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# Legal Cannabis: Implications for the Practicing Psychiatrist

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Adult, Child, and Adolescent Psychiatrist  
Addiction Medicine Physician

# Disclosure Information

I do not have any relevant disclosures to report.

I will not be discussing the use of off-label medications.

# Practice Setting

## The ASAM Criteria Continuum of Care: Adolescent

	Adolescent Specific Levels of Care		Adult/Youth Medically Managed Levels of Care	
Level 4: Inpatient			4 4 Psych	Medically Managed Inpatient
Level 3: Residential	3.5Y Youth Residential		3.7 3.7 COE 3.7 BIO	Medically Managed Residential
Level 2: Intensive Home and Community Based	2.1Y Intensive Home and Community Based	2.5Y High Intensity Home and Community Based	2.7 2.7 COE	Medically Managed Intensive Outpatient
Level 1: Outpatient	1.0Y Long term remission monitoring	1.5Y Youth and Family Outpatient	1.7 1.7 COE	Medically Managed Outpatient
Therapeutic Foster Home	TF Therapeutic Foster Home	The Adolescent Dimensional Admission Criteria may recommend any medically managed level in the Adult Continuum of Care		

# Objectives

- Describe the landscape of cannabis policy across the country.
- Describe trends and impact of legalization of medical and recreational cannabis.
- Describe current trends in adolescent and young adult cannabis and nicotine vaping use including potency, delivery methods, and associated health risks.
- Identify early signs of problematic use and discuss screening tools appropriate for adult and adolescent populations.



# Patient Jacob

23yo M with history of depression, anxiety, insomnia who present for psychiatric evaluation. Is interested in medication for sleep and maybe mood. Reports excessive worry, restlessness, sadness and anhedonia. States it takes him “hours” to fall asleep at night and his schedule of sleep currently is “2am to 12pm”. Lives at home with his parents, graduated high school, considering applying for disability due to mental health symptoms. Sometimes works as a DoorDasher. No current medications.



# Screening, Brief Intervention, Referral

## WHAT IS SBIRT?

**The SBIRT process includes:**



1. **SCREENING** to identify a person's risk for a substance use challenge.
2. **BRIEF INTERVENTION (BI)** to raise a person's awareness of risks, elicit internal motivation for change, and help set behavior-change goals.
3. **REFERRAL TO TREATMENT** to facilitate access to and engagement in specialized services and coordinated care for people at highest risk.

+ LOW RISK  
PHARMACOTHERAPY

# Screening Assessment: CAGE-AID



## CAGE-AID Screening Tool

**insight**  
Centre for alcohol and other drug  
training and workforce development

When thinking about substance use over the past 3 months, include any drug use and the use of prescription drug use other than prescribed.

\*Including nicotine

<b>C</b>	Have you ever felt the need to <b>cut</b> down on your drinking or drug use?	Yes	<input checked="" type="radio"/> No
<b>A</b>	Have people <b>annoyed</b> you by criticising your drinking or drug use?	Yes	<input checked="" type="radio"/> No
<b>G</b>	Have you ever felt <b>guilty</b> about drinking or drug use?	Yes	<input checked="" type="radio"/> No
<b>E</b>	Have you ever felt you needed a drink or used drugs first thing in the morning to steady your nerves or to get rid of a hangover ( <b>eye-opener</b> )?	<input checked="" type="radio"/> Yes	No

**Scoring:** One or more "yes" responses is regarded as a positive screening test, indication possible substance use and need for further evaluation.

## Intake Questionnaire:

- ☒ Nicotine
- ☒ Alcohol
- ☒ Marijuana
- ☐ Other Street Drugs
- ☐ History of Substance Treatment

# Patient Jacob

Tell me a little bit about your use of nicotine, alcohol, and marijuana...



*I used to smoke cigarettes, about ½ pack per day. Now I use a combination of a vape and Zin pouches. I use alcohol on the weekends when I'm playing video games with friends online. A few beers. I smoke marijuana to help me with sleep. It is for medicinal purposes. I also use it for my anxiety and depression. I've never had a problem with them.*



Source: <https://us.zyn.com/>

# Patient Jacob

What else do you want to know about the substance use?

What does it help with? Any problems with it?

Has he ever tried to stop using nicotine or marijuana?

What does he see as his future with nicotine and marijuana?

Marijuana for medical purposes? What else has he tried?

How often does he use the marijuana? Just sleep?

How long has he been using marijuana?

What marijuana products?

How does he use marijuana?





# Patient Jacob

Describes use of flower via bowl every evening. Estimates about a bowl a day. Not sure the THC potency in the product he buys. Does not notice anything negative about it. When asked, describes tolerance but not withdrawal. Open to stopping daily use “if I have something to help me sleep”. Does not plan to be abstinent completely.



# Patient Jacob

He isn't really concerned about his nicotine use. He was told by his PCP that it was better to use vapes or pouches as compared to tobacco.

*Maybe some day I'll stop... I have bigger problems right now.*



Source: people.com and qq.com via google images

# Patient Jacob



What management ideas do you have for Jacob's sleep?

Do you recommend marijuana cessation first?

How will you handle his marijuana use and prescribing?

Does he need an addiction treatment program? How do you know?

If you prescribe something for sleep, what education will he need as a marijuana user?

Are there any medications that might help him decrease his cannabis use?



# PATIENT ELI

17yo male 11<sup>th</sup> grader at nearby private school with history of ADHD who presents for appointment after being caught vaping at hockey practice. Parents state school needs a letter stating patient is “cleared” to return to school and sports.



# Schools are putting vape detectors in bathrooms -- paid for by Juul



By **Scott Neuman**

Published September 12, 2024 at 6:00 AM EDT



The vape detectors, which resemble home smoke detectors and cost about \$1,000 each, send an email or text message to school officials every time vape smoke is detected — including cannabinoid THC or CBD. They also detect loud noises that might indicate a fight has broken out and can signal staff if someone tampers with them. Vape detectors are often integrated with security cameras in halls and other public areas, so if a staff member can't respond immediately, they might still be able to identify a student who has been vaping.

# Screening Assessment S2BI



Discuss the plan for communication of results if a teen.

## WHO SHOULD BE SCREENED?

**Universal screening for alcohol and substance use should be performed with all adolescents aged 12 and older.**

### S2BI: SCREENING TO BRIEF INTERVENTION

In the past year, how many times have you used:

- **Tobacco?** (Cigarettes, e-cigarettes, vapes etc.)
- **Alcohol?**
- **Marijuana?** (Smoked, vaped, edibles, etc.)

**STOP** if all “Never.” Otherwise **CONTINUE**

- **Prescription drugs that were not prescribed for you** (pain medication, Adderall, etc.)
- **Illegal drugs?** (Cocaine, Ecstasy, etc.)
- **Inhalants?** (Nitrous oxide, etc.)
- **Herbs/synthetic drugs** (Salvia, K2, bath salts, etc.)

☐ **Never**

☐ **Once or twice**

☐ **Monthly**

☒ **Weekly or more**

Copyright Acknowledgment: The S2BI is protected under a Creative Commons NonCommercial license, which means it is free to use and distribute as long as you are 1) not using it for commercial purposes (making any profit off of your use) and 2) the following attribution is used: © Boston Children's Hospital 2014. All rights reserved. This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

Source: <https://www.ysbirt.org/>

# PATIENT ELI

Eli reports he vapes nicotine daily — described as “all day” at home and at school.

He reports he recently started using a vape with THC in it to help with falling asleep after hockey 3 days a week. He uses it on the weekends a few times a month during the day by himself and with friends.



Source: Chicken Strip/Alamy



# Diagnosing Cannabis Use Disorder



Substance use disorders and other addictions – History, definitions and diagnosis

## DSM-5 diagnostic criteria for substance-use disorders

The DSM-5 criteria for substance-use disorder broadly include 11 items

A problematic pattern of substance use leading to clinically significant impairment or distress, as manifested by  $\geq 2$  of the following, occurring within a 12-month period

- 1 **Drug** is taken in larger amounts or over a longer period than intended
- 2 There is a persistent desire or unsuccessful effort to reduce **drug use**
- 3 A great deal of time is spent in activities necessary to obtain, use, or recover from the **drug**
- 4 Craving for the **drug**
- 5 Recurrent **drug use** resulting in a failure to fulfill major obligations at work, home, or school
- 6 Continued **drug use** despite persistent or recurrent social or interpersonal problems caused by drug use
- 7 Important activities are given up or reduced because of **drug use**
- 8 Recurrent **drug use** in situations where it is physically hazardous
- 9 Continued **drug use** despite knowledge of having a persistent or recurring physical or psychological problem that is likely to have been caused by or exacerbated by the **drug**
- 10 Tolerance to the **drug**
- 11 Withdrawal: either experiencing a **drug withdrawal syndrome** or taking **drug** to relieve or avoid the withdrawal syndrome

Severity Level:

Mild: 2-3

Mod: 4-5

Sev: 6+

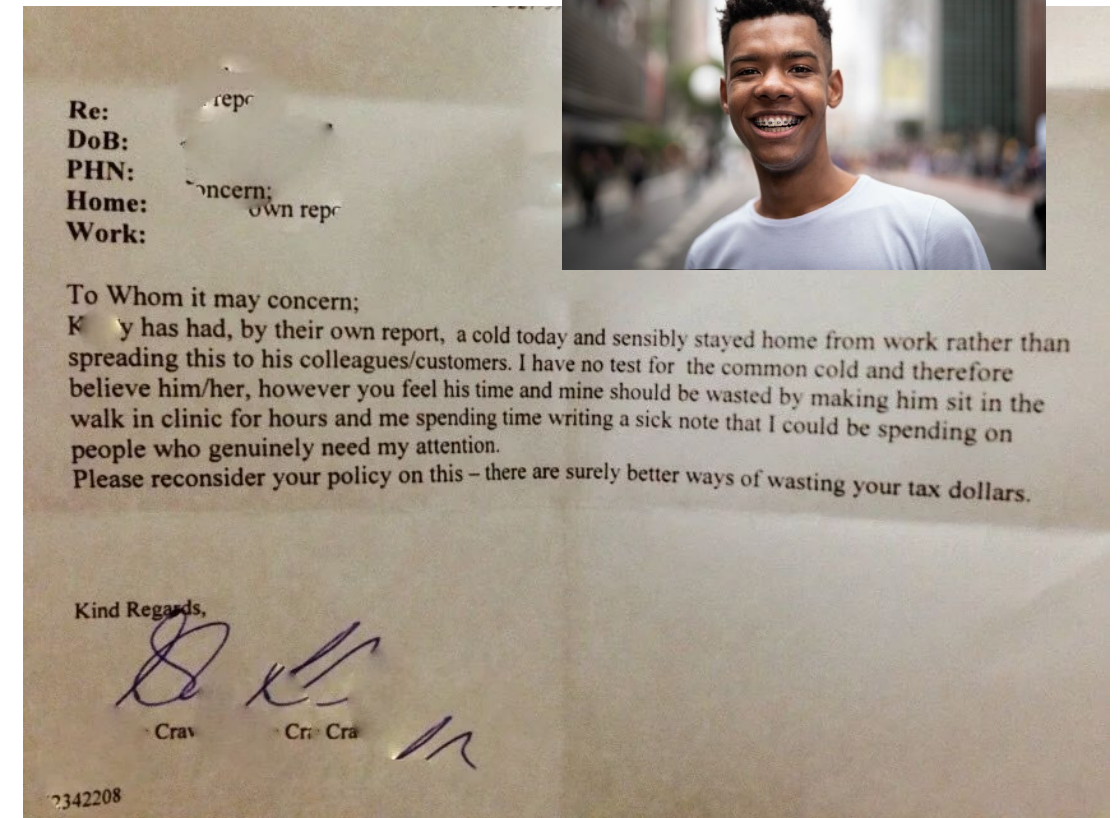
# Planning: Is Eli Cleared for School and Hockey?

Plan communication with patient.

Share diagnoses with family.

What is the letter supposed to say?!

Do you need to send him for an ASAM SUD Assessment? Can you do it?



# Planning: In Office Next Steps?

Patient is prescribed long-term Adderall XR for ADHD....

Does this change anything?

What do you do about the nicotine use?

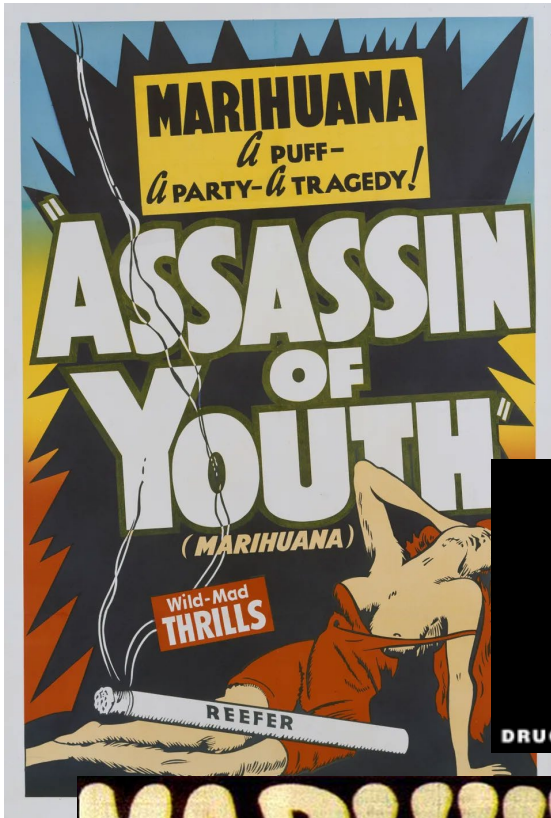
Do you prescribe medications to assist with cannabis and nicotine cessation?

Follow-up?



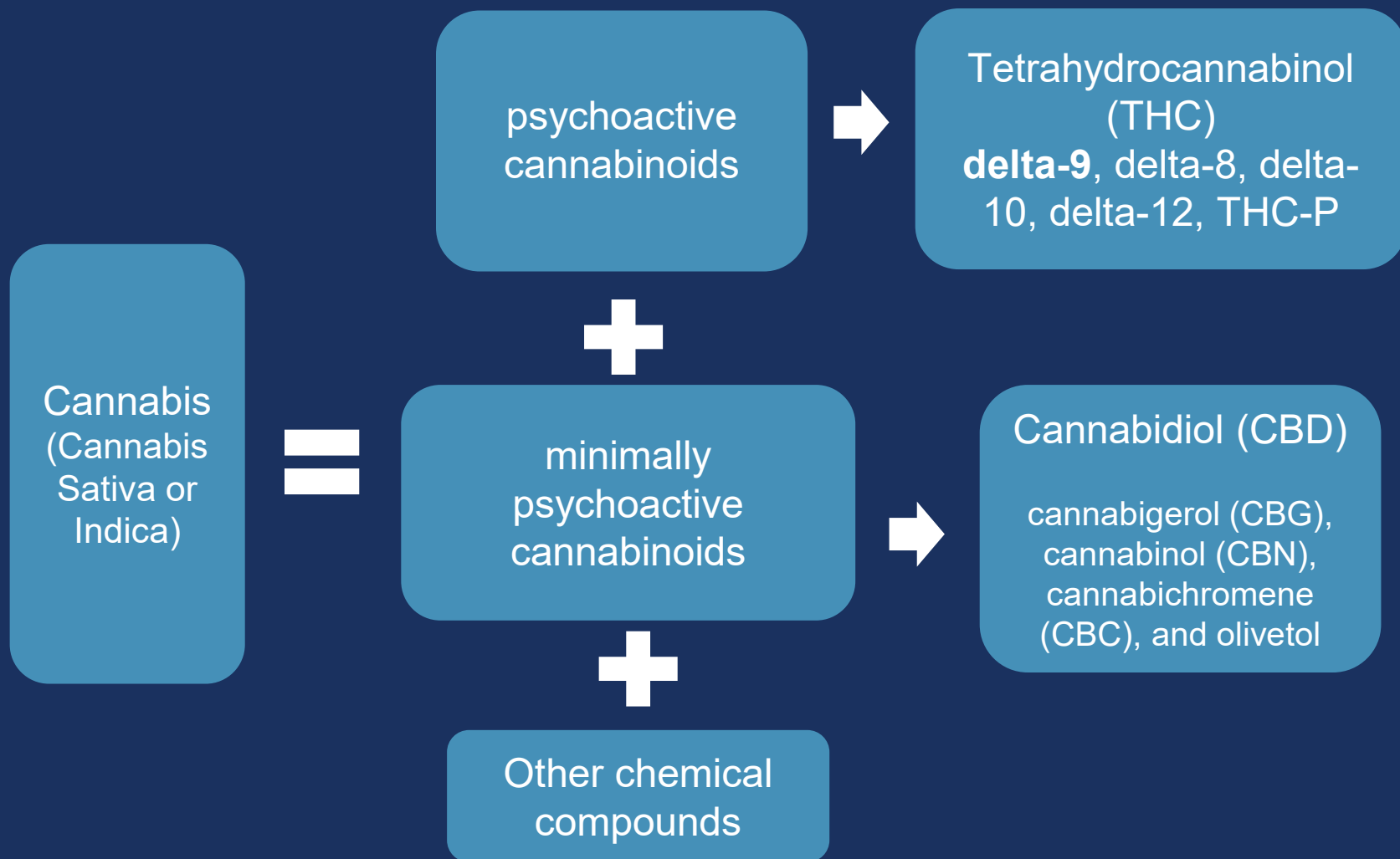
Source: Getty Images / [Bloomberg](#) / Contributor







# What is Marijuana?



## Hemp:

Cannabis plant bred to be <0.3% THC, CBD and levels of other compounds are not regulated \*Federally Legal\*

## Marijuana:

Dried flower, leaves of cannabis, varying degrees of THC and other compounds

## Psychoactive:

Affects thinking, behavior, memory, processing

## Synthetic:

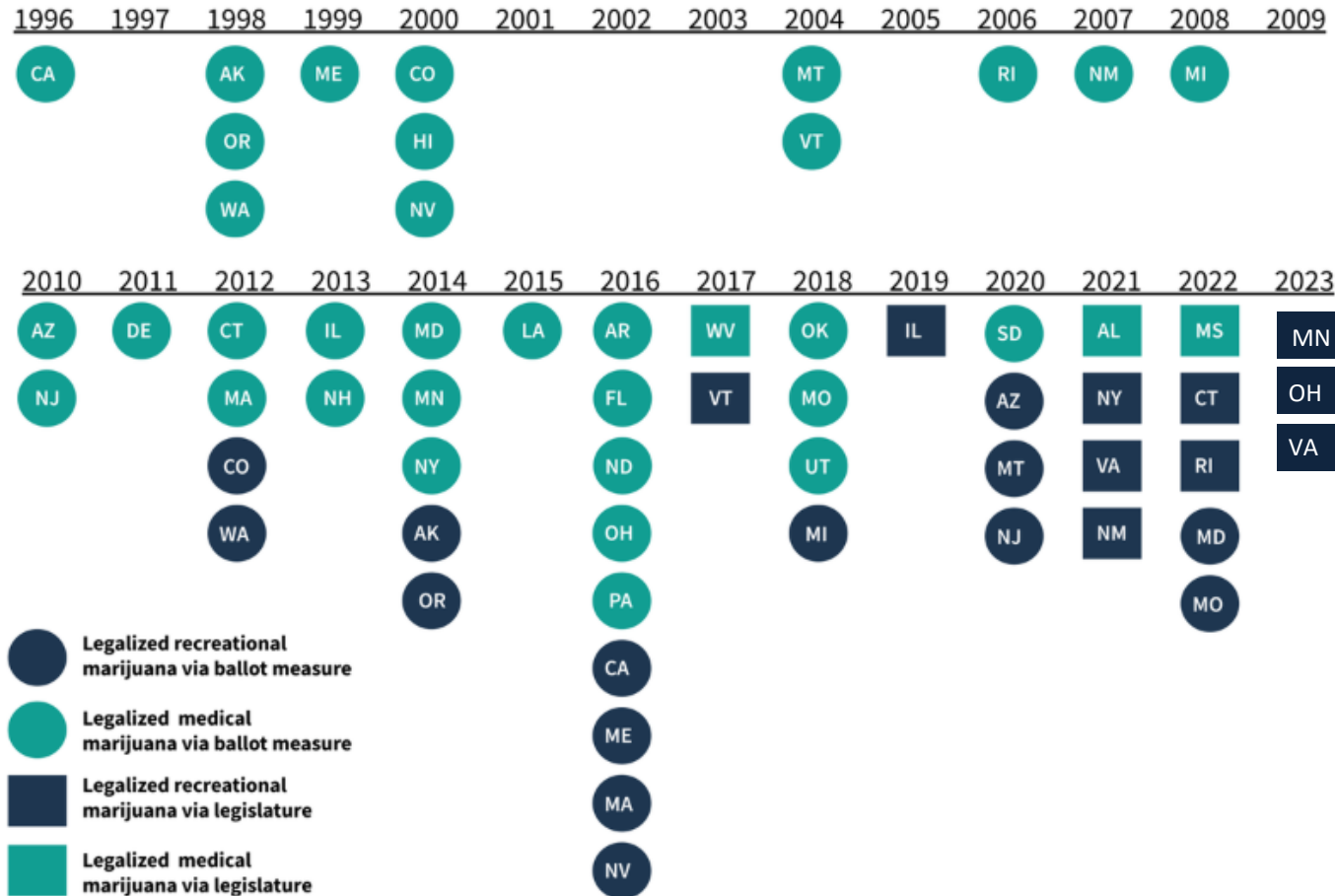
Manufactured chemical that mimics natural psychoactive compounds.

## State Level Cannabis Laws



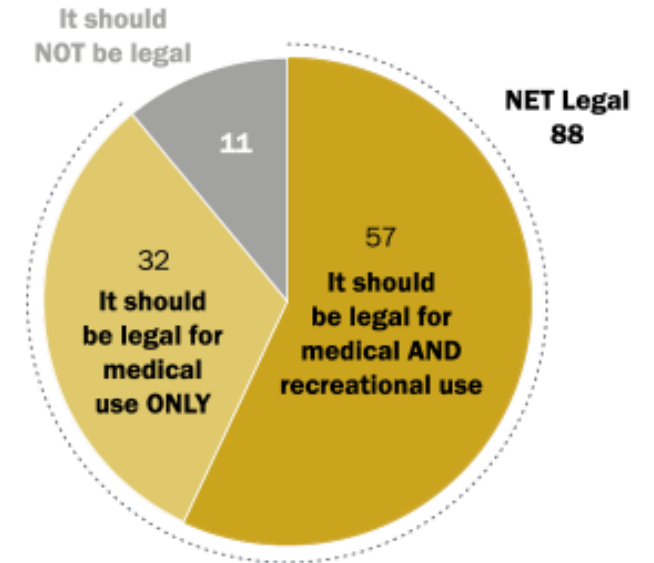
## Marijuana Legalization Timeline

M



**Only about 1 in 10 U.S. adults say marijuana should not be legal at all**

% of U.S. adults who say the following about marijuana



Note: Fewer than 1% of respondents did not answer the question.

Source: Survey of U.S. adults conducted Jan. 16-21, 2024.

PEW RESEARCH CENTER

Young Adults > Older Adults

# Commercialized Cannabis

## 10 Most Effective Marijuana Marketing Tactics for Your Business



Made with ❤️  
From @illegalsphotos

ShaneOnline

**CANNABIS ADS ON META? IT'S POSSIBLE!**

An advertisement featuring a man with a beard and a red cap pointing towards the viewer. Above him are icons for WhatsApp and Facebook. Below him is a smartphone screen displaying three cannabis-related ads: 'USA-ORIGIN BROAD SPECTRUM HEMP', 'THE ALCOHOL MICHIGAN', and 'CATCH UP ON THOSE ZZZs WITH ELDERBERRY GUMMIES'. The background is purple with light effects.

CMC cannabismedia Sponsored

You asked:

**“Can cannabis help a senior in the sack?”**

An advertisement with a green background. It features a hand holding a light-colored pillow. The text 'You asked: Can cannabis help a senior in the sack?' is prominently displayed. At the bottom, there is a logo for 'ImHighRightNow.com' with the tagline 'Get the lowdown at'.

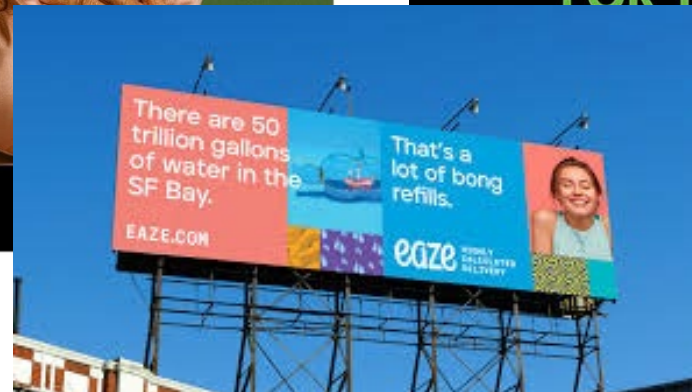
Trulieve

**WE ARE HERE**

FOR YOUR BEST LIFE

CANNABIS + PERSONALIZED SUPPORT

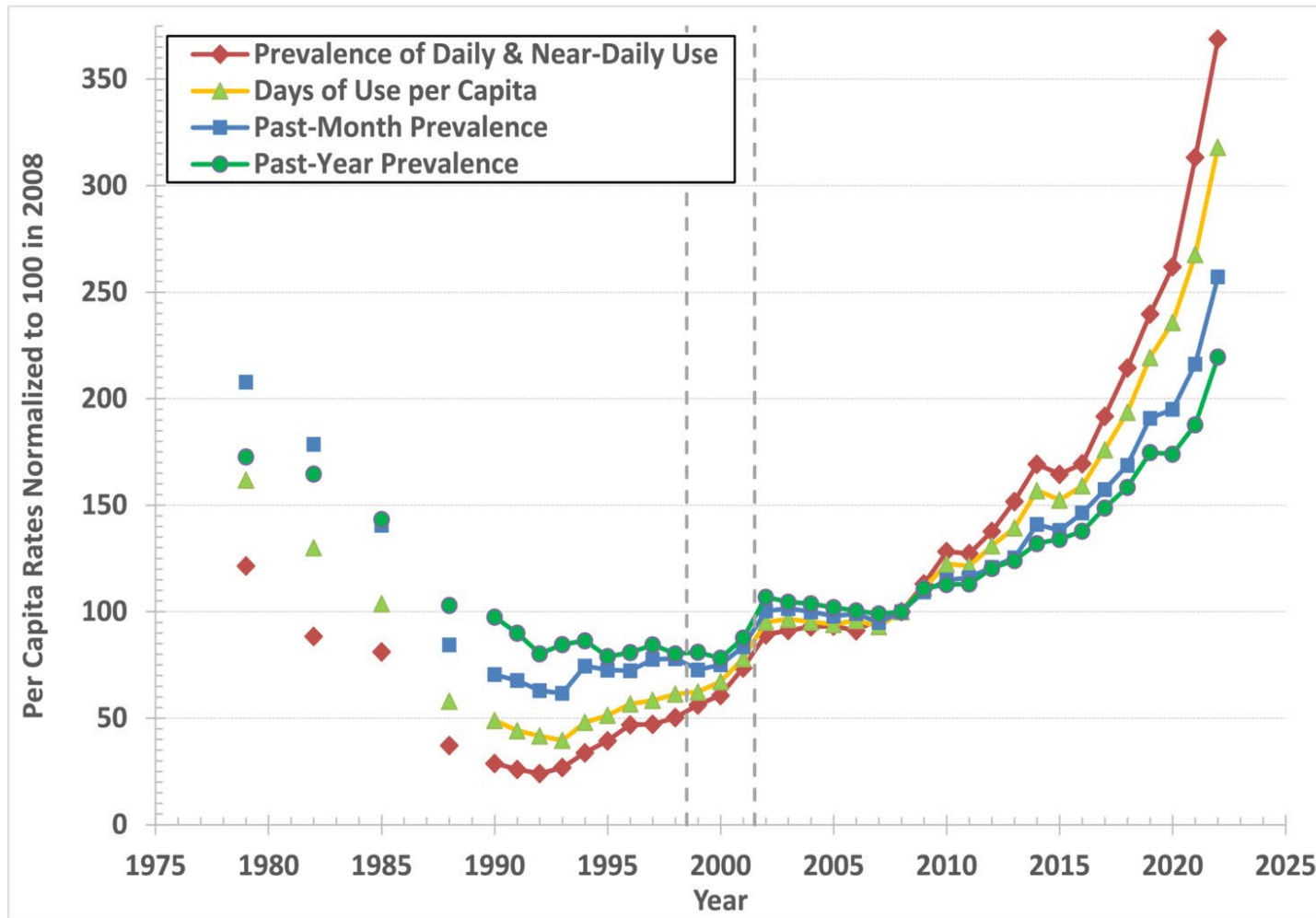
(REC) 00000014ESNA15249640

An advertisement for Trulieve. It features a close-up of a woman with curly hair wearing green-tinted sunglasses. The text 'WE ARE HERE FOR YOUR BEST LIFE' is overlaid in large, bold letters. Below it, it says 'CANNABIS + PERSONALIZED SUPPORT' and a small reference code at the bottom.

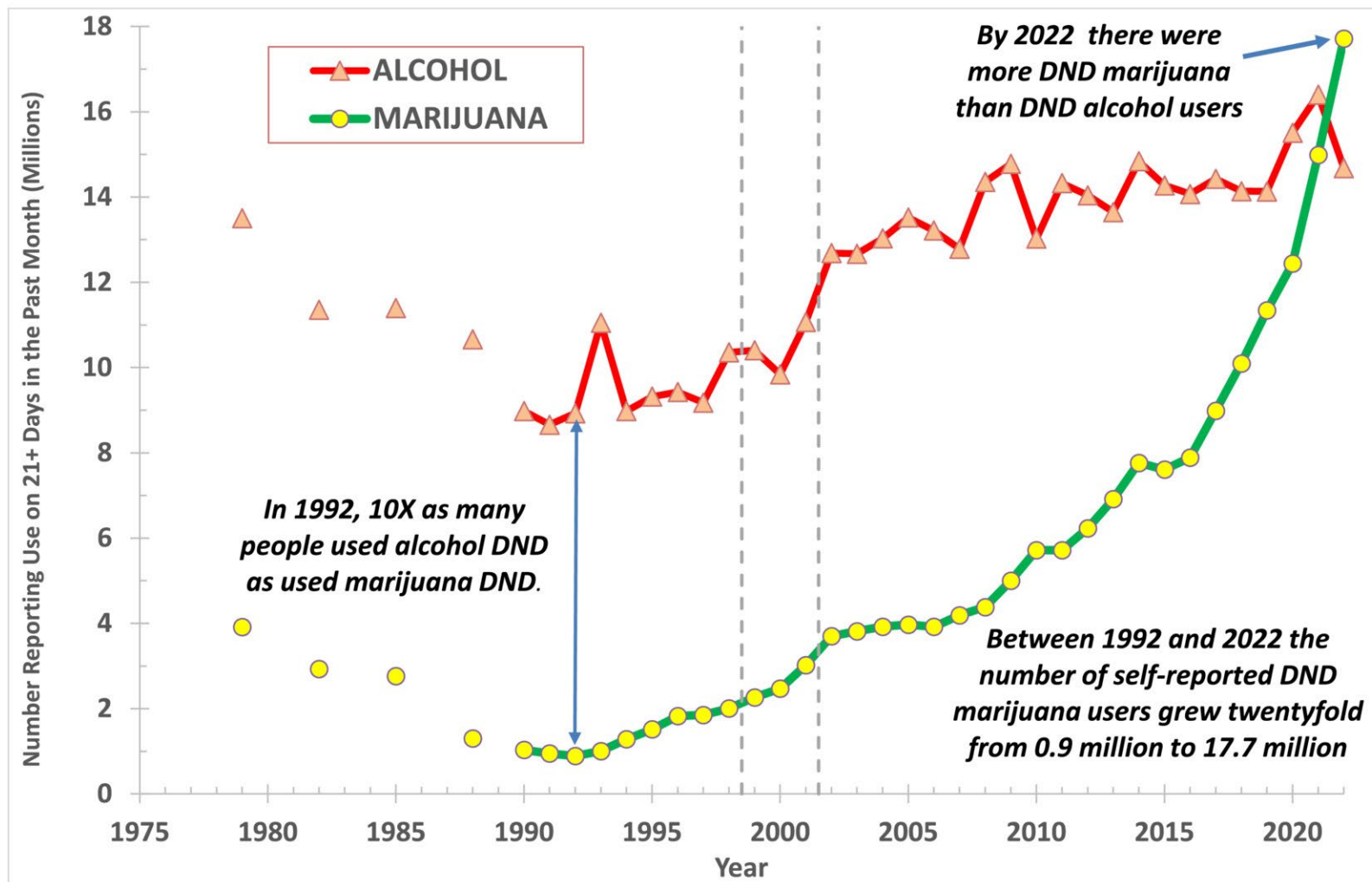


# Self-Reported Adult Cannabis Use

(All indexed to be 100 in 2008; Dashed lines indicate two major survey redesigns)



# Daily and Near Daily Adult Use





# Adult Cannabis Use Trends

Data from National Survey on Drug Use and Health (NSDUH) and the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC): 18yo +

- Increases in use over time starting in 2007 – most for young adults and >65yo
- Decreases in perceived harm from use of cannabis “1-2 times a week”
- Increased reported diagnoses of Cannabis Use Disorder, more in legalized states
- Rates of increased use and decreased harm perception higher among adults with Major Depressive Disorder, Generalized Anxiety Disorder and Chronic Pain
- Increased co-use of alcohol and cannabis
- Increased odd of self-reported driving under the influence

# Young Adult Cannabis Use Trends

National Survey on Drug Use and Health  
Ages 18-23 years old  
Before and after state legalization, 2008 – 2019

## Results:

- Increased prevalence of past-month cannabis use: 21% to 25%
- Frequent use (>20 days a month): 11% to 13%
- Only significant in non-college attending 21-23yo.
- No increase in binge drinking or alcohol use among any group





# Youth Cannabis Use: Past Year

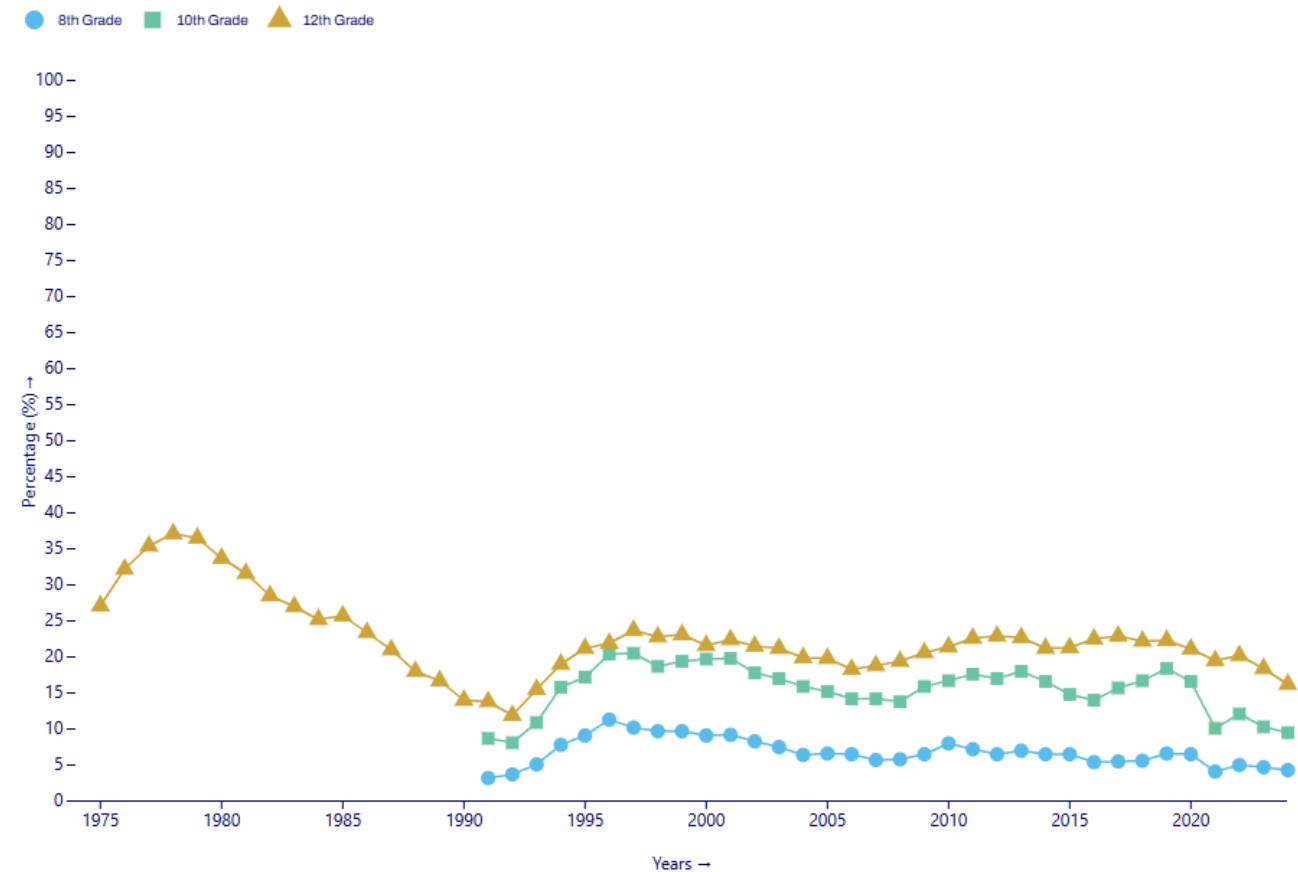
MARIJUANA (CANNABIS): Trends in 12 Month Prevalence of Use in 8th, 10th, and 12th Grade



Grade	Percentage
12th	25.8%
10th	15.9%
8th	7.2%

# Youth Cannabis Use: Past Month

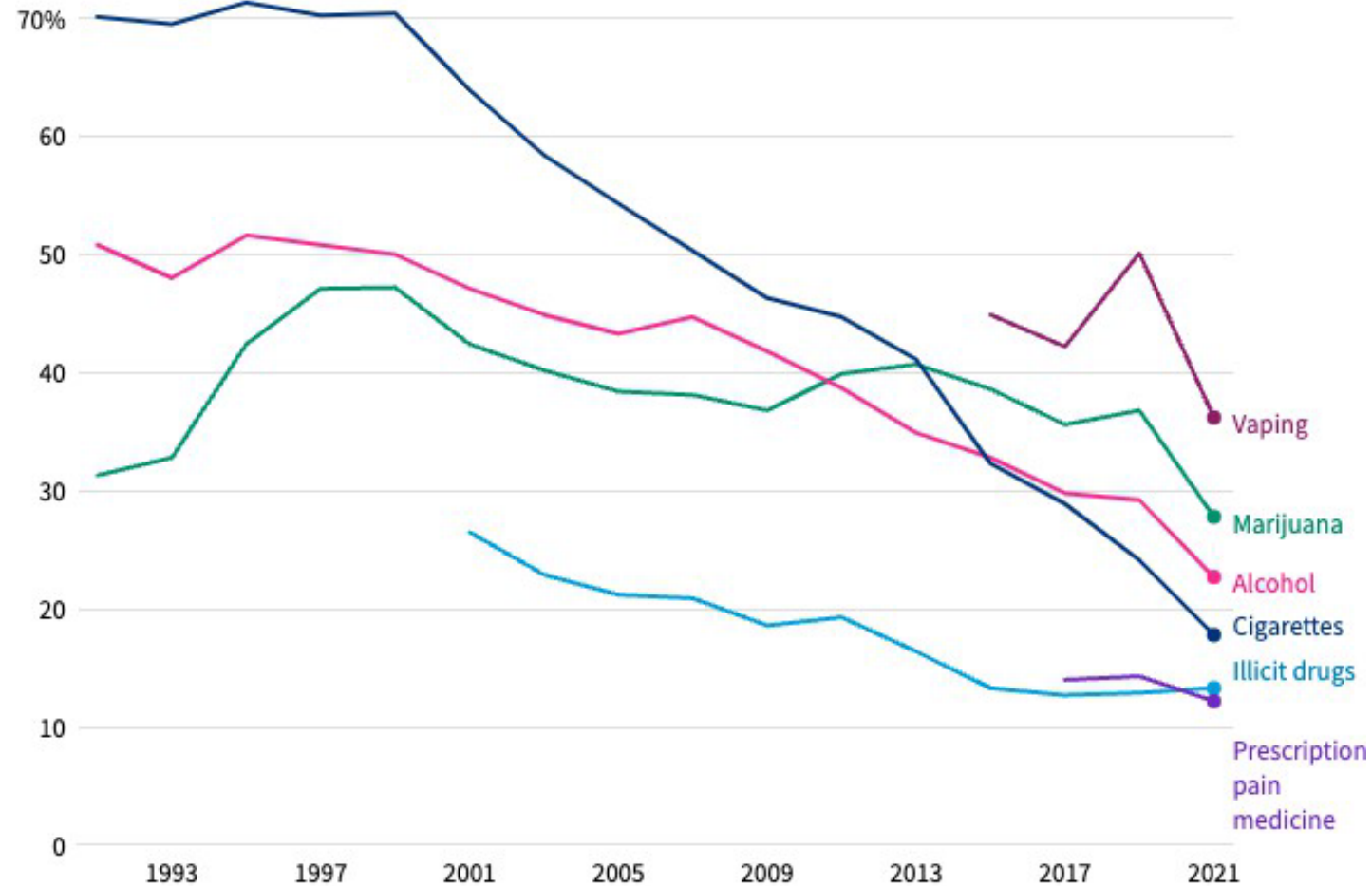
MARIJUANA (CANNABIS): Trends in 30 Day Prevalence of Use in 8th, 10th, and 12th Grade



Grade	Percentage
12th	16.2%
10th	9.5%
8th	4.3%

## Teen substance abuse has been declining for decades.

Percent of high school students who have used select drugs or alcohol



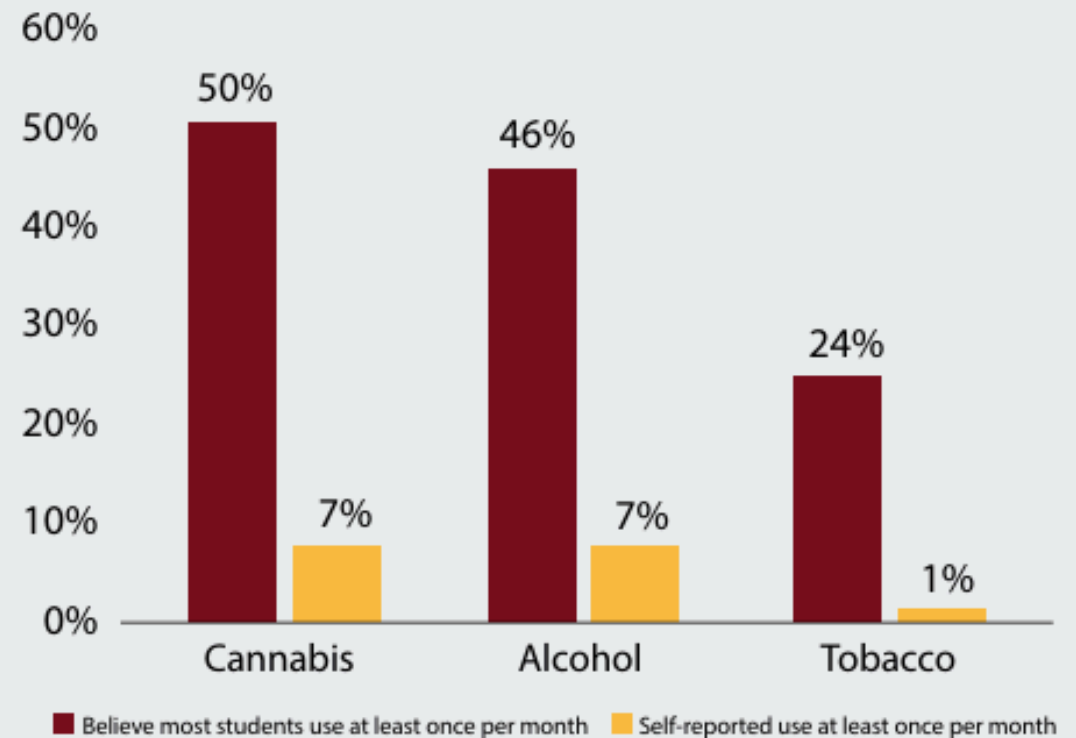
Alcohol data reflects students who currently drink (at least 1 drink in the last 30 days). All other data reflects students who have ever used the substance. Illicit drugs counted in this survey are cocaine, inhalants, heroin, methamphetamines, ecstasy, or hallucinogens.

Source: [Centers for Disease Control and Prevention](#) • [Get the data](#) • [Embed](#) • [Download image](#) • [Download SVG](#)

# Minnesota Youth: Perceptions of Cannabis



**Figure 10: Percentage of Minnesota 9th and 11th Graders Who Think Most Peers Use Cannabis at Least Once per Month and Who Report Using Cannabis Themselves at Least Once per Month (with Other Substances), 2022**



Source: SHADAC/CRC analysis of Minnesota Student Survey

# Trends in Youth Substance Use





# SMOKING MARIJUANA BUD

Blunt – cigar size, 1-2 grams



Joint – small cigarette size  
~ 0.3 grams



THC containing fluid placed in e-cigarette device

Smoking “a bowl” through a pipe, 0.3 grams

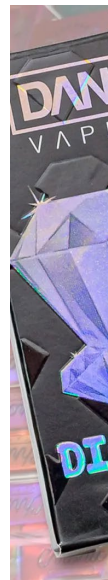


Delta-9 THC is a high affinity partial agonist/antagonist at CB1\* and CB2 R

**Leafly** A Visual Guide to Cannabis Quantities



# VAPING DELTA-9 THC FLUID





# VAPING DELTA-9 THC FLUID



Source: Bloomberg.com

## SIGNS That Vape Is Fake

It's not easy to tell the difference between authentic, regulated vapor products and black-market vapor products. Sometimes it can be nearly impossible. Here are a few signs that the vapor product may be "fake."

- Strange particles or foreign materials in the product
- Products that have been tampered with or are tainted
- Pricing that is unusually lower than market value
- Packaging or labeling that seems off-kilter, lacking, or containing errors such as misspellings
- Products that have been purchased from unauthorized retailers or third-party online marketplaces
- Products that are no longer commercially available from the manufacturer or illegal in the jurisdiction where they are sold

NATIONAL CRIME PREVENTION COUNCIL



# THC Vaping and EVALI

E-cigarette and Vape Related Lung Injury

Hypersensitivity pneumonitis

Organizing pneumonia

Diffuse alveolar damage, hemorrhage

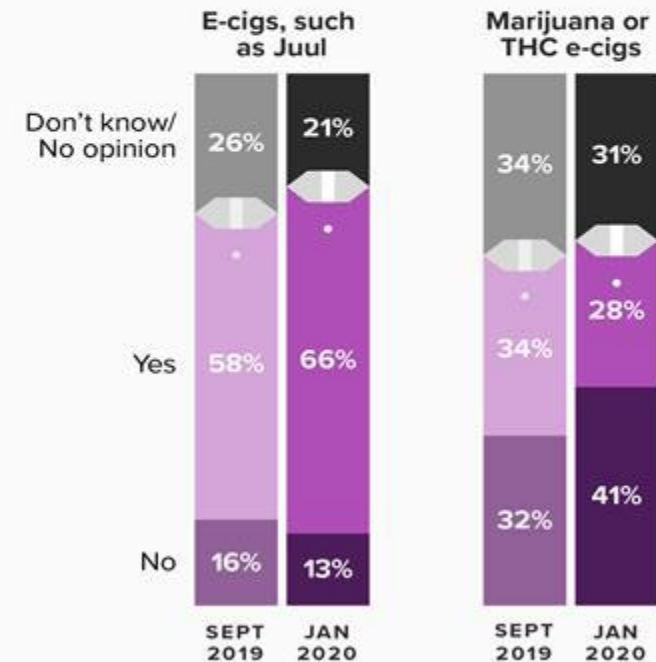
Acute Eosinophilic Pneumonia

Caused by Vitamin E Acetate  
in illicitly prepared THC vape juice

Source: <https://pulmccm.org/review-articles/vaping-associated-lung-injury-part-1/attachment/evali/>

## More People Blame Juul For Vaping Deaths Even as CDC Linked THC Vapes to Illnesses

Based on what you have seen, read or heard on the news lately, have any people died from lung disease related to using any of the following products?



MORNING CONSULT

Polls conducted among roughly 2,200 U.S. adults each between Sept. 12-14, 2019, and Jan. 28-30, 2020, with margins of error of 2%.

# DABBING CONCENTRATED THC

## CANNABIS CONCENTRATES



### CRUMBLE

Dried oil with a honey-comb like consistency



### BADDER/BUDDER

Concentrates whipped under heat to create a cake-batter like texture



### SHATTER

A translucent, brittle, & often golden to amber colored concentrate made with a solvent



### DISTILLATE

Refined cannabinoid oil that is typically free of taste, smell & flavor. It is the base of most edibles and vape cartridges



### CRYSTALLINE

Isolated cannabinoids in their pure crystal structure



### DRY SIFT

Ground cannabis filtered with screens leaving behind complete trichome glands. The end-product is also referred to as kief



### ROSIN

End product of cannabis flower being squeezed under heat and pressure

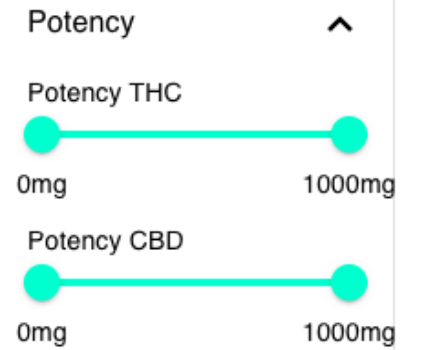


### BUBBLE HASH

Uses water, ice, and mesh screens to pull out whole trichomes into a paste-like consistency



# MARIJUANA EDIBLES



- Effects ^
- ☒ All Effects
  - ☐ Calm
  - ☐ Clear Mind
  - ☐ Creative
  - ☐ Energetic
  - ☐ Focused
  - ☐ Happy
- Show more

# NEW THC PRODUCTS

**Tetrahydrocannabiphorol (THC-P)** isolated in cannabis plant in 2019, also lab created from CBD.

**STRONGEST** known affinity for CB1 and CB2 of any identified phytocannabinoid (33x that of Delta-9 THC)

Federally Legal

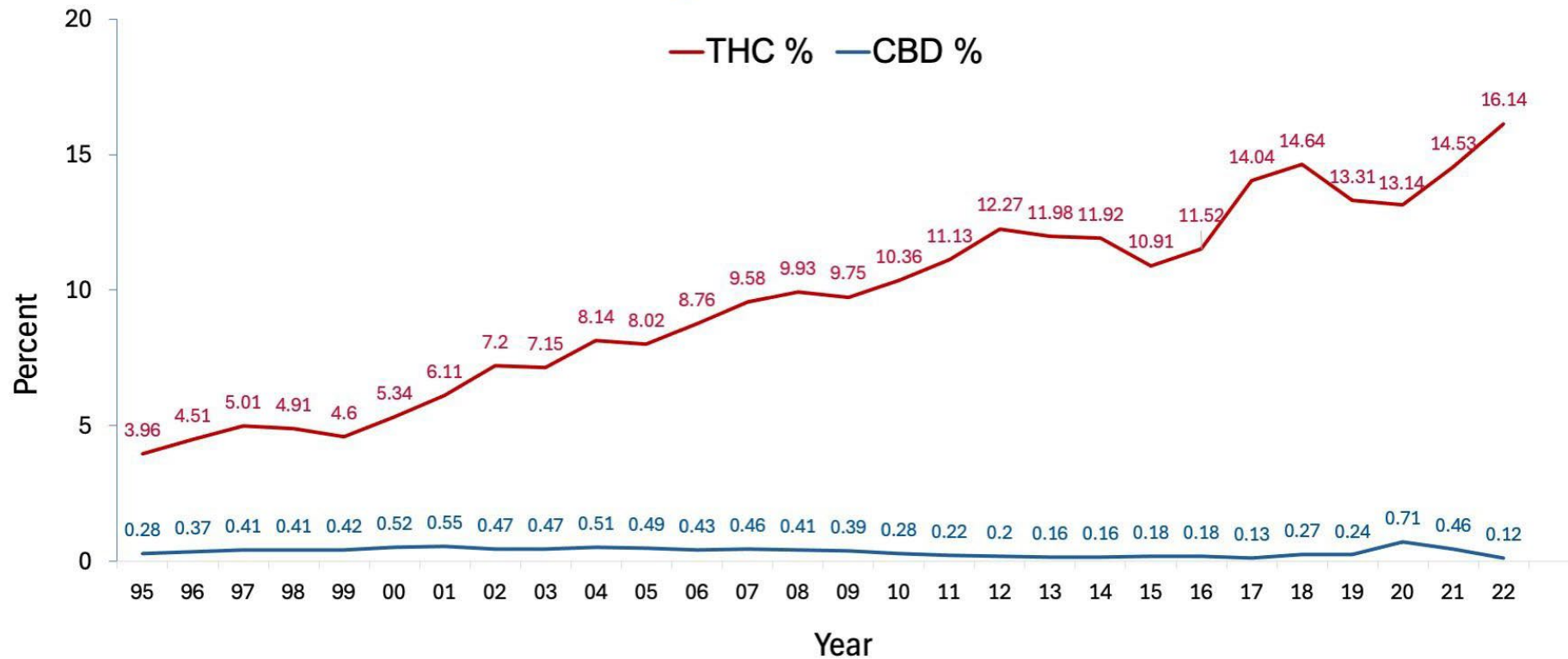


Citti, C., Linciano, P., Russo, F. et al. A novel phytocannabinoid isolated from Cannabis sativa L. with an in vivo cannabimimetic activity higher than  $\Delta^9$ -tetrahydrocannabinol:  $\Delta^9$ -Tetrahydrocannabiphorol. Sci Rep 9, 20335 (2019).



# THC POTENCY

**Percentage of THC and CBD in Cannabis Samples  
Seized by the DEA, 1995-2022**



SOURCE: U Miss, Potency Monitoring Project

# Cannabis Use Disorder

## Marijuana Addiction

Contrary to popular belief, marijuana is addictive. Research shows that:

- 1-in-6 people who start using the drug before the age of 18 can become addicted.
- 1-in-10 adults who use the drug can become addicted.

Among 18yo with severe SUD – 60% still met criteria for SUD at 50yo

Among 18yo with mild SUD – 45% still met criteria for SUD at 50yo.

Population risk is 15%

TABLE 2.

**DSM-5 Criteria for Substance Use Disorder**

Criterion	Severity
Use in larger amounts or for longer periods of time than intended	Severity is designated according to the number of symptoms endorsed: 0-1: No diagnosis 2-3: Mild SUD 4-5: Moderate SUD 6 or more: Severe SUD
Unsuccessful efforts to cut down or quit	
Excessive time spent using the drug	
Intense desire/urge for drug (craving)	
Failure to fulfill major obligations	
Continued use despite social/interpersonal problems	
Activities/hobbies reduced given use	
Recurrent use in physically hazardous situations	
Recurrent use despite physical or psychological problem caused by or worsened by use	
Tolerance	
Withdrawal	

*SUD, substance use disorder*

*Adapted from Diagnostic and Statistical Manual of Mental Disorders, fifth edition.<sup>23</sup>*

# Marijuana and Amotivational Syndrome

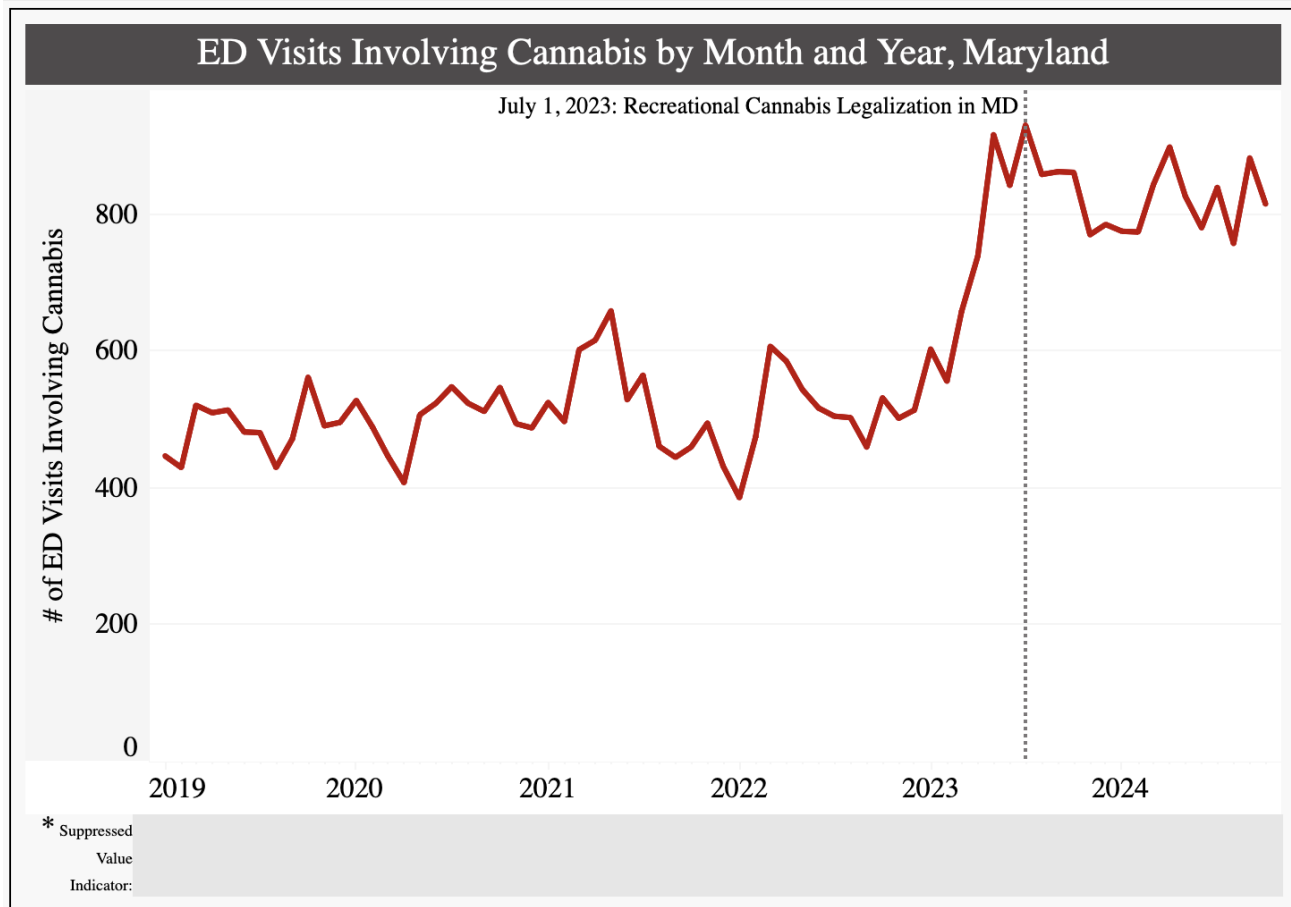
Unique to regular marijuana use

Characterized by: Anhedonia,  
Apathy, Decreased Self – Efficacy

Research participants who smoke  
>3 times a week score lower on  
measures of initiative and  
persistence



# Cannabis Toxicity



## Signs of THC Toxicity

- High HR and BP
- Confusion
- Anxiety
- Delusions
- Hallucinations (visual, tactile)
- Severe nausea and vomiting



# Cannabis Hyperemesis Syndrome

## 7 characteristics of CHS

The following characteristics have been found to occur in patients with cannabinoid hyperemesis syndrome (CHS).

Characteristic	Frequency
History of regular cannabis use for any duration of time	100%
Cyclic nausea and vomiting	100%
At least weekly cannabis use	97.4%
Resolution of symptoms after stopping cannabis	96.8%
Compulsive hot baths with symptom relief	92.3%
Abdominal pain	85.1%
Male predominance	72.9%

Source: Sorenson et al 2017



## 2.75 Million

Americans are estimated to suffer from Cannabinoid Hyperemesis Syndrome (CHS) each year

Angulo M. Cannabinoid Hyperemesis Syndrome. JAMA. Published online October 18, 2024. doi:10.1001/jama.2024.17116

**SAM** School of Advanced Medicine

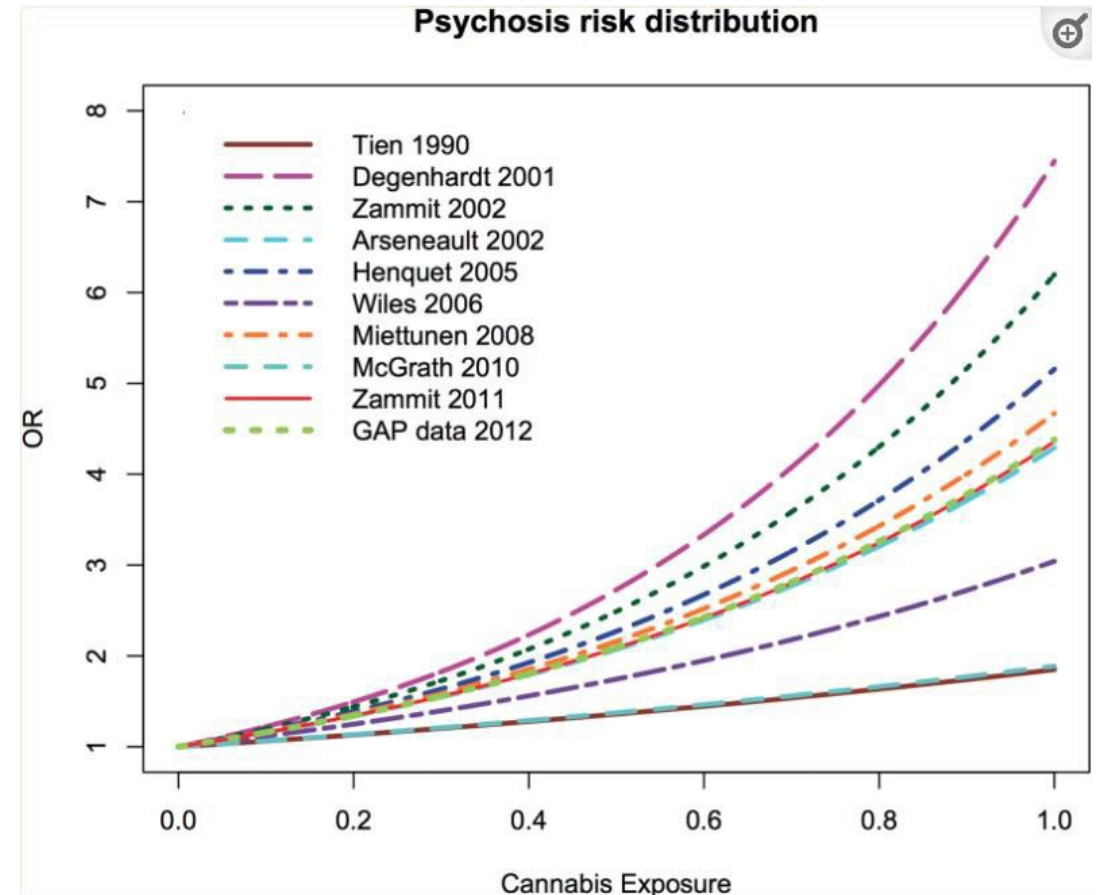
# Marijuana and Psychosis

- 4X population risk for heavy users
- 2X population risk for moderate use
- 1.5x population risk with any use

Population Risk: 3%

Sullivan SA, Kounali D, Cannon M, David AS, Fletcher PC, Holmans P, et al. A Population-Based Cohort Study examining the incidence and impact of psychotic Experiences from Childhood to Adulthood, and prediction of psychotic disorder. *Am J Psychiatry*. 2020 Jan;7(4):308–17.

Marconi A, Di Forti M, Lewis CM, Murray RM, Vassos E. Meta-analysis of the Association Between the Level of Cannabis Use and Risk of Psychosis. *Schizophr Bull*. 2016 Sep;42(5):1262-9. doi: 10.1093/schbul/sbw003. Epub 2016 Feb 15. PMID: 26884547; PMCID: PMC4988731.



# Marijuana and Psychosis

- Cannabis induced psychosis increases risk of further unprovoked psychotic episodes.
- Earlier age of onset for psychotic disorders in those with family history.
- Influenced by genetic and environmental factors.
- THC potency, CBD/THC ratio of product, duration of use.
- Can occur in setting of cannabis cessation.



# But I'm Using It For Medical Reasons?!

Phrase marijuana treatment like it were an experimental drug...



- Avoids invalidating the patient's experiences.
- Acknowledges there is excitement and promise but limited information, especially for impacts of long-term use of recreational products.
- Frames the conversation around risks and benefits of care decisions
- Doesn't box the patient into "giving it up forever"

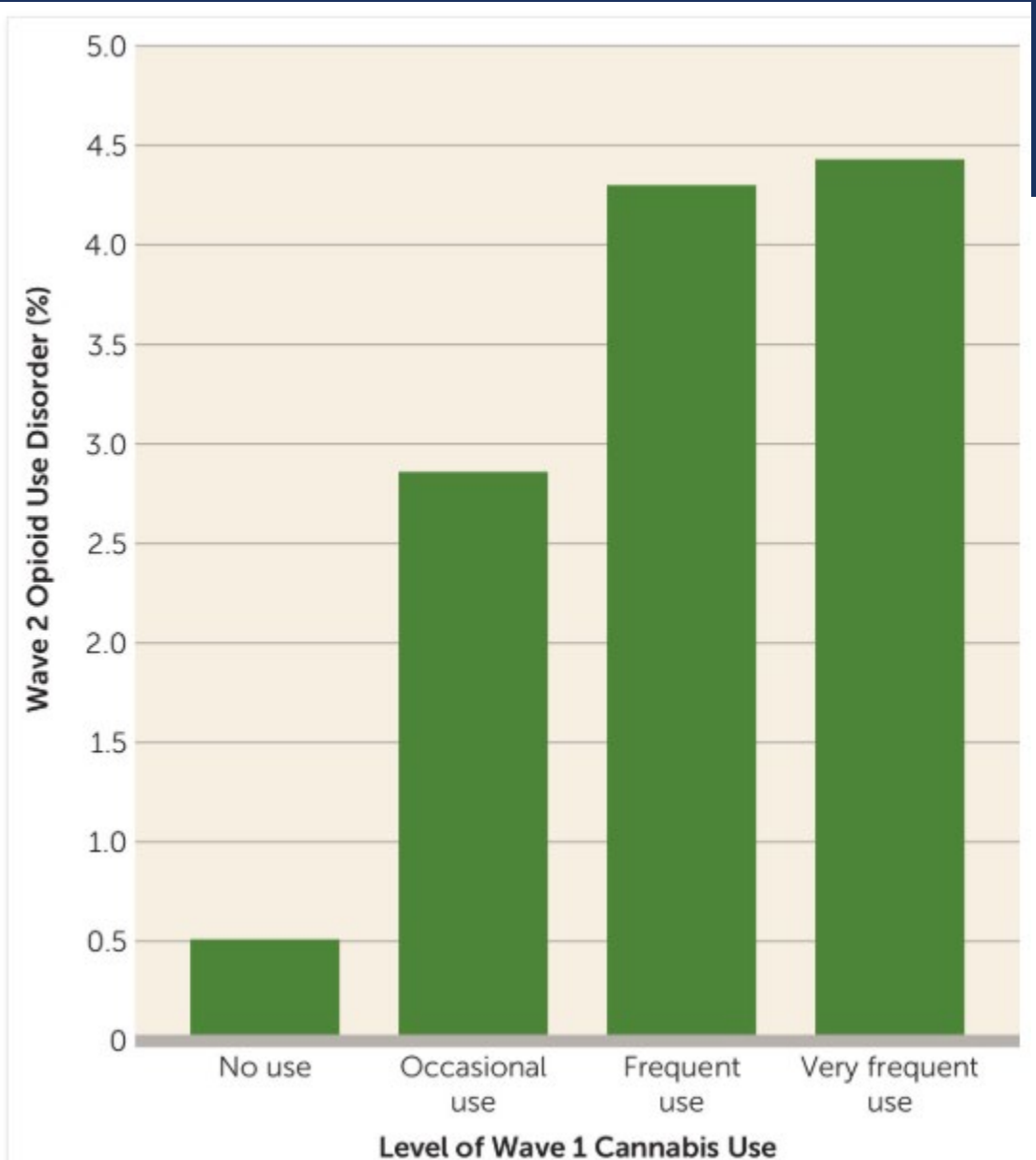


# Cannabis and Opioid Use Disorder (OUD)

Cannabis use associated with increased risk of non-medical use of opioids and OUD.

In the context of existing opioid use, cannabis use was associated with increased opioid use and OUD.

Stronger association with those who have chronic pain.



**"Give your throat a vacation..."**

# Smoke a FRESH cigarette

If the cigarette you have been smoking stings or burns your throat, switch to Camels and see the difference.

It's the peppery dust left in tobacco by inefficient cleaning methods that makes you cough.

It's the unkindly hot smoke of harsh, dried-out tobacco that burns and irritates your throat.

There is no peppery dust in Camels—that's whisked away by a special vacuum-cleaning process.

There are no stale, crumbly, parched tobaccos—the fine Turkish and mild Domestic tobaccos of which Camels are blended come to you in prime, factory-fresh condition, thanks to the Humidor Pack.

This scientific germ-safe wrapping—not plain ordinary Cellophane, but moisture-proof Cellophane which coats nearly twice as much—seals in all the natural aroma and freshness, seals it so tightly that wet weather cannot make Camels damp, nor drought weather make them dry.

Camels are milder and more throat-friendly because they are dust-free and fresh.

Give your throat a vacation, switch to Camels for just one day. Then leave them—if you can.

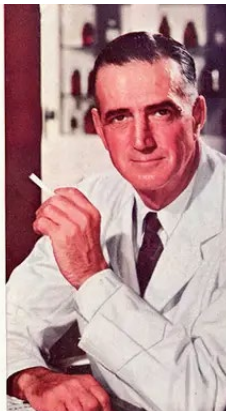
There is CAMEL QUARTER ROUGH including Marine, Doctor and Easy Taste — Camel Softlights, American Blend, French Blend — Camels, Virginia — every single variety.



**CAMELS**  
Mild... NO CIGARETTE AFTER-TASTE

According to repeated nationwide surveys,

**More Doctors  
Smoke CAMELS  
than any other  
cigarette!**



## Vaping is 95% less harmful than smoking

**2014**

### NUTT AND COLLEAGUES

An expert group led by Professor David Nutt estimated vaping carried only 4% of the harm of cigarette smoking

**2015**

### PUBLIC HEALTH ENGLAND

"E-cigarettes are 95% less harmful to your health than normal cigarettes" based on a comprehensive review of the scientific evidence in 2015 and again in 2018

**2016**

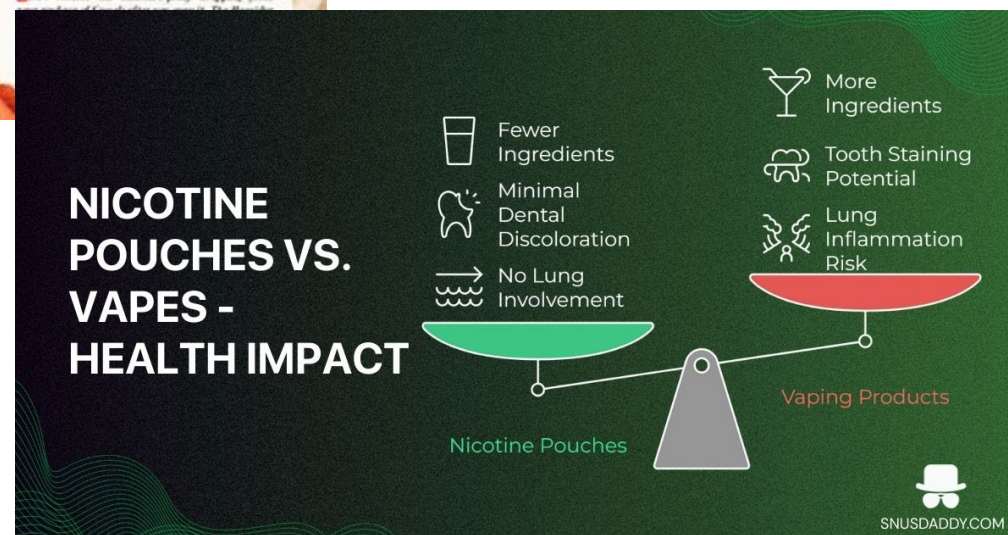
### UK ROYAL COLLEGE OF PHYSICIANS

A detailed independent review concluded health risks "are unlikely to exceed 5% of those associated with smoked tobacco products, and may well be substantially lower"

**2018**

### NASEM

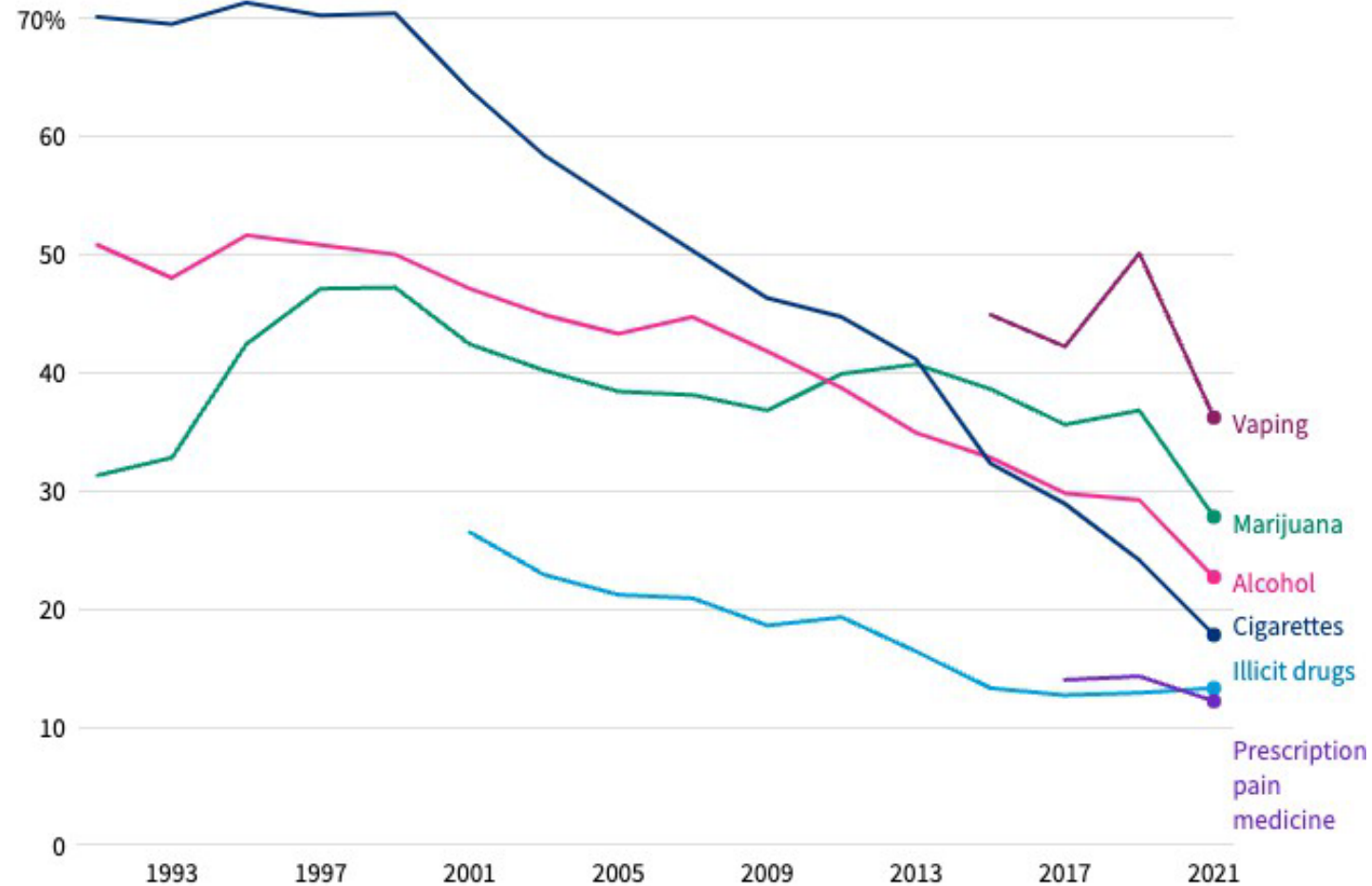
The US National Academies of Sciences, Engineering and Medicine: "while e-cigarettes are not without risks, they are likely to be far less harmful than conventional cigarettes"





## Teen substance abuse has been declining for decades.

Percent of high school students who have used select drugs or alcohol



Alcohol data reflects students who currently drink (at least 1 drink in the last 30 days). All other data reflects students who have ever used the substance. Illicit drugs counted in this survey are cocaine, inhalants, heroin, methamphetamines, ecstasy, or hallucinogens.

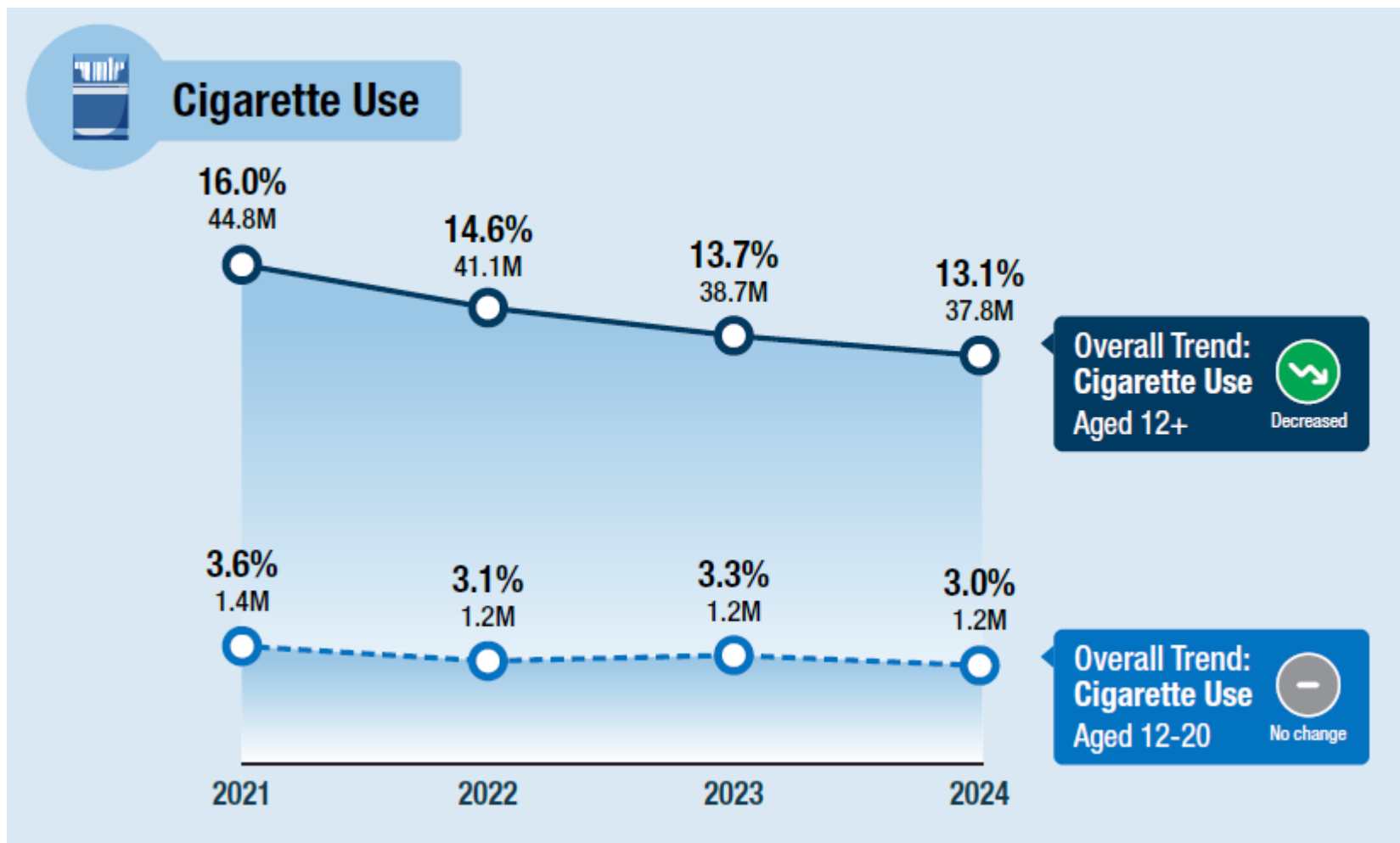
Source: [Centers for Disease Control and Prevention](#) • [Get the data](#) • [Embed](#) • [Download image](#) • [Download SVG](#)



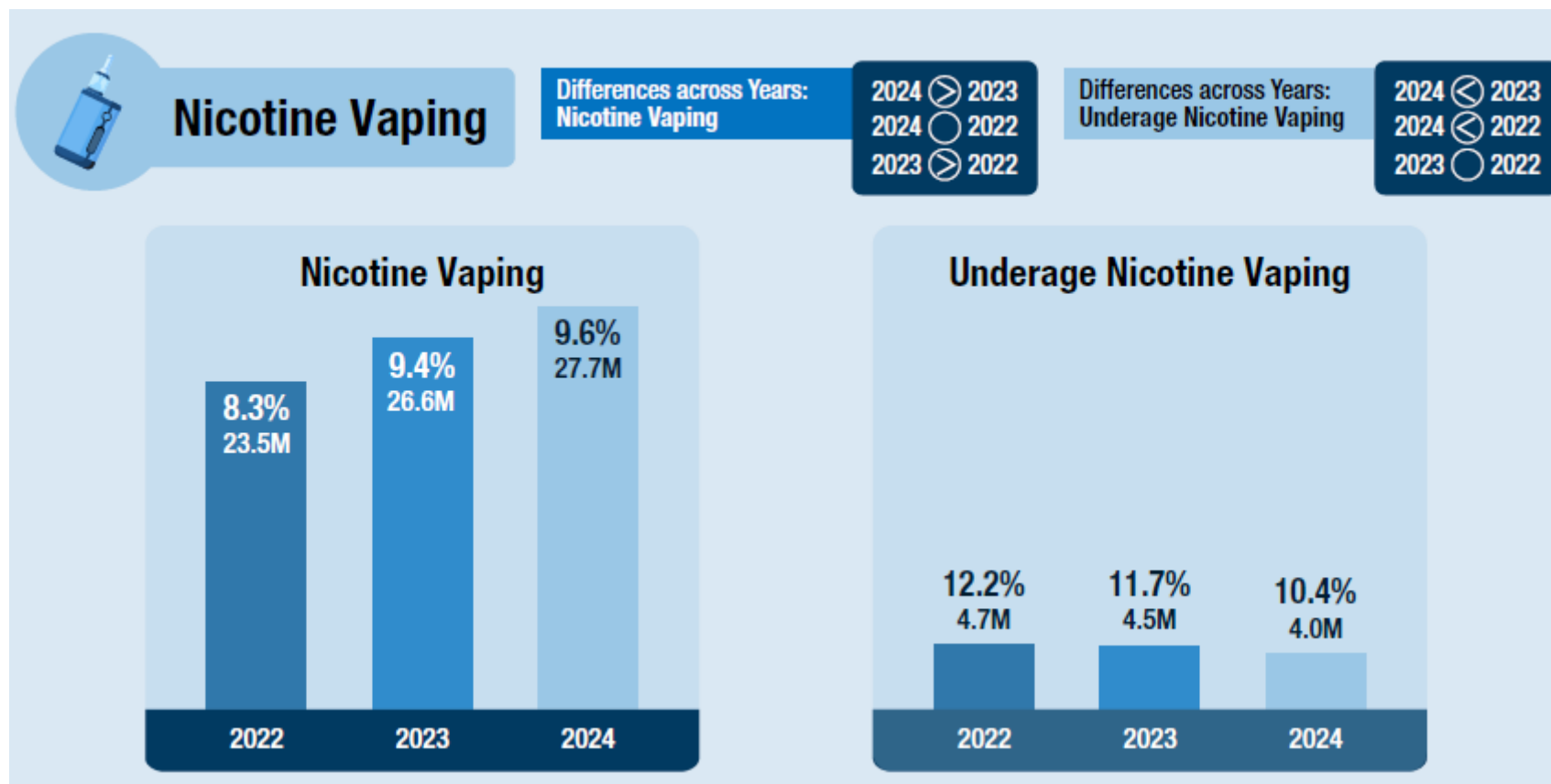
Quitting nicotine cigarette smoking was associated with 30% greater odds of recovery from other substance use disorders.



# Nicotine Use Trends

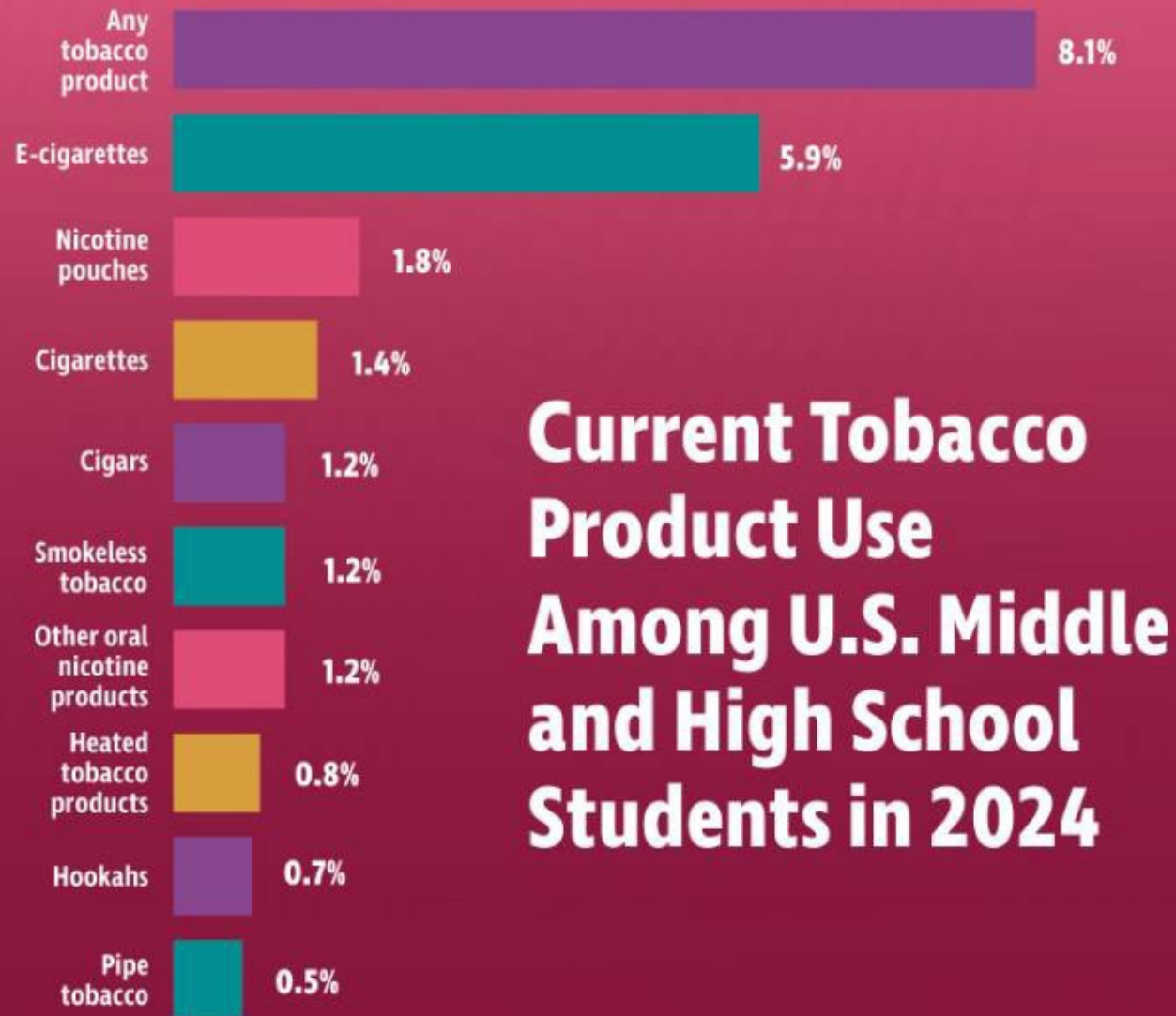


# Nicotine Use Trends



# Trends in Youth Substance Use





Source: National Youth Tobacco Survey, 2024



Vaping: most popular way to use nicotine for youth since 2014.

7.8% (1 out of 13) high schoolers have tried vaping nicotine

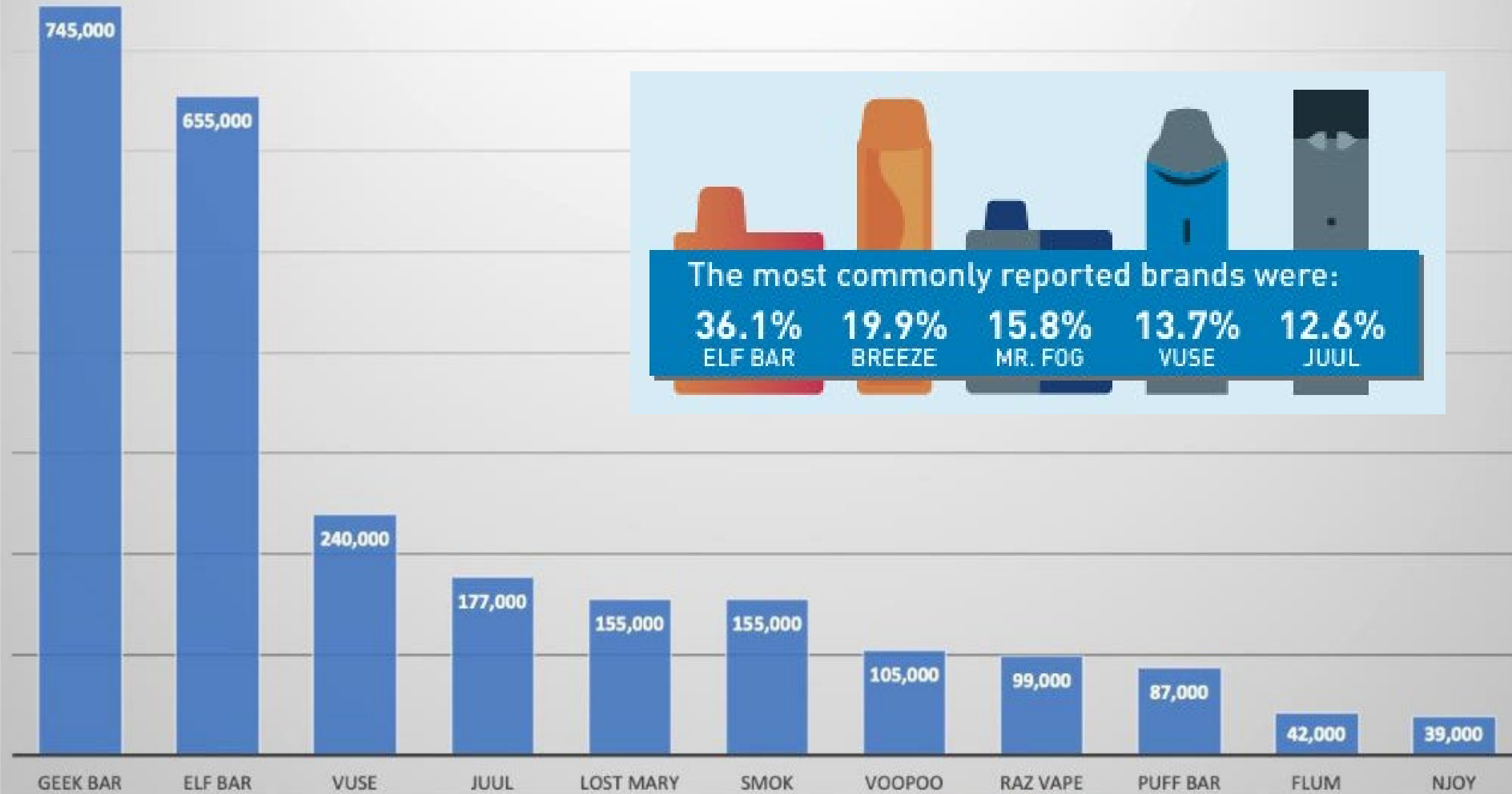
3.5% (1 out of 29) middle schoolers have tried vaping nicotine

Of those who have tried, 23% are daily users.

Nearly all adults who use nicotine started when they were < 18yo.



## What Vaping Brands Receive the Most Monthly Search Volume?



Geek Bar is the most popular vaping brand in the world as of 2025. (Want to use this image?)

Source: [ecigone.com](https://ecigone.com), Jamal et al. 2024

## SLUSH EDITION



Grape Slush



Cola Slush


A purple e-liquid bottle with a label that reads "MR FOG Magic Cotton".

**MAGIC COTTON**

- 30ml: 35/50mg
- 60ml: 3/6/12mg/18mg
- 100ml: 3/6/12/18mg



AS LOW AS \$13.46



87% of youth vapers use fruit flavor products.





# Tobacco (Nicotine) Use Disorder

Around 90% of regular nicotine users become addicted.

70% of adults using tobacco want to quit.  
60% of adults vaping nicotine want to quit.

Exposure rates as low as 1-2 cigarettes a day are associated with addiction in at-risk populations.

23% of worlds population is addicted to nicotine.

75% of youth who use nicotine with continue to use in adulthood.

Source: Ren et al 2019, cancer.org, <https://nida.nih.gov/publications/research-reports/tobacco-nicotine-e-cigarettes/what-scope-tobacco-use-its-cost-to-society>

TABLE 2.

## DSM-5 Criteria for Substance Use Disorder

Criterion	Severity
Use in larger amounts or for longer periods of time than intended	Severity is designated according to the number of symptoms endorsed: 0-1: No diagnosis 2-3: Mild SUD 4-5: Moderate SUD 6 or more: Severe SUD
Unsuccessful efforts to cut down or quit	
Excessive time spent using the drug	
Intense desire/urge for drug (craving)	
Failure to fulfill major obligations	
Continued use despite social/interpersonal problems	
Activities/hobbies reduced given use	
Recurrent use in physically hazardous situations	
Recurrent use despite physical or psychological problem caused by or worsened by use	
Tolerance	
Withdrawal	

*SUD, substance use disorder*

*Adapted from Diagnostic and Statistical Manual of Mental Disorders, fifth edition.<sup>23</sup>*



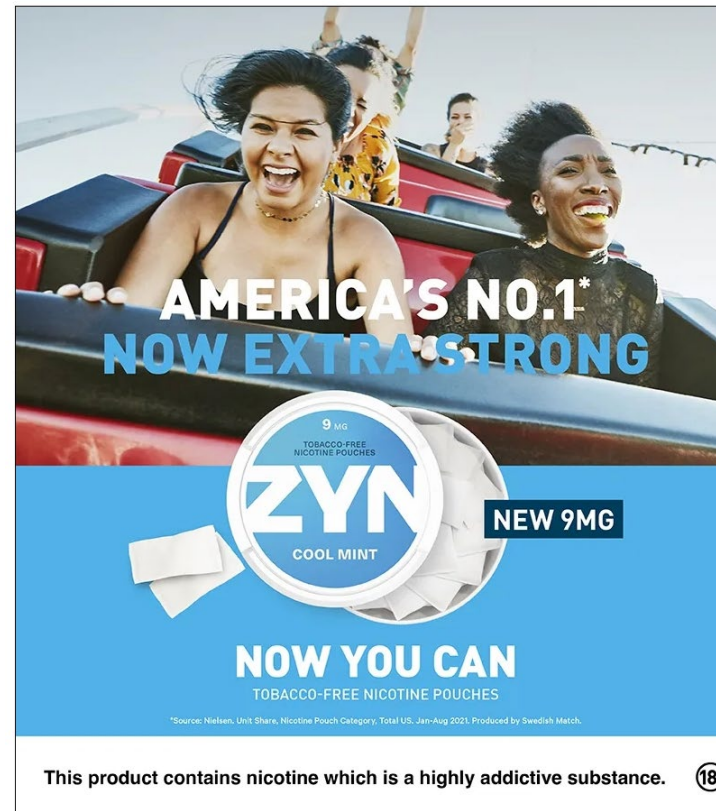
# Nicotine Toxicity

## Early Stages:

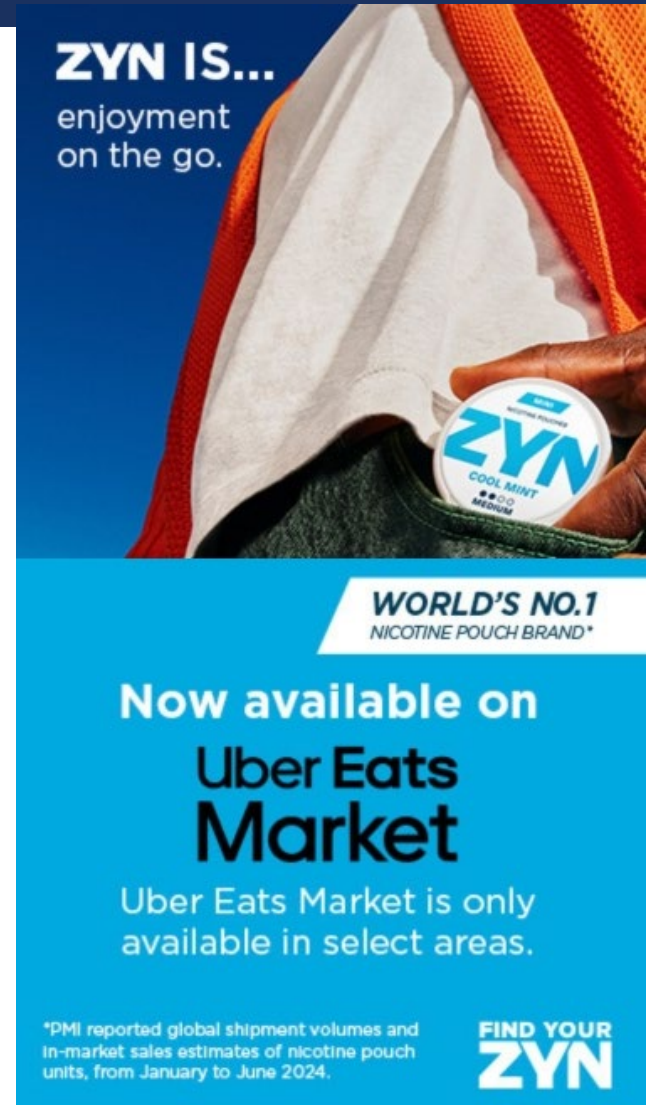
- Increased impulsivity
- Confusion and agitation
- Elevated HR and BP
- Increased muscle breakdown
- Nausea/vomiting
- Sweating

## Later Stages:

- Sedation and slowing
- Ongoing confusion
- Increased muscle breakdown
- Weakness and decreased reflexes
- Respiratory failure



America's No. 1 Now Extra Strong", (Zyn Ad. 2023)



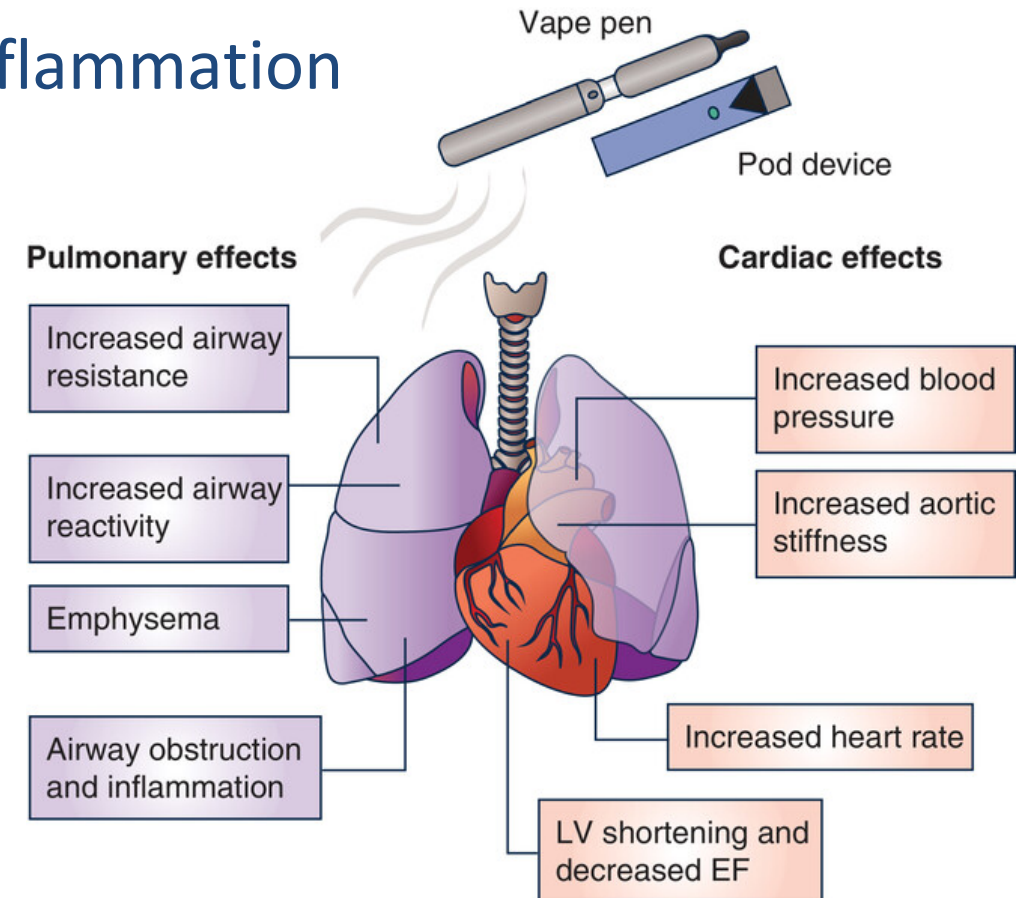
# Physiologic Impacts of Vaping

Exposure -> cell damage and inflammation



## E-Liquid Contents

- Flavourings
- Nicotine
- Vegetable Glycerin
- Propylene Glycol

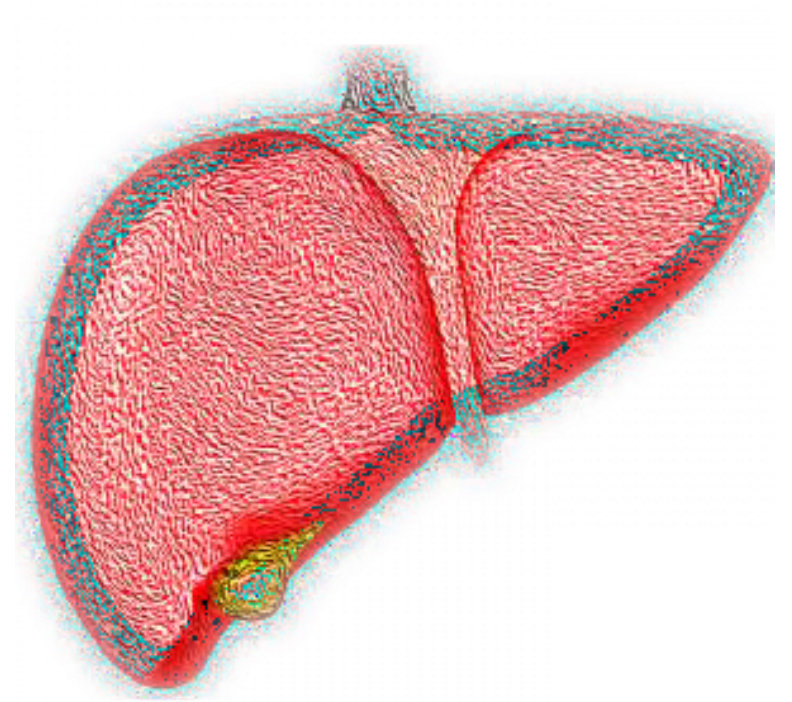


# Medication Interactions

## Risk of Drug-Substance Interactions

### Impacts:

- Cannabinoids liver enzyme metabolism inhibitors
- Nicotine liver enzyme metabolism inducers
- Unpredictable drug levels mean risk of side effects and toxicity



# NICOTINE, MARIJUANA AND COGNITIVE PERFORMANCE



## Executive Functioning Skills

cognitive flexibility

working memory

declarative memory

attention span

inhibitory control

visuospatial memory (sleep?)

**These symptoms may  
persist beyond acute  
use depending on  
substance  
concentration,  
duration, age**

**Associated most often  
with use at or before  
16yo**



# NICOTINE, MARIJUANA AND COGNITIVE PERFORMANCE



Intellectual Ability – Verbal IQ

modified by social, economic and  
psychologic factors

Cortical Thickening

Impairments in myelination

Excess gray matter

Increased fMRI signaling

These symptoms may  
persist beyond acute  
use depending on THC  
concentration,  
duration, age of  
cessation

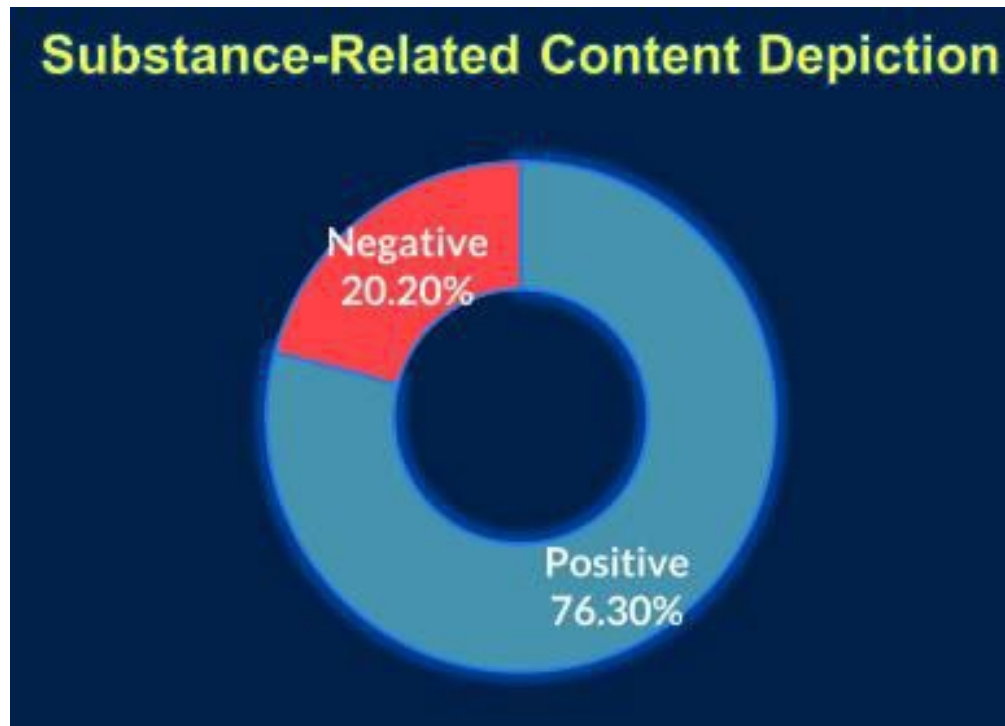
Associated most often  
with use at or before  
16yo

# Who Is At Risk of Vaping?

- Heavy social media users
- Having peers or parents who vape
- High school athletes (nicotine)
- Young age at first use
- In-utero nicotine exposure
- Mental health concerns like ADHD, anxiety and depression
- Decreased parental supervision
- Unclear rules in the home about use
- Exposure to community stress
- Proximity to point of sale locations
- Poor school performance
- Difficulty managing stress or lack of coping skills

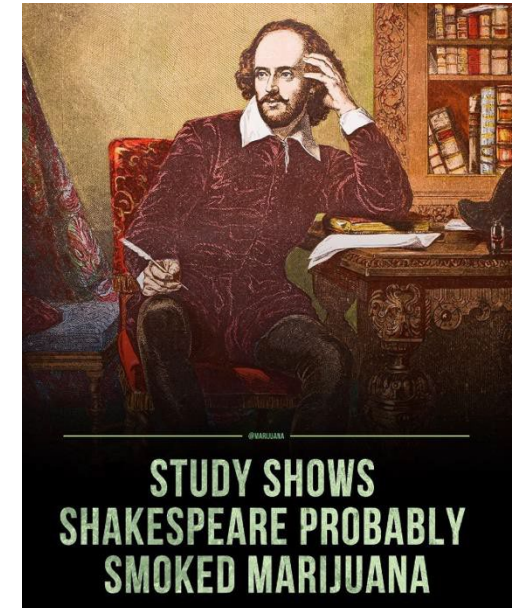
# SOCIAL MEDIA AND VAPING

Review of 73 studies, 15.9 million substance related posts:



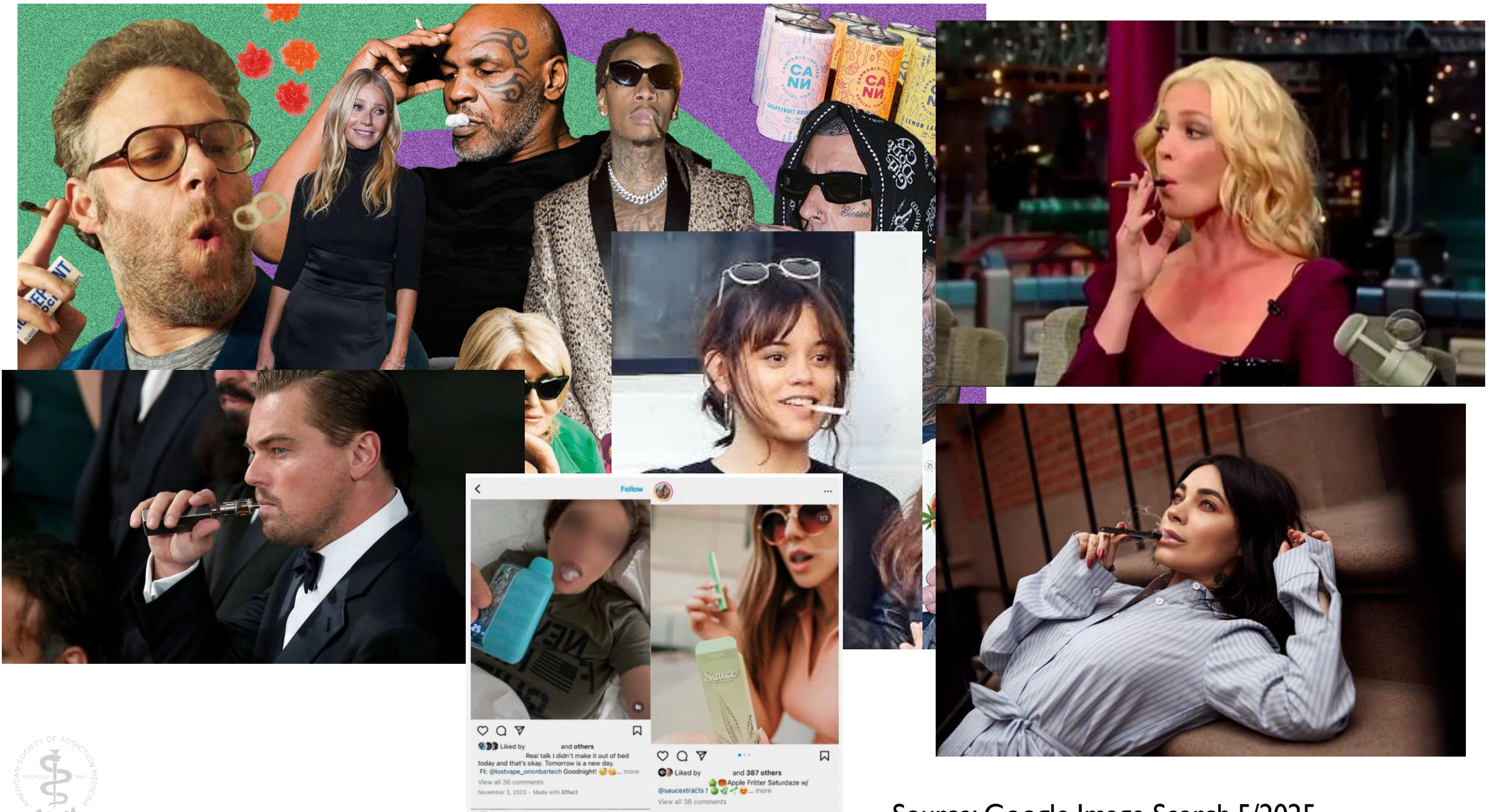
Rutherford et al.

Ranker et al.



Teens who are regular social media users have greater likelihood of tobacco and cannabis use.







# Warning Signs of Youth Vaping

- Friends who vape
- Use of slang terms, discussing vaping
- Changes in online purchasing, package delivery, money use
- Sweet food or fruit scents in the home
- Changes in physical complaints and symptoms
- Pro-vaping post engagement on social media
- Withdrawal and sneaking
- Decreased caffeine use
- Seeing Equipment

# Warning Signs of Escalating Use

- Declining engagement in prosocial activities.
- Friends wanting to be alone rather than engaging in activities together.
- Abrupt decreases in family participation
- Increased reporting or signs of low motivation, poor attention, forgetfulness.
- Academic difficulty.
- Irritability.



Photo 149173336 © Milkos - Dreamstime.com

# Warning Signs of Escalating Use

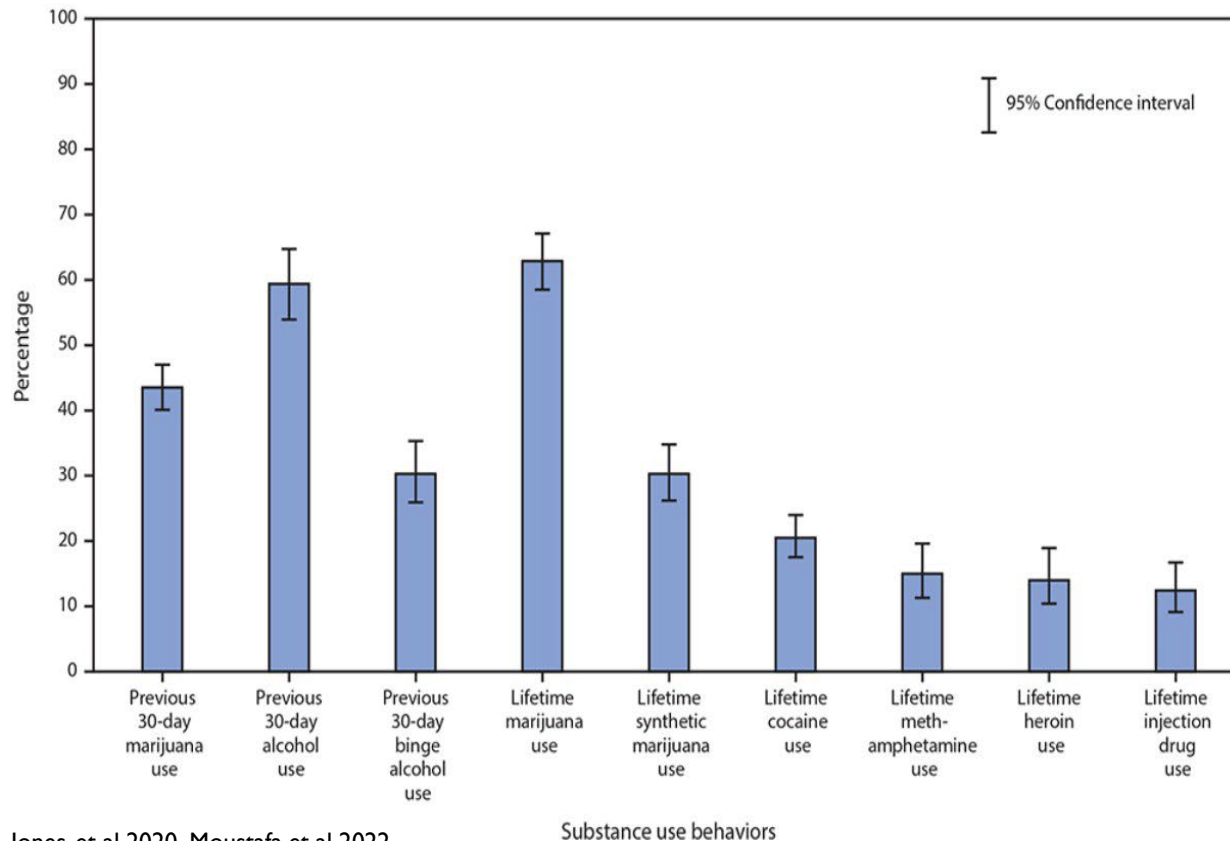
- Sleep changes
- Changes with anxiety or mood – reporting less, more, or increased fluctuations.
- Recurrent episodes of nausea, vomiting, bowel changes.
- Changes in eating patterns.
- Acting unusually silly or impulsive at times.
- Medications “not working anymore”



Photo: <https://www.nytimes.com/>

# Nicotine and Marijuana Use Associated with Opioid Use

FIGURE. Percentage of co-occurring substance use behaviors among high school students who reported previous 30-day prescription opioid misuse\* — Youth Risk Behavior Survey, United States, 2019



Looking at nicotine and THC vaping:

*“The fact that single-use trajectories (nicotine vaping only, cannabis vaping only) were not identified indicates that adolescents either vape both substances or neither.”*

*- Moustafa et al 2022*


Most youth actively using opioids are using other substances – nicotine, marijuana and alcohol primarily.



# Getting More Help

## WHAT IS SBIRT?

### The SBIRT process includes:

1. **SCREENING** to identify a person's risk for a substance use challenge.
2. **BRIEF INTERVENTION (BI)** to raise a person's awareness of risks, elicit internal motivation for change, and help set behavior-change goals.
3.  **REFERRAL TO TREATMENT** to facilitate access to and engagement in specialized services and coordinated care for people at highest risk.

To Be Continued...

**VAPING?**

**WANT TO QUIT? WE CAN HELP!**



FREE 24/7 SUPPORT: 1-800-QUIT-NOW

 **QuitlineNC**

Welcome to

**HeyNorm.org**



# Summary

- Although there are factors that increase someone risk of vaping, it is important to screen all patients for substance use using validated tools.
- Vaping nicotine and cannabis is increasingly common among young adults likely secondary to legalization and commercialization.
- The majority of youth are not using these substances, legalization of cannabis products is likely increasing youth use due to decreased perception of risk and increased availability.
- Vaping impacts the body negatively and can lead to lung injury and disease along with increased risk of hear problems. Both THC and nicotine impact the brain of youth differently than adults.

# Summary

- We can decrease risk of addiction to nicotine and cannabis by supporting youth mental health, discussing social norms and commercialization, empowering parental discussions and limit setting, minimizing social media use, and supporting resilience from other risk factors.
- Nicotine vaping increase the risk of cannabis use. Cannabis and nicotine use increase the risk of other substance use. The inverse is likely also true.
- We can discuss more about brief intervention, pharmacotherapy and referral to treatment during our panel discussion later today!





# THANK YOU!

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Adult, Child and Adolescent Psychiatrist  
Addiction Medicine Physician

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# REFERENCES

- Anderson DM, Fe HT, Liang Y, Sabia JJ. Recreational Marijuana Laws and Teen Marijuana Use, 1993 -2021. *JAMA Psychiatry*. Published online April 24, 2024. doi:10.1001/jamapsychiatry.2024.0698
- Brown, T., Ackerman, R. A., Kroon, E., Kuhns, L., Cousijn, J., & Filbey, F. M. (2024). The role of sleep in the link between cannabis use and memory function: evidence from a cross- sectional study. *The American Journal of Drug and Alcohol Abuse*, 50(4), 547–556. <https://doi.org/10.1080/00952990.2024.2362832>
- US DHHS, Health Resources and Services Administration, Maternal and Child Health Bureau. *Child Health USA 2010*. Rockville, Maryland: U.S. Department of Health and Human Services, 2010.
- Casey BJ, et al., Development Reviews. 2008; 28(1): 62-77
- Crean RD, Crane NA, Mason BJ. An evidence-based review of acute and long-term effects of cannabis use on executive cognitive functions. *J Addict Med*. 2011;5(1):1-8. doi:10.1097/ADM.0b013e31820c23fa
- Adolescents Differ from Adults in Substances Most Abused Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2013. SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2013.
- National Institute on Drug Abuse; National Institutes of Health; U.S. Department of Health and Human Services.
- NIDA. 2023, May 8. Is there a link between marijuana use and psychiatric disorders?. Retrieved from <https://nida.nih.gov/publications/research-reports/marijuana/there-link-between-marijuana-use-psychiatric-disorders> on 2024, January 9
- McCabe, S.E.; West, B.T.; Morales, M.; Cranford, J.A.; and Boyd, C.J. Does early onset of non-medical use of prescription drugs predict subsequent prescription drug abuse and dependence? Results from a national study. *Addiction* 102(12):1920–1930, 2007.
- Meier, M.H.; Caspi, A.; Ambler, A.; Harrington, H.L.; Houts, R.; Keefe, R.S.E.; McDonald, K.; Ward, A.; Poulton, R.; and Moffitt, T.E. Persistent cannabis users show neuropsychological decline from childhood to midlife. *Proceedings of the National Academy of Sciences of the United States of America* Oct 2;109(40):E2657–E2664, 2012.
- Mennis et al. 2022 Recreational cannabis legalization alters associations among cannabis use, perception of risk, and cannabis use disorder treatment for adolescents and young adults, *Addictive Behaviors*, Volume 138, 2023, 107552, ISSN 0306-4603, <https://doi.org/10.1016/j.addbeh.2022.107552>.
- Dennis, M.; Babor, T.F.; Roebuck, C.; and Donaldson, J. Changing the focus: The case for recognizing and treating cannabis use disorders. *Addiction* 97:(s1):4–15, 2002.
- Chan, Y.F.; Dennis, M.L.; and Funk, R.R. Prevalence and comorbidity co-occurrence of major internalizing and externalizing disorders among adolescents and adults presenting to substance abuse treatment. *Journal of Substance Abuse Treatment* 34:14–24, 2008
- Iversen L. How cannabis works in the brain. In *Marijuana and Madness*. Ed. Castle & Murray, 2004. Oxford University Press.
- Doohan PT, Oldfield LD, Arnold JC, Anderson LL. Cannabinoid Interactions with Cytochrome P450 Drug Metabolism: a Full-Spectrum Characterization. *AAPS J*. 2021 Jun 28;23(4):91. doi: 10.1208/s12248-021-00616-7. PMID: 34181150.
- Ta M., Greto L, Bolt K. Trends and Characteristics in Marijuana Use Among Public School Students — King County, Washington, 2004–2016. *MMWR Morb Mortal Wkly Rep* 2019;68:845–850. DOI: <http://dx.doi.org/10.15585/mmwr.mm6839a3external> icon

# REFERENCES

- Center for Substance Abuse Treatment. Enhancing Motivation for Change in Substance Abuse Treatment. Rockville (MD): Substance Abuse and Mental Health Services Administration (US); 1999. (Treatment Improvement Protocol (TIP) Series, No. 35.) Chapter 3—Motivational Interviewing as a Counseling Style. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK64964/>
- Logan DE, Marlatt GA. Harm Reduction Therapy: A Practice-Friendly Review of Research. *Journal of clinical psychology*. 2010;66(2):201-214. doi:10.1002/jclp.20669. Weaver, Michael, Hopper; John.
- Cannabis Conversations. ASAM Annual Conference. April 2022, <https://www.eventscribe.com/2015/APP/PresentationSlides/slideShareV3.asp?sfp=MTAyMDR8MTkwNzk5NHwINjU1NTU4MHwtMQ==&SlidesID=193616>. PowerPoint Presentation.
- Pham, Victoria; Hurley, Brian. Cannabis: Products, Health Effects, Policies and Clinical Interventions. ASAM Annual Conference. April 2022, <https://www.eventscribe.com/2015/APP/PresentationSlides/slideShareV3.asp?sfp=MTAyMDR8MTkwNzk5MHwINjU1NTU4MHwtMQ==&SlidesID=208289>. PowerPoint Presentation.
- NIDA. 2021, September 8. Marijuana use at historic high among college-aged adults in 2020. Retrieved from <https://nida.nih.gov/news-events/news-releases/2021/09/marijuana-use-at-historic-high-among-college-aged-adults-in-2020> on 2022, July 25
- Bien, T., Miller, W.R., and Tonigan, J.S., Brief interventions for alcohol problems: a review. *Addiction*, 1993. 88(3): p. 315-336.
- Ricci V, De Berardis D, Martinotti G, Maina G. New insight in psychotic cannabis withdrawal: case series and brief overview. *Riv Psichiatr*. 2024 Nov-Dec;59(6):316-321. doi: 10.1708/4386.43840. PMID: 39648835.
- Stringfield SJ, Torregrossa MM. Disentangling the lasting effects of adolescent cannabinoid exposure. *Prog Neuropsychopharmacol Biol Psychiatry*. 2021 Jan 10;104:110067. doi: 10.1016/j.pnpbp.2020.110067. Epub 2020 Aug 11. PMID: 32791165.
- Squeglia LM, Jacobus J, Tapert SF. The influence of substance use on adolescent brain development. *Clin EEG Neurosci*. 2009 Jan;40(1):31-8. doi: 10.1177/155005940904000110. PMID: 19278130; PMCID: PMC2827693.
- Zamberletti E, Rubino T. Dose and Age: Role of Dose and Age in the Long-Term Effect of Cannabinoids on Cognition. *Molecules*. 2022 Feb 19;27(4):1411. doi: 10.3390/molecules27041411. PMID: 35209200; PMCID: PMC8876668.
- SE McCabe, JE Schulenberg, TS Schepis, VM McCabe, PT Veliz [Longitudinal analysis of substance use disorder symptom severity at age 18 and substance use disorder in adulthood](#). *JAMA Network Open*. DOI: 10.1001/jamanetworkopen.2022.5324 (2022)
- ND Volkow, EM Wargo. [Association of Severity of Adolescent Substance Use Disorders and Long-term Outcomes](#). *JAMA Network Open*. DOI: 10.1001/jamanetworkopen.2022.5656 (2022)
- Substance Abuse and Mental Health Services Administration. (2025). 2024 Companion infographic report: Results from the 2021 to 2024 National Surveys on Drug Use and Health (SAMHSA Publication No. PEP25-07-006). Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. <https://www.samhsa.gov/data/data-we-collect/nsduh-national-survey-drug-use-and-health/national-releases>

# REFERENCES

- Starzer MSK, Nordentoft M, Hjorthøj C. [Rates and predictors of conversion to schizophrenia or bipolar disorder following substance-induced psychosis](#) [published correction appears in *Am J Psychiatry*. 2019 Apr 1;176(4):324]. *Am J Psychiatry*. 2018;175(4):343-350. doi:10.1176/appi.ajp.2017.17020223
- Murrie B, Lappin J, Large M, Sara G. [Transition of substance-induced, brief, and atypical psychoses to schizophrenia: A systematic review and meta-analysis](#). *Schizophr Bull*. 2020;46(3):505-516. doi:10.1093/schbul/sbz102
- Kendler KS, Ohlsson H, Sundquist J, Sundquist K. [Prediction of onset of substance-induced psychotic disorder and its progression to schizophrenia in a Swedish national sample](#). *Am J Psychiatry*. 2019;176(9):711-719. doi:10.1176/appi.ajp.2019.18101217
- Chester LA, Valmaggia LR, Kempton MJ, et al. [Influence of cannabis use on incidence of psychosis in people at clinical high risk](#). *Psychiatry Clin Neurosci*. 2023;10.1111/pcn.13555. doi:10.1111/pcn.13555
- Ortiz-Medina MB, Perea M, Torales J, et al. [Cannabis consumption and psychosis or schizophrenia development](#). *Int J Soc Psychiatry*. 2018;64(7):690-704. doi:10.1177/0020764018801690
- Gujska JH, Silczuk A, Madejek R, Szulc A. Exploring the Link Between Attention-Deficit Hyperactivity Disorder and Cannabis Use Disorders: A Review. *Med Sci Monit*. 2023 May 6;29:e939749. doi: 10.12659/MSM.939749. PMID: 37147797; PMCID: PMC10171029.
- Roehler DR, Smith H IV, Radhakrishnan L, et al. Cannabis-Involved Emergency Department Visits Among Persons Aged <25 Years Before and During the COVID-19 Pandemic — United States, 2019–2022. *MMWR Morb Mortal Wkly Rep* 2023;72:758–765. DOI: <http://dx.doi.org/10.15585/mmwr.mm7228a1>
- Bailey JA, Epstein M, Roscoe JN, Oesterle S, Kosterman R, Hill KG. Marijuana Legalization and Youth Marijuana, Alcohol, and Cigarette Use and Norms. *Am J Prev Med*. 2020 Sep;59(3):309-316. doi: 10.1016/j.amepre.2020.04.008. Epub 2020 Jul 9. PMID: 32654862; PMCID: PMC7483911.
- Rutherford BN, Lim CCW, Johnson B, Cheng B, Chung J, Huang S, Sun T, Leung J, Stjepanović D, Chan GCK. #TurntTrending: a systematic review of substance use portrayals on social media platforms. *Addiction*. 2023 Feb;118(2):206-217. doi: 10.1111/add.16020. Epub 2022 Sep 8. PMID: 36075258; PMCID: PMC10087142.
- Ranker, L. R., Wu, J., Hong, T., Wijaya, D., Benjamin, E. J., Bhatnagar, A., Robertson, R. M., Fetterman, J. L., & Xuan, Z. (2024). Social media use, brand engagement, and tobacco product initiation among youth: Evidence from a prospective cohort study.
- Olfson, M., Wall, M. M., Liu, S.-M., & Blanco, C. (2018). Cannabis Use and Risk of Prescription Opioid Use Disorder in the United States. *American Journal of Psychiatry*, 175(1), 47–53. <https://doi.org/10.1176/appi.ajp.2017.17040413>



# REFERENCES

- Jamal A, Park-Lee E, Birdsey J, et al. Tobacco Product Use Among Middle and High School Students — National Youth Tobacco Survey, United States, 2024. *MMWR Morb Mortal Wkly Rep* 2024;73:917–924. Park-Lee E, Jamal A, Cowan H, et al. Notes from the Field: E-Cigarette and Nicotine Pouch Use Among Middle and High School Students — United States, 2024. *MMWR Morb Mortal Wkly Rep* 2024;73:774–778.
- Goriounova NA, Mansvelder HD. Short- and long-term consequences of nicotine exposure during adolescence for prefrontal cortex neuronal network function. *Cold Spring Harb Perspect Med*. 2012 Dec 1;2(12):a012120. doi: 10.1101/cshperspect.a012120. PMID: 22983224; PMCID: PMC3543069.
- Moustafa AF, Rodriguez D, Pianin SH, Testa SM, Audrain-McGovern JE. Dual Use of Nicotine and Cannabis Through Vaping Among Adolescents. *Am J Prev Med*. 2022 Jul;63(1):60-67. doi: 10.1016/j.amepre.2021.11.022. Epub 2022 Mar 29. PMID: 35365396; PMCID: PMC9232951.
- Ren M, Lotfipour S. Nicotine Gateway Effects on Adolescent Substance Use. *West J Emerg Med*. 2019 Aug 20;20(5):696-709. doi: 10.5811/westjem.2019.7.41661. PMID: 31539325; PMCID: PMC6754186.
- McCabe SE, Pasman E, Wilens T, et al. Attention-Deficit/Hyperactivity Disorder Symptoms and Later E-Cigarette and Tobacco Use in US Youths. *JAMA Netw Open*. 2025;8(2):e2458834. doi:10.1001/jamanetworkopen.2024.58834
- Gali, K., Winter, S.J., Ahuja, N.J. et al. Changes in cannabis use, exposure, and health perceptions following legalization of adult recreational cannabis use in California: a prospective observational study. *Subst Abuse Treat Prev Policy* 16, 16 (2021). <https://doi.org/10.1186/s13011-021-00352-3>
- Zuikova E, Ioannides C, Bailey A, Marczylo T. Effects of nicotine and E-cigarette fluids on cytochromes P450 in hCMEC/D3 blood-brain barrier cell line. *Tobacco Prevention & Cessation*. 2018;4(Supplement):A151. doi:10.18332/tpc/90508.
- Jessica T Kent, Garrick Mok, Emily Austin, Nicotine Toxicity From Repeat Use of Nicotine Pouches, *Nicotine & Tobacco Research*, Volume 27, Issue 4, April 2025, Pages 767–768, <https://doi.org/10.1093/ntr/ntae111>
- Carr, Z.J., Strand, E. (2024). The Impact of Cannabis Use Disorder on Critical Illness. In: Karamchandani, K., Grant, J.E. (eds) *Substance Use Disorders in Adult Critically Ill Patients*. Springer, Cham. [https://doi.org/10.1007/978-3-031-67069-5\\_7](https://doi.org/10.1007/978-3-031-67069-5_7)
- Turner AR, Spurling BC, Agrawal S. Marijuana Toxicity. [Updated 2023 Jul 31]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK430823/>
- Jones CM, Clayton HB, Deputy NP, et al. Prescription Opioid Misuse and Use of Alcohol and Other Substances Among High School Students — Youth Risk Behavior Survey, United States, 2019. *MMWR Suppl* 2020;69(Suppl- 1):38–46.
- Hasin D, Walsh C. Trends over time in adult cannabis use: A review of recent findings. *Curr Opin Psychol*. 2021 Apr;38:80-85. doi: 10.1016/j.copsyc.2021.03.005. Epub 2021 Mar 20. PMID: 33873044; PMCID: PMC8905582.
- Miech, R. A., Johnston, L. D., Patrick, M. E., & O'Malley, P. M. (2025). Monitoring the Future national survey results on drug use, 1975–2024: Overview and detailed results for secondary school students. *Monitoring the Future Monograph Series*. Ann Arbor, MI: Institute for Social Research, University of Michigan. Available at <https://monitoringthefuture.org/results/annual-reports/>
- Ren M, Lotfipour S. Nicotine Gateway Effects on Adolescent Substance Use. *West J Emerg Med*. 2019 Aug 20;20(5):696-709. doi: 10.5811/westjem.2019.7.41661. PMID: 31539325; PMCID: PMC6754186.

# Youth Substance Use and The Big Four

Reason One: Immediate Harm

Reason Two: Negative Impacts on Health

Reason Three: Risk to a Vulnerable Young Brain

Reason Four: Addiction

# Reason One: Immediate Harm

Young Brain

Pleasure Seeking

Impulsive

Novelty

Instant Gratification

Limited Planning

(Sensitive to Dopamine)



Substance Intoxication

Cognitive changes

Euphoria

Decreased IQ

Increased risk-taking

Impaired motor skills

Sensation Seeking

(Release a LOT of Dopamine)



Morbidity  
and  
Mortality

## Reason Two: Mental Health Vulnerability

Number of mental health diagnoses, suicidality

Diagnostic complexity

Environmental changes

Treatment resistance

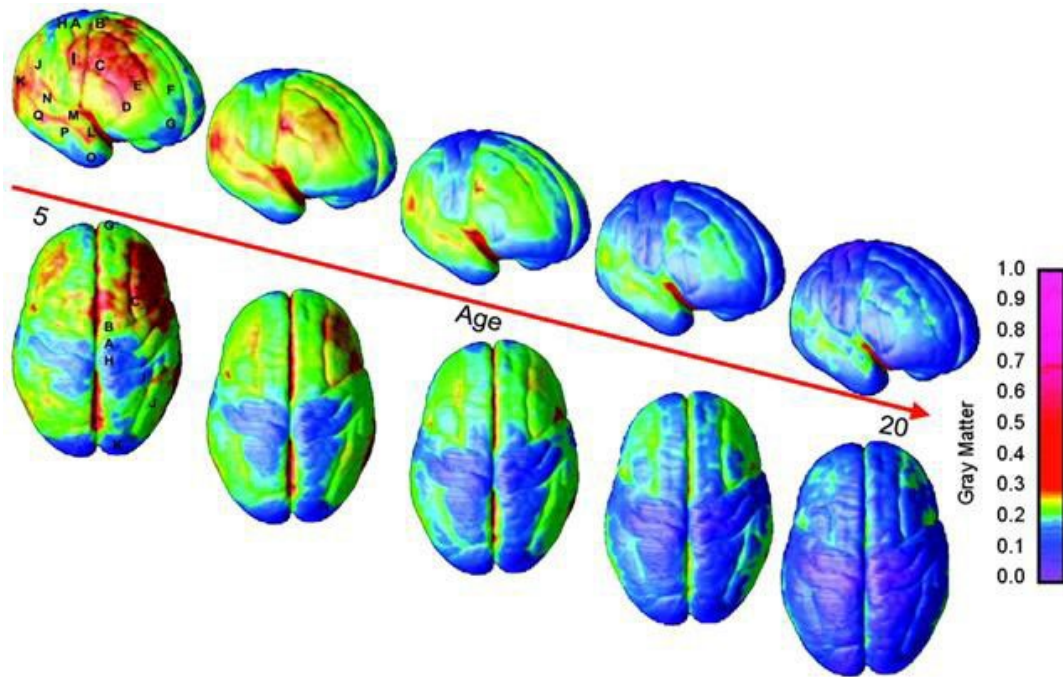
Medication toxicity or inefficacy

Psychosis risk with regular cannabis use

Decreases use of health coping skills



# Reason Three: Altered Brain Development



# Reason Four: Risk of Adulthood Addiction

## Marijuana Addiction

Contrary to popular belief, marijuana is addictive. Research shows that:

- 1-in-6 people who start using the drug before the age of 18 can become addicted.
- 1-in-10 adults who use the drug can become addicted.

Among 18yo with severe SUD – 60% still met criteria for SUD at 50yo

Among 18yo with mild SUD – 45% still met criteria for SUD at 50yo.

Population risk is 15%

TABLE 2.

### DSM-5 Criteria for Substance Use Disorder

Criterion	Severity
Use in larger amounts or for longer periods of time than intended	Severity is designated according to the number of symptoms endorsed: 0-1: No diagnosis 2-3: Mild SUD 4-5: Moderate SUD 6 or more: Severe SUD
Unsuccessful efforts to cut down or quit	
Excessive time spent using the drug	
Intense desire/urge for drug (craving)	
Failure to fulfill major obligations	
Continued use despite social/interpersonal problems	
Activities/hobbies reduced given use	
Recurrent use in physically hazardous situations	
Recurrent use despite physical or psychological problem caused by or worsened by use	
Tolerance	
Withdrawal	

*SUD, substance use disorder*

*Adapted from Diagnostic and Statistical Manual of Mental Disorders, fifth edition.<sup>23</sup>*

# Cause of Increased Addiction Risk

