WELCOME to the *Cannabis in the Workplace: An ECHO on Health, Safety, and Management*

June 11 – August 29, 2025

Series Learning Objectives

After participating in this activity, learners will be able to:

1. Describe the potential impacts of cannabis on individual health and workplace health and safety
2. Recognize cannabis-related impairment and intervene to support health and safety in the workplace and the health of the involved individual
3. Describe legal and regulatory policies at state and national level that shape management of cannabis in the workplace
4. Develop and implement workplace policies related to cannabis that support health and safety

Series Sessions

Date	Session Title
6/11/2025	Pharmacology of cannabis and impact on individual
6/25/2025	Impact of cannabis on workplace
7/9/2025	Cannabis testing
7/23/2025	Assessing impairment in the workplace
8/6/2025	Intervention, management of leave, treatment, re-entry into the workplace
8/20/2025	The legal and regulatory landscape
8/27/2025*	Development of workplace policies

Core Panel

Bob McLellan, MD, MPH	Occupational Medicine Physician, Geisel School of Medicine
Charla Stevens, JD	Legal/ Regulatory Expert at Charla Stevens Consulting
Claire Bryant, MPH	Senior Program Manager, National Safety Council
Dana Lariviere	President/CEO at Chameleon Group
Jackie Pogue, MPH	Research Project Manager at Dartmouth College, Course Director
Jeanne Venuti, BS	Director of Workforce Development at Recovery Friendly Workplace
Liz Bailey, JD	Legal/ Regulatory Expert at Sheehan Phinney
Luke Archibald, MD	Section Chief, Addiction Treatment Program, Dartmouth Health
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Cannabis Pharmacology and Actions
What Employers Need to Know

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6-2025

Disclosures

- I do not have any relevant financial disclosures

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Project ECHO

Objectives

- Discuss prevalence of cannabis use
- Describe reported reasons for therapeutic & recreational cannabis use
- Outline diversity of U. S. state laws for therapeutic & recreational cannabis use
- Describe cannabis pharmacology and routes of administration
- Discuss cannabis risks, side effects and impact on work performance

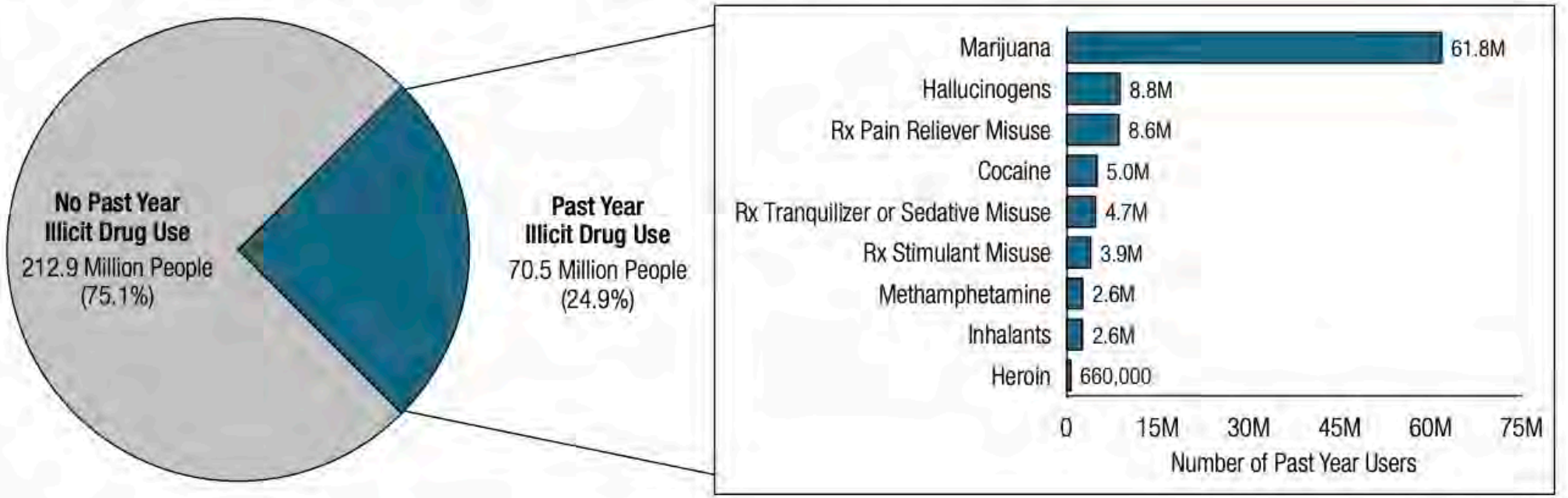
Cannabis has been in use for centuries

- 4000 B.C use China
- 450-200 B.C. Greco-Roman Use
- 1000 – 1464 A.D. Treatment for epilepsy
- 1850 U.S. Pharmacopeia -neuralgia, opioid addiction, alcoholism
- 1937 Marihuana Tax Act; Federal prohibition
- 1942 Removed from U. S. Pharmacopeia
- 1964 THC discovered
- 1970 CSA Schedule 1 (Recreational >> criminalization)
- 1988 CBD1 and CBD2 receptors discovered
- 2000 – present Increased therapeutic use > Push for legalization

https://www.deamuseum.org/ccp/cannabis/history.html; https://www.visualcapitalist.com/history-medical-cannabis-shown-one-giant-map

Cannabis Use in the U.S. 2023 Past year use

Figure 12. Past Year Illicit Drug Use: Among People Aged 12 or Older; 2023



Rx = prescription.

Note: The estimated numbers of past year users of different illicit drugs are not mutually exclusive because people could have used more than one type of illicit drug in the past year.

National Survey on Drug Use and Health, 2023
https://www.samhsa.gov/data/sites/default/files/reports/rpt47095/National%20Report/National%20Report/2023-nsduh-annual-national.pdfç

People use cannabis for a variety of reasons

- According to surveillance data 38% use for recreational, 33% for recreational and medical and 29% for medical only[1]
- Young adults' motives for cannabis use were enjoyment/fun, conformity, experimentation, social enhancement, and relaxation[2]
- College students reported using cannabis for social facilitation, peer acceptance, emotional pain, and sex-seeking[3]
- In a small Canadian study of long term users the top reason for use was **relaxation**; other reasons included feeling good, enjoyment of media, medical use, inspiration, depression, anxiety, better sleep, and boredom[4]

[1]Kurtzman & Wolff; *Drug Alcohol Depend;* 2021;226 https://doi.org/10.1016/j.drugalcdep.2021.108880; [2]Lee et al.. Addict Behav. 2007;;32(7):1384-94. doi: 10.1016/j.addbeh.2006.09.010. [3]Beck et alAddict Behav. 2009;34(9):764-8. doi: 10.1016/j.addbeh.2009.05.001; [4]Hathaway. *Addiction Research & Theory*, 2003;*11*(6), 441–458.

People use cannabis to self-treat symptoms

27,169 respondents to 2018 online survey in U.S and Canada

- Self-reported ever symptom management use (27%)
- Higher in legal use states (34%) versus illegal use states (23%)
- Among reported reasons for symptom management:

Physical symptoms

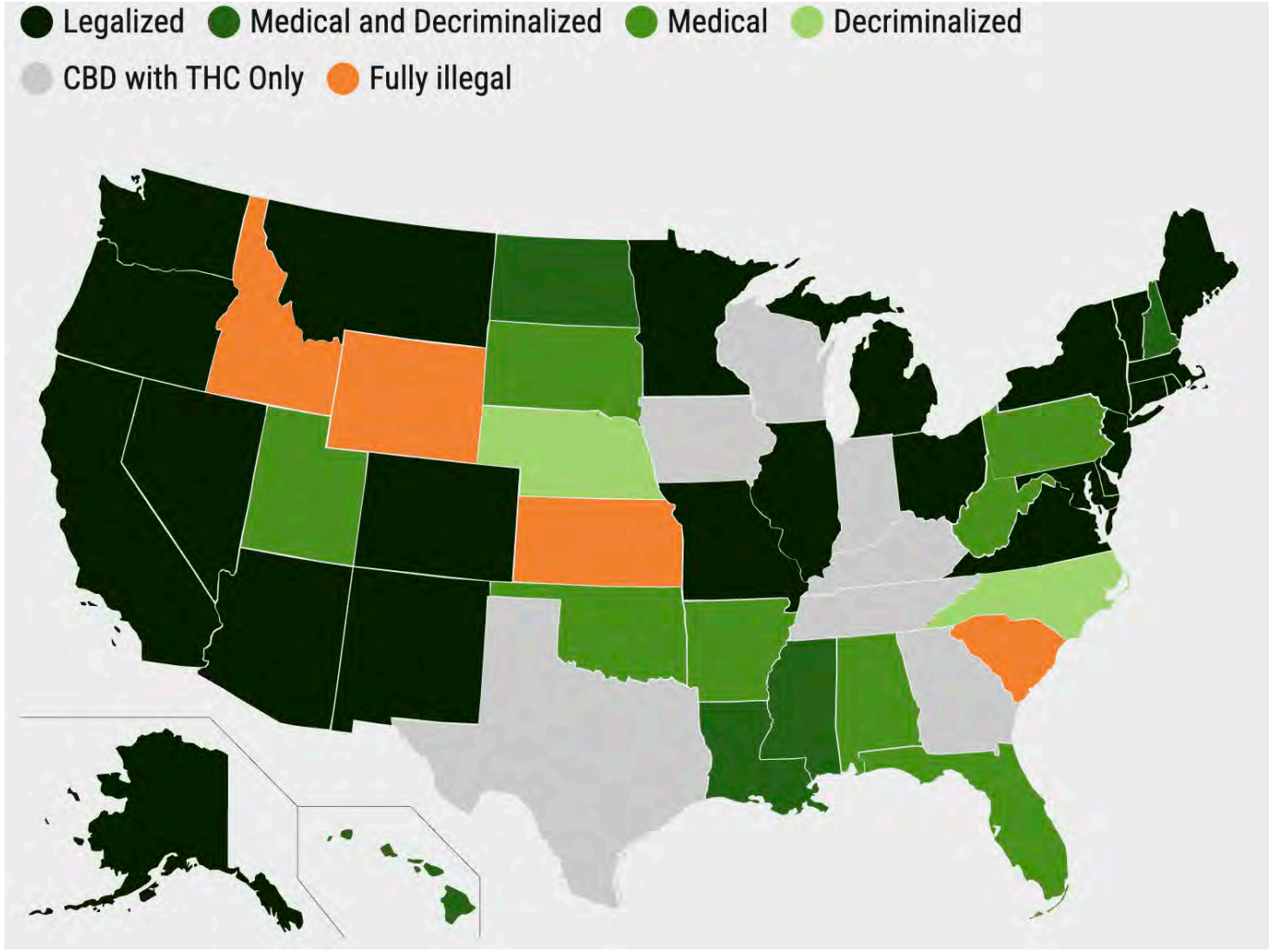
Pain 53%
Sleep 46%
Headaches 35%
Appetite 22%
N/V 21%

Mental health symptoms

Anxiety 52%
Depression 40%
PTSD/Trauma 17%
SUD 11%
Psychosis 4%

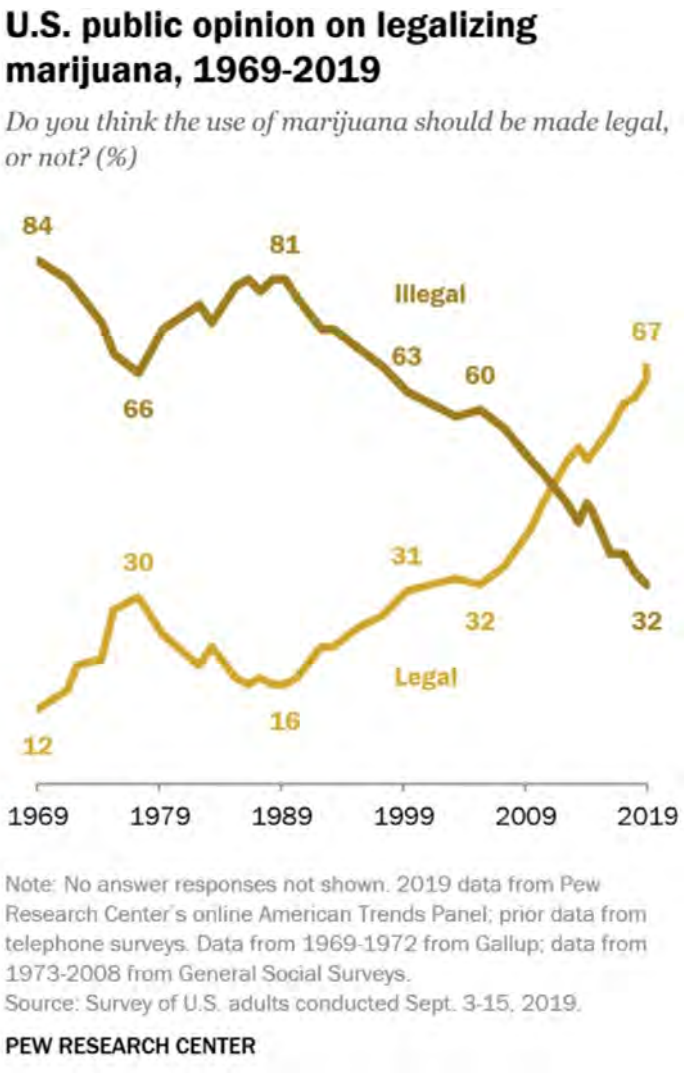
Leung et al . Psychopharmacology (Berl). 2022https://pmc.ncbi.nlm.nih.gov/articles/PMC9110511/

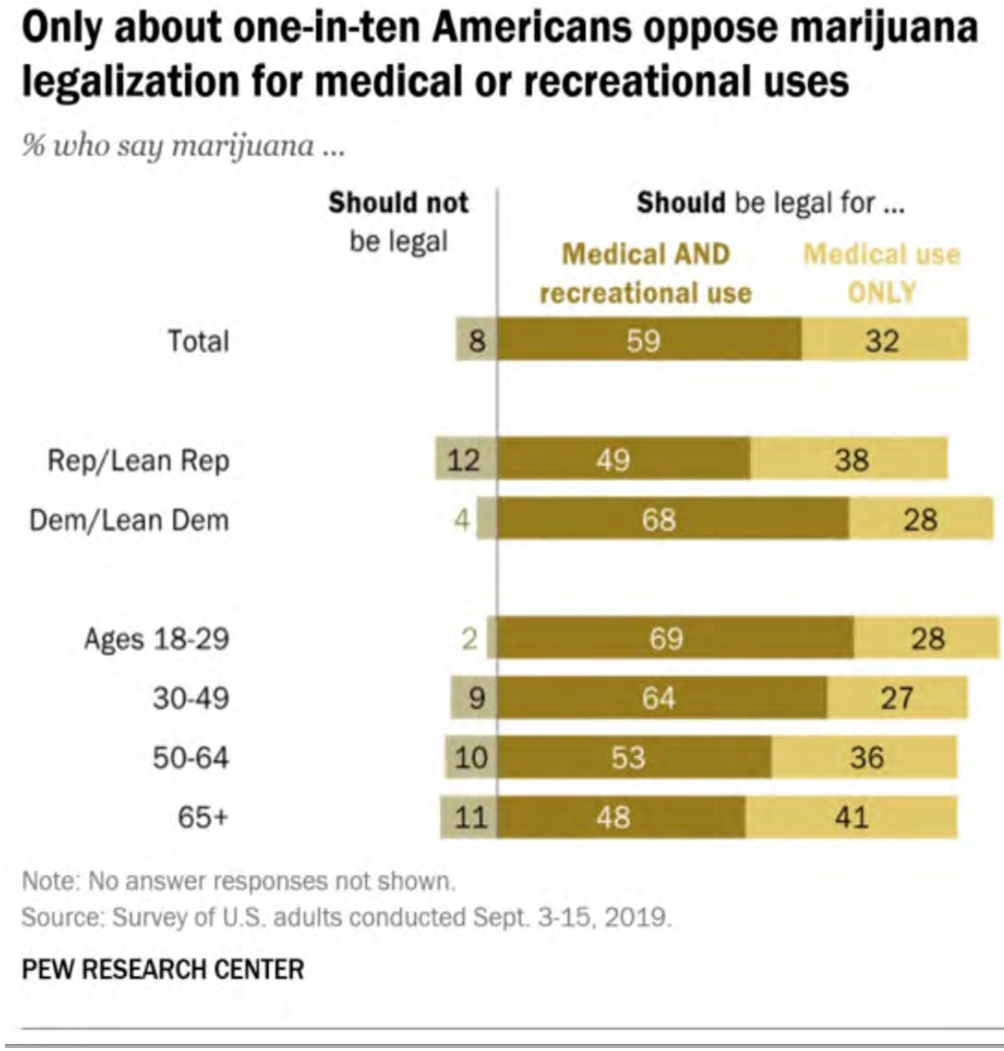
State cannabis policies are variable/changing



https://disa.com/marijuana-legality-by-state

Majority of Americans now support legalization of marijuana





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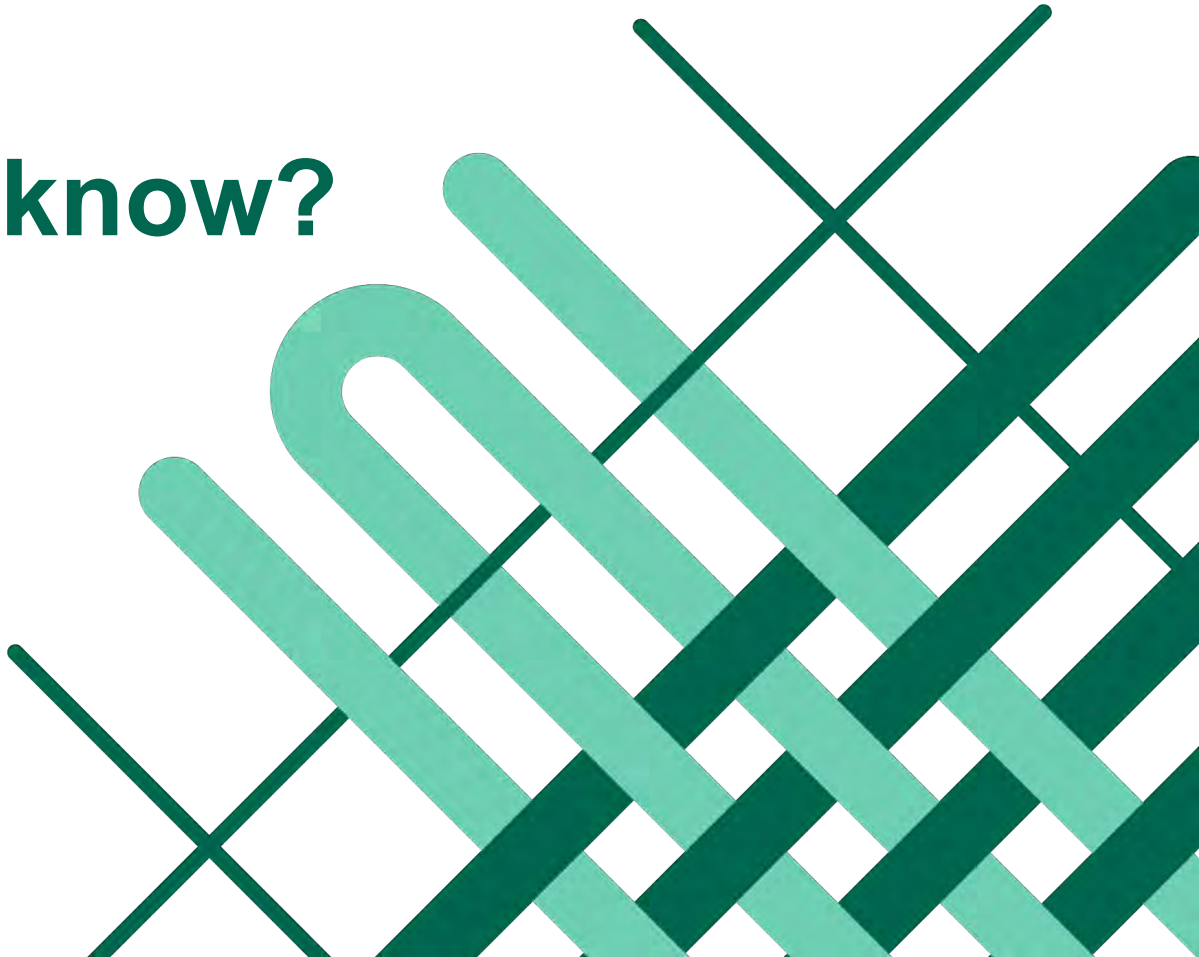
Cannabis – What do we know?



Cannabis contains > 100 phytocannabinoids and > 600 chemical constituents

- Two most prevalent cannabinoids
  - **Δ^9-tetrahydrocannabinol (THC)** - psychoactive; anti-emetic, analgesia, appetite stimulation (discovered 1964)
  - **Cannabidiol (CBD)** –not psychoactive; anti-convulsant, anxiolysis, anti-inflammatory
- Less studied cannabinoids & terpenes may contribute to effects
- NO standardization -Diverse strains bred and available
  - Very high THC concentrations are available
    - 1970s - 3-5% THC typical -Vape products > **94% THC available in dispensary**
  - Low THC, high CBD products and intermediate blends are available

Rock, Parker,. Adv Exp Med Biol. 2021;1264:1-13. doi: 10.1007/978-3-030-57369-0_1. PMID: 33332000.

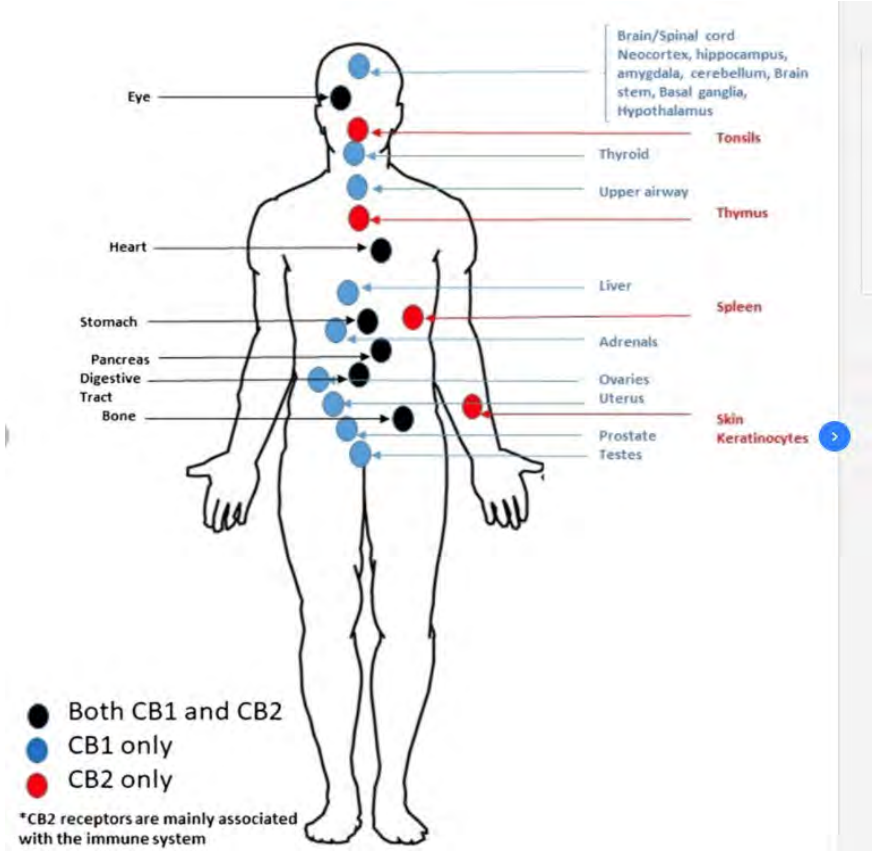
Endogenous cannabinoid system

Endocannabinoids bind to cannabinoid receptors to exert diverse physiologic effects

- CB1 (primarily in nervous system)
- CB2 (primarily in immune system)

Physiologic roles in

- Nociception (pain regulation)
- Mood modulation including reward
- Cognition, learning & memory
- Energy balance, appetite



Implications: Limited understanding of the effects of exogenous (external) cannabinoids (like THC/CBD) on endogenous (internal) cannabinoid system

Volkow et al. *Annu Rev Pharmacol Toxicol,* 2017;57:285-308; DiMarzo & Piscitelli, The Endocannabinoid System & Its Modulation by Phytocannabinoids, Neurotherapeutics, 2015

Three pharmaceutical cannabis products are available in the U. S.

Dronabinol
appetite loss HIV; CINV*

← Synthetic **THC** (1985) →

Nabilone
CINV*

CBD (2018) →

Epidiolex®
Seizures secondary to Lennox-Gastaut or Dravet syndrome

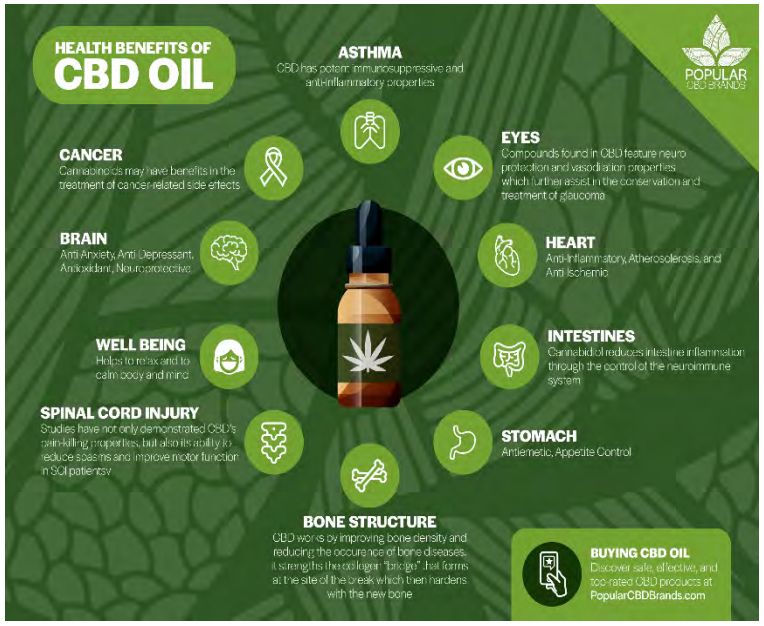
THC/CBD 1:1
Not approved US →

Nabiximols
MS** spasticity;
Off-label neuropathic pain

*CINV – chemotherapy induced nausea and vomiting; **MS multiple sclerosis

Cannabidiol (CBD) is widely available, but not well-regulated

Marketed indications not well studied



58 of 84 samples of CBD purchased online had mislabeled CBD content Bonn-Miller et al. *JAMA*. 2017;318 (17):1708-1709

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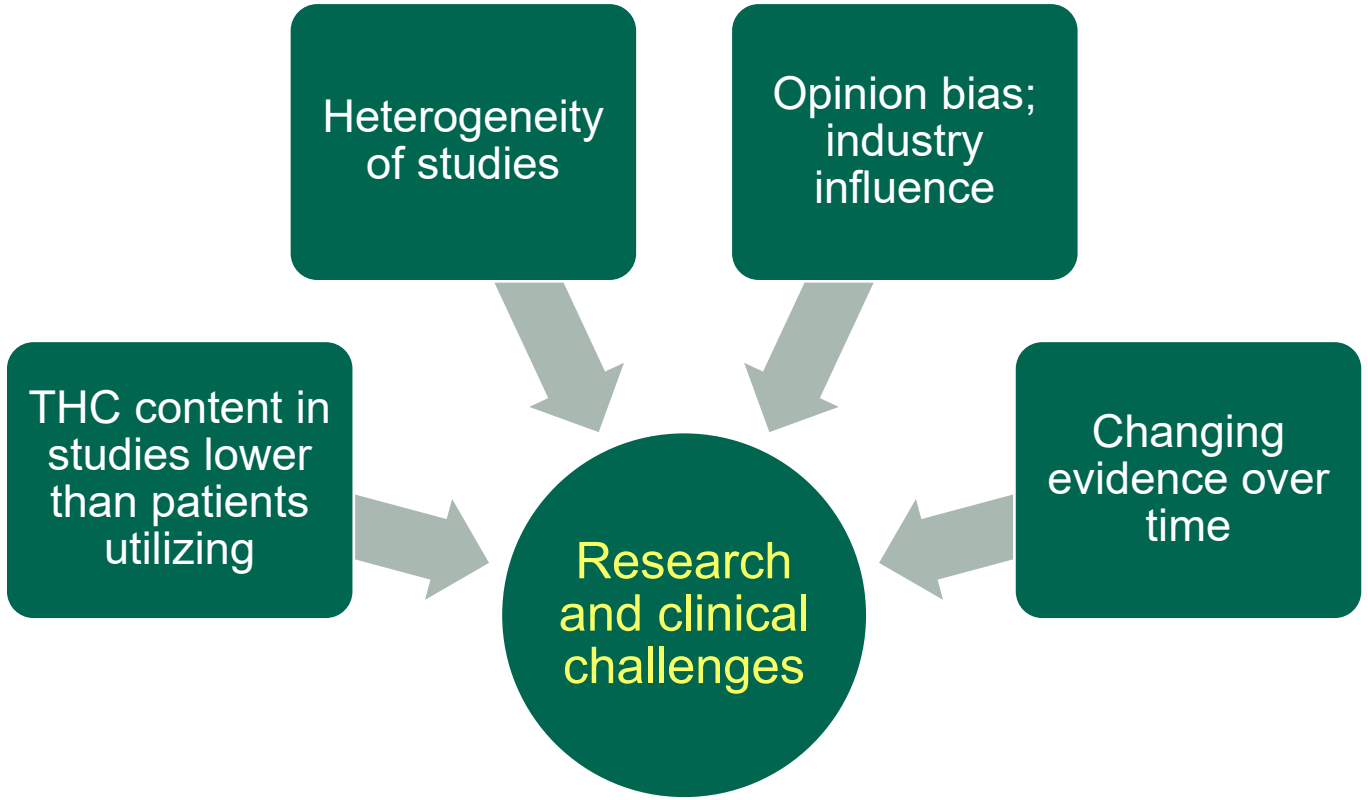
What does the evidence show about cannabis therapeutic effects?

Cannabis evidence of effects is difficult to accurately determine



NASEM; 2017https://www.nap.edu/catalog/24625/the-health-effects-of-cannabis-and-cannabinoids-the-current-state; Abrams, *Eu J Int Med,* 2018, 49, 7-11

Cannabis: Evidence of Effects

Substantial or conclusive evidence for efficacy

- Chronic pain in adults, particularly neuropathic pain[1,2]
- Chemotherapy-induced nausea & vomiting[1,3]
- Subjective spasticity multiple sclerosis[1]
- Epilepsy (Dravet and Lennox-Gastaut) CBD Epidiolex®[4]

Moderate

- Short-term sleep[1,5]

[1] NASEM; 2017https://www.nap.edu/catalog/24625/the-health-effects-of-cannabis-and-cannabinoids-the-current-state; [2]Nugent et al. 2017;*167*(5):319-331. [3]Lichtman et al JPSM 2018 https://doi.org/10.1016/j.jpainsymman.2017.09.001
[4]Chow et al. Support Care in Cancer. 2020;28:2095–2103 https://doi.org/10.1007/s00520-019-05280-4 ; MacCallum & Russo. *Eur J Int Med.* 2018;49:12-19; [4] Privitera et al. *Epilepsia.* 2021;62(5):1130-1140 [5]Bonaccorso. *Neurotoxicol.* https://doi.org/10.1016/j.neuro.2019.08.002

Cannabis: Evidence of Effects

Limited

- Appetite & weight loss in HIV/AIDS[1]
- Tourette symptoms[1]
- Anxiety symptoms in social anxiety disorders (CBD)[1,2]
- PTSD symptoms[1]
- Dementia[1]

Insufficient evidence

- Cancer cachexia >appetite, > side effects, <QOL[3]
- Cancer – most literature preclinical[4,5]
- Neurodegenerative disorders[1]
- Irritable bowel syndrome[1]
- Addiction abstinence[6]

[1] NASEM. 2017;https://www.nap.edu/catalog/24625/the-health-effects-of-cannabis-and-cannabinoids-the-current-state; [2]Wright. *Cannabis Cannabinoid Res* 2020. https://pubmed.ncbi.nlm.nih.gov/32923656/
[3]Wang et al. *Biomed Res Int.* 2019; https://doi.org/10.1155/2019/2864384; [4]Abu-Amna et al. *Curr. Treat. Options in Oncol*. 2021;22:16 doi: 10.1007/s11864-020-00811; [5]Goyal et al. *Comp Ther Med.* 2020; https://doi.org/10.1016/j.ctim.2020.102336; [6]Bonaccorso. *Neurotoxicol.* https://doi.org/10.1016/j.neuro.2019.08.002

CBD may have efficacy for symptoms such as anxiety, insomnia, addiction, and mood, but high-quality studies lacking

- Trials suggest that CBD may be effective for some anxiety[1]
  - Few human trials, mostly healthy males, social anxiety disorder[2]
- Preclinical, small clinical trials, anecdotal evidence
- *Unclear side effects of CBD use due to lack of studies*

Take home: Evidence is lacking, but people are experimenting with use of CBD for these conditions

[1]Wright. *Cannabis Cannabinoid Res* 2020. https://pubmed.ncbi.nlm.nih.gov/32923656/
[2]Bonaccorso. *Neurotoxicol.* https://doi.org/10.1016/j.neuro.2019.08.002

Cannabis product formulations

Smoked

- Rapid onset of action 5-10 min
- Duration 2-4 hr
- Bioavailability 10-30%

Vaporization

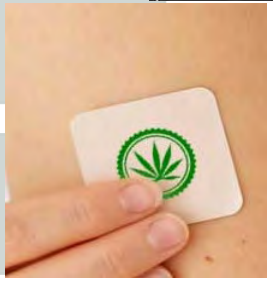
- Rapid onset of action (peak 5-10 min)
- Metered dosing devices
- Risk of EVALI (e-cig/vaping associated lung injury)

Edibles

- Slower onset of action 60-180 min
- Duration 6-8 hours
- Bioavailability 6% extensive first pass effects

Transmucosal Sublingual

- More rapid onset of action than orals 15-45 minutes
- Duration 6-8 hours
- Pharmaceutical form (nabiximols) available



Transdermal Topical

- Variable onset - duration
- Highly lipophilic
- Slow onset, stable blood levels

MacCallum & Russo. *Eur J Int Med.* 2018;49:12-19

Cannabis detection in urine drug testing varies

- Detection of THC in urine varies dependent on use
  - Single use 3 days
  - Moderate use (4x week) 5-7 days
  - Chronic use (daily) 10-15 days
  - Chronic heavy smoker >30 days

Moeller, Karen E. et al. Mayo Clinic Proceedings, 2017; (92)5: 774 - 796

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What are the adverse effects or potential harms of cannabis?

Reported THC adverse effects

Common reported adverse effects

- **CNS**
  - Drowsiness
  - Dizziness
  - Confusion
  - Mental Clouding
  - Slurred speech
- **Physical**
  - Tachycardia and hypotension
  - Nausea
  - Fatigue
  - Dry mouth
  - Cannabis hyperemesis syndrome

National Institute of Drug Abuse – Cannabis https://nida.nih.gov/research-topics/cannabis-marijuana#short-term-health-cannabis

CBD also has adverse effects

- Adverse effects to CBD less studied except for FDA approved Epidiolex® for seizures
- Reported adverse effects include
  - Drowsiness/sedation
  - Mood changes
  - Interactions with prescription medications that may affect actions and cause toxicity
  - Liver toxicity
  - Reproductive and developmental effects

Take home: People are experimenting with CBD and may not be cognizant of potential adverse effects

Huestis et al. Curr Neuropharmacol. 2019;17(10):974-989. doi: 10.2174/1570159X17666190603171901. Cannabidiol (CBD) – Potential Harms, Side Effects, and Unknowns; What You Need to Know (And What We're Working to Find Out) About Products Containing Cannabis or Cannabis-derived Compounds, Including CBD | FDA

Potential harms of cannabis use

Prenatal developmental changes	• Potential cognitive deficits, learning disabilities
Developmental changes in adolescents	• Intellectual, motivational, maturational
Motor vehicle accidents from acute cannabis intoxication	• Some studies show a significant correlation between high THC blood concentrations and car crash risk
Cardiopulmonary	• Mixed effects BP, Limited evidence - trigger MI, CVA, exacerbation COPD

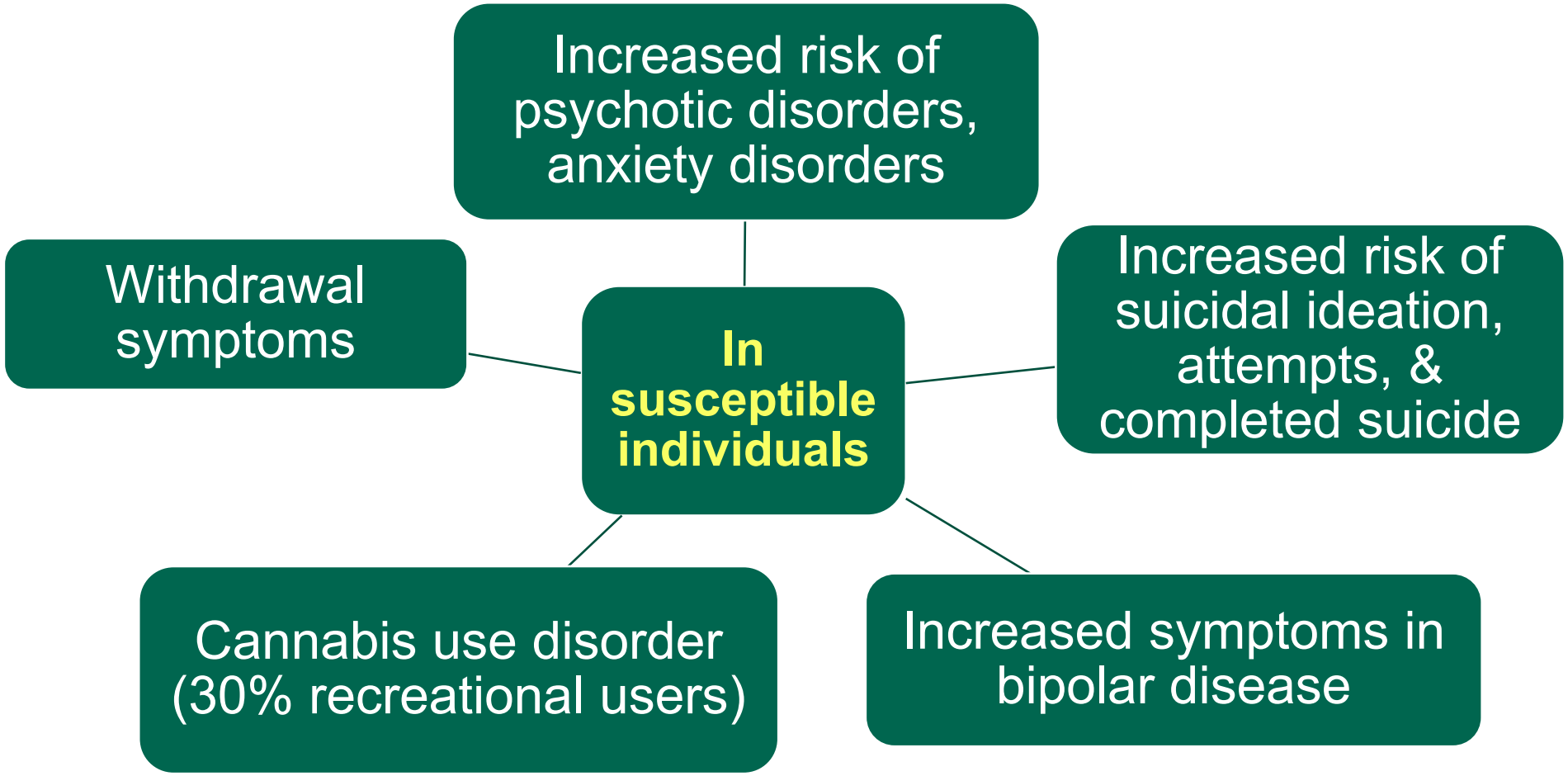
National Institute of Drug Abuse – Cannabis https://nida.nih.gov/research-topics/cannabis-marijuana#short-term-health-cannabis
Preuss et al. Front Psychiatry. 2021 28;12:643315. doi: 10.3389/fpsyt.2021.643315

Cannabis may affect work performance

- High quality studies evaluating effect of **medical** cannabis on workplace performance lacking[1]
  - Reported ‘adverse effects’ such as sedation, nausea/vomiting, dizziness and euphoria could be associated with performance
- Canadian study showed 2-fold increase of injury risk for ‘workplace cannabis use’ but none for ‘non-workplace use’[2]
- Case control study recreational marijuana legalization adoption and workplace injuries among younger workers aged 20 to 34 years
  - Recreational cannabis legalization adoption associated with 8.4% increase in injury[3]

[1]O’Neill et al. *Workplace Health & Safety*. 2023;71(9):400-410. doi:10.1177/21650799; [2] Carnide et al. *Canadian Journal of Public Health*. 2023;114(6):947-955. doi:10.17269/s41997-023-00795-0 ; Li et al.JAMA Health Forum. 2024 2;5(2):e235438. doi: 10.1001/jamahealthforum.2023.5438

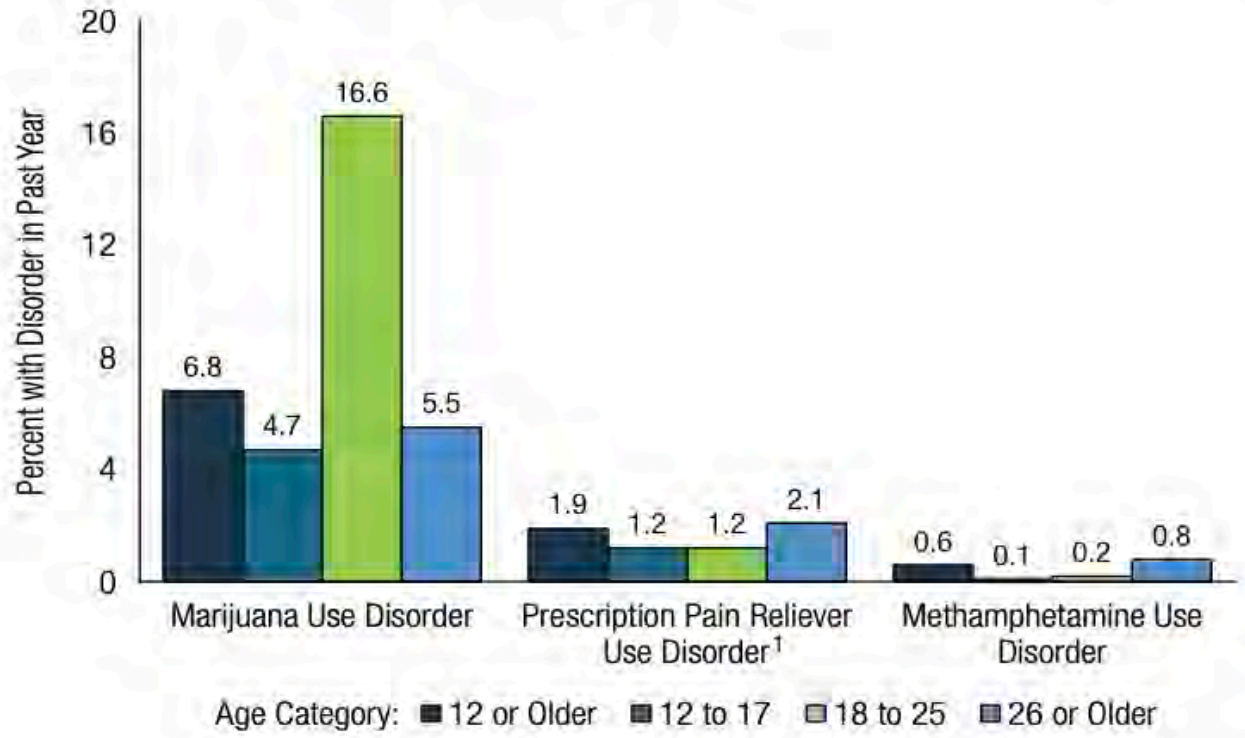
Potential mental health harms of cannabis



National Academies of Science, Engineering & Medicine, 2017 Report; Substance Abuse and Mental Health Services Administration-https://www.samhsa.gov/substance-use/learn/marijuana/risks

Cannabis Use Disorder (CUD) & absenteeism

Figure 32. Marijuana Use Disorder, Prescription Pain Reliever Use Disorder, or Methamphetamine Use Disorder in the Past Year: Among People Aged 12 or Older; 2023



Dose-response relationship observed between CUD severity and skipping work[2]

National Survey on Drug Use and Health, 2023 https://www.samhsa.gov/data/sites/default/files/reports/rpt47095/National%20Report/National%20Report/2023-nsduh-annual-national.pdfç;

[2]Yang et al . *American Journal of Preventive Medicine*. 2024;67(6):803-810. doi:10.1016/j.amepre.2024.07.021

Some take away considerations

- Cannabis use is common in the U.S.
- People use cannabis for diverse reasons
- Laws and regulations are variable at state levels
- Cannabis use may impact individual well-being, work performance and workplace safety

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Thank you