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Blunt Truths: Debunking Myths about Cannabis in the Perinatal and Postpartum Period

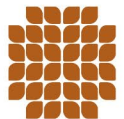
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Associated Medical Director, Addiction Medicine Director, Sierra Tucson

Disclosure

- I, Luke Peterson, hereby declare that the content for this activity, including any presentation on therapeutic options, is well balanced, unbiased, and to the extend evidenced based.
- My partner/spouse and I have no financial relationships with commercial entities producing, marketing, re-selling, or distributing health care goods or services consumed by, or used on, patients relevant to the content I am planning, developing, presenting, or evaluating.
- Off label discussion of medication for cannabis use disorder will be discussed and noted in this presentation.



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Objectives

- Review risks of cannabis use in the perinatal and postpartum period
- Provide anticipatory guidance for patients using cannabis while breastfeeding
- Discuss biopsychosocial treatment for patients with cannabis use disorder



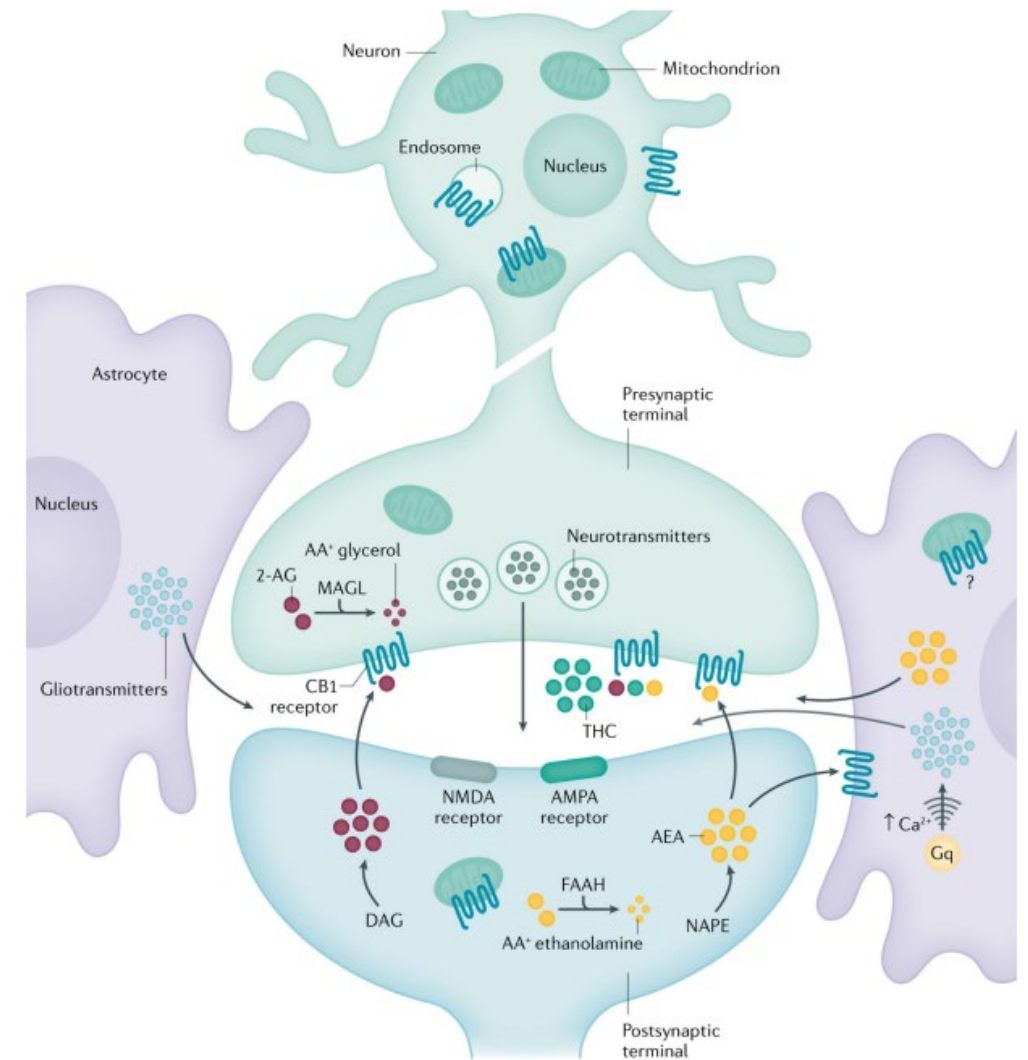
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Cannabis Pharmacology

- Marijuana contains over 500 chemical compounds
- Δ^9 -tetrahydrocannabinol (THC) is major psychoactive compound
 - Partial agonism of presynaptic cannabinoid receptor CB1 – euphoric effect
 - Inhibition of adenylyl cyclase activity through activation of Gi/o protein
 - Reduces presynaptic neurotransmitter release
 - Highest expression of CB1 is in glutamate and GABAergic neurons
- Reward pathway
 - THC inhibits GABA in the ventral tegmental presynaptic neuron which increases dopamine release
- Metabolized by liver various P450 enzymes



Cannabis Pharmacology



INHALED

- Smoking, vaping or dabbing
- Quickest method
- Less chance of overconsumption

Onset (Min): 1-3

Duration (hrs): 1-3

ORAL ABSORPTION (GI)

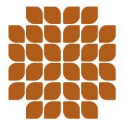
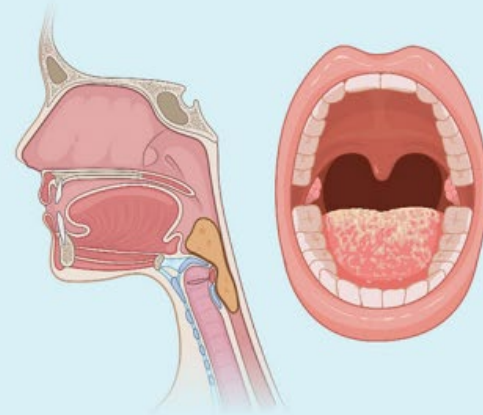
- **Oral:** Drops, tinctures, sprays, lollipops, strips
- **GI:** Edibles, candies, drinks, snacks, capsules
- Delay in onset symptoms/ Higher likelihood of overconsumption

Onset (min)

- Oral: 10-25
- Ingested: 30-90

Duration (hrs):

- Oral: 1-3
- Ingested: 6-8

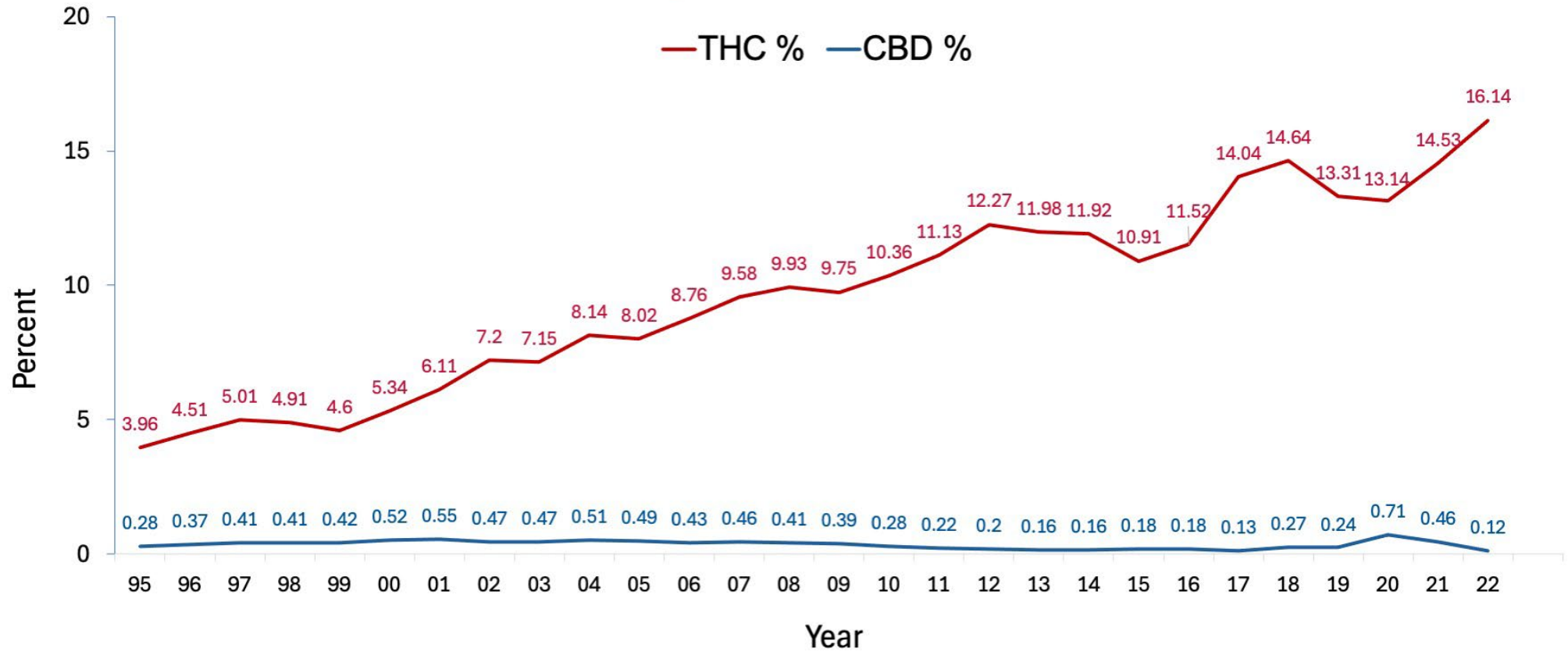


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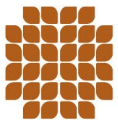
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Hayer et al, 2024

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

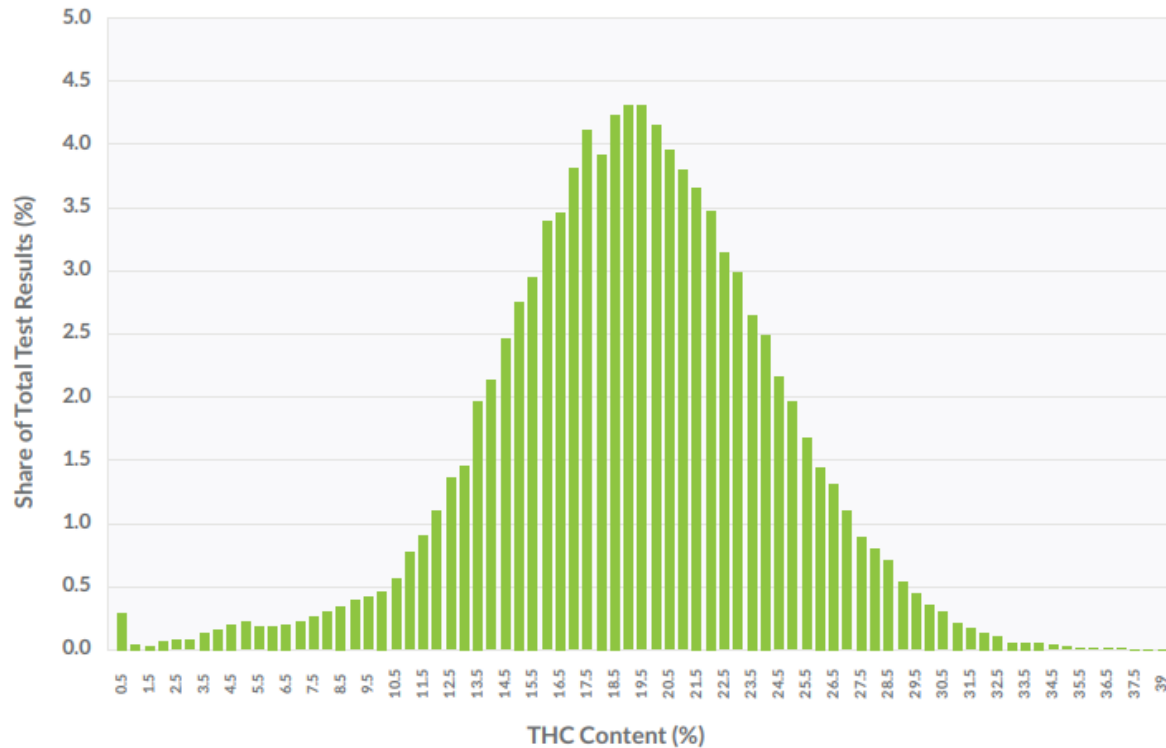


SOURCE: U Miss, Potency Monitoring Project

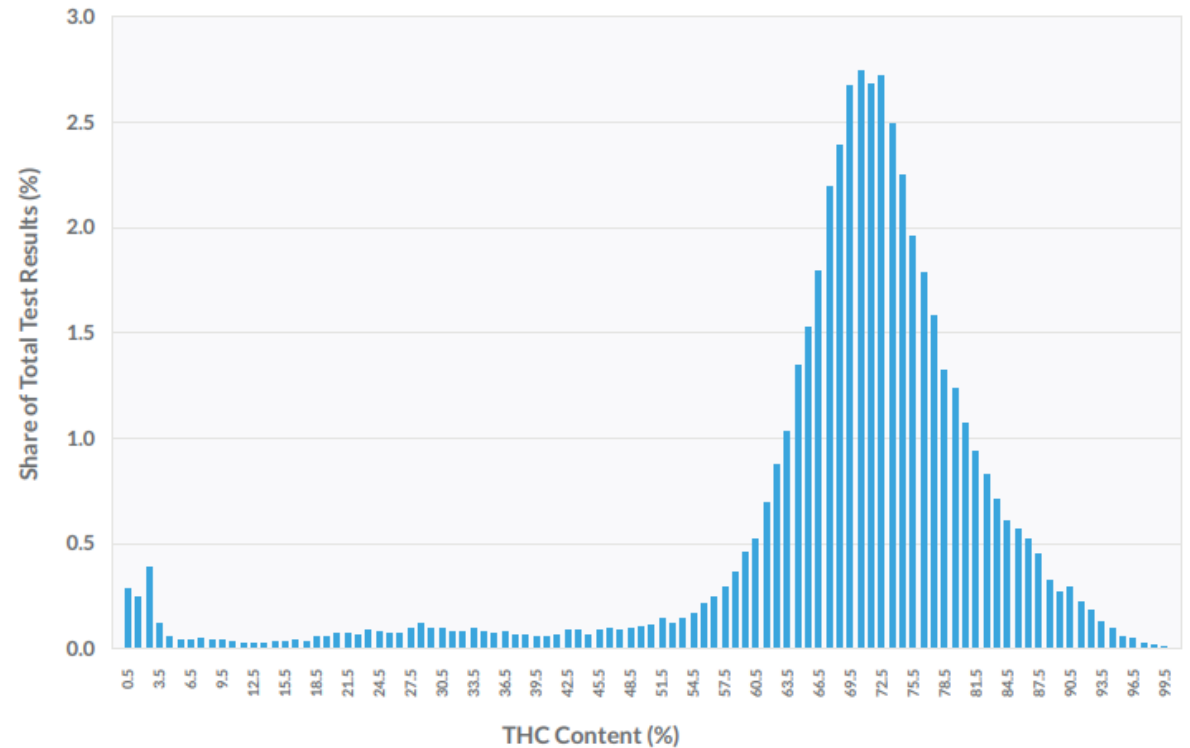


Potency Distribution for Flower & Concentrates

2020 FLOWER POTENCY DISTRIBUTION



2020 CONCENTRATE POTENCY DISTRIBUTION

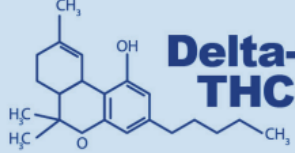


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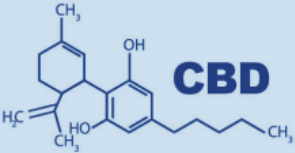
2020 Regulated Marijuana Market Update, 2020, MGP Marketing, Colorado University, Prepared report for The Colorado Department of Revenue's Marijuana Enforcement Division, accessed online <https://sbg.colorado.gov/sites/sbg/files/2020-Regulated-Marijuana-Market-Update-Final.pdf>

Effects of Cannabis

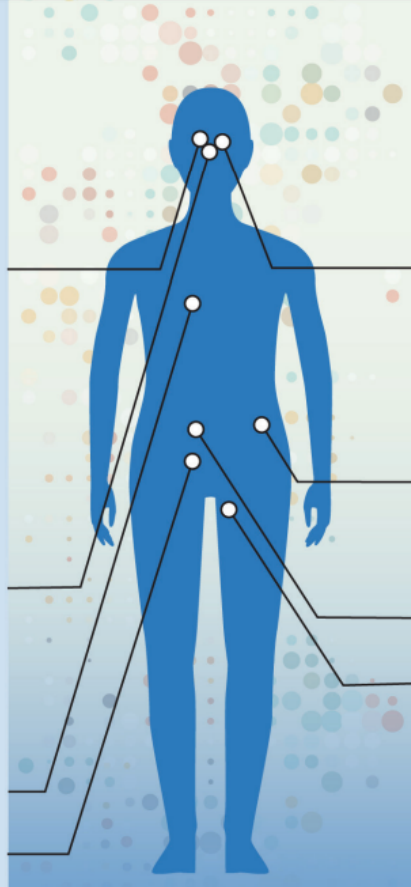
POTENTIAL HEALTH EFFECTS OF DELTA-9 THC AND CBD



Delta-9 THC



CBD



EFFECTS OF DELTA-9 THC

Short-Term

Effects on the Brain and Nervous System

- Altered senses
- Distorted perception of time
- Changes in mood
- Delusions
- Difficulty thinking
- Impaired movement
- Impaired memory
- Hallucinations
- Psychosis

Long-Term

Effects on the Brain and Nervous System

- Impacts on child development (if used when pregnant)
- Impaired brain development
- Impaired learning, memory, and thinking
- Mental illness (e.g., depression, anxiety, paranoia)

Effects on the Respiratory System

- Breathing problems

Effects on the Digestive System

- Nausea and vomiting

EFFECTS OF CBD

Short-Term

Effects on the Brain and Nervous System

- Changes in alertness
- Changes in mood (e.g., irritability, agitation)
- Drowsiness and/or sedation
- Drug interactions that may cause serious side effects

Effects on the Digestive System

- Gastrointestinal distress (e.g., nausea, diarrhea)

Long-Term

Effects on the Digestive System

- Liver injury

Effects on the Reproductive System

- Male reproductive toxicity



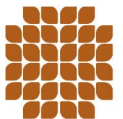
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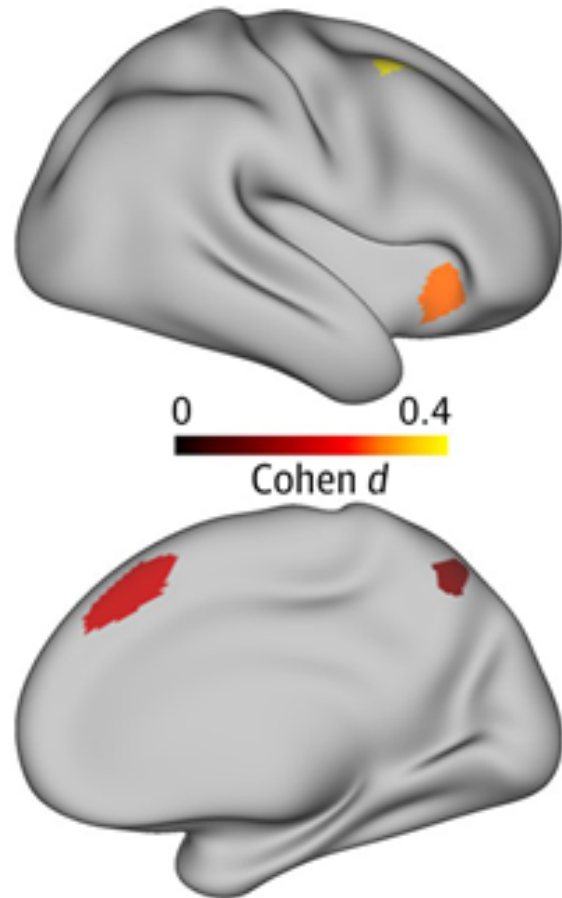
SAMHSA, 2023

Effects of Cannabis

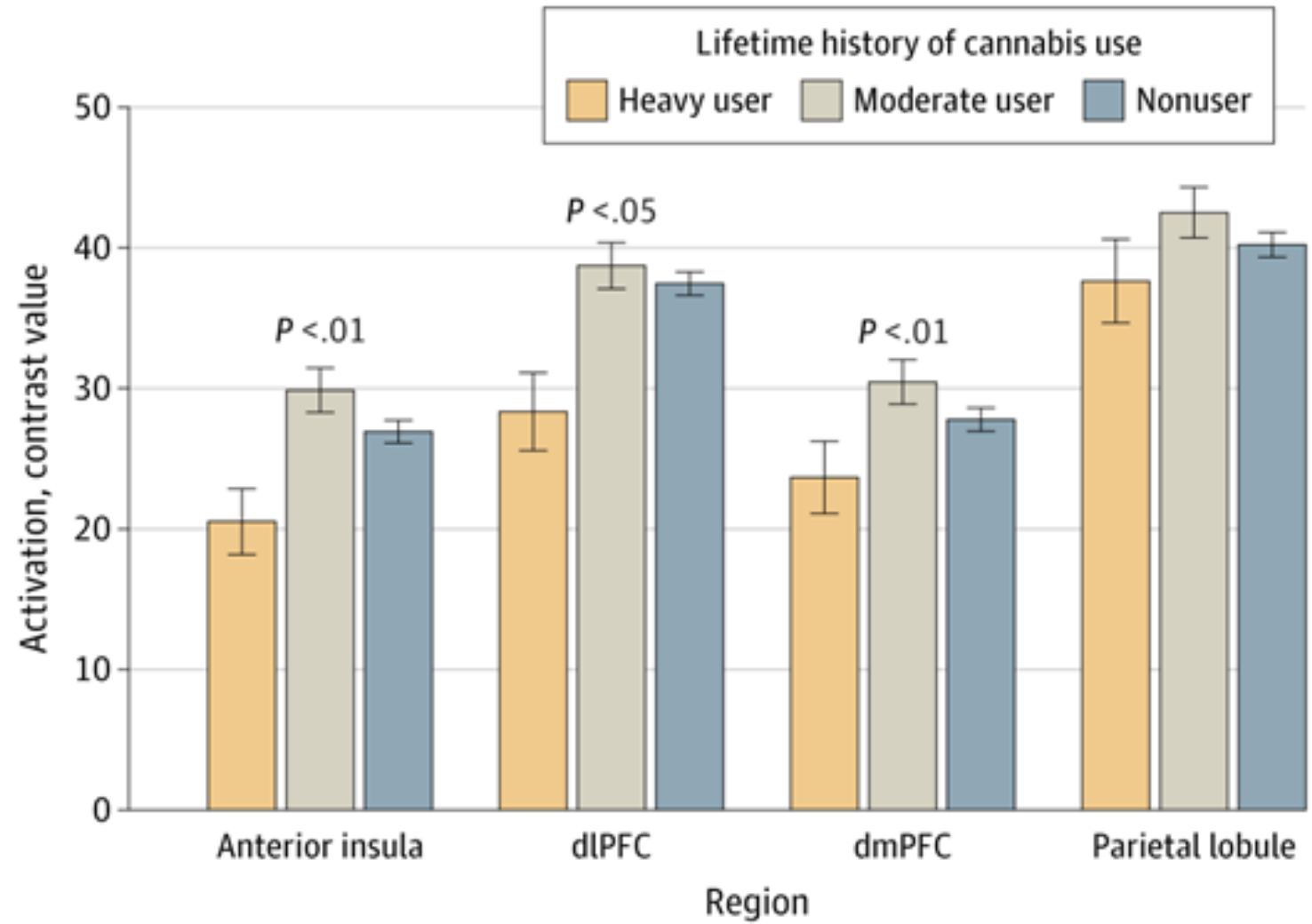
- Decreases working memory
- Temporary trends in motor vehicle accidents
- Increase in ER presentations due to cannabis use
- Increase in cannabis use disorder prevalence after medicinal and recreational legalization
 - Larger increase in patients with chronic pain
- Increase in cardiovascular disease
- Psychosis/paranoia occurs in 1 in 10 people who use daily/regularly
- Increase of anxiety (OR 1.04-1.15)



A Region and effect size



B Working memory task (2-back - 0-back)



- Cannabis use disorder prevalence by state status for legalization of cannabis

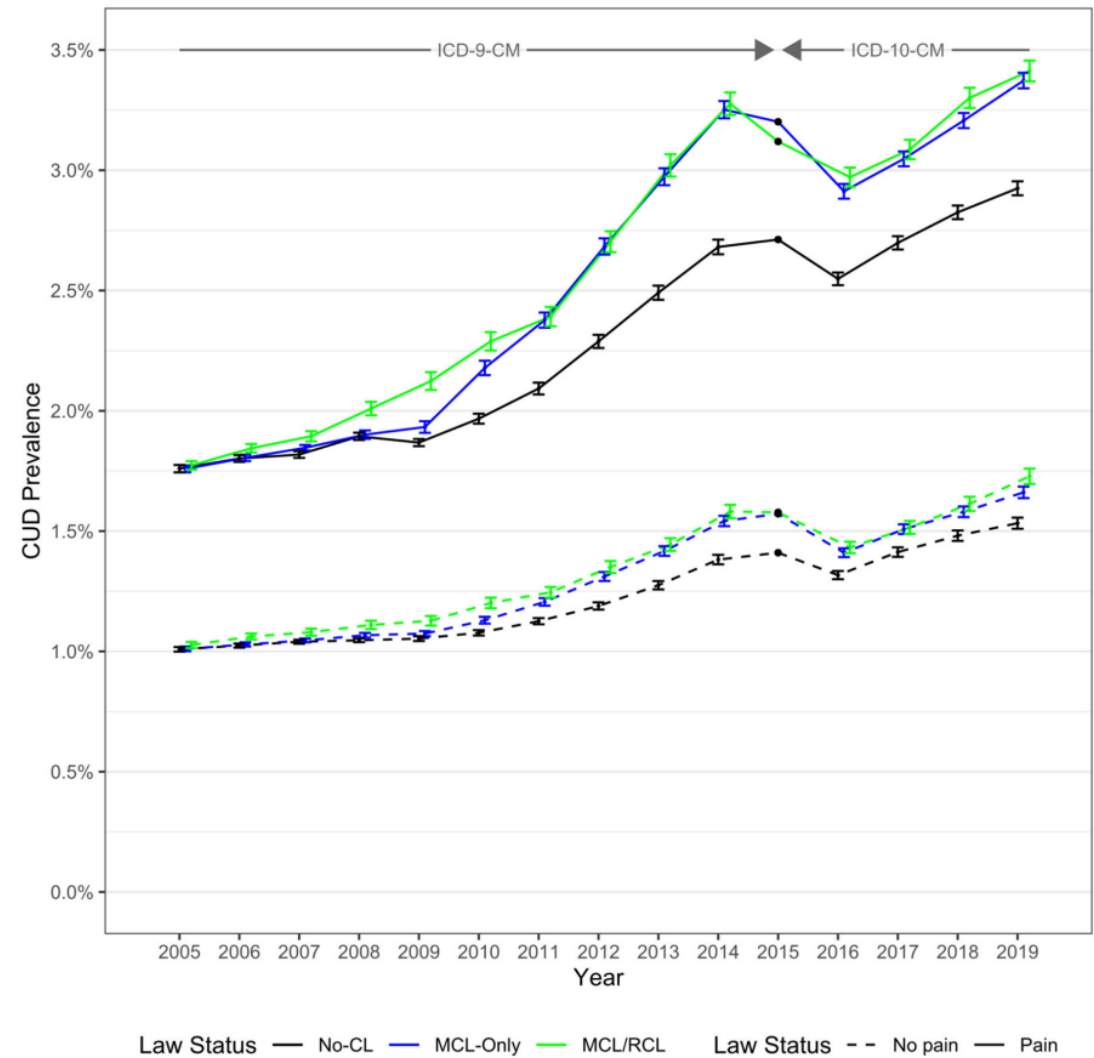
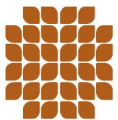
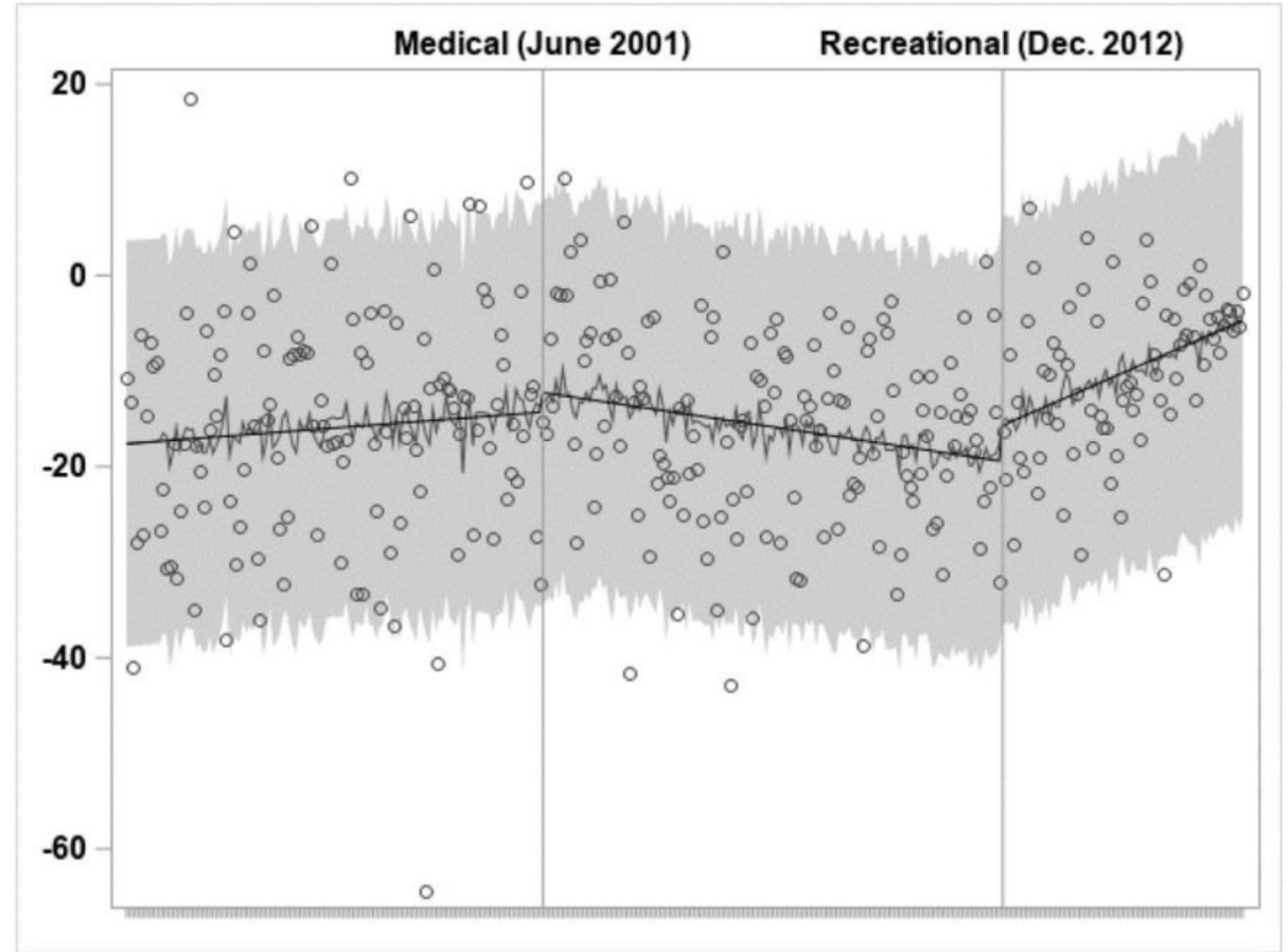


Figure 1. Cannabis Use Disorder prevalence by state law status as of 2019, among patients with and without chronic pain

- Multiple studies show increase in non-fatal and fatal car crashes after passing of marijuana legislation, in particular recreational laws.

**Difference in monthly fatal motor vehicle
crashes per million population**



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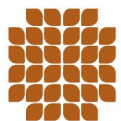
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Calvert et al, 2020

Cannabis associated with heart disease

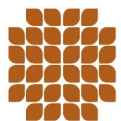
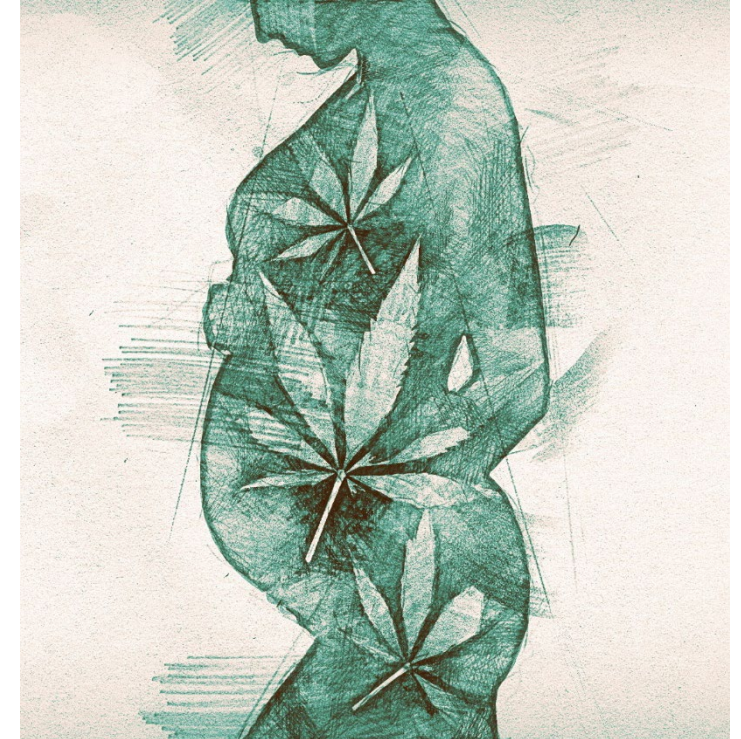
- Jeffers et al, 2024
 - Controlled for tobacco smoking status, age, sex, race and ethnicity, body mass index, diabetes, alcohol use, educational attainment, and physical activity
 - Past 30 day cannabis use associated with
 - Myocardial infarction
 - Stroke
 - Composite cardiovascular disease
 - More prevalent in people who use more frequently

Cardiovascular disease	aOdds Ratio	95% CI
Coronary heart disease	1.16	0.98-1.38
Myocardial infarction	1.25	1.07-1.46
Stroke	1.42	1.20-1.68
Composite (CHD, MI, CVA)	1.28	1.13-1.44



Cannabis use

- In the last decade, cannabis use among child bearing aged people has increased from 10.4% to 18%
- Cannabis use in pregnancy has increased from 3.4% (2002) to 7% (2017)
 - **COVID19 pandemic 2020 reported 25%**
 - Highest prevalence among 18-25 years and during 1st trimester



Cannabis use in prenatal period

Serious maternal complications linked with use of marijuana before and early in pregnancy, study says

By Sandee LaMotte, CNN
6 minute read · Updated 4:39 PM EDT, Mon July 22, 2024

15 comments

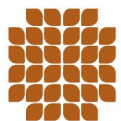
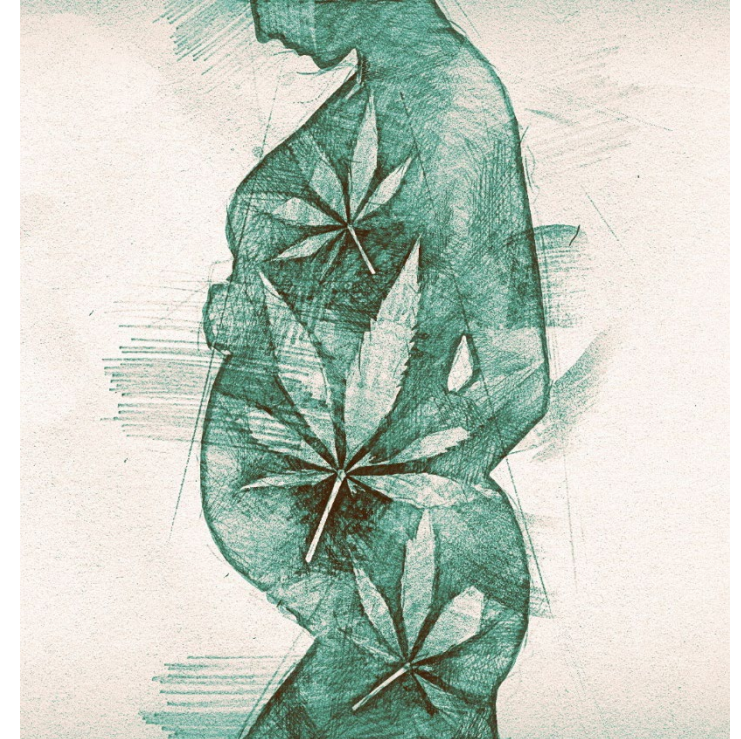


“While it is sensible to advise women to abstain from all drugs during pregnancy, the weight of scientific evidence suggests that marijuana dose not directly harm the human fetus” – 420 Magazine, March 25, 2013, Use of Marijuana during pregnancy



Perception of Cannabis use in Pregnancy

- Perception that cannabis has no risk has risen three-fold from 2005 to 2015
- 70% of pregnant and non-pregnant women believe there is little or no risk of using cannabis one to two times per week
- Most commonly cited source of information for cannabis use in pregnancy is the internet and anecdotal evidence



Recommendations From Cannabis Dispensaries About First-Trimester Cannabis Use

Dickson, Betsy MD; Mansfield, Chanel MPH; Guiahi, Maryam MD, MSc; Allshouse, Amanda A. MS; Borgelt, Laura M. PharmD; Sheeder, Jeanelle PhD; Silver, Robert M. MD; Metz, Torri D. MD, MS

[Author Information](#) 

Obstetrics & Gynecology 131(6):p 1031-1038, June 2018. | DOI: 10.1097/AOG.0000000000002619

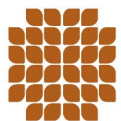
Findings:

- 69% recommended cannabis for morning sickness
- 36% safe in pregnancy
- 81% recommended discussion with healthcare provider



A word of caution....

- Limited and poor studies have led to fear mongering and finger pointing
- Many studies associating drug use with risk in pregnancy don't account for other confounding issues that people with substance use face:
 - Nicotine and alcohol use, prenatal care, insured, mental health, medical history, psychopharmacology, domestic violence, trauma, SDoH, unstable housing, STD, nutrition, blood born pathogens, etc.
- Lesson's learned...
 - "Yet, after almost 20 years of research, not one single condition or disorder that could be labeled "crack baby" has been identified. Nor is there evidence of the extent of harm that was predicted by physicians and trumpeted by the media." (Lewis, 2005)
- **Recommendation: Be skeptical, and dig in to the evidence**



Cannabis effect on pregnancy fetus and neonate

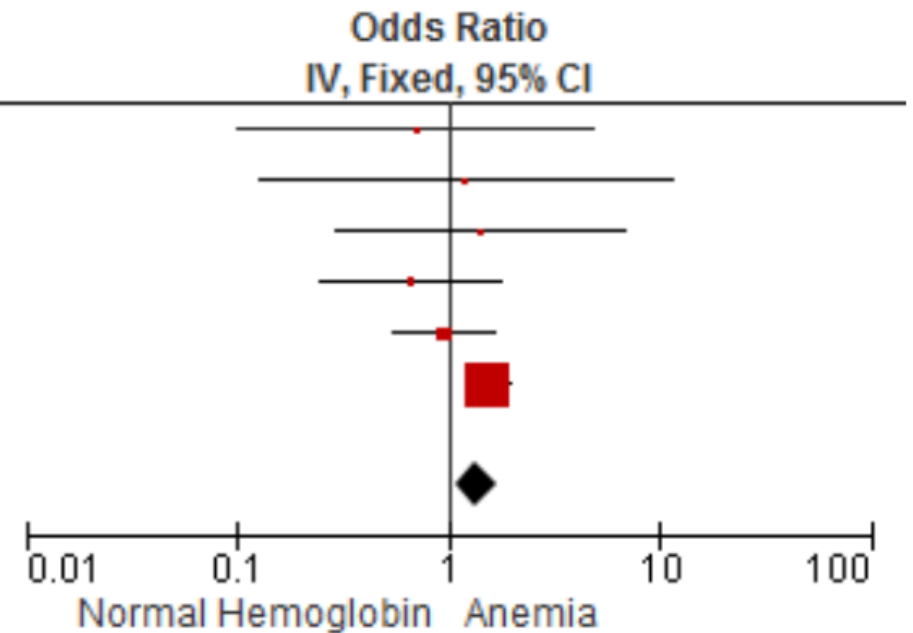
- Increased risk of NICU admission
- Lower birth weight
- Small of gestational age
- Preterm birth
- Higher still birth rates
- Lower Apgar scores
- Growth of infant while breastfeeding
- Decreased childhood and adolescent memory and problems with impulse control, problem solving, quantitative reasoning, verbal development, visual analysis tests



Supplement 4: Forest Plot 1: Odds of Maternal Anemia among Cannabis Users

Study or Subgroup	log[Odds Ratio]	SE	Weight	Odds Ratio IV, Fixed, 95% CI
Berenson 1996	-0.35	0.99	1.2%	0.70 [0.10, 4.91]
Gargari 2012	0.1773	1.147	0.9%	1.19 [0.13, 11.31]
Greenland 1982	0.3502	0.80434	1.8%	1.42 [0.29, 6.87]
Greenland 1983	-0.4081	0.503	4.6%	0.66 [0.25, 1.78]
Quinlivan 2002	-0.05	0.275	15.4%	0.95 [0.55, 1.63]
Witter 1990	0.4381	0.1236	76.1%	1.55 [1.22, 1.97]
Total (95% CI)			100.0%	1.36 [1.10, 1.69]

Heterogeneity: $\text{Chi}^2 = 5.29$, $\text{df} = 5$ ($P = 0.38$); $I^2 = 5\%$
 Test for overall effect: $Z = 2.88$ ($P = 0.004$)

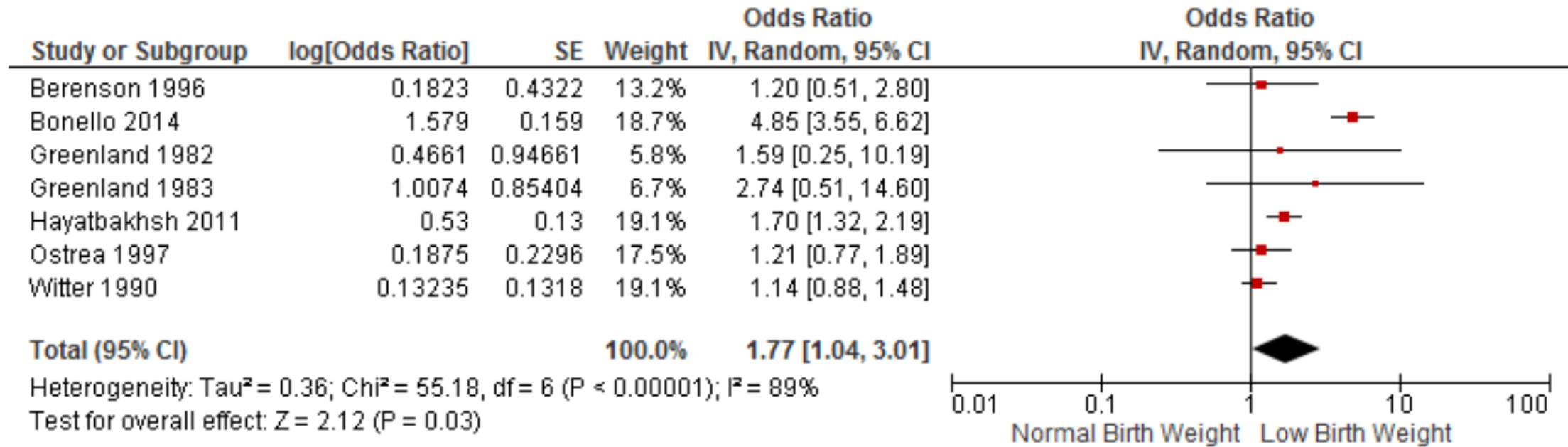


Exclusions/Adjustments

(Witter) 1990, recruitment in 1980's, only crude data

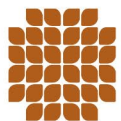


Supplement 3: Forest Plot 3: Odds of Low Birth Weight among Infants Exposed to Cannabis

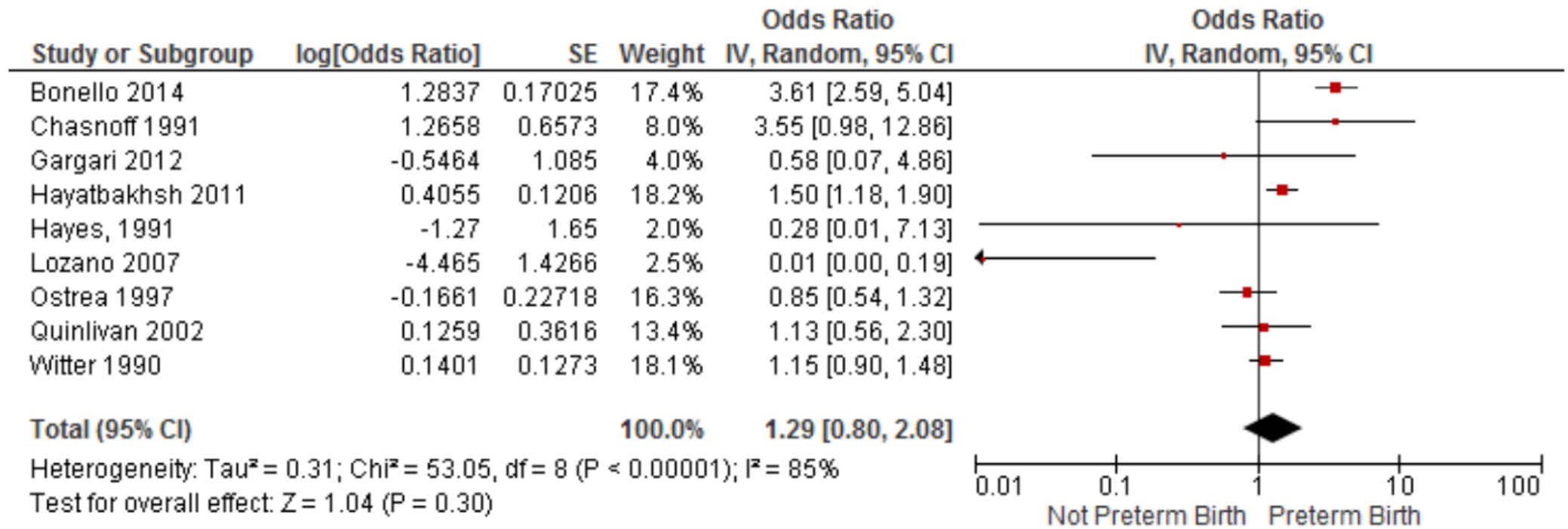


Exclusions/Adjustments

- (Berenson) Adjusted for race, #cigarettes, alcohol
- (Bonello) Pre-existing DM/HTN, PreE, GDM, smoking, SES, delivery, infant gender, fetal death
- (Greenland) Matched based off age, ethnicity (laxed), gravida – tobacco and alcohol allowed
- (Greenland) Crude numbers
- (Hayatbakhsh) Mothers age, arity, ethnicity, weight, cigarette, alcohol, other substances
- (Ostrea) Crude numbers
- (Witter) 1990, recruitment in 1980’s, only crude data



Supplement 3: Forest Plot 7: Odds of Preterm Birth Among Infants Exposed to Cannabis in-utero

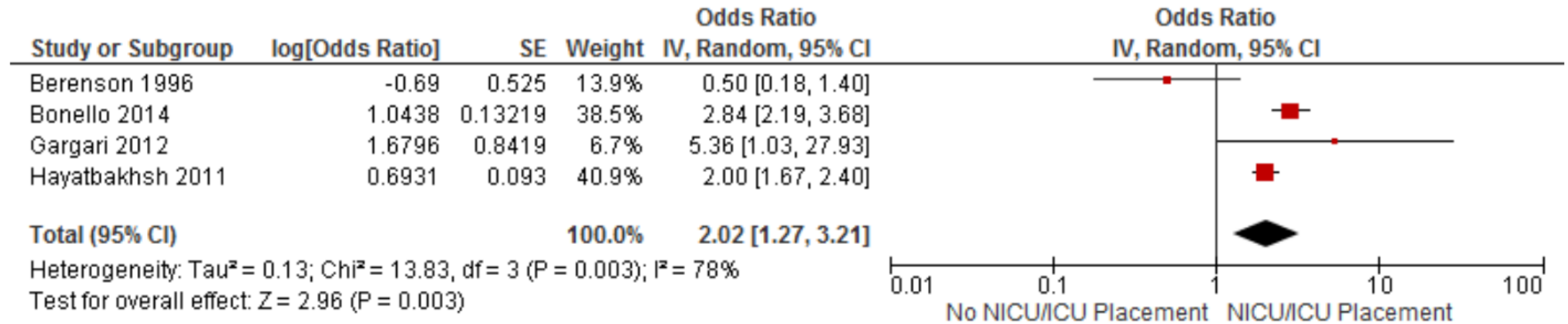


Exclusions/Adjustments

(Bonello)	Pre-existing DM/HTN, PreE, GDM, smoking, SES, delivery, infant gender, fetal
(Chasnoff)	Age, race, SES
(Gargari)	Crude numbers
(Hayatbakhsh)	Mothers age, arity, ethnicity, weight, cigarette, alcohol, other substances
(Hayes)	Not confounded by drugs, alcohol, tobacco, low birth weight
(Loranzo)	Cigarette smoking, sex, maternal age and gestation weeks
(Ostrea)	Crude numbers
(Quinlivan)	Height, weight, age, race, GA, gender, smoking and alcohol use
(Witter)	1990, recruitment in 1980's, only crude data

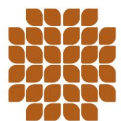


Supplement 3: Forest Plot 8: Odds of Admission to NICU/ICU among Infants Exposed to Cannabis in-utero



Exclusions/Adjustments

- (Berenson) Adjusted for race, #cigarettes, alcohol
- (Bonello) Pre-existing DM/HTN, PreE, GDM, smoking, SES, delivery, infant gender, fetal death
- (Gargari) Crude numbers
- (Hayatbakhsh) Mothers age, arity, ethnicity, weight, cigarette, alcohol, other substances



Cannabis effect on fetus and neonate

- Gunn et al, 2024
 - Systematic Review/Meta analysis
 - **Cannabis exposure increases:**
 - **NICU Admission**
 - **Low birth rate**
 - **Anemia***
 - No statistical association with:
 - Gestational age
 - NICU/ICU length
 - Head circumference
 - **Preterm birth***
- Avalos et al, 2024
 - Retrospective population cohort (Kaiser)
 - **Adjusted for SES, non-cannabis substance use, medical and mental health comorbidities, and adequacy of prenatal care**
 - Cannabis exposure increases (OR [95% CI]):

• Low birthweight	1.2 (1.12-1.28)
• SGA	1.24 (1.18-1.30)
• Preterm birth <37w	1.06 (1.00-1.13)
• NICU admission	1.06 (1.01-1.11)



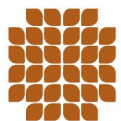
Cannabis effect on development (limited data)

- Maternal Health Practices and Child Development (MHPCD) study (N=763)
 - Inconsistent findings for timing of developmental delays
 - Lower performance on Stanford-Binet Intelligence Score @ 36 mo
 - Deficits in short term memory and verbal reasoning @ 6 years
 - Reading and spelling deficits @ 10-14 years
 - Lower teacher's ratings on memory, impulsivity, hyperactivity, and delinquency
- Ottawa Prenatal Prospective Study (OPPS) (N=583)
 - Increased behavioral problems
 - Decreased language comprehension, memory, and attention
 - Increased impulsivity at age 9-12



Cannabis effect on development (limited data)

- Generation R study (N=7,452) ongoing
 - Behavioral problems but not emotional problems
 - No change in global brain volume but had thicker frontal cortices
- IQ – OPPS and other studies show normal IQ
- Autism Spectrum Disorder – Retrospective Canadian study showed association with cannabis exposure (aHR 1.51, 95% CI 1.17–1.96)
- Sleep – Very small cohort study (N=38) showed disturbed nocturnal sleep
- Mental health – conflicting evidence about MH conditions such as psychosis and other psychopathology including ADHD and SUD.
- No congenital abnormalities in most studies, may be associated with anencephaly with early first trimester exposure (note THC users are less likely to supplement folic acid during pregnancy).



Cannabis and pregnancy risk



The American College of
Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS

ACOG COMMITTEE OPINION

Number 722 • October 2017

(Replaces Committee Opinion No. 637, July 2015)

Committee on Obstetric Practice

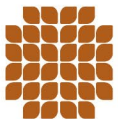
This document reflects emerging clinical and scientific advances as of the date issued and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed.

INTERIM UPDATE: This Committee Opinion is updated as highlighted to reflect a limited, focused change in the language and supporting evidence regarding marijuana use and neonatal outcomes.

Marijuana Use During Pregnancy and Lactation

- No association with maternal or perinatal mortality
- Increase risk of still birth
- Lower birth weight (<2500g) appears dose dependent (use at least weekly)
- Preterm birth association appears to be confounded by tobacco use

“Because the effects of marijuana use may be as serious as those of cigarette smoking or alcohol consumption, marijuana also should be avoided during pregnancy”



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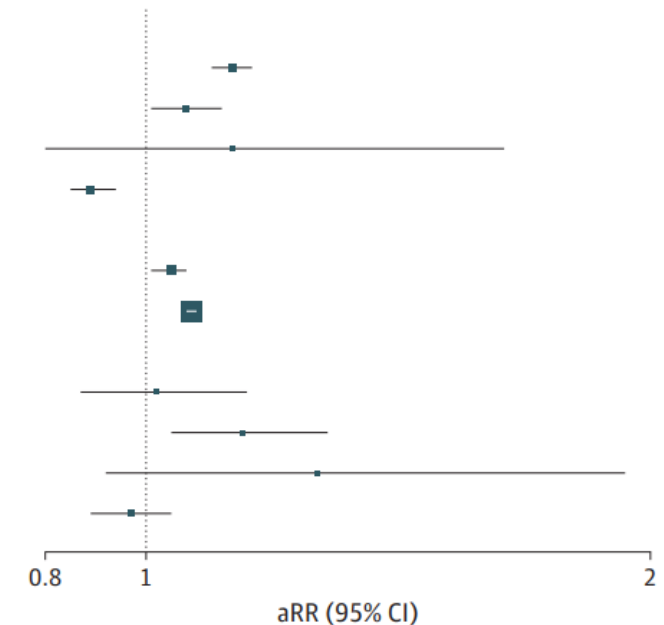
Committee Opinion No. 722, 2017

Cannabis and pregnancy risk

- Young-Wolff et al 2024 (N=316,722, 6.3% +THC)
 - Adjusted for SES, parity, birth year, prenatal care initiation, prepregnancy BMI, noncannabis prenatal substance use, and comorbidities.

Figure. Adjusted Risk Ratios (aRRs)^a of Maternal Outcomes in Pregnancies With Any Prenatal Cannabis Use vs None^b

Metabolic outcomes	aRR (95% CI)
Hypertensive disorders	
Gestational hypertension	1.17 (1.13-1.21) ^c
Preeclampsia	1.08 (1.01-1.15) ^c
Eclampsia	1.17 (0.80-1.71)
Gestational diabetes	0.89 (0.85-0.94) ^c
Gestational weight gain	
Less than guidelines	1.05 (1.01-1.08) ^c
Greater than guidelines	1.09 (1.08-1.10) ^c
Placental outcomes	
Placenta previa	1.02 (0.87-1.20)
Placental abruption	1.19 (1.05-1.36) ^c
Placenta accreta	1.34 (0.92-1.95)
Severe maternal morbidity	0.97 (0.89-1.05)



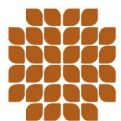
*Gestational hypertension showed dose response increasing in risk from reported monthly, weekly, and daily THC use.

Cannabis use and breastfeeding

- Postnatal THC exposure is poorly understood/studied
- THC is most common substance in lactating individuals (5-15%)
- THC is 8-times higher in milk v serum
- Infants exposed to 0.8-2.5% of the mother's dose
- Small studies with conflicting findings regarding infant development
 - Often confounded by prenatal exposure



“In the absence of definitive data on infant safety, professional guidelines encourage reducing or eliminating cannabis use while breastfeeding. The ABM suggest that breastfeeding mothers be counseled to reduce or eliminate use to avoid possible neurobehavioral effects on the infant.”



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Hayer et al 2024

Screening for cannabis use disorder in pregnancy

- ACOG Opinion Statement 722: *“Before pregnancy and in early pregnancy, all women should be asked about their use of tobacco, alcohol, and other drugs, including marijuana and other medications used for nonmedical reasons.”*

Screening tool	Sensitivity %	Specificity %
4P’s	90.2	29.6
NIDA Quick Screen	79.7	82.8
SURP-P	92.4	21.8

Reference: hair and urine tests combined, positive on either





NIDA Quick Screen- ASSIST

Quick Screen[†]

1. In the past year, how often have you used the following?
 - a. Five or more alcohol drinks in a day for men or 4 or more alcohol drinks in a day for women
 - b. Tobacco products
 - c. Prescription drugs for nonmedical reasons
 - d. Illegal drugs

ASSIST[‡]

1. In your lifetime, which of the following substances have you used? (response options of yes or no)
2. In the past 3 mo, how often have you used the substances you mentioned? (response options of never, once or twice, monthly, weekly, and daily or almost daily for items 2–5)
3. In the past 3 mo, how often have you had a strong desire or urge to use (each substance)?
4. (During the past 3 mo, how often has your use of (each substance) led to health, social, legal or financial problems?
5. During the past 3 mo, how often have you failed to do what was normally expected of you because of your use of (each substance)?
6. Has a friend or relative or anyone else ever expressed concern about your use of (each substance)?
7. Have you ever tried to control, cut down or stop using (each substance)?
8. Have you ever used any drug by injection?

SURP-P[§]

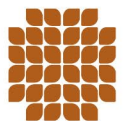
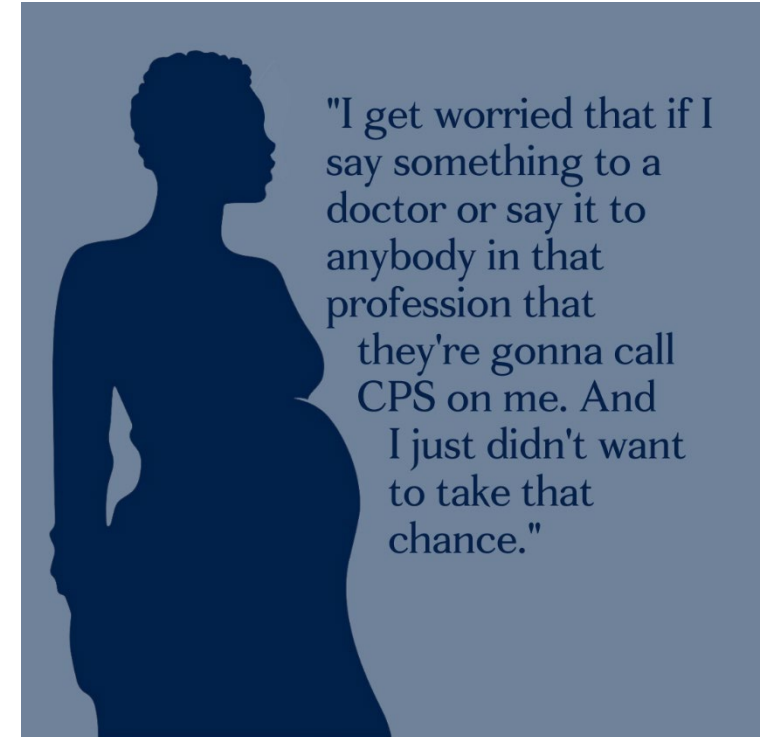
1. Have you ever used marijuana?
2. How many alcoholic drinks have you consumed in the month before knowing you were pregnant?
3. Do you feel the need to cut down on your alcohol or drug use?

4Ps+: Parents, Peers, (+Partner), Past, Present



Reporting in AZ

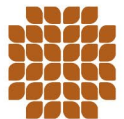
- AZ Appeals court ruled 2023 – Arizona Department of Child Safety will no longer investigate reports of newborns testing positive for THC as long as the parent has a medical marijuana card
- Two thirds of study participants did not disclose cannabis use to their provider
 - Main fear was reporting to child protection services
- Call to revise DCS reporting policies and practices and improve provider education. Move away from punitive to treatment and support.



Cannabis use disorder treatment

WEED: Practice Mnemonic for Addressing Cannabis Use in Pregnancy

- **W**elcome questions about cannabis use
- **E**xplore alternatives to cannabis for common pregnancy ailments, such as anxiety and nausea
- **E**xplain the potential risks of cannabis use
- **D**eliver a harm-reduction message by recommending a decrease in the dose and frequency for patients who are not able or willing to remain abstinent during pregnancy



Cannabis use disorder (DSM-V)

1. Using more of a substance or longer than intended 2. Wanting to limit or stop using but not being able to 3. Spending a lot of time using or recovering from use 4. Craving	Impaired control
5. Failure to fulfil duties in social roles (work, housekeeping) 6. Continue using despite substance-related social problems 7. Giving up activities because of substance use	Social impairments
8. Using in situations where using is dangerous to oneself or others 9. Continue using despite substance-related mental or physical problems	Risky use
10. Tolerance 11. Withdrawal*	Pharmacological criteria



Cannabis withdrawal

- Supportive care
- Behavioral approaches
 - Skills training, normalizing time line, coping skills, exercise, hot baths, avoiding caffeine
- Non-FDA comfort meds, small short term studies
 - Gabapentin
 - Quetiapine
 - Mirtazapine
 - Sedatives
 - Dronabinol, nabilone or nabiximol

TABLE 1

DSM-5 Diagnostic Criteria for Cannabis Withdrawal Syndrome (e6)

A.	Cessation of cannabis use that has been heavy and prolonged (i.e., usually daily or almost daily use over a period of a least a few months)
B.	3 or more of the following signs and symptoms develop within approximately 1 week of Criterion A: <ul style="list-style-type: none">– Irritability, anger or aggression– Nervousness or anxiety– Sleep difficulty (insomnia, disturbing dreams)– Decreased appetite or weight loss– Restlessness– Depressed mood– At least one of the following physical symptoms causing significant discomfort: abdominal pain, shakiness/tremors, sweating, fever, chills, or headache
C.	The signs or symptoms from criterion B cause clinically significant distress or impairment in social, occupational or other important areas of functioning.
D.	The symptoms are not due to another medical condition and are not better explained by another mental disorder.

DSM-5, Diagnostic and Statistical Manual of Mental Disorders



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Walther et al, 2016; Conner et al 2021

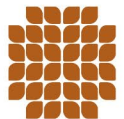
Cannabis use disorder treatment

- Psychosocial interventions (first line, moderate effect size, mod-high confidence in evidence)
 - Cognitive behavioral therapy
 - Motivational enhancement therapy
 - Contingency management
- Other modalities (unable to assess effect size, low confidence in evidence)
 - Social support counseling
 - Drug education counseling
 - Relapse prevention
 - Mindfulness
 - Mutual support programs (12 step, SMART, Refuge, Women for Sobriety, The Luckiest Club)



Cannabis use disorder treatment

- Biologic interventions (Non-FDA)
- Reduce cravings and relapse (limited small studies)
 - **Gabapentin** reduces cravings and relapse
 - **N-acetylcysteine** reduces relapse in adolescence population, effect not seen in adults
 - **Naltrexone** reduction in use



Conclusions

- Cannabis use is increasing in the US; As are cannabis and THC related medical, pregnancy, and psychiatric conditions
- Cannabis is associated with pregnancy risks, fetal complications, and neonatal risks
- Screen for cannabis in all pregnancies and provide education about risks
- Pregnant and lactating individuals should receive council to stop or reduce use to avoid pregnancy and neonatal complications and possible developmental problems
- Cannabis use disorder is managed with psychosocial support. There are no current FDA approved medications; however, some medications have shown promise in treating withdrawal, craving and preventing relapse.



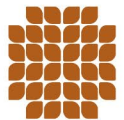
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Thank you! Questions?

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Sources

Avalos LA, Adams SR, Alexeeff SE, Oberman NR, Does MB, Ansley D, Goler N, Padon AA, Silver LD, Young-Wolff KC. Neonatal outcomes associated with in utero cannabis exposure: a population-based retrospective cohort study. *Am J Obstet Gynecol*. 2024 Jul;231(1):132.e1-132.e13. doi: 10.1016/j.ajog.2023.11.1232. Epub 2023 Nov 27. PMID: 38029850; PMCID: PMC11128475.

Calvert C, Erickson D. An examination of relationships between cannabis legalization and fatal motor vehicle and pedestrian-involved crashes. *Traffic Inj Prev*. 2020;21(8):521-526. doi: 10.1080/15389588.2020.1810246. Epub 2020 Aug 28. PMID: 32856949; PMCID: PMC7709737.

Coleman-Cowger VH, Oga EA, Peters EN, Trocin KE, Koszowski B, Mark K. Accuracy of Three Screening Tools for Prenatal Substance Use. *Obstet Gynecol*. 2019 May;133(5):952-961. doi: 10.1097/AOG.0000000000003230. PMID: 30969217; PMCID: PMC6485306.

Committee Opinion No. 722: Marijuana Use During Pregnancy and Lactation. *Obstet Gynecol*. 2017 Oct;130(4):e205-e209. doi: 10.1097/AOG.0000000000002354. PMID: 28937574.

Dickson, Betsy MD; Mansfield, Chanel MPH; Guiahi, Maryam MD, MSc; Allshouse, Amanda A. MS; Borgelt, Laura M. PharmD; Sheeder, Jeanelle PhD; Silver, Robert M. MD; Metz, Torri D. MD, MS. Recommendations From Cannabis Dispensaries About First-Trimester Cannabis Use. *Obstetrics & Gynecology* 131(6):p 1031-1038, June 2018. | DOI: 10.1097/AOG.0000000000002619

Jeffers AM, Glantz S, Byers AL, Keyhani S. Association of Cannabis Use With Cardiovascular Outcomes Among US Adults. *J Am Heart Assoc*. 2024 Mar 5;13(5):e030178. doi: 10.1161/JAHA.123.030178. Epub 2024 Feb 28. PMID: 38415581; PMCID: PMC10944074.

Gowin JL, Ellingson JM, Karoly HC, et al. Brain Function Outcomes of Recent and Lifetime Cannabis Use. *JAMA Netw Open*. 2025;8(1):e2457069. doi:10.1001/jamanetworkopen.2024.57069

Gunn JK, Rosales CB, Center KE, Nuñez A, Gibson SJ, Christ C, Ehiri JE. Prenatal exposure to cannabis and maternal and child health outcomes: a systematic review and meta-analysis. *BMJ Open*. 2016 Apr 5;6(4):e009986. doi: 10.1136/bmjopen-2015-009986. PMID: 27048634; PMCID: PMC4823436.



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Sources

Hasin DS, Wall MM, Alschuler DM, Mannes ZL, Malte C, Olfson M, Keyes KM, Gradus JL, Cerdá M, Maynard CC, Keyhani S, Martins SS, Fink DS, Livne O, McDowell Y, Sherman S, Saxon AJ. Chronic pain, cannabis legalisation, and cannabis use disorder among patients in the US Veterans Health Administration system, 2005 to 2019: a repeated, cross-sectional study. *Lancet Psychiatry*. 2023 Nov;10(11):877-886. doi: 10.1016/S2215-0366(23)00268-7. Epub 2023 Oct 11. Erratum in: *Lancet Psychiatry*. 2023 Dec;10(12):e30. doi: 10.1016/S2215-0366(23)00362-0. PMID: 37837985; PMCID: PMC10627060.

Hayer S, Mandelbaum AD, Watch L, Ryan KS, Hedges MA, Manuzak JA, Easley CA 4th, Schust DJ, Lo JO. Cannabis and Pregnancy: A Review. *Obstet Gynecol Surv*. 2023 Jul;78(7):411-428. doi: 10.1097/OGX.0000000000001159. PMID: 37480292; PMCID: PMC10372687.

Lewis D. We were wrong about "crack babies": are we repeating our mistake with "meth babies"? *MedGenMed*. 2005 Oct 31;7(4):30. PMID: 16614652; PMCID: PMC1681748.

Malin K. Hildebrandt, Raoul Dieterich, Tanja Endrass, Neural correlates of inhibitory control in relation to the degree of substance use and substance-related problems – A systematic review and perspective, *Neuroscience & Biobehavioral Reviews*, Volume 128, 2021, Pages 1-11, ISSN 0149-7634, <https://doi.org/10.1016/j.neubiorev.2021.06.011>.

Urits I, Gress K, Charipova K, Li N, Berger AA, Cornett EM, Hasoon J, Kassem H, Kaye AD, Viswanath O. Cannabis Use and its Association with Psychological Disorders. *Psychopharmacol Bull*. 2020 May 19;50(2):56-67. PMID: 32508368; PMCID: PMC7255842.

NIDA 2024, Delta-9-tetrahydrocannabinol (THC) and Cannabidiol (CBD) Potency of Cannabis Samples Seized by the Drug Enforcement Administration (DEA), Percent Averages from 1995-2022 Source: Potency Monitoring Program, NIDA Contract Number: N01DA-15-7793. <https://nida.nih.gov/research/research-data-measures-resources/cannabis-potency-data>

Substance Abuse and Mental Health Services Administration: Cannabidiol (CBD) – Potential Harms, Side Effects, and Unknowns. Publication No. PEP22- 06-04-003. Rockville, MD: National Mental Health and Substance Use Policy Laboratory. Substance Abuse and Mental Health Services Administration, 2023.



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Sources

Gilger, L. What does medical marijuana use actually do to a fetus? Jan 18, 2024. KJZZ.org. <https://www.kjzz.org/2024-01-18/content-1868660-what-does-medical-marijuana-use-actually-do-fetus>

Walther L, Gantner A, Heinz A, Majić T. Evidence-based Treatment Options in Cannabis Dependency. Dtsch Arztebl Int. 2016 Sep 30;113(39):653-659. doi: 10.3238/arztebl.2016.0653. PMID: 27776623; PMCID: PMC5098026.

Katie Woodruff, Karen A. Scott, and Sarah C.M. Roberts. Pregnant People Who Use Marijuana Fear Disclosing Use to Providers — Even Where Marijuana Use is Legal. September 20, 2021. California Preterm Birth Initiative. <https://pretermbirthca.ucsf.edu/news/pregnant-people-who-use-marijuana-fear-disclosing-use-providers-%E2%80%94-even-where-marijuana-use>

Young-Wolff KC, Adams SR, Alexeeff SE, et al. Prenatal Cannabis Use and Maternal Pregnancy Outcomes. JAMA Intern Med. 2024;184(9):1083–1093. doi:10.1001/jamainternmed.2024.3270

Zoorob, R and J Quinlan. Cannabis Use During Pregnancy. Family Pract Manag. 2024;31(4):19-21. Accessed online on 2/17/2025. <https://www.aafp.org/pubs/fpm/issues/2024/0700/cannabis-during-pregnancy.html#fpm20240700p19-bt1>



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