

Top 10 Questions: Cannabis and Health

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Berry, J. *Avoiding Pot Holes: Navigating the Cautionary Trails of Cannabis*. NC Governor's Institute Addiction Medicine Conference. 4/20/2024

Hill, KP. *Cannabis and Cannabinoids in 2025*. Emory University Grand Rounds. 5/28/2025

Hurley, B and Pham, V. *Cannabis: Products, Health Effects, Policies, and Clinical Interventions*. ASAM Annual Conference. 4/2/2022.

NC Psychiatric Association. *Cannabis Use and Mental Health: A Critical Review of Risks and Benefits*. 2017.

Potee, R. *Physiology of Addiction: Role of Pharmaceuticals*. 2019.

Romero-Sandoval, EA. *Cannabis/CBD for Pain and Anxiety: Clinical Utilities and Risks*. NC Governor's Institute Addiction Medicine Conference. 5/2/2020.

Cannabis 101



> 500

Individual chemicals

delta-9-THC

- Primary psychoactive component
- Causes the “high”
- Can cause psychosis

CBD

- Calming effect
- No euphoria or “high”
- Antipsychotic properties



Synthetic cannabinoids

“Spice, K2”

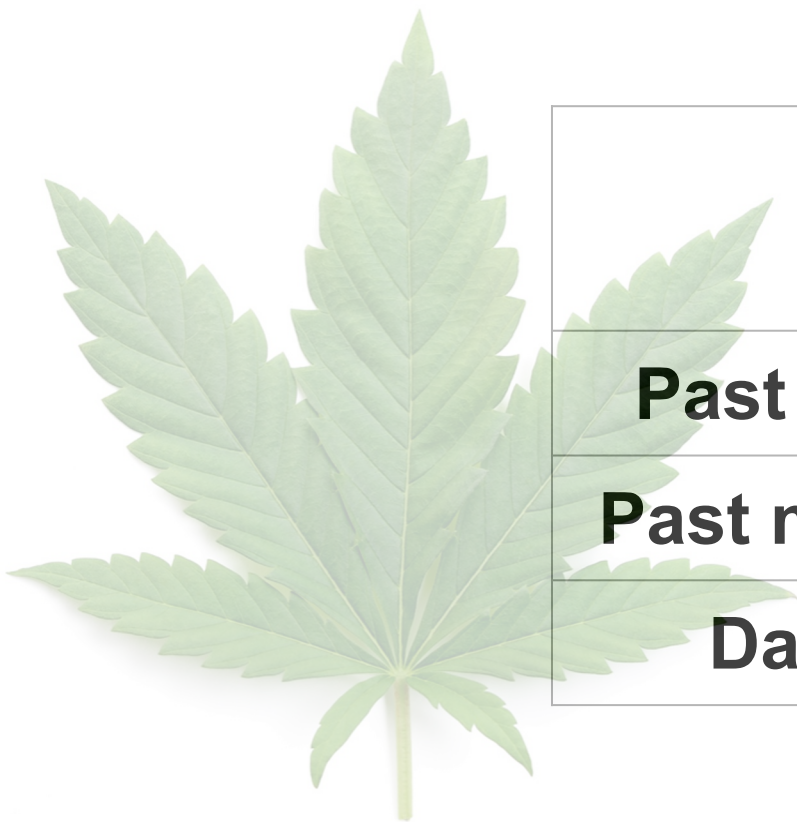
Top 10 questions

1. People have been using cannabis for a long time. What's changed?
2. What happens when people use cannabis?
3. What happens when people *stop* using cannabis?
4. Are there any medical benefits to using cannabis?
5. What do we know about cannabis and chronic pain?
6. How does cannabis affect sleep?
7. How does cannabis affect the body?
8. How does cannabis affect the brain?
9. How does cannabis affect mental health?
10. Is cannabis addictive?

1. People have been using cannabis for a long time. What's changed?



Cannabis use is at an all-time high.

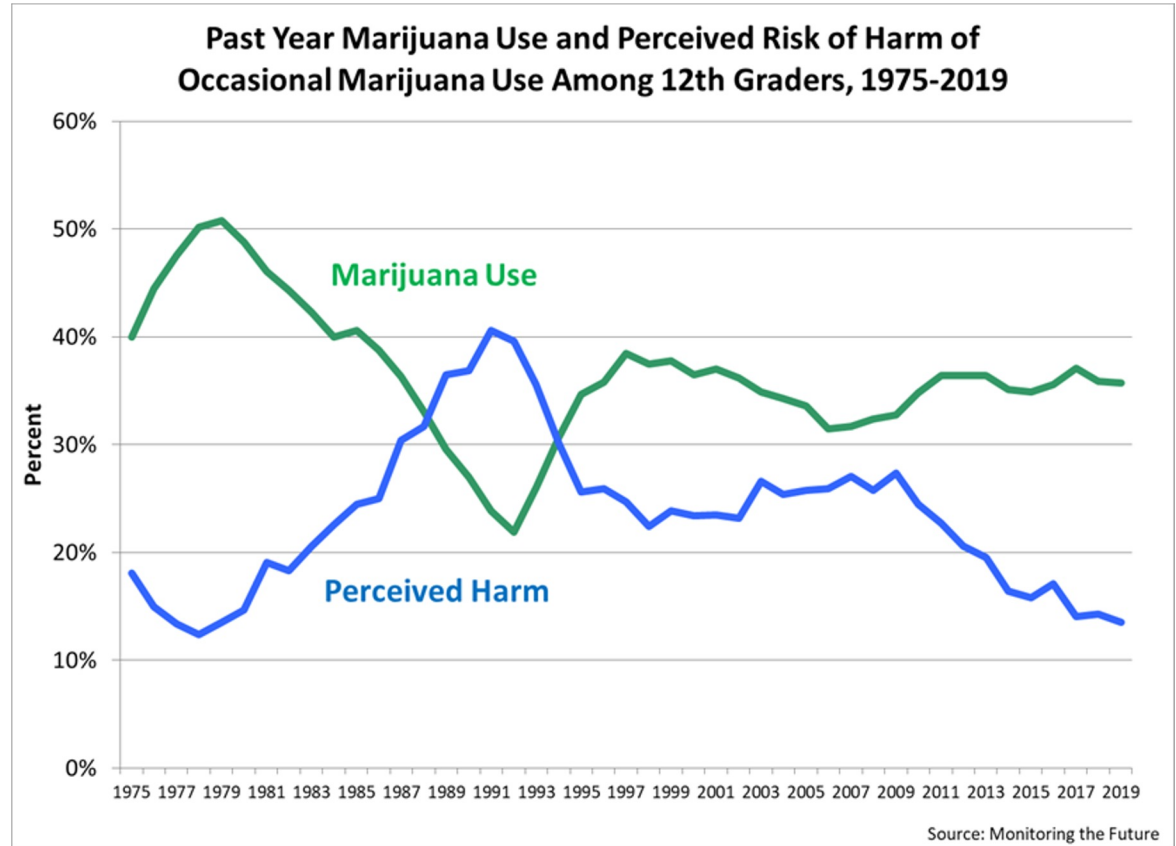


	Adults (19-30)	Adults (30-50)
Past year	42%	29%
Past month	29%	19%
Daily	10%	8%

NIDA. Cannabis and hallucinogen use among adults remained at historic highs in 2023. National Institute on Drug Abuse website. <https://nida.nih.gov/news-events/releases/2024/08/cannabis-and-hallucinogen-use-among-adults-remained-at-historic-highs-in-2023>. August 29, 2024.

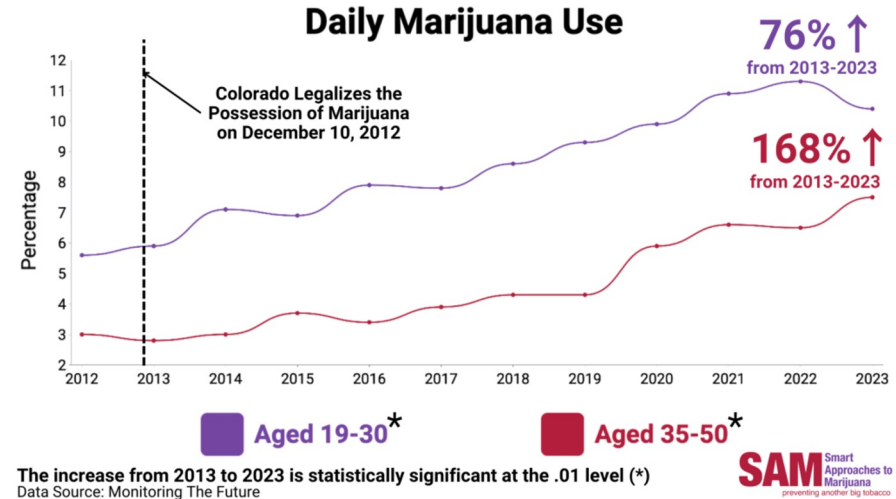
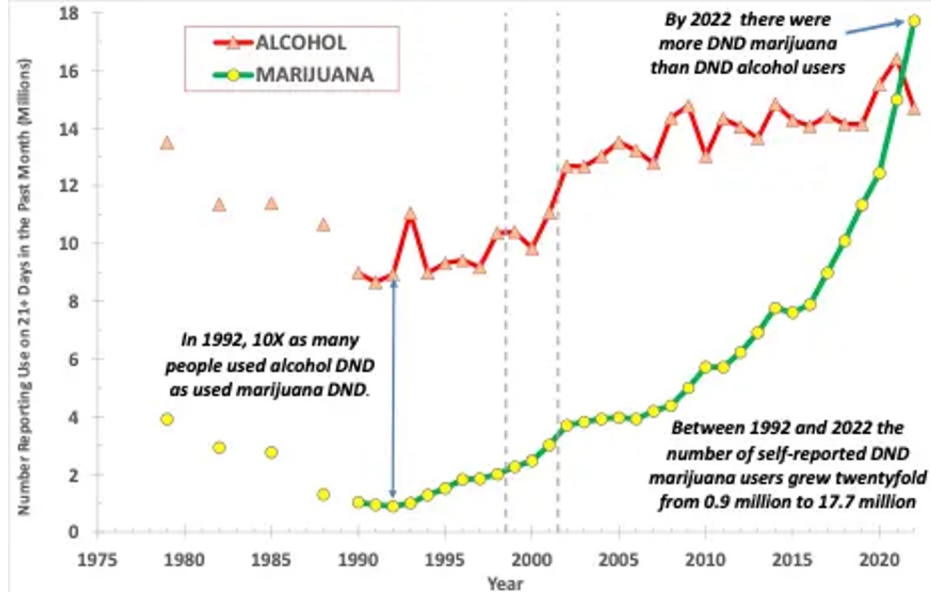
**Adolescents are
using more...**

**... while
thinking it is
less harmful.**



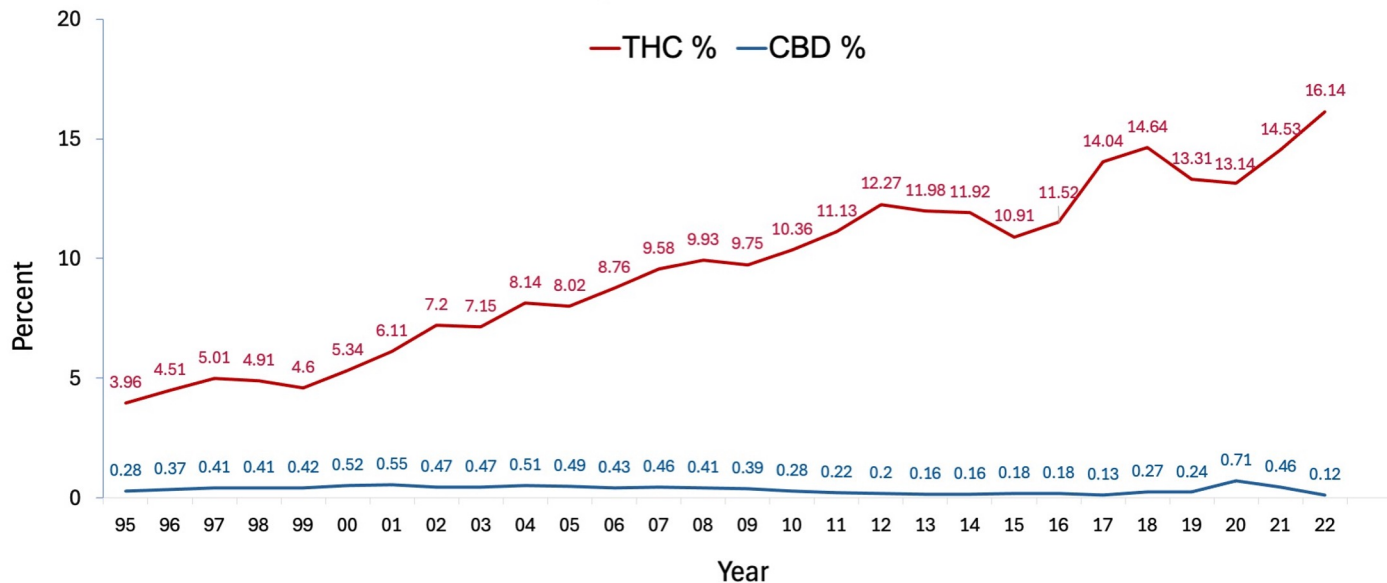
Not only are more adults and adolescents using cannabis – they are also using more frequently.

Daily or Near Daily use of THC vs.
Alcohol in the US (1972-2022)



THC potency has increased significantly. Today's cannabis products regularly contain 20-30% THC.

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



Avg THC content
(Cannabis plant)

1970s: ~2%

2025: 15-30%

SOURCE: U Miss, Potency Monitoring Project

<https://nida.nih.gov/research/research-data-measures-resources/cannabis-potency-data>

Higher Potency
=
Higher Risk

Concentrated
products now
available with
50-80+% THC

THC Concentrates



"Green Crack" wax



"Ear Wax"



Butane Hash Oil (BHO)



Hash Oil Capsules



"Budder"



"Shatter"



Heroin

Lethal dose: 10–12 mg



Fentanyl

Lethal dose: 1–2 mg



Carfentanil

Lethal dose: 0.02 mg

Higher Potency
=
Higher Risk



1. People have been using cannabis for a long time. What's changed?

2. What happens when people use cannabis?

Cannabis can have a range of physical and mental effects in the short term. Multiple factors play a role (THC content, tolerance, etc.).

“The Good” Desired...

- Euphoria and pleasure
- Relaxation
- Altered senses
- Emotions more poignant
- Relief from anxiety
- Increased appetite
- Altered sense of time
- Decreased nausea
- Sleepiness

“The... Not So Good” Undesired...

- Dizziness
- Coordination issues
- Problem-solving issues
- Cognitive + memory issues
- Increased heart rate
- Dry mouth
- Nausea
- Sedation
- Bloodshot eyes

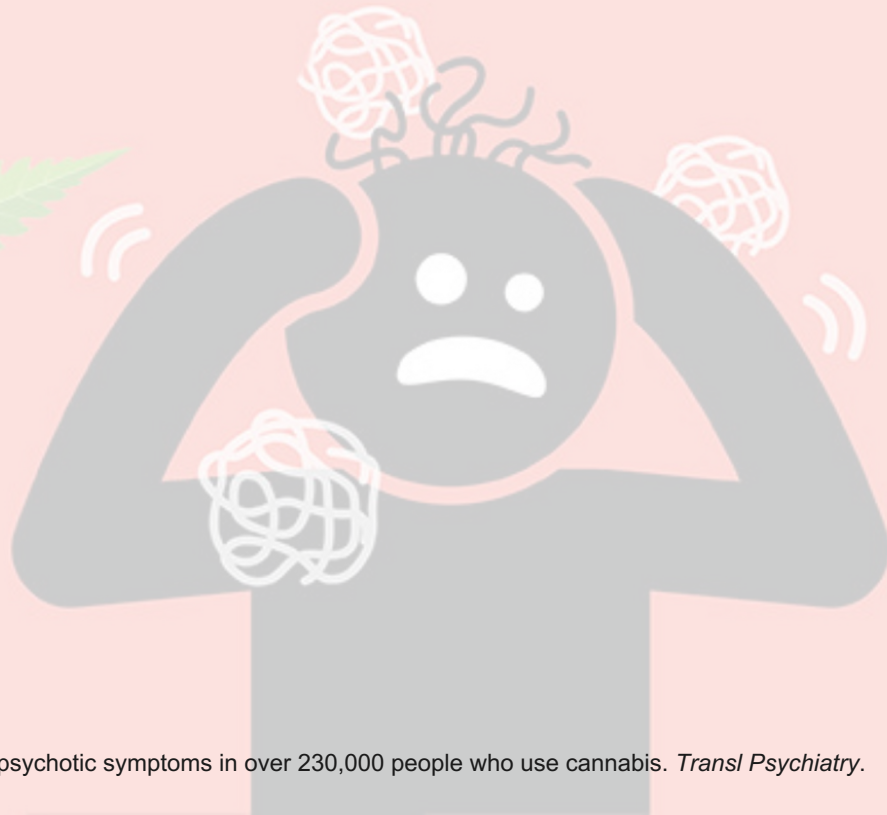
“The Ugly” Adverse...

- Severe anxiety
- Disorientation
- Paranoia
- Panic
- Psychosis
- Hallucinations
- Social withdrawal

Cannabis can trigger acute psychosis. One study estimated a lifetime risk of 1 in 200 requiring emergency treatment.

Symptoms of cannabis-induced psychosis:

- Disassociation
- Hallucinations
- Delusions
- Confused thoughts
- Garbled speech
- Behavioral changes
- Paranoia
- Social withdrawal



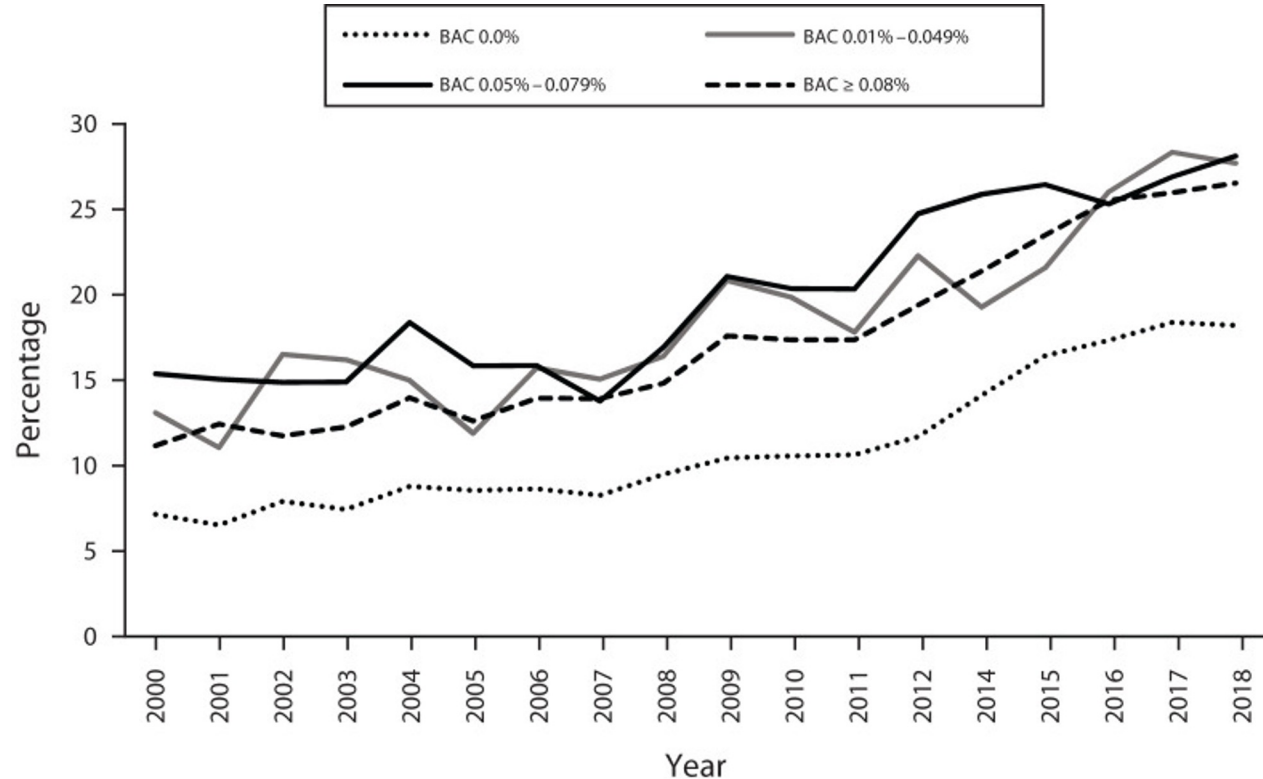
Rates of traffic fatalities involving cannabis are increasing.

Change in fatal car accidents from 2000-2018 involving:

THC alone: 9% to 21.5%

THC + alcohol: ~5% to 10%

However, testing positive for THC ≠ impairment.



Lira MC, Heeren TC, Buczek M, et al. Trends in Cannabis Involvement and Risk of Alcohol Involvement in Motor Vehicle Crash Fatalities in the United States, 2000–2018. *Am J Public Health*. 2021;111(11):1976-1985.

Rates of cannabis-related ER visits are increasing.

- In California:
 - **1804%** increase in ER visits among **older adults** between 2005-2019
- In Colorado:
 - Large increases in ER visits and Poison Control cases from 2013-2017
 - Increases in **adolescent** ER visits from 2005-2015

1. Han BH, Brennan JJ, Orozco MA, Moore AA, Castillo EM. Trends in emergency department visits associated with cannabis use among older adults in California, 2005-2019. *J Am Geriatr Soc.* 2023;71(4):1267-1274.
2. Wang GS, Buttorff C, Wilks A, et al. Comparison of hospital claims and poison center data to evaluate health impact of opioids, cannabis and synthetic cannabinoids. *Am J Emerg Med.* 2022;53:150-153.
3. Wang GS, Davies SD, Halmo LS, Sass A, Mistry RD. Impact of Marijuana Legalization in Colorado on Adolescent Emergency and Urgent Care Visits. *J Adolesc Health.* 2018;63(2):239-241.

3. What happens when someone
stops using cannabis?

Cannabis withdrawal can occur after heavy or prolonged use. Rates of withdrawal are variable (> 50% in chronic pain).

Psychological Symptoms

- Cravings
- Sleep disturbance
- Poor appetite
- Anxiety
- Depression
- Irritability
- Brain fog
- Concentration difficulties

Physical Symptoms

- Headache
- Nausea / upset stomach
- Sweating
- Hot flashes
- Restlessness
- Muscle tension
- Tremor / shakiness

Typical Marijuana Detox Timeline



Day 1-2

Immediate Discomfort

- Irritability Spikes
- Cravings Begin
- Sleep Disruption

THC Still in Body:



Day 3-6

Peak Withdrawal

- Restlessness
- Low Appetite
- Mood Swings

THC Still in Body:



Day 7-10

Gradual Relief

- Improved Sleep
- Weed Cravings Ease
- Energy Returns

THC Still in Body:

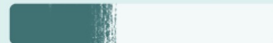


Weeks 2-3

Mental Rebalancing

- Clearer Thinking
- Emotional Steadiness
- Sleep Normalizing

THC Still in Body:



1 Month+

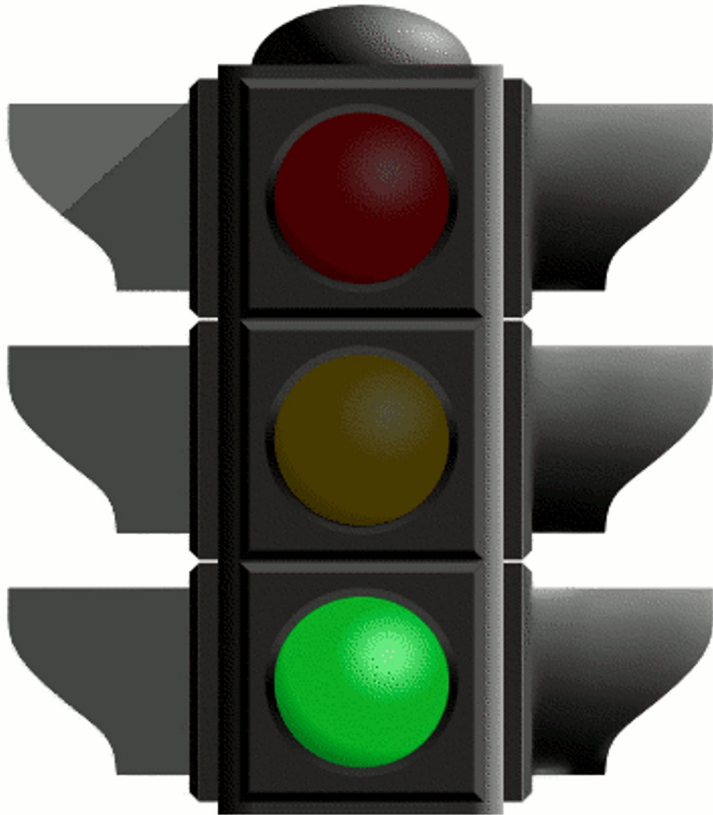
System Reset

- Mood Stability
- Focus Improves
- Symptoms Fade

THC Still in Body:



4. Are there any medical benefits
to using cannabis?

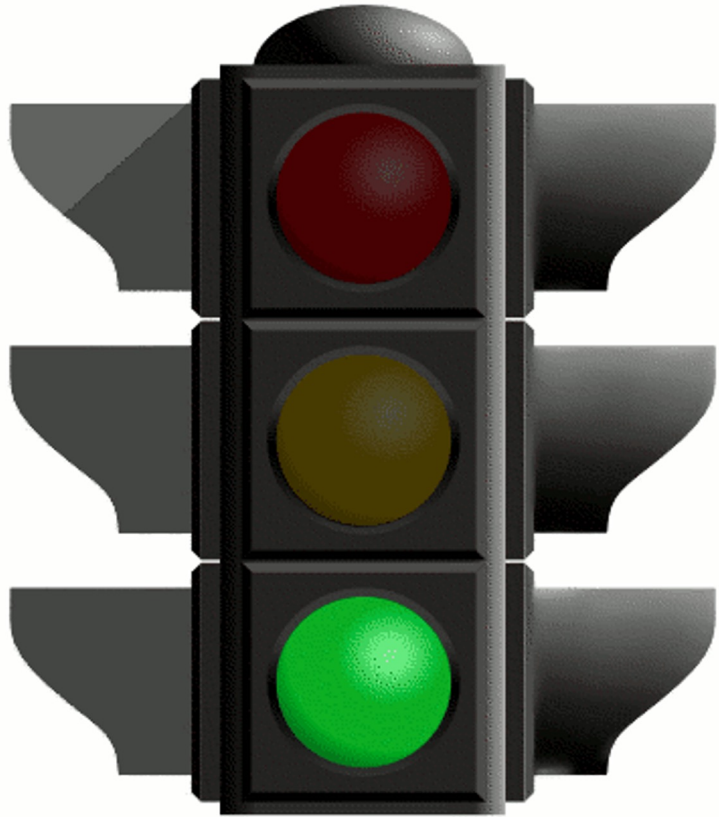


Strong and Conclusive Evidence **FDA Approved Use**

- ★ Chemotherapy induced nausea and vomiting
 - Dronabinol (synthetic THC, oral capsule)
 - Nabilone (synthetic THC, oral capsule)

- ★ Appetite stimulation and weight loss in HIV
 - Dronabinol (synthetic THC, oral capsule)

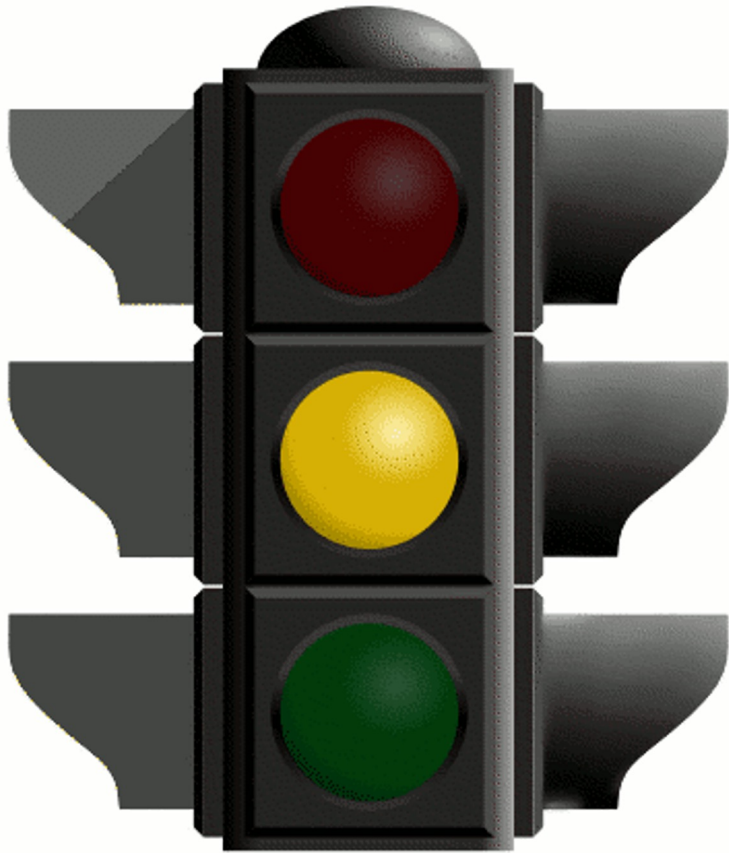
- ★ Certain seizure disorders
 - Epidiolex (plant-derived CBD liquid)



Substantial Evidence **No FDA Approval**

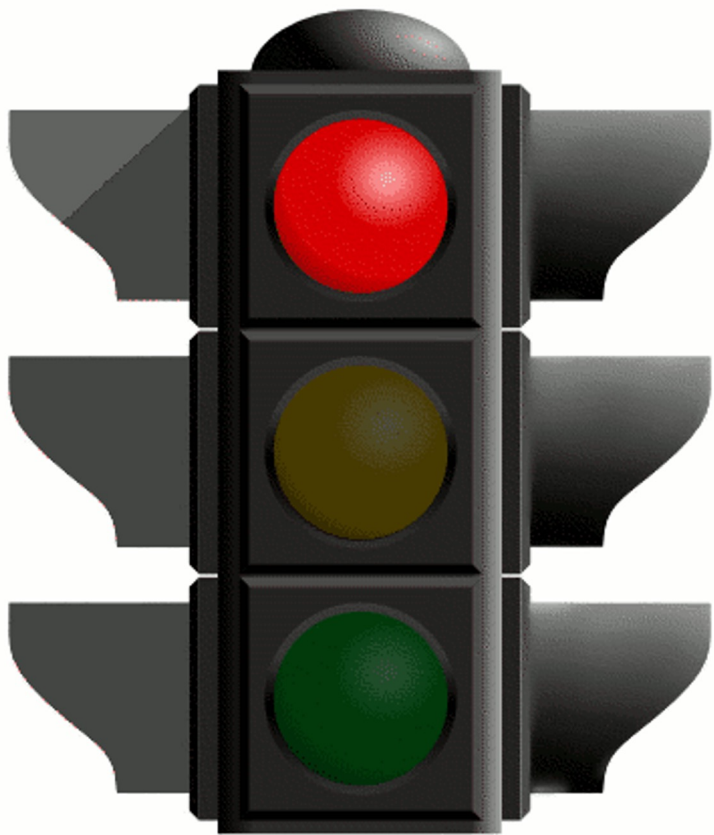
- ★ Muscle spasticity in Multiple Sclerosis
 - Nabiximols (plant-derived THC/CBD mix, oral spray)

- ★ Chronic neuropathic pain
 - inhaled herbal cannabis, low THC concentration



Mixed or Conflicting Evidence

- Reduce opioids in chronic pain?
- Short-term sleep problems in select patients with fibromyalgia, sleep apnea, or chronic pain



Limited, Weak, or No Evidence

- Eye disease (glaucoma)
- Irritable Bowel Syndrome
- Depression
- Insomnia (general public)
- Tourette Syndrome

5. What do we know about cannabis and chronic pain?

Cannabis and Pain

- Cannabinoids (THC < 10%, smoked or vaped) can reduce chronic non-cancer pain by 30-50%.
- More evidence of benefit in neuropathic pain, less evidence in other types of pain (rheumatoid arthritis, fibromyalgia).
- Mild to moderate side effects are common (nervous system, psychiatric, GI).
- Severe side effects are less common.

Cannabis and Pain: Caveats

- Generally recommended as 2nd or 3rd line options if other treatments fail.
- Patients may develop tolerance, which limits long term benefits.
- Studies generally looked at short term treatments (several days up to 12 wks).

Medical research supports the use of cannabis for pain in some cases (up to 10% THC).

There is NO research supporting higher potency recreational products (> 15% THC).

THC Content	
0 - 10%	More tolerable and effective for Pain Management.
~10%	Effective but risky for Pain Management.
≥ 15%	Recreational. No proven benefit. Higher risk.

Counseling Patients on Benefits and Harms of Using Cannabis for Chronic Non-Cancer Pain

- *Inhaled* cannabis is not recommended. Try oral sprays / oral regimens instead.
- Advise against if pregnant / breastfeeding.

Harms Probably Outweigh Benefits

- Young adults and adolescents
- History of addiction
- History of psychiatric illness
- Elderly, frail, or risk of falling

6. How does cannabis affect sleep?

Cannabis and Sleep

- Limited research
- Short term use may help you fall asleep faster
- Long term use probably leads to worse sleep

“Our findings summarize the **lack of robust evidence to support the use of cannabis for sleep disorders...**

Further studies assessing cannabis and sleep are needed to discern what works in what context, how it works, and for whom.”



7. How does cannabis affect the body?

Cannabis affects multiple organ systems in the body and may increase the risk of multiple chronic health issues.

- Cancer risks?
 - Low quality evidence for increased risk of testicular cancer and head and neck cancer.
- Cardiovascular Risks?
 - Can cause angina in high risk patients
 - Unclear risk of heart disease, heart attack, or stroke in lower risk patients
- Respiratory Risks?
 - Increased risk of breathing problems and lung disease (bronchitis, likely COPD)
 - Similar or increased tar retention compared to tobacco cigarettes
- Men's Health Issues?
 - Probable negative effects on fertility

**Common symptoms of
cannabinoid hyperemesis syndrome include:**



Persistent nausea.



**Intense
abdominal pain.**



Loss of appetite.



Repeated vomiting.

Cannabis Hyperemesis Syndrome

- Complication of chronic use
- 1-10% of users?
- May require ER or hospital treatment
- Only cure is stopping use.

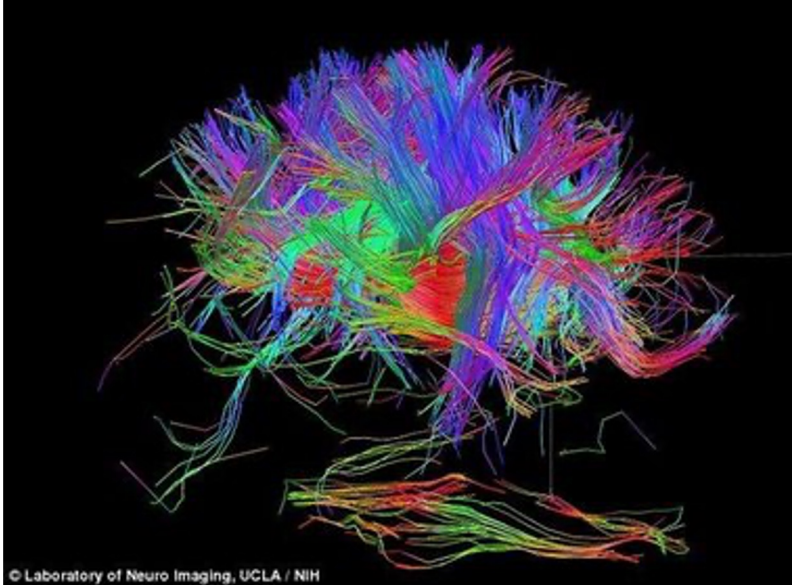
Ample Evidence of Harms in Pregnancy

- Low birth weight
- Preterm birth
- Stillbirth
- NICU admission
- Behavioral issues in childhood
- Developmental and neurological issues



8. How does cannabis affect the brain?

THC disrupts normal adolescent brain development.



Adolescent THC use is associated with cognitive changes that can persist into adulthood.

- Adolescent studies show show a link between heavy use and lower scores in
 - attention
 - verbal learning
 - memory
 - processing speed...
- Frequent and heavy use → small but significant decline in IQ (2 points)

Messinis, L. Neuropsychological deficits in long-term frequent cannabis users. *Neurology*. 2006 Mar 14;66(5):737-9.

Power et al. Intelligence quotient decline following frequent or dependent cannabis use in youth: a systematic review and meta-analysis of longitudinal studies. *Psychol Med*. 2021;51(2):194-200.

In adults, cannabis causes cognitive impairment, but the impairment seems to resolve with abstinence over time.



- Impaired memory
- Impaired attention
- Decreased concentration
- Impaired coordination
- Changes in judgment

Cannabis “amotivational” syndrome?

...apathy...
...lethargy...
...loss of ambition...
...reduced drive to pursue goals...

Research is mixed.

Some studies suggest it is real.

Other studies point to ***underlying differences in depression, substance use, and personality*** between cannabis users and non-users.

Lac A, Luk JW. Testing the Amotivational Syndrome: Marijuana Use Longitudinally Predicts Lower Self-Efficacy Even After Controlling for Demographics, Personality, and Alcohol and Cigarette Use. *Prev Sci*. 2018;19(2):117-126.

Petrucci AS, LaFrance EM, Cuttler C. A Comprehensive Examination of the Links between Cannabis Use and Motivation. *Subst Use Misuse*. 2020;55(7):1155-1164.

Cannabis increases the risk of psychosis and schizophrenia later in life.

- Risk of psychosis is higher with high potency (> 10%) THC products.
- 4x risk of schizophrenia with early use (adolescence or early adulthood).
 - 4% will develop schizophrenia compared to 1% of non-users
- Risk is likely due to underlying genetic / biologic vulnerability.
- Risk may relate to **amount** of THC and **ratio** of THC to CBD.
- Once schizophrenia develops, continued use of cannabis is associated with more relapse, rehospitalization, and worse outcomes.

9. How does cannabis affect mental health?

Psychiatric patients are more likely to use cannabis, tend to use higher amounts, and more likely to become addicted.

Effects of cannabis in psychiatric conditions

- Contributes to and can worsen **Depression**.
- Chronic use may increase **Suicidal Ideation** in adolescents.
- Mixed findings for **Anxiety**.
 - CBD may be beneficial in Social Anxiety.
 - THC may help at lower doses (≤ 7.5 mg) but hurt at higher doses (≥ 12.5 mg)
 - Chronic use may *increase* anxiety

Churchill et al. The association between cannabis and depression: an updated Systematic Review and Meta-analysis. *Psychol Med*. 2025;55:e44

Gobbi et al. Association of Cannabis Use in Adolescence and Risk of Depression, Anxiety, and Suicidality in Young Adulthood: A Systematic Review and Meta-analysis. *JAMA Psychiatry*. 2019;76(4):426-434.

Crippa JA, Zuardi AW, Martín-Santos R, et al. Cannabis and anxiety: a critical review of the evidence. *Hum Psychopharmacol*. 2009;24(7):515-523.

Effects of cannabis in psychiatric conditions

- Mixed findings for **PTSD**.
 - Some studies showed worsening symptoms, violence, and alcohol/drug use
 - Other studies showed improvement in nightmares and overall well-being
- Not recommended in **ADHD**; probably makes symptoms worse.

Negative *indirect* effects of cannabis on psychiatric treatment

- May interfere with psychiatric medication
- May interfere with participation in counseling and therapy



Risks and Benefits of Cannabis in Psychiatry

“There is considerable evidence that cannabinoids have a potential for harm in vulnerable populations such as adolescents and those with psychotic disorders.

The current evidence base is insufficient to support the prescription of cannabinoids for the treatment of psychiatric disorders.”

10. Is cannabis addictive?

“4 C’s”

- Compulsive Use
- Cravings
- Control
- Consequences

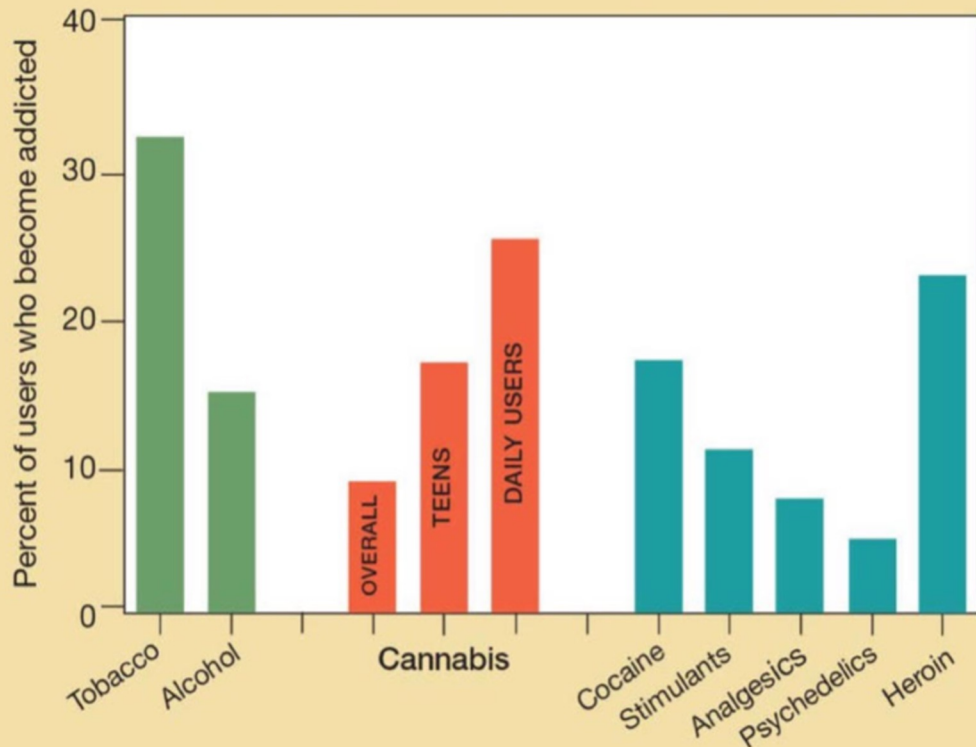
Cannabis Use Disorder

Overall risk: ~**10-20%**

Risk is higher with daily use: ~33%

Most users will NOT develop addiction

Comparison of addictive potential by drug type¹⁹



Risk of Cannabis Addiction

- Overall: ~1 in 10
- Teens: ~1 in 6
- Daily Use: ~1 in 3

Treatments for Cannabis Addiction are more limited compared to Alcohol, Tobacco, and Opioids.

- Behavioral strategies
- Counseling
- Marijuana Anonymous

... no FDA approved medication treatments

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Discussion

APPENDIX

Limitations

Many unanswered questions

Clinical trials and research on a single cannabinoid cannot be extrapolated to cannabis in general

Research gaps

Cannabidiol (CBD)

Not regulated

Often mislabeled

Limited evidence for sleep

Topical CBD cream not absorbed into bloodstream... expensive OTC cream!

Companies make often outrageous claims

Concerns for liver toxicity

Concerns when used in lieu of evidence based treatments

Can be expensive!