



Marijuana 101

Maine AAP April 30, 2023

1

Marijuana Cannabis which is it

- DEA Lists as Marijuana = "Marijuana is a mind-altering (psychoactive) drug, produced by the Cannabis sativa plant. "¹
- Used interchangeably
Goes by many street names Refer/ weed/dope/ganja²
- Hemp is strain of Cannabis sativa that legally is less than 0.3% THC

1. <https://www.dea.gov/sites/default/files/2023-03/Marijuana-Cannabis%202022%20Drug%20Fact%20Sheet.pdf>

2. Hourfane S, Mechqoq H, Bekkali AY, Rocha JM, El Aouad N. A Comprehensive Review on *Cannabis sativa* Ethnobotany, Phytochemistry, Molecular Docking and Biological Activities. *Plants (Basel)*. 2023 Mar 9;12(6):1245. doi: 10.3390/plants12061245. PMID: 36986932; PMCID: PMC10058143.

2

Cannabis is a plant

- Cannabis sativa
- Cannabis indica
- Cannabis ruderalis
- More than 550 molecules including alkaloids/ carotenoids/flavonoids/lignanamide/
- Cannabinoids- Cannabidiol and Δ -9-Tetrahydrocannabinol

Hourfane S, Mechqoq H, Bekkali AY, Rocha JM, El Aouad N. A Comprehensive Review on Cannabis sativa Ethnobotany, Phytochemistry, Molecular Docking and Biological Activities. Plants (Basel). 2023 Mar 9;12(6):1245. doi: 10.3390/plants12061245. PMID: 36986932; PMCID: PMC10058143.

Gloss D. An Overview of Products and Bias in Research. Neurotherapeutics. 2015 Oct;12(4):731-4. doi: 10.1007/s13311-015-0370-x. PMID: 26202343; PMCID: PMC4604179.

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Marijuana is a Schedule One Substance

- Schedule one drugs substances or chemicals have no currently accepted medical use and high potential for abuse (Heroin LSD marijuana ecstasy..)
- THIS DOES NOT APPEAR TO BE THE CASE FOR MARIJUANA
- Epidiolex- Cannabidiol for use in treating certain rare severe seizure disorders Dravet/Lennox Gastaut
- Manufactured pharmaceutical cannabinoids- dronabinol/nabilone
-

[1 https://www.dea.gov/sites/default/files/2023-03/Marijuana-Cannabis%202022%20Drug%20Fact%20Sheet.pdf](https://www.dea.gov/sites/default/files/2023-03/Marijuana-Cannabis%202022%20Drug%20Fact%20Sheet.pdf)

2Hourfane S, Mechqoq H, Bekkali AY, Rocha JM, El Aouad N. A Comprehensive Review on Cannabis sativa Ethnobotany, Phytochemistry, Molecular Docking and Biological Activities. Plants (Basel). 2023 Mar 9;12(6):1245. doi: 10.3390/plants12061245. PMID: 36986932; PMCID: PMC10058143.

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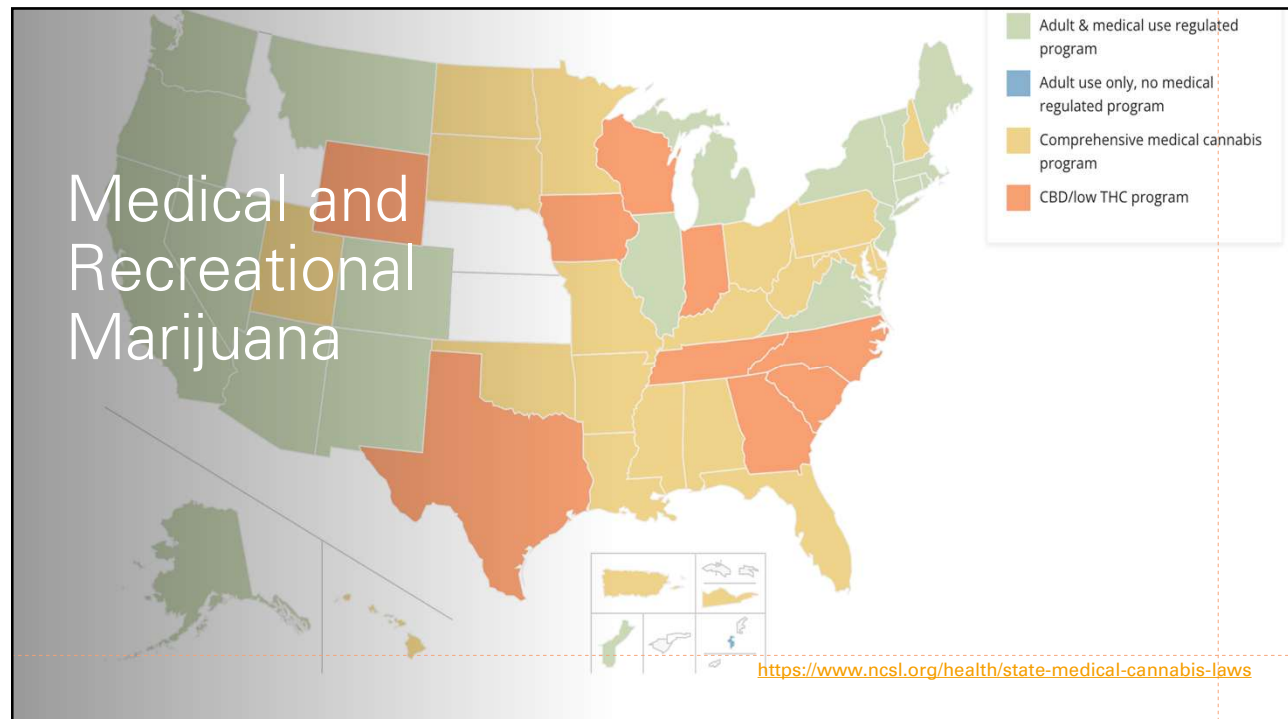
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Marijuana Used to Treat

- Appetite Stimulation- in AIDS wasting syndrome
- Treatment of Chemotherapy induced nausea and vomiting
- Severe pain
- Spasticity
- Other indications where studies indicate use : Glaucoma, Epilepsy, Anti-Inflammatory

Volkow ND, Baler RD, Compton WM, Weiss SR. Adverse health effects of marijuana use. N Engl J Med. 2014 Jun 5;370(23):2219-27. doi: 10.1056/NEJMra1402309. PMID: 24897085; PMCID: PMC4827335.

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Risk of Harm

- Teens NSDUH Risk of harm : 19% reported no risk in monthly cannabis use and 29% reported slight risk in monthly cannabis ¹
- Qualitative opinions adult use changing/ many adults worry about teen use ^[2]
- Children of Parents who use marijuana are much more likely to use marijuana ^[2]
- About 1/3 of adults in recreational states use marijuana products ^[3]
- Prevalence in recreational marijuana states is double that of both nonlegal and medical marijuana use states ^[3]

1] Mariani AC, Williams AR. Perceived risk of harm from monthly cannabis use among US adolescents: National Survey on drug Use and Health, 2017. *Prev Med Rep.* 2021 Jun 2;23:101436. doi: 10.1016/j.pmedr.2021.101436. PMID: 34168952; PMCID: PMC8209744.

2] Jones TM, Eisenberg N, Kosterman R, Lee JO, Bailey JA, Haggerty KP. Parents' Perceptions of Adolescent Exposure to Marijuana Following Legalization in Washington State. *J Soc Social Work Res.* 2020 Spring;11(1):21-38. doi: 10.1086/707642. Epub 2020 Jan 29. PMID: 33841719; PMCID: PMC8034260.

3] Black JC, Amiocka E, Iwanicki JL, Dart RC, Monte AA. Evaluation of Cannabis Use Among US Adults During the COVID-19 Pandemic Within Different Legal Frameworks. *JAMA Netw Open.* 2022;5(11):e2240526. doi:10.1001/jamanetworkopen.2022.40526

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Cannabis Epidemiology in Youth

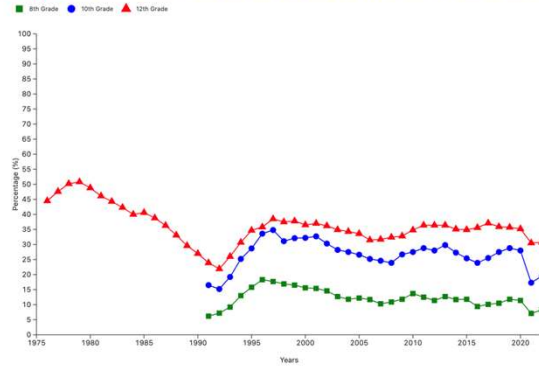
- In 2017 daily cannabis use exceeded daily cigarette use
 - 8th graders (0.8% vs. 0.6%) – 1st year this ever happened in this age group according to NIDA
 - 10th graders (2.9% vs 2.2%) – this trend began in 2014
 - 12th graders (5.9% vs 4.2%) – this trend began in 2015
- 12th graders are 82.1% more likely to use cannabis in their lifetime than they are to smoke a cigarette
- 12th graders prevalence of using cannabis daily for a month or more during one's lifetime
 - 1982 – 21% (first time measured)
 - 1992 – 8%
 - 1997- 19%
 - 2018 – 12%
 - 2022 – 14%

Miech, R. A., Johnston, L. D., Patrick, M. E., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2023). Monitoring the Future National Survey Results on Drug Use, 1975–2022: Secondary School Students. Ann Arbor: Institute for Social Research, The University of Michigan. Available at <http://monitoringthefuture.org/results/publications/monographs>

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Marijuana use in past 12 months

Marijuana: Trends in Last 12 Months Prevalence of Use in 8th, 10th, and 12th Grade



Suggested citation: Miech, R. A., Johnston, L. D., Patrick, M. E., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2023). Monitoring the Future National Survey Results on Drug Use, 1975–2022: Secondary School Students. Ann Arbor: Institute for Social Research, The University of Michigan. Available at <https://monitoringthefuture.org/results/publications/mozooqarsh/>

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MIYHS Maine HS

Maine Marijuana -- 2021 MIYHS High School Report					
Questions	Answers of Interest	Maine 2021 95% CI*	Maine 2019 95% CI*	Significance Tests	
				A. Maine 2021 vs. Maine 2019	
33. During your life, how many times have you used marijuana? (hn98/hn98)	Percentage of students who answered at least 1 time	30.5% (29.4% - 31.5%)	36.4% (35.2% - 37.6%)	L	
34. How old were you when you tried marijuana for the first time? (hn99/hn99)	Among students who have tried marijuana, the percentage of students who answered before age 13	18.5% (17.2% - 19.9%)	16.6% (15.3% - 17.9%)		
35. How old were you when you tried marijuana for the first time? (hn99_2/hn99_2)	Percentage of students who answered before age 13	5.7% (5.2% - 6.2%)	6.1% (5.6% - 6.6%)		
36. During the past 30 days, how many times did you use marijuana? (hn100/hn100)	Percentage of students who answered at least 1 time	17.9% (17.0% - 18.7%)	22.0% (21.1% - 23.0%)	L	
37. If you wanted to get some marijuana, how easy would it be for you to get some? (hn101/hn101)	Percentage of students who answered "Sort of easy" or "Very easy"	47.1% (45.9% - 48.3%)	53.1% (51.9% - 54.4%)	L	
38. How much do you think people risk harming themselves (physically or in other ways) if they use marijuana once or twice a week? (hn259/hn259)	Percentage of students who answered "No risk" or "Slight risk"	65.1% (64.1% - 66.1%)	66.7% (65.8% - 67.5%)		

MIYHS

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Cannabis Ingestions with Increases in Recreational and Medical Use In States

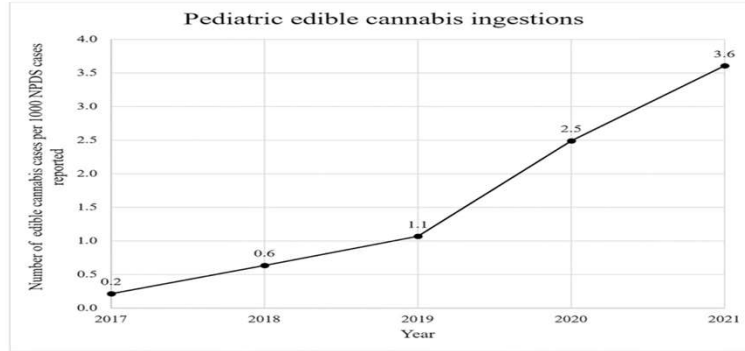
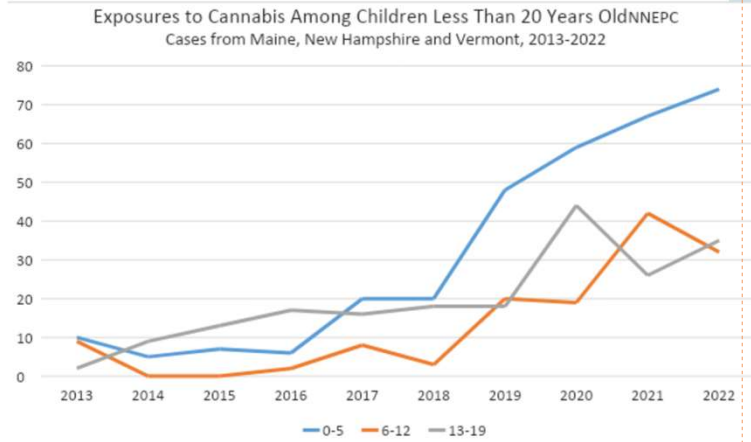


FIGURE 1 Pediatric edible cannabis product ingestions per 1000 pediatric calls to the National Poison Data System by year.

Tweet MS, Nemanich A, Wahl M. Pediatric Edible Cannabis Exposures and Acute Toxicity: 2017–2021. *Pediatrics*. 2023;151(2):e2022057761

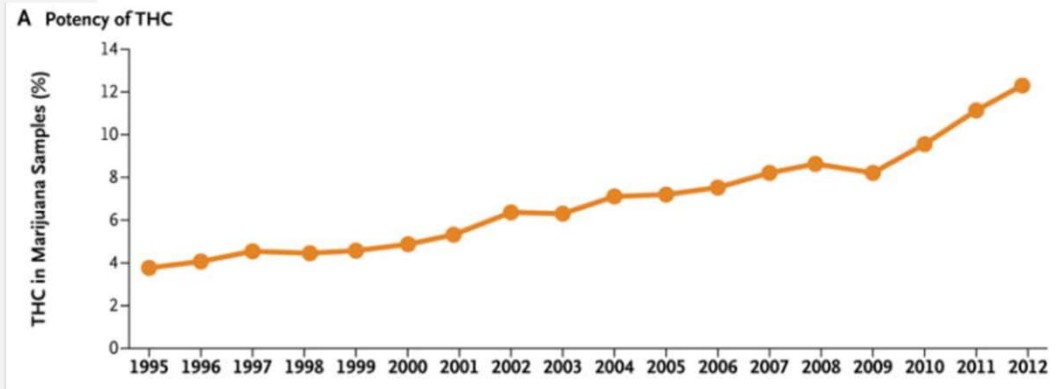
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New England Poison Center



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Increasing Potency THC



Volkow ND, Baler RD, Compton WM, Weiss SR. Adverse health effects of marijuana use. N Engl J Med. 2014 Jun 5;370(23):2219-27. doi: 10.1056/NEJMra1402309. PMID: 24897085; PMCID: PMC4827335.

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Forms

- Inhalation- Smoked/Vaped/
- Oral Mucosa- Sprays
- Ingested- Edibles/Drinkables/Tablets Capsules
- Topicals- Ointments/Rubs
- Synthetic-Spice/
- Δ^8 THC- synthesized from Hemp



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<https://www.travelandleisureasia.com/in/dining/bhang-holi/>

Bhang- ground fresh leaves stems flowers

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Other Forms

- Hashish
- Dried flower buds/stems/leaves
- Oil
- Tinctures



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A Quick Word About Dabs

- High Concentrations THC 80-90%
- Extract oil with
- Special rigs

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Look Familiar

Marijuana vaping devices



ERA PRO

More powerful and packed with features



\$50

[SHOP NOW](#)

Pods

SUNSET SHERBET

95% THC

Available in 1G PAX Era pods.

KEY TERPENES

Caryophyllene
Limonene

FLAVORS

Sweet
Fruity

EFFECTS

Unwinding
Relaxing



Here's the scoop on Sunset Sherbet. This hybrid is a cross of the popular Girl Scout Cookies and Pink Panties cultivars and is famous for its full-body, relaxing effects. Sunset Sherbet's laid back vibes and sweet notes of fruit make it more than worthy of a second helping.

<https://www.pax.com/>

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Mechanism of Action

- Δ^9 THC partial CB1 and CB2 agonist ¹
- Neuronal activity modulation affecting GABA/Glutamate/and Dopamine¹
- Developmentally endocannabinoid system important for scaffold of burgeoning nervous system and synaptic connections during adolescence.²

Bloomfield MAP, Hinocha C, Green SF, Wall MB, Lees R, Petrilli K, Costello H, Ogunbiyi MO, Bossong MG, Freeman TP. The neuropsychopharmacology of cannabis: A review of human imaging studies. *Pharmacol Ther.* 2019 Mar;195:132-161. doi: 10.1016/j.pharmthera.2018.10.006. Epub 2018 Oct 19. PMID: 30347211; PMCID: PMC6416743.
Metz TD, Borgelt LM. Marijuana Use in Pregnancy and While Breastfeeding. *Obstet Gynecol.* 2018 Nov;132(5):1198-1210. doi: 10.1097/AOG.0000000000002878. PMID: 30234728; PMCID: PMC6370295.

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Pharmacokinetics

Rapid absorption via inhalation or oral-mucosa-5
10 minutes onset

Ingested products variable absorption / extensive
first pass metabolism in liver onset often not for a
1.5- 3hours

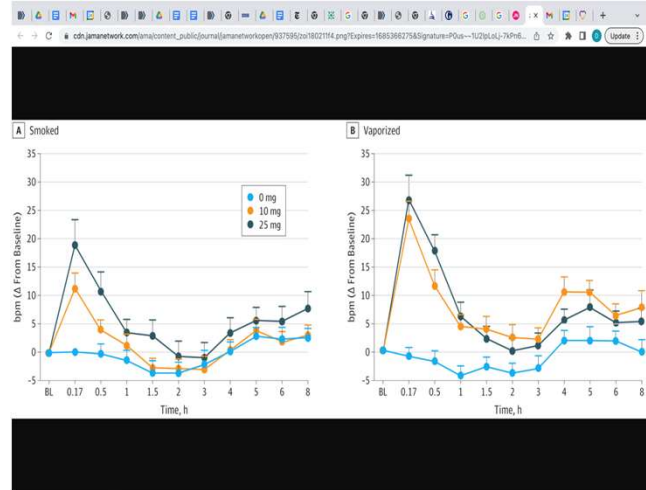
Poorly absorbed through skin

Mostly excreted through feces(65%) 20% urine

1-3 day half life in infrequent users/ 7-13 day in
heavy users

Psychomotor and cognitive impairments reported
up to 6 hours after acute use in adults

Chayasirisobhon S. Mechanisms of Action and Pharmacokinetics of Cannabis. Perm J. 2020
Dec;25:1-3. doi: 10.7812/TPP/19.200. PMID: 33635755;PMCID: PMC8803256.



Spindle JR, Cone EJ, Schliez NJ, et al. Acute Effects of Smoked and Vaporized Cannabis in Healthy Adults Who Infrequently Use Cannabis: A Crossover Trial. *JAMA Netw Open.* 2018;1(7):e184841. doi:10.1001/jamanetworkopen.2018.4841

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Acute Use

- Euphoric feeling
- Increased heartrate/BP
- Poor Coordination - MVA
- Poor Judgement-MVA/STI
- Red Eyes
- Munchies
- Dry Mouth
- Sedation
- Acute Anxiolytic

Increased Anxiety

Paranoia/Psychosis

Rare- Cardiac Dysrhythmia, EVALI

Hypertensive crisis, CV disease

Cardiomyopathy, Several Case

Reports of MI in Peds Population

Desai R, Jain A, Sultan W, Gandhi Z, Raju AR, Varughese VJ, Jnaneswaran G, Agarwal C, Rizvi B, Mansuri Z, Gupta P, Kumar G, Sachdeva R. Hypertensive Crisis-Related Hospitalizations and Subsequent Major Adverse Cardiac Events in Young Adults with Cannabis Use Disorder: A Nationwide Analysis. *Medicina (Kaunas).* 2022 Oct 16;58(10):1465. doi: 10.3390/medicina58101465. PMID: 36295625; PMCID: PMC9609556.

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Long Term Effects

- Increased Risk Cognitive Loss- Loss of IQ/Poor educational attainment ¹
- A-motivational syndrome/diminished life satisfaction and achievement ¹
- Increased risk mood disorders (Depression) ²
- Increased risk suicide- 3.5 the odds of making a suicide attempt ²
- Increased risk of psychotic disorder and exacerbation of the course of these illnesses
- Chronic Bronchitis
- Hyperemesis/Weight loss
- Cardiovascular disease

1. Volkow ND, Baler RD, Compton WM, Weiss SR. Adverse health effects of marijuana use. *N Engl J Med*. 2014 Jun 5;370(23):2219-27. doi: 10.1056/NEJMra1402309. PMID: 24897085; PMCID: PMC4827335

2. Gobbi G, Atkin T, Zytynski T, Wang S, Askari S, Boruff J, Ware M, Marmorstein N, Cipriani A, Dendukuri N, Mayo N. 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 Apr 1;76(4):426-434. doi: 10.1001/jamapsychiatry.2018.4500. Erratum in: *JAMA Psychiatry*. 2019 Apr 1;76(4):447. PMID: 30758486; PMCID: PMC6450286.

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Risk of Addiction

- 1 in 6 teens who use will develop addiction
- Daily adolescent users have much higher risk 25 to 50%
- Onset of use in adolescence versus adulthood increases risk by 2 to 4 times of dependence in 2 years after initiation.
- Increases risk of other substance use.

Volkow ND, Baler RD, Compton WM, Weiss SR. Adverse health effects of marijuana use. *N Engl J Med*. 2014 Jun 5;370(23):2219-27. doi: 10.1056/NEJMra1402309. PMID: 24897085; PMCID: PMC4827335.

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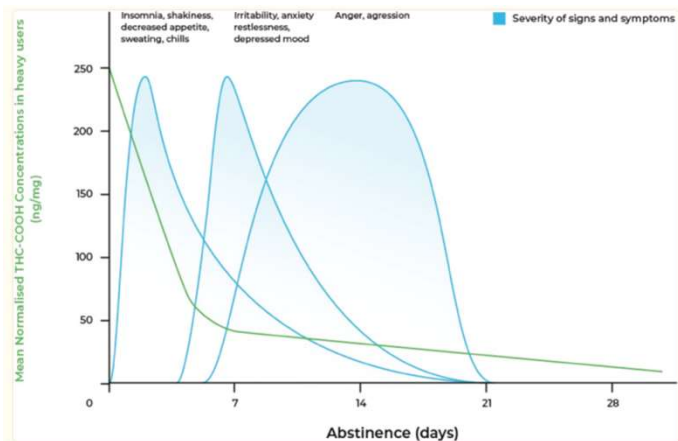
Cannabis Use Disorder

- Cannabis is often taken in larger amounts or over a longer period than intended
- There is a persistent desire or unsuccessful efforts to cut down or control cannabis use
- A great deal of time is spent in activities necessary to obtain cannabis, use cannabis or recover from its effects
- Craving or a strong desire to use cannabis
- Recurrent cannabis use results in failure to fulfill role obligations at work, school or home
- Continued cannabis use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of cannabis
- Important social, occupational or recreational activities are given up or reduced because of cannabis use
- Recurrent cannabis use in situations in which it is physically hazardous
- Cannabis use continues despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by cannabis.
- Tolerance, as defined by either: (1) a need for markedly increased cannabis to achieve intoxication or desired effect or (2) a markedly diminished effect with continued use of the same amount of the substance.
- Withdrawal, as manifested by either (1) the characteristic withdrawal syndrome for cannabis or (2) cannabis is taken to relieve or avoid withdrawal symptoms.

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Cannabis Withdrawal Syndrome

- Onset 24-48 post cessation/window of improvement after 4-7 days
- Symptoms: poor appetite/shakiness/ poor sleep/strange dreams/sweating/chills/rarely fever Anxious/irritable/depressed//angry/aggressive
- More severe with CUD/psychiatric illness/polysubstance use



Connor JP, Stjepanović D, Budney AJ, Le Foll B, Hall WD. Clinical management of cannabis withdrawal. *Addiction*. 2022 Jul;117(7):2075-2095. doi: 10.1111/add.15743. Epub 2022 Jan 10. PMID: 34791767; PMCID: PMC9110555.

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Marijuana Pregnancy/ Breast Feeding

- Limited evidence of association with growth restriction, preterm birth, still birth and NICU admission
- Evidence of poor neurodevelopmental outcomes in offspring of neonates exposed especially at higher doses
- ACOG and AAP recommend against
- American Academy of Breastfeeding Medicine – Reduce or Eliminate to reduce potential long term neurobehavioral effects of longterm exposure.

Metz TD, Borgelt LM. Marijuana Use in Pregnancy and While Breastfeeding. *Obstet Gynecol.* 2018 Nov;132(5):1198-1210. doi: 10.1097/AOG.0000000000002878. PMID: 30234728; PMCID: PMC6370295.

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Treatments

- Psychotherapy is mainstay:¹
 - CBT/ ACRA/MET
 - Contingency Management
 - Family Therapies
- Treat comorbid psychiatric illness /substance use
- NAC studied in teens 1200mg bid²
- Adults trials using pharmaceutical cannabinoids dronabinol/³
- TREATME- MORE TO COME

¹Fadus MC, Squeglia LM, Valadez EA, Tomko RL, Bryant BE, Gray KM. Adolescent Substance Use Disorder Treatment: an Update on Evidence-Based Strategies. *Curr Psychiatry Rep.* 2019 Sep 14;21(10):96. doi: 10.1007/s11920-019-1086-0. PMID: 31522280; PMCID: PMC7241222.

²Squeglia LM, Fadus MC, McClure EA, Tomko RL, Gray KM. Pharmacological Treatment of Youth Substance Use Disorders. *J Child Adolesc Psychopharmacol.* 2019 Aug;29(7):559-572. doi: 10.1089/cap.2019.0009. Epub 2019 Apr 22. PMID: 31009234; PMCID: PMC6727439.

³Connor JP, Stjepanović D, Budney AJ, Le Foll B, Hall WD. Clinical management of cannabis withdrawal. *Addiction.* 2022 Jul;117(7):2075-2095. doi: 10.1111/add.15743. Epub 2022 Jan 10. PMID: 34791767; PMCID: PMC9110555.

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Prevention

- Parental Attitudes/Use
- Parental Monitoring
- Peer Attitudes
- School Engagement
- Engagement in Extracurricular Activities

Donnelly J, Young M, Marshall B, Hecht ML, Saldutti E. Public Health Implications of Cannabis Legalization: An Exploration of Adolescent Use and Evidence-Based Interventions. *Int J Environ Res Public Health*. 2022 Mar 11;19(6):3336. doi: 10.3390/ijerph19063336. PMID: 35329023; PMCID: PMC8950733.