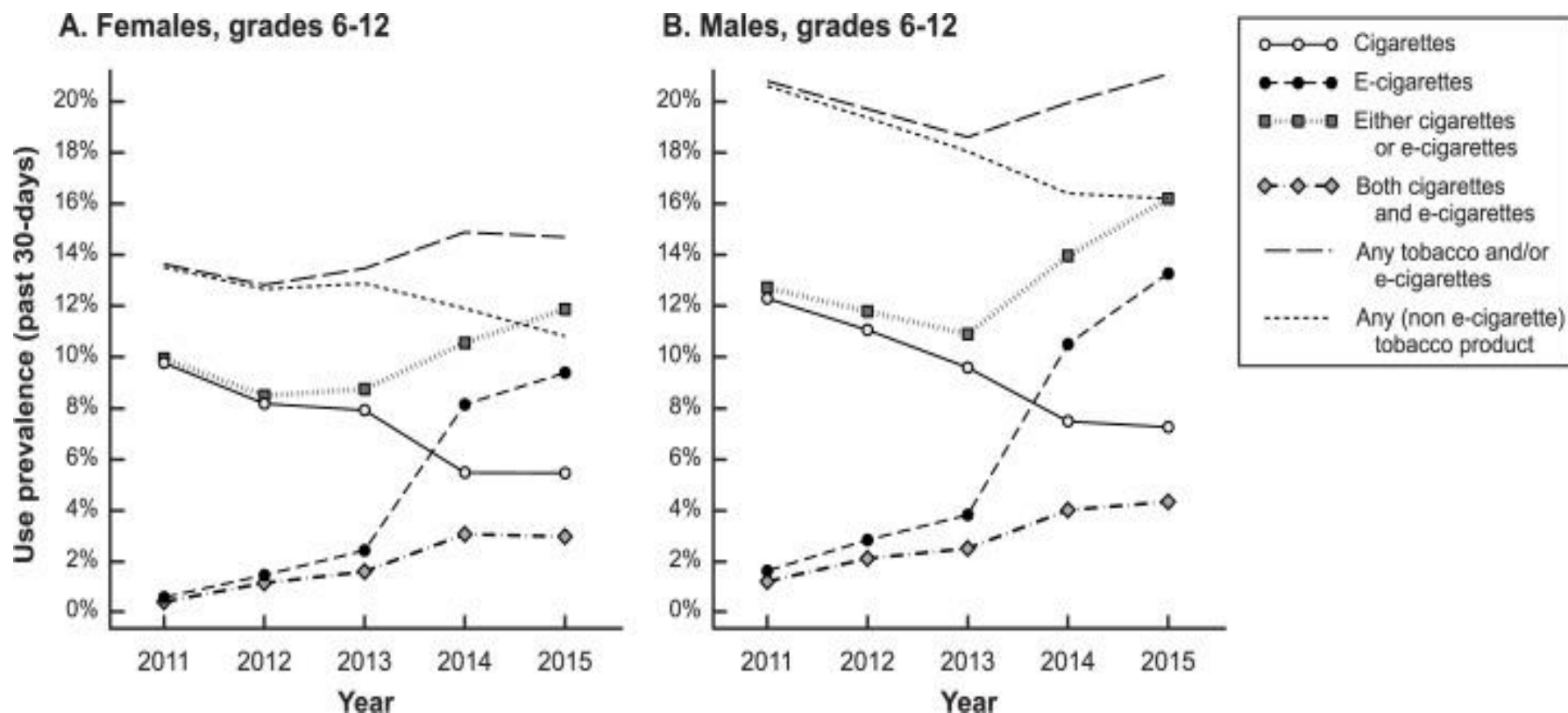


Fig. 2. Typical plasma nicotine levels observed during nicotine pharmacokinetic studies with combustible cigarettes and various types of e-cigarettes.

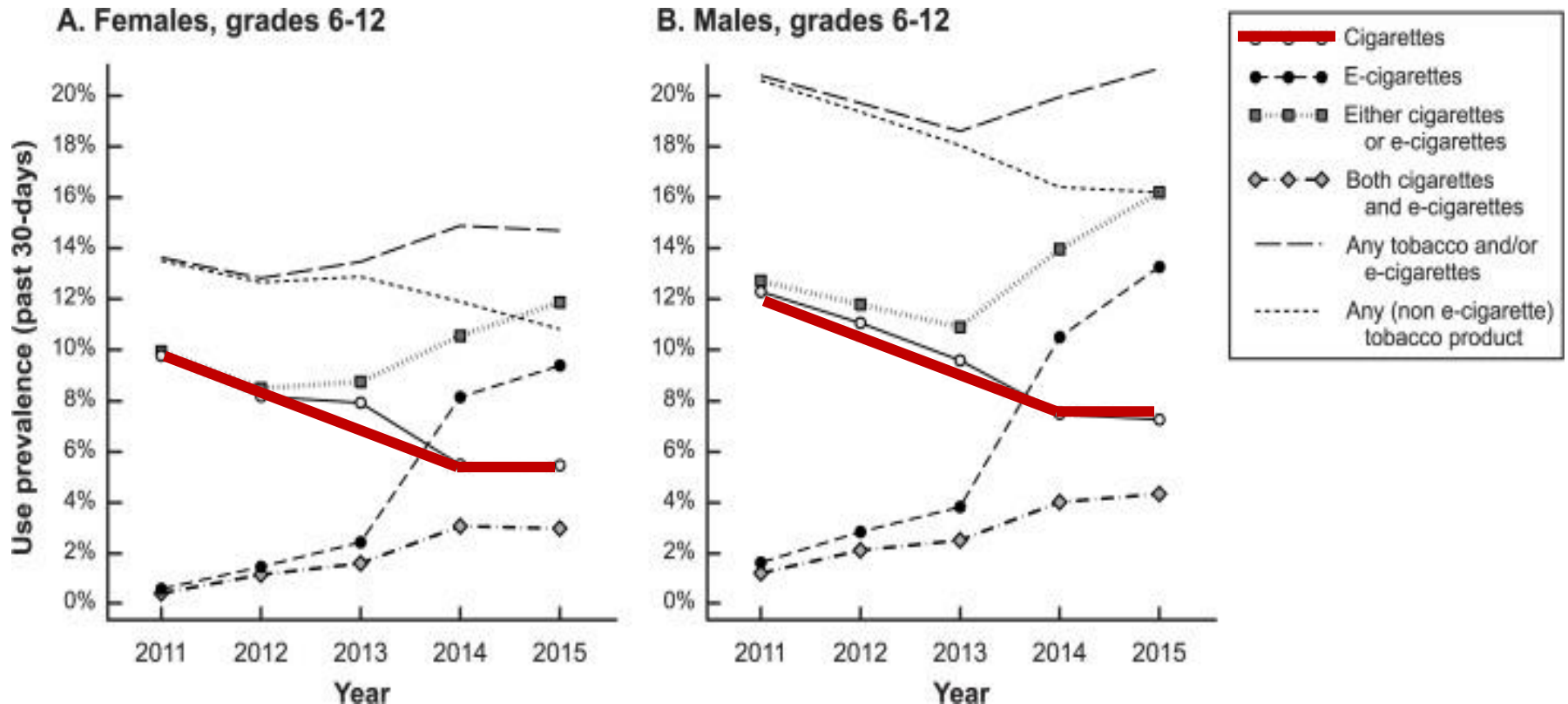
Nicotine effects adolescent brain differently than the adult brain



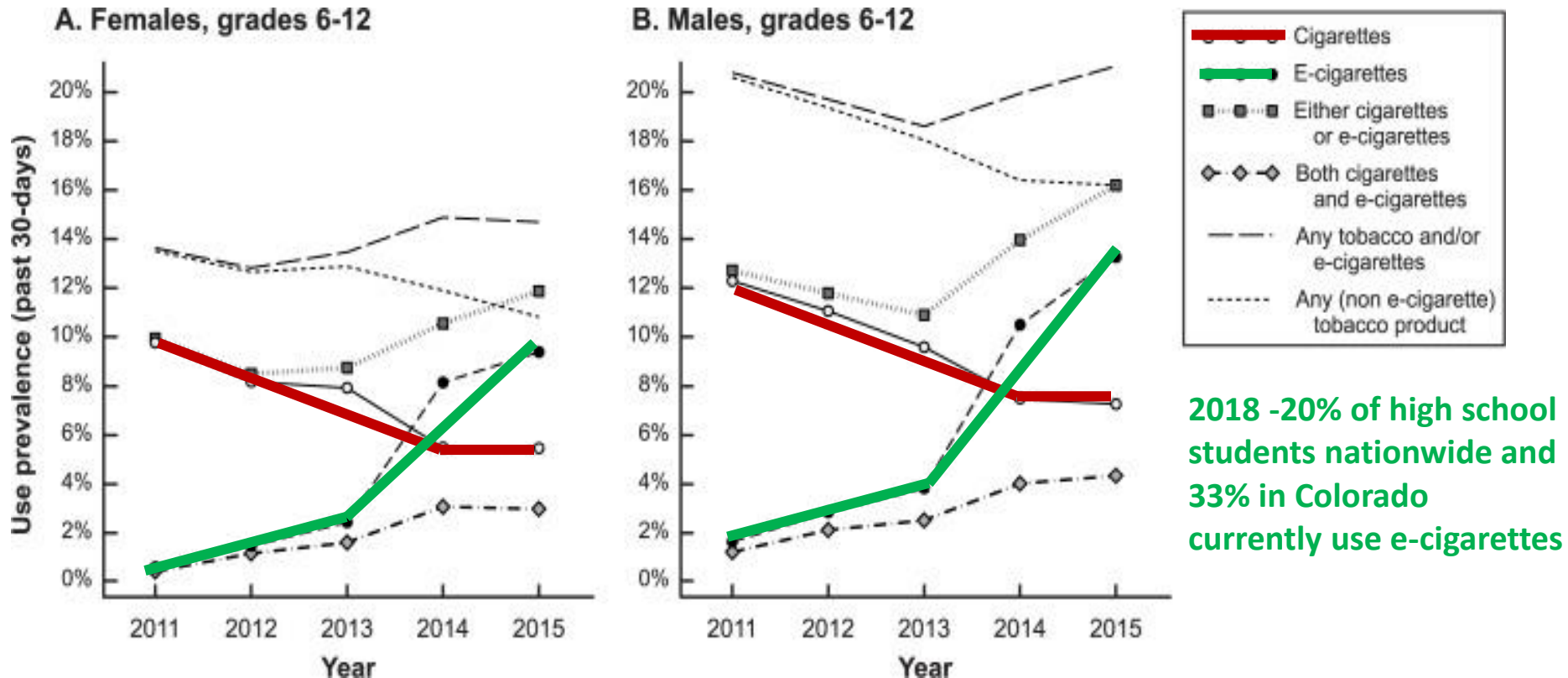
E-cigarettes increase tobacco use among US adolescents



In 2015 –First time in 30 years that smoking has not declined in adolescents

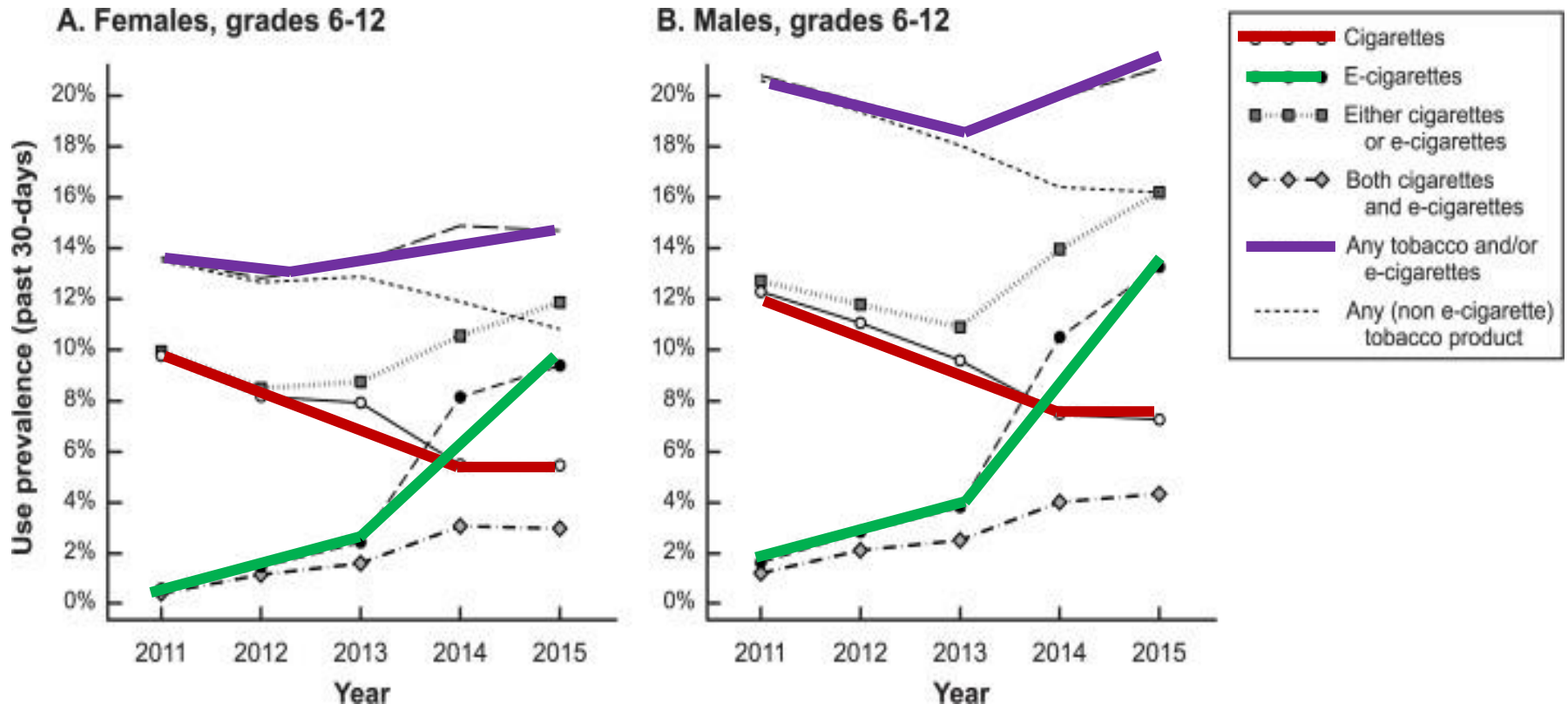


E-cigarette use started spiking in 2015



- [PLoS One](#). 2017; 12(5): e0177073.
- Int J Environ Res Public Health. 2019 Aug 20;16(16)
- MMWR / November 16, 2018 / 67(45);1276–1277

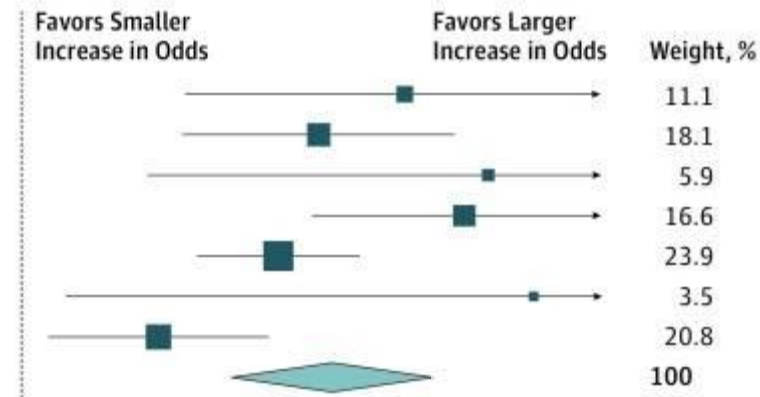
First time in 30 years -overall tobacco use has increased in adolescents.



Adolescents who have vaped are 3.5 x more likely to start smoking than those who have never vaped.

Drag image to reposition.

Source	Probability of Cigarette Smoking Initiation, %		Unadjusted OR (95% CI)	Adjusted OR (95% CI)
	Ever e-Cigarette Users	Never e-Cigarette Users		
Miech et al, ¹⁰ 2017	31.1	6.8	6.23 (1.57-24.63)	4.78 (1.91-11.96)
Spindle et al, ⁹ 2017	29.4	10.6	3.50 (2.41-5.09)	3.37 (1.91-5.94)
Primack et al, ²² 2016	37.5	9.0	6.06 (2.15-17.10)	6.82 (1.65-28.22)
Barrington-Trimis et al, ⁸ 2016	40.4	10.5	5.76 (3.12-10.66)	6.17 (3.29-11.57)
Wills et al, ⁷ 2016	19.5	5.4	4.25 (2.74-6.61)	2.87 (2.03-4.05)
Primack et al, ⁶ 2015	37.5	9.6	5.66 (1.99-16.07)	8.30 (1.19-58.00)
Leventhal et al, ⁵ 2015	8.8	3.1	2.65 (1.73-4.05)	1.75 (1.10-2.78)
Total	23.2	7.2	3.83 (3.74-3.91)	3.50 (2.38-5.16)



Vaping as part of popular youth culture - Cloud chasing using a Box Mod



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Vaping as part of youth culture – stealth vaping



Evidence emerging that vaping is associated pulmonary symptoms in adolescence

- 2086 students in southern California who reported on vaping use followed from 2008 to 2014
- 501/2086 reported either past or current vaping
- 368/2086 students reported chronic bronchitis symptoms

Among 2086 11th and 12th graders

-Vaping associated with chronic bronchitis symptoms

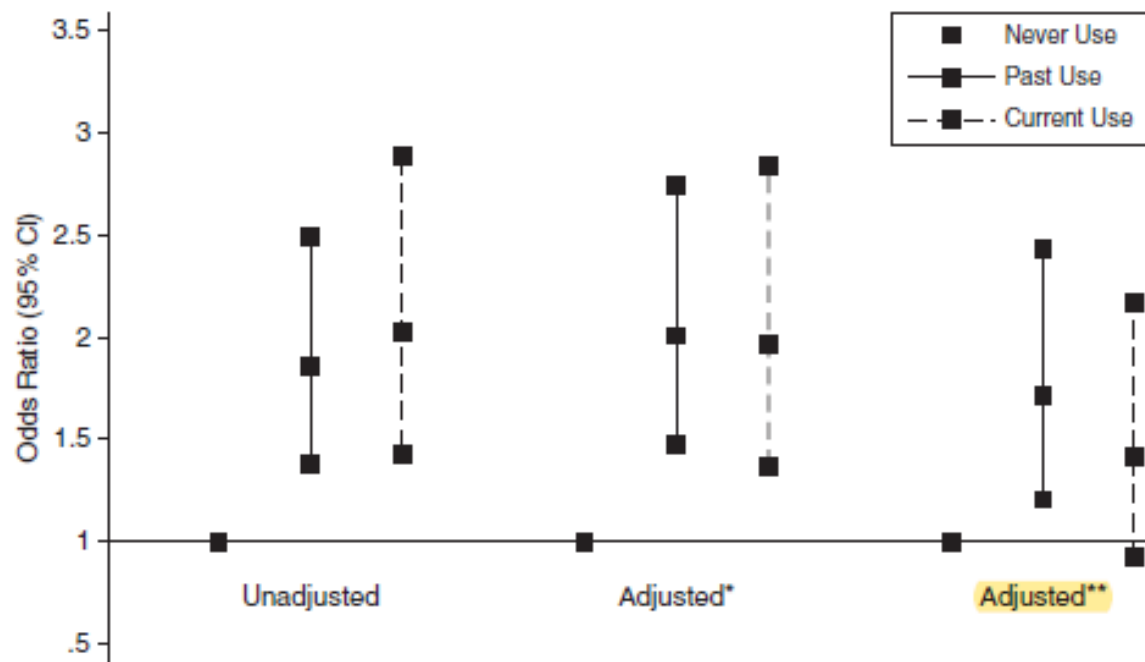


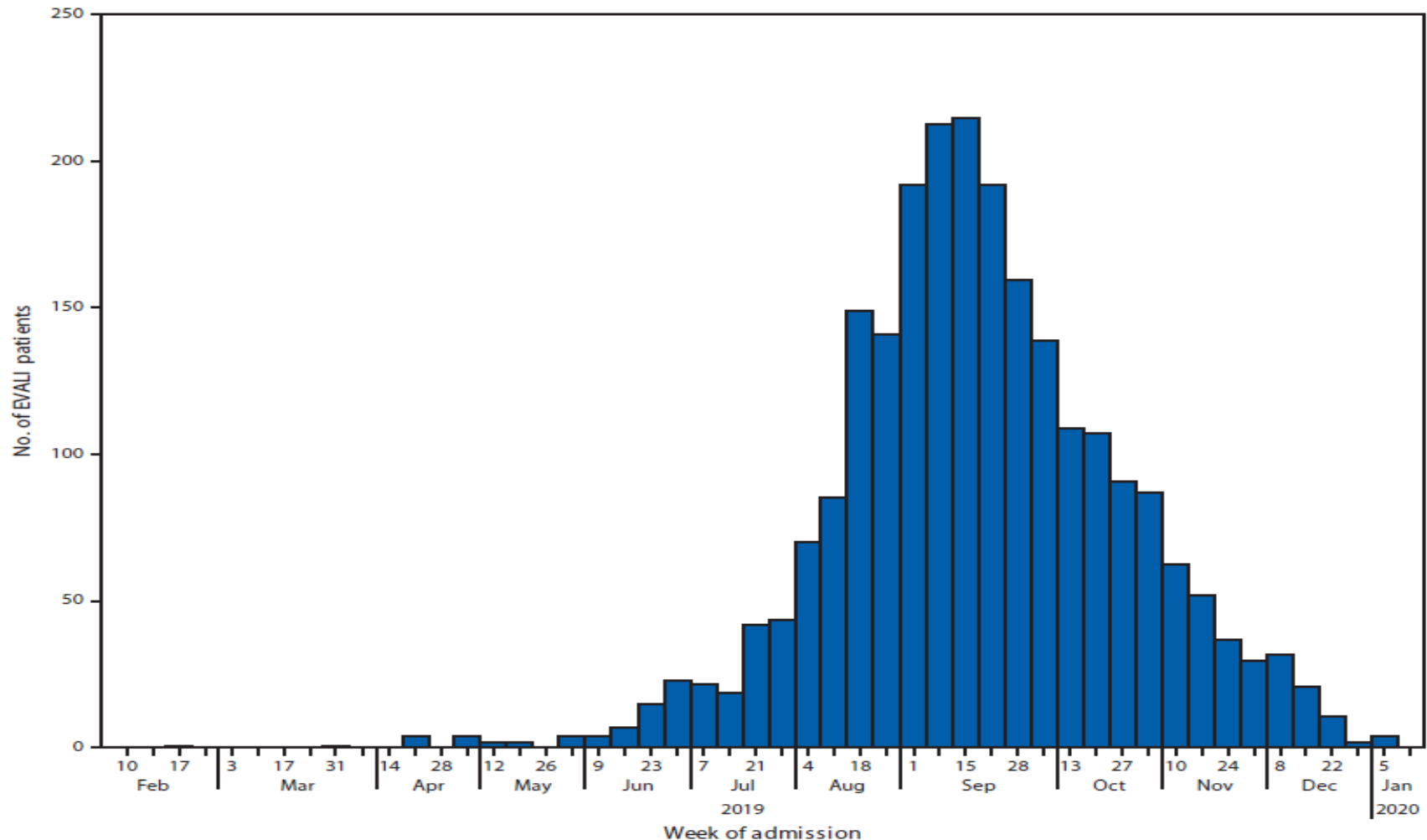
Figure 1. Association of current and past electronic cigarette use with bronchitis, adjusted for sociodemographic characteristics, smoking history, and secondhand tobacco smoke exposure (n = 1,922). *Adjusted for sex, ethnicity, parental education, and community. **Adjusted for sex, ethnicity, parental education, community, secondhand smoke, and lifetime number of cigarettes smoked. CI = confidence interval.

New cases of vaping associated lung injury (3/31/19 and 1/5/20)

- 2668 cases of acute lung injury requiring hospitalization
 - By age group category:
 - Median age 24
 - 76% under 35
 - 15% under 18
- 68 deaths in 29 states*
- 82% vaped THC product
- 57% vaped nicotine product
- 41% vaped both nicotine and THC

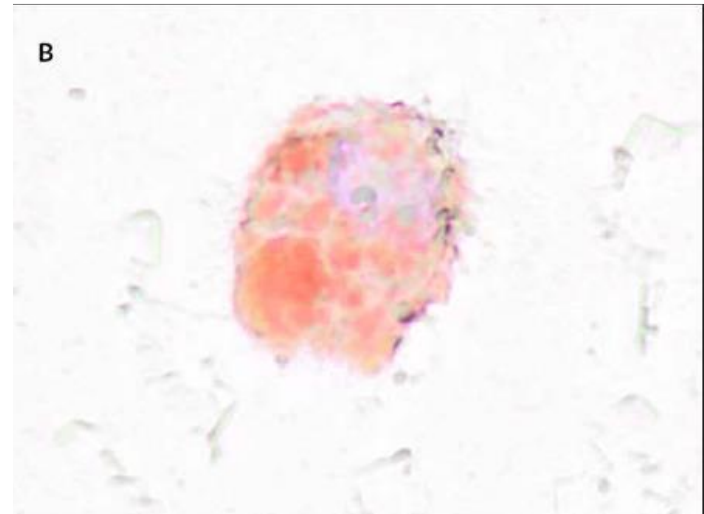
Dates of symptom onset and hospital admission for patients with lung injury associated with e-cigarette use, or vaping — United States, March 31– January 5, 2020

FIGURE 1. Number of patients (N = 2,398) with e-cigarette, or vaping, product use–associated lung injury (EVALI) by week of hospital admission — United States, February 10, 2019–January 14, 2020



Vaping associated various forms of lung injury

- Lipoid pneumonia



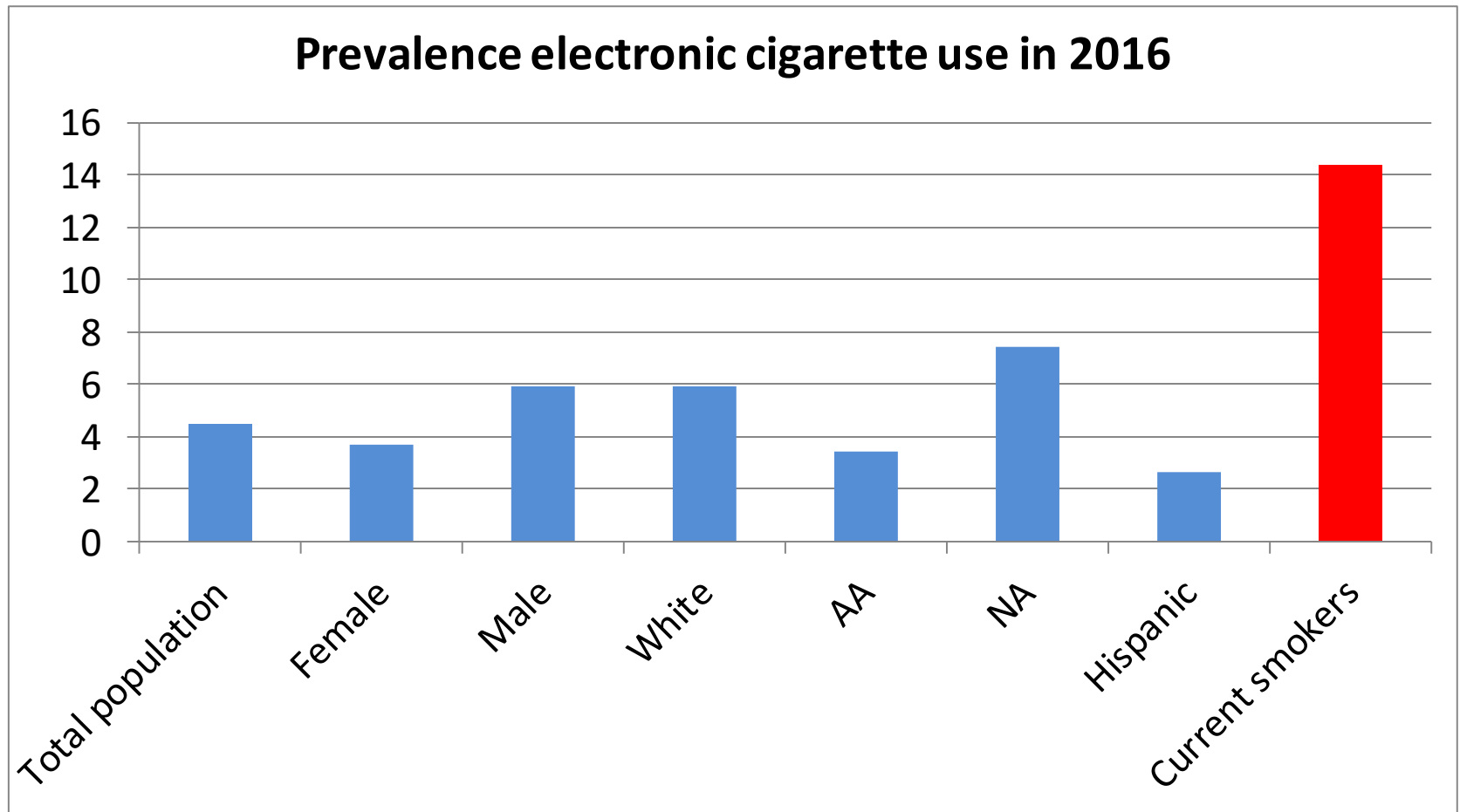
- Non-lipoid pathology
 - fibroblast plugs, hyaline membranes, fibrinous exudates, type 2 pneumocyte hyperplasia, and interstitial organization.

Most, but not all, studied cases linked to vitamin E acetate

- Viscous supplement to cosmetic lotions
- Can thicken and dilute oil based substances at the same time
- Inhalation can cause lipid pneumonitis



Most Adults E-cigarette users in U.S. in also smoke



1ST generation E-cigarettes NOT associated with increased quitting success among Quitline users

- Study of 2476 smokers from 6 states calling the Quitline between June 2011 and March 2012.
 - 30.9% reported past or current use of electronic cigarettes

	Total	Used e-cigarette: 1 month or more,	Used e-cigarette: less than 1 month,	Never used e- cigarettes,	
Charecteristics	(N = 2,476)	n = 273 (11.3%)	n = 439 (18.1%)	n = 1,711 (70.6%)	P-value
Mean cpd ± SD	18.4 ± 11.2	19.4 ± 11.6	18.9 ±10.6	18.1 ±11.2	0.88
7 month survey response					
30 day sustained quit rate	27%	21.7%	16.6%	31.3%	<0.01

A recent study showed e-cigarettes more effective than nicotine replacement therapy for quitting smoking –WITH ONE BIG CAVEAT

- 886 Smokers
- Randomized to either 3 months of nicotine replacement therapy or 1 E-cigarette starter pack (smoker would purchase remaining e-cigarette cartilages)

Recent study show e-cigarettes more effective than nicotine replacement therapy –WITH ONE BIG CAVEAT

Table 2. Abstinence Rates at Different Time Points and Smoking Reduction at 52 Weeks.*

Outcome	E-Cigarettes (N = 438)	Nicotine Replacement (N = 446)	Primary Analysis: Relative Risk (95% CI)†	Sensitivity Analysis: Adjusted Relative Risk (95% CI)
Primary outcome: abstinence at 52 wk — no. (%)	79 (18.0)	44 (9.9)	1.83 (1.30–2.58)	1.75 (1.24–2.46)‡
Secondary outcomes				
Abstinence between wk 26 and wk 52 — no. (%)	93 (21.2)	53 (11.9)	1.79 (1.32–2.44)	1.82 (1.34–2.47)§
Abstinence at 4 wk after target quit date — no. (%)	192 (43.8)	134 (30.0)	1.45 (1.22–1.74)	1.43 (1.20–1.71)¶
Abstinence at 26 wk after target quit date — no. (%)	155 (35.4)	112 (25.1)	1.40 (1.14–1.72)	1.36 (1.15–1.67)‡
Carbon monoxide–validated reduction in smoking of ≥50% in participants without abstinence between wk 26 and wk 52 — no./total no. (%)	44/345 (12.8)	29/393 (7.4)	1.75 (1.12–2.72)	1.73 (1.11–2.69)

The Big Caveat -Smokers who quit smoking with e-cigarettes are still using nicotine at the end of one year.

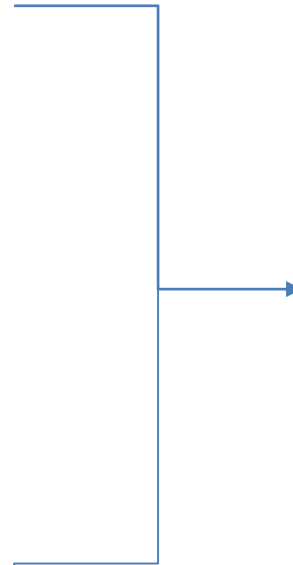
	Smokers abstinent at 1 year	
	E-cigarettes (79)	NRT (44)
Number still using product	63	4

Vaping associated with relapse in those who have previously quit

- 3210 smokers
- Median time quitting smoking: 18 months

	Prevalence of relapse in %	Adjusted Odds Ratio
Never e-cigarette user	1.8	Reference
Prior e-cigarette user	10.4	2.00 (1.25 to 3.20)
Current e-cigarette use	15	3.77 (1.48 to 9.65)

Vaping marijuana oil (e-juice) – either made your self or illicitly purchased



Cutting agent: any oil (like vitamin e acetate) to make
e-juice more thick/less and more palatable to smoker

Marijuana oils purchased on-line or in vape shops (where legal)



High concentrate marijuana wax can be vaped also (dabbing)



A Call to Action

- No validated treatment to help vapers quit – especially adolescent vapors.
- Health care providers need to spread message about dangers of vaping.

Thank You

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- LinkedIn: Ali Zirakzadeh
- <https://www.bostonglobe.com/2019/12/17/opinion/i-nearly-died-vaping/>
- <https://www.nytimes.com/2019/11/23/health/juul-vaping-crisis.html>
- <https://www.denverhealth.org/blog/2019/12/the-teen-vaping-crisis>

QUESTIONS / DISCUSSION

Webinars

See our website for previous presentations & resources as well as upcoming topics

- <https://www.practiceinnovationco.org/opioids/mat-forum/>

The screenshot shows a web browser at the URL <https://www.practiceinnovationco.org/opioids/mat-forum/>. The website header includes the Practice Innovation Program Colorado logo and navigation links: MAT TEAM TRAINING, 6 BUILDING BLOCKS, PROVIDER WAIVER TRAINING, EXPERT SUPPORT, and RESOURCE HUB. The main content area features two sections:

Virtual Colorado MAT Learning Forum

Please credit the presenter for any slides you choose to use in your own presentations.

Suboxone Initiation: Home vs Office	+
MAT selection: Naltrexone, Buprenorphine or Methadone (incl CO-SLAW intro)	+
Buprenorphine Dose Stabilization & Maintenance	+
The Difficult Patient & Discharge from MAT – How to Maintain the Therapeutic Relationship	+
MAT Induction: Tips and Techniques	+
Boring but Necessary: Billing and Coding for OUD Treatment	+
Perinatal Addiction Medicine: Pearls and Updates	+
Stimulant Use: Current State of the Evidence	+

Denver Health Learning Collaborative

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Reviewing the Data from the 2018 National Survey on Drug Use and Health	+
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