



Up In Smoke: The Potential Health Impact of Cannabis Use During Pregnancy and Lactation on the Baby

Title:

Up In Smoke: The Potential Health Impact of Cannabis Use During Pregnancy and Lactation on the Baby

Presenter

Laurel Wilson,
IBCLC, BSc, RLC, INHC,
CLSP, CLE, CLD, CCCE

Abstract

As the recreational and medicinal use of cannabis increases worldwide, the questions about this herb's use during breast/chestfeeding rises exponentially. In the United States, the majority of states have legalized or are on the path to legalizing the consumption of cannabis or have decriminalized cannabis. This trend has led to more lactation and healthcare professionals being faced with the question, “Is it safe for me to use cannabis during pregnancy and lactation?” The answers vary widely due to myth, bias, and poorly conducted and accessed research. These widely differing recommendations lead healthcare professionals to scratch their heads and face the knowledge that they don’t know what to say to families. The problematic question of safety is compounded when issues involving equity and healthcare access come into play, as bias certainly plays a role in the US response to cannabis. Healthcare professionals have a sincere concern as the endocannabinoid system, which interacts with almost every organ system and the immune system, reacts to the molecules found in cannabis. The endocannabinoid system plays a role in brain development, system homeostasis, and the functioning immune system. What we actually know about how much perinatal use affects babies is still unknown. This presentation takes a harm reduction approach while looking at the most recent research and policies surrounding this controversial herb during the perinatal period.

Objectives

- Identify two active cannabinoids found in cannabis of potential concern during pregnancy and breastfeeding
- Identify two potential risks to the developing baby for prenatal and postpartum exposure to cannabis.
- Describe why a harm reduction approach to cannabis use during perinatal period is more effective than risk reduction.

© MotherJourney/Laurel Wilson 2024

www.motherjourney.com

info@motherjourney.com



Up In Smoke: The Potential Health Impact of Cannabis Use During Pregnancy and Lactation on the Baby

Subject

The Potential Impact of Cannabis Use During Pregnancy and Lactation on the baby.

Highlights

Cannabis is the most commonly used illicit substance among pregnant women in Western societies.

• Cannabis is the world's third most popular recreational drug, after alcohol and tobacco.

History of Cannabis

- Originated in China > India
- Medicinal use for over 5000 years
- Found in 2700 tomb in western China Gobi desert
- 1611 Hemp brought to North America as a crop
- 1840's Cannabis brought to colonies as a medicine
- Early 1900's decline as other medicines (opiates) became available
- 1930's Harry Anslinger (Comm of Fed Bureau of Narcotics) determined to eradicate cannabis post Prohibition.
- 1937 US Federal Government - Marijuana Tax
- \$1 per oz medical use, \$100 per oz for rec use - Response to Mexican immigration and anti-blackness
- 1942 removed from Pharmacopia
- 1970 added to Schedule 1 -1970 Drug Wars under Nixon

Schedule 1 Substances

- Heroin
- LSD
- **Marijuana**
- Mescaline
- MDMA
- GHB
- Ecstasy
- Psilocybin
- Methaqualone
- Khat
- Bath Salts

Schedule 1 Challenges

- American Medical Institute
- Institute of Medicine
- DHHS wrote a patent on Cannabinoids – antioxidants and neuro-protectant
- FDA approved medicines made with THC and CBD
- NASEM recognizes medicinal effects

Antenatal and Postpartum use

- 3.9% of pregnant women used in past month and 7.0% used in past 2-12 months*
- Self reported use 5.7% in pregnancy and 5% during lactation**

Notes



Up In Smoke: The Potential Health Impact of Cannabis Use During Pregnancy and Lactation on the Baby

Subject

The Potential Impact of Cannabis Use During Pregnancy and Lactation on the Baby

Highlights

Why do parents use during perinatal period?

- Women with severe nausea during pregnancy (3.7%), were significantly more likely to use marijuana (Robertson, 2014)
- To treat “naturally” other ailments, such as migraines, chronic pain, etc.
- Ko (2018) found postpartum use is associated with depressive symptoms and shorter breastfeeding duration.
- Vanstone et al, 2021 found parents reported use for “sensation seeking”, symptom management, and stress reduction.

Perception of Little Harm

- 30% said no harm to fetus (Mark et al, 2017)
- Perceive no general or specific risk (Mark et al 2017; Jarlenski et al, 2017)
- Perceived as safer and less expensive as a coping mechanism (Bayrampour et al, 2018)

National Academy of Sciences, Engineering, Medicine

- There is conclusive or substantial evidence that cannabis or cannabinoids are effective:
 - For chronic pain in adults
 - Antiemetics in the treatment of chemotherapy-induced nausea and vomiting
 - Multiple sclerosis spasticity symptoms
- There is moderate evidence that cannabis or cannabinoids are effective for:
 - Improving short-term sleep outcomes
- There is limited evidence that cannabis or cannabinoids are effective for:
 - Increasing appetite and decreasing weight loss associated with HIV/AIDS
 - Symptoms of Tourette syndrome
 - Anxiety symptoms
 - PTSD
- Types of Cannabis
 - Sativa
 - Indica
- Types of Use
 - Smoking, Vaping, Tea, Edibles, Capsules, Suppositories

Do Not Confuse with Synthetic Cannabis

- K2 or Spice
- SynCanns
- Sprayed on dried plant for smoking or used as oil
- Symptoms-rapid heart rate, vomiting, violent behavior, suicidal thoughts, death

Pesticides

- Myclobutanil - “Bad Actor”
- Imidacloprid - “moderately hazardous”
- Abamectin and the avermectin chemical family - “Bad Actor”
- Etoxazole
- Spiromesifen

Notes



Up In Smoke: The Potential Health Impact of Cannabis Use During Pregnancy and Lactation on the Baby

Subject

The Potential Impact of Cannabis Use During Pregnancy and Lactation on the Baby.

Highlights

- **Dried Herb**
 - Leaves, stems, and flowers
 - Smoked as a cigarette, cigars, vaped, pipe, or water pipe (bong)
 - Made into a medicinal tea
- **Hashish**
 - Resin from the flower buds
 - Compressed plates
 - Generally mixed with tobacco and smoked
 - Sometimes added to edibles
- **Oil**
 - Extracted by percolation with organic solvent/alcohol or butane
 - “Enhance” marijuana cigarettes or make edibles or vape
 - More THC than other forms - 30% to 60% THC
- **Concentrates**
 - Hash oil or honey oil - a gooey liquid
 - Wax or budder - a soft solid with a texture like lip balm
 - Shatter - a hard, amber colored solid
 - Dabbing
- **Topicals/Transdermals**
 - Slows absorption
 - Fewer psychotropic effects
 - Mainly for pain relief
 - Balms, oils, patches, and suppositories
- **Edibles**
 - Generally made with oil or hash butter
 - Can take 30 minutes to an hour for one to feel effects
 - Body processes differently
 - Can ingest much higher quantities of THC than smoking
 - Bioavailability 6-20%
- **Overdose/Overuse/Addiction**
 - Infants/children can overdose and have died (lockbox)
 - Adults can overuse
 - Can develop cannabis hyperemesis syndrome
 - Rare and only occurs in daily long-term users
 - Can lead to serious medical issue (brain swelling, kidney failure)
 - Can become addicted 1-6 people who use before the age of 18 can become addicted
 - 1-10 adults can become addicted

Notes



Up In Smoke: The Potential Health Impact of Cannabis Use During Pregnancy and Lactation on the Baby

Subject

The Potential Impact of Cannabis Use During Pregnancy and Lactation on the Baby.

Highlights

Pesticides

- 2013 Journal of Toxicology report found 70% of pesticides used on cannabis can pass through body via inhalation
- Smoking can mean absorbing 10 times what you would through ingestion of pesticides
- Dabbing increases risk significantly

Cannabis Molecules

- THC
 - Psychoactive
 - Euphoria
 - Analgesic
 - Antibacterial
 - Antiemetic
 - Anti-tumoral
 - Bronchodilator
 - Appetite Stimulant
 - Neuroprotective (medium doses)
 - Sleep Inducing
 - Anticonvulsant
 - Muscle Relaxant
 - Immunomodulating
- CBD
 - Neuroprotection
 - Anticonvulsant
 - Analgesia
 - Sedation
 - Antiemetic
 - Antispasmodic
 - Antiinflammatory
 - Antianxiety

Endocannabinoid System

- CB1 – Nervous System, Connective Tissue, Glands, Gonads, Organs
- CB2 – Immune System and Associated Structures
- Endogenous Ligands - Anandamide (AEA) and 2-arachidonoyl glycerol (2-AG)
- Interacts with
 - Learning and memory
 - Anxiety
 - Depression
 - Addiction
 - Appetite
 - Neuro-protection

Notes



Up In Smoke: The Potential Health Impact of Cannabis Use During Pregnancy and Lactation on the Baby

Subject

The Potential Impact of Cannabis Use During Pregnancy and Lactation on the Baby.

Highlights

Cannabis and the Brain

- Hippocampus/Hypothalamus
 - Hunger
 - Feelings of hunger
- Hippocampus
 - Short term memory
 - Lack of memory
- Cerebellum
 - Coordination
 - Lack of coordination
- Amygdala
 - Learn to fear
 - Become paranoid
- Limbic System
 - Dopamine
 - Feel pleasure

Preconception, fertility, pregnancy

- THC and Animal Studies
 - Disrupts EC signaling
 - Alters dopamine, serotonin, and opioid receptors
 - Disrupts synaptogenesis
- Fetal Brain Study
 - 42 postmortem fetal brain samples (from saline induced abortions)
 - Decrease in dopamine receptor (D2) mRNA expression in amygdala
 - Significant prevalence in males. Chronic use association with low mRNA levels
- Pre-term Labor
 - Meta-analysis – 31 studies – 78,000 women using marijuana and 124,000 non-users
 - When taking into account women who also smoked tobacco and those who did not the risk of pre-term delivery was eliminated
- A critical review by Torres et al., published on May 8, 2020, found the "totality of the evidence suggests prenatal cannabis exposure does not lead to cognitive impairments." They reviewed 40 studies that met their inclusion criteria and found that the cognitive performance of cannabis exposed children did not significantly differ from non-exposed children. One of the most interesting parts of the review to me was that the reviewers found "evidence for scores being below the normal range in only 0.3% of the total sample".

Human Milk and Cannabis

- Presence of THC in Human Milk: Letter to the Editor, NEMJ, 1982 -Perez-Reyes and Wall
 - Where does the 8:1 serum concentration myth come from???

Notes



Up In Smoke: The Potential Health Impact of Cannabis Use During Pregnancy and Lactation on the Baby

Subject

The Potential Impact of Cannabis Use During Pregnancy and Lactation on the Baby.

Highlights

Baker and Hale Study

- Abstained 24 hours
- 0.1 g of containing 23.18% THC – with a new glass pipe Presidential Kush Sativa
- Smoked (3-4 hits over 10-20 minutes)
- Pumped at 20 minutes and 1, 2, and 4 hours
- Peaked at 1 hour, with a peak of 94 ng/mL (range 12.2–420.3 ng/mL), and receded slowly over the subsequent 4 hours.
- What we don't know
 - What is the plasma level in the breastfeeding infant?
 - What effect would repeated and continuous doses have on breast milk concentrations?
 - What do cannabis products do to the endocannabinoid system?
 - What is the lasting effect of exposing developing infants to cannabis?
- Pediatrics Bertrand et al.
 - 54 Samples - exposure in past 14 days
 - 88% daily use
 - 64% primarily inhaled
 - Lower detection rate >1 ng/ml (Baker/Hale > 5 ng/ml)
 - Date not based on dosing, but self reporting
 - 20/54 no THC
 - Median THC conc. = 9.47 ng/mL (range = 1.01 – 323)
 - 11-OH-THC (Psychoactive) was detected in 5 samples
 - CBD (Not psychoactive) was detected in 5 samples
 - RID 2.5 (1000 lower than adult dose)
- What do we know?
 - RID 2.5 (1000 lower than adult dose)
 - Oral Bio-availability is 1-5%, reported in Infant Risk as 4-12%
 - Peak levels seem to be 60-120 minutes post use
 - Half life of THC in milk is about 1 day
 - Metabolism can vary dramatically between daily and occasional users

Focus on Harm Reduction

- Acceptance that drug use is part of the world we live in: work to minimize the harmful effects
- Drug-use is complex and multi-dimensional
- Cessation of drug use is not necessarily criteria for successful intervention
- Services should be non-judgmental to help reduce harm
- Social inequalities affect people's ability to deal effectively with the harm
- Recognize the real harm associated with drug-use.

Notes



Up In Smoke: The Potential Health Impact of Cannabis Use During Pregnancy and Lactation on the Baby

Subject

The Potential Impact of Cannabis Use During Pregnancy and on Lactation on the Baby.

Highlights

Focus on Harm Reduction

- Non-judgmental, non-coercive care
- Avoid paternalism
- Intersectoral - other issues may be present

Organizational Statements

- ABM #21 Updated 2023
 - Cannabis: We encourage cessation and/or reduction of cannabis use during breastfeeding. 234–236
 - Level of Evidence: 2. Strength of Recommendation: B.
 - For mothers who continue to use cannabis and wish to breastfeed, we recommend a shared decision-making process to discuss the risks and benefits of breastfeeding. Discussions may be guided by examining the route and type of cannabis product use, potency of product use, and frequency of use.
 - Level of Evidence: 3. Strength of Recommendation: C.
- Hill/Reed
 - If a woman is going to smoke tobacco, she should be encouraged to continue breastfeeding. There is a lack of evidence to suggest that the recommendation to a mother who uses marijuana should be any different.
- AAP
 - AAP - Women who are pregnant or breastfeeding avoid marijuana use.
 - ACOG also recommends that obstetrician-gynecologists counsel women against using marijuana while trying to get pregnant, during pregnancy, and while they are breastfeeding.
- Lactmed/NIH
 - In general, professional guidelines recommend that cannabis use should be avoided by nursing mothers, and nursing mothers should be informed of possible adverse effects on infant development from exposure to cannabis compounds in breastmilk. In addition to possible adverse effects from cannabinoids in breastmilk, paternal cannabis use may also increase the risk of sudden infant death syndrome in breastfed infants.
- Surgeon General 2019
 - Maternal marijuana use may still be dangerous to the baby after birth. THC has been found in breast milk for up to six days after the last recorded use. It may affect the newborn's brain development and result in hyperactivity, poor cognitive function, and other long-term consequences. Additionally, marijuana smoke contains many of the same harmful components as tobacco smoke. No one should smoke marijuana or tobacco around a baby

Notes



The Potential Impact of Cannabis During the Perinatal Period

Subject

The Potential Impact of Cannabis Use During Pregnancy and Lactation on the Baby.

Highlights

Counseling Challenge

- Lack of Quality Studies
- Legal vs. Illegal Drug?
- Occasional vs. Chronic User

Public Health Responsibilities

- Educate families about potential harms of child
- Practitioners who prescribe or work with pregnant families should have cannabis education
- Informational materials should be available at all sites that prescribe or sell marijuana, and a government warning label, similar to alcohol, regarding marijuana use and pregnancy should be posted" (Chasnoff, 2017)
- Government should fund research about impact of cannabis during perinatal period

Stop Bias

- African American women 10X more likely to be reported for positive screens*
- Only women as parents are screened - sexual discrimination.
- Unnecessarily invasive and costly with no current database of teratogenicity during pregnancy.
- Positive screen can show from single or rare use of substance which can lead to being placed in social services system.

Resources

- National Advocates for Pregnant Women advocatesforpregnantwomen.org
- Elephant Circle elephantcircle.net

Focus on Harm Reduction

- Acceptance that drug use is part of the world we live in: work to minimize the harmful effects.
- Drug-use is complex and multi-dimensional.
- Cessation of drug use is not necessarily criteria for successful intervention.
- Services should be non-judgmental to help reduce harm.
- Social inequalities affect people's ability to deal effectively with the harm
- Recognize the real harm associated with drug-use.
- Non-judgmental, non-coercive care.
- Avoid paternalism.
- Intersectoral - other issues may be present.

Think about the Conversation

- Have ways to discuss concerning substances with pregnant and lactating parents for many substances.
- Alcohol Use - Increases bad outcomes.
- Cigarette Use - Increases bad outcomes, changed respiratory effort, changes birth weight.
- Is it your role to assess cannabis use? Or merely to support parents and point them to best information?

Notes



Up In Smoke: The Potential Health Impact of Cannabis Use During Pregnancy and Lactation on the Baby

Subject

The Potential Impact of Cannabis Use During Pregnancy and Lactation on the Baby.

Highlights

Three Step Counseling

- Ask
 - Ask open ended questions
 - Ask about cannabis use with non-judgmental approach
 - Ask about frequency and amount of use
 - Ask why they are using?
 - Ask if parent is open or has considered alternative form of medication/plant medicine
- Affirm
 - Affirm: Most important step
 - Let the parent know they are not alone in their feelings
 - Let the parent know that their reasons for using are understood, and there are many options should they choose.
 - Share relationship building information.
- Counsel
 - Counsel: Ask permission!!!!
 - Depend on need and openness
 - Potential risks of use
 - Alternatives during breastfeeding
 - Offer services/counseling/cognitive behavior therapy
 - Specific screening for developmental milestone
 - Depending on chronic or occasional use - advise appropriately

All Options on the Table

- Choose an alternative route of administration
- Avoid nursing at times of peak drug concentrations in milk
- Use immediately after breast/chestfeeding and/or before infant's longest sleep
- Temporarily withhold breast/chestfeeding
- Discontinue lactation (wean)

Questions:

info@motherjourney.com

motherjourney.com

Subscribe to my research newsletter:

Text Breastmilk to 66866

Social Media Handles:

[@motherjourneylaurelwilson](https://www.instagram.com/motherjourneylaurelwilson)

Notes



Up In Smoke: The Potential Health Impact of Cannabis Use During Pregnancy and Lactation on the Baby

Subject

The Potential Impact of Cannabis Use During Pregnancy and Lactation on the Baby.

Case Studies

Things to consider when counseling:

What is in your scope of practice to say?

Who should you refer the parent to, if anyone?

Are there alternatives for this parent?

What are the laws in your state? Are you required to report? Does this change what you ask?

Does your facility/org have a policy regarding cannabis? What are those guidelines?

Is this a daily/chronic/high THC user or an occasional user?

- Does the person know whether the product is organic, pesticide-free, CO2 extracted, metal-free, mildew and mold tested?

- Have they viewed the certificate of analysis for the cannabis product?

- Do they know the strength of the THC/CBD?

- What method of use are they using? Is there a better option?

- Are they willing to abstain/reduce use? Use during most prolonged hours of baby's sleep? Change method of use? Use a lower dosage?

Case Study 1

Parent is a new client with you. She is eight weeks pregnant and has one other child who is four years old. She is suffering from hyperemesis gravidarum and refuses to take any pharmaceuticals because she fears the repercussions on the development of her child. She tells you she has been smoking cannabis once a day to manage her nausea.

What does she need to know?

Case Study 2

A local hospital (or pediatric office/OB/lactation consultant/WIC clinic, etc.) has been telling parents/mothers who admit to any cannabis use that they are not allowed to breast/chestfeed. They tell the mothers who want to breast/chestfeed who also admit use that they must abstain from all cannabis use and pump for six weeks before they offer any human milk to their baby.

What do these parents need to know?

Are their civil rights being impaired?

Is this evidence-based information?

Is this information in line with your organization's/employer's policy?



Up In Smoke: The Potential Health Impact of Cannabis Use During Pregnancy and Lactation on the Baby

Subject

The Potential Impact of Cannabis Use During Pregnancy and Lactation on the Baby.

Case Studies

Things to consider when counseling:

What is in your scope of practice to say?

Who should you refer the parent to, if anyone?

Are there alternatives for this parent?

What are the laws in your state? Are you required to report? Does this change what you ask? Does your facility/org have a policy regarding cannabis? What are those guidelines?

Is this a daily/chronic/high THC user or an occasional user?

- Does the person know whether the product is organic, pesticide-free, CO2 extracted, metal-free, mildew and mold tested?
- Have they viewed the certificate of analysis for the cannabis product?
- Do they know the strength of the THC/CBD?
- What method of use are they using? Is there a better option?
- Are they willing to abstain/reduce use? Use during most prolonged hours of baby's sleep? Change method of use? Use a lower dosage?

Case Study 3

A parent gives birth to a baby at 29 weeks gestation. Baby has been in NICU for three weeks. The parent has been pumping human milk to provide for the baby. Parent suffers from MS and their symptoms, after a period of abatement during pregnancy the symptoms have returned. Cannabis was their medication of choice to address spasticity and pain symptoms as these symptoms will interfere with their ability to pick up, hold, and care for the baby without help. They want to continue to breastfeed their child.

What does this parent need to know?

Do you know the hospital substance use policy?

What questions should you ask them?

Case Study 4

You show up at a home visit. You notice a pipe on the kitchen counter as you enter and smell the scent of cannabis in the air. The mother has a healthy child who is six weeks, and she is breastfeeding exclusively. She has never asked you about nor mentioned her use of cannabis.

What, if anything, would you share with or ask the mother/parents?



Up In Smoke: The Potential Health Impact of Cannabis Use During Pregnancy and Lactation on the Baby

Subject

The Potential Impact of Cannabis Use During Pregnancy and Lactation on the Baby.

References

- Abbey, James. Infant Risk Center website: BF and Marijuana Thread. Accessed Feb 4, 2015. <https://www.infantrisk.com/forum/showthread.php?1797-BF-and-marijuana>
- Academy of Breastfeeding Medicine Protocol Committee. (2015). ABM Clinical protocol #21: Guidelines for breastfeeding and Substance Use or Substance Use Disorder. *Breastfeeding Medicine*, 10(3). DOI: 10.1089/bfm.2015.9992
- Agrawal, A., Grucza, R. A., & Rogers, C. E. (2019). Public Health Implications of Rising Marijuana Use in Pregnancy in an Age of Increasing Legalization—Reply. *JAMA pediatrics*, 173(6), 607-607.
- American Academy of Pediatrics. (2019). Maternal Marijuana Use: Cannabinoids in Breast Milk. *AAP Grand Rounds*, 41(2), 22-22.
- Bayrampour, H., Zahradnik, M., Lisonkova, S., & Janssen, P. (2018). Women's perspectives about cannabis use during pregnancy and the postpartum period: An integrative review. *Preventive medicine*.
- Benke et al. Prenatal Substance Abuse: Short- and Long-term Effects on the Exposed Fetus. *AAP Technical Report*, 2013. doi:10.1542/peds.2012-3931
- Bertrand, K. A., Hanan, N. J., Honerkamp-Smith, G., Best, B. M., & Chambers, C. D. (2018). Marijuana use by breastfeeding mothers and cannabinoid concentrations in breast milk. *Pediatrics*, 142(3), e20181076.
- Castro-Navarro, I., McGuire, M. A., Williams, J. E., Holdsworth, E. A., Meehan, C. L., & McGuire, M. K. (2024). Maternal cannabis use during lactation and potential effects on human milk composition and production: a narrative review. *Advances in Nutrition*, 100196.
- Chasnoff, I. J. (2017). Medical marijuana laws and pregnancy: implications for public health policy. *American journal of obstetrics and gynecology*, 216(1), 27-30.
- Collaco, Conrad. What we know about how safe cannabis is for pregnant women and breastfeeding moms. *CBC News Online*. March 21, 2019. <https://www.cbc.ca/news/canada/hamilton/pregnant-cannabis-1.5064238>
- Colorado Department of Public Health and Environment. (2017). Marijuana pregnancy and breastfeeding guidance. Retrieved from https://www.colorado.gov/pacific/sites/default/files/MJ_RMEP_Pregnancy-Breastfeeding-Clinical-Guidelines.pdf
- Conner, S. N., Carter, E. B., Tuuli, M. G., Macones, G. A., & Cahill, A. G. (2015). Maternal marijuana use and neonatal morbidity. *American journal of obstetrics and gynecology*, 213(3), 422-e1.
- Conner, S. N., Bedell, V., Lipsey, K., Macones, G. A., Cahill, A. G., & Tuuli, M. G. (2016). Maternal marijuana use and adverse neonatal outcomes. *Obstetrics & Gynecology*, 128(4), 713-723.
- Crume, Tessa L., et al. "Cannabis Use During the Perinatal Period in a State With Legalized Recreational and Medical Marijuana: The Association Between Maternal Characteristics, Breastfeeding Patterns, and Neonatal Outcomes." *The Journal of pediatrics* (2018).
- Dickson, B., Mansfield, C., Guiahi, M., Allshouse, A. A., Borgelt, L. M., Sheeder, J., ... & Metz, T. D. (2018). Recommendations from cannabis dispensaries about first-trimester cannabis use. *Obstetrics and gynecology*, 131(6), 1031-1038.
- Eloisa Gonzalez, M. D., Tsai, G., FAPA, F., Officer, S. A., Jeff Chen, M. D., Director, M. B. A., & Guerry, S. (2018). Pregnant and Breastfeeding Women and Cannabis.
- ElSohly, M. A., Mehmedic, Z., Foster, S., Gon, C., Chandra, S., & Church, J. C. (2016). Changes in cannabis potency over the last 2 decades (1995–2014): analysis of current data in the United States. *Biological psychiatry*, 79(7), 613-619.
- EMCDDA. European Drug Report 2015: Trends and Developments. JUNE, 2015. <http://www.emcdda.europa.eu/publications/edr/trends-developments/2015>
- Gnofam, M., Allshouse, A. A., & Metz, T. D. (2019). 341: Impact of legalization on prevalence of maternal marijuana use and obstetrical outcomes. *American Journal of Obstetrics & Gynecology*, 220(1), S238-S239.
- Gross, M. S., Rosenblum, N., Bossano, C. M., & Milio, L. A. (2019). Breastfeeding and Marijuana Use: Medical and Ethical Policy Analysis [10I]. *Obstetrics & Gynecology*, 133, 98S.
- Gunn JKL, Rosales CB, Center KE, et al. Prenatal exposure to cannabis and maternal and child health outcomes: a systematic review and meta-analysis. *BMJ Open*. 2016;6(4):e009986.



Up In Smoke: The Potential Health Impact of Cannabis Use During Pregnancy and Lactation on the Baby

Subject

The Potential Impact of Cannabis Use During Pregnancy and Lactation on the Baby.

References

- Hale, TW. Infant Risk Center Website: marijuana and breastfeeding thread. Accessed Feb 4, 2015. <https://www.infantrisk.com/forum/showthread.php?192-marijuana-and-breastfeeding&highlight=Marijuana>
- Harding, K. D., & Poole, N. (2018). CanFASD issue paper: cannabis use during pregnancy. *parenting*, 8, 9. <https://resources.beststart.org/product/a30e-risks-of-cannabis-booklet/>
- Harris M, Schiff DM, Saia K, et al. Academy of Breastfeeding Medicine Clinical Protocol #21: Breastfeeding in the Setting of Substance Use and Substance Use Disorder (Revised 2023). *Breastfeed Med.* 2023 Oct;18(10):715-733. doi: 10.1089/bfm.2023.29256.abm
- Hazekamp, Arno, et al. "The medicinal use of cannabis and cannabinoids—an international cross-sectional survey on administration forms." *Journal of psychoactive drugs* 45.3 (2013): 199-210.
- High Times Website. The Strongest Trains on Earth 2016. Accessed 2/2017. <http://hightimes.com/strains/the-strongest-strains-on-earth-2016/>
- Hill M, Reed K. Pregnancy, breast-feeding, and marijuana: A review article. *Obstet Gynecol Surv.* 2013;68:710-8. PMID: 25101905
- Hsiao, P., & Clavijo, R. I. (2018). Adverse effects of cannabis on male reproduction. *European urology focus*, 4(3), 324-328.
- Jakabek, David, et al. "An MRI study of white matter tract integrity in regular cannabis users: effects of cannabis use and age." *Psychopharmacology* 233.19-20 (2016): 3627-3637.
- Jansson, L. M., Jordan, C. J., & Velez, M. L. (2018). Perinatal marijuana use and the developing child. *Jama*, 320(6), 545-546.
- Jarlenski, M., Koma, J.W., Zank, J., Bodnar, L.M., Bogen, D.L., Chang, J.C., 2017. Trends in perception of risk of regular marijuana use among US pregnant and nonpregnant reproductive-aged women. *Am. J. Obstet. Gynecol.* 217 (6), 705-707.
- Josan, C., Shiplo, S., Fusch, G., Raha, S., & Shea, A. K. (2023). Cannabis use during lactation may alter the composition of human breast milk. *Pediatric Research*, 93(7), 1959-1968.
- Josan, C. (2023). The Effect of Cannabinoids and Cannabis on Mammary Epithelial Cell Function and Breast Milk Composition (Doctoral dissertation).
- Kaplan, S. (2018, April 19). F.D.A. Panel Recommends Approval of Cannabis-Based Drug for Epilepsy. *New York Times*. Retrieved from <https://www.nytimes.com/2018/04/19/health/epidiox-fda-cannabis-marijuana.html>
- Ko, J. Y., Tong, V. T., Bombard, J. M., Hayes, D. K., Davy, J., & Perham-Hester, K. A. (2018). Marijuana use during and after pregnancy and association of prenatal use on birth outcomes: A population-based study. *Drug and alcohol dependence*, 187, 72-78.
- Ko, Jean Y., et al. "Prevalence and patterns of marijuana use among pregnant and nonpregnant women of reproductive age." *American Journal of Obstetrics & Gynecology* 213.2 (2015): 201-e1.
- Krening, C., & Hanson, K. (2018). Marijuana—Perinatal and legal issues with use during pregnancy. *The Journal of perinatal & neonatal nursing*, 32(1), 43-52.
- Mark, K., Gryczynski, J., Axenfeld, E., Schwartz, R.P., Terplan, M., 2017. Pregnant women's current and intended cannabis use in relation to their views toward legalization and knowledge of potential harm. *J. Addict. Med.* 11 (3), 211-216.
- Mark K, Desai A, Terplan M. Marijuana use and pregnancy: prevalence, associated characteristics, and birth outcomes. *Arch Womens Ment Health* 2015
- Metz, T. D., & Borgelt, L. M. (2018). Marijuana use in pregnancy and while breastfeeding. *Obstetrics & Gynecology*, 132(5), 1198-1210.
- Moss, M. J., Bushlin, I., Kazmierczak, S., Koop, D., Hendrickson, R. G., Zuckerman, K. E., & Grigsby, T. M. (2021). Cannabis use and measurement of cannabinoids in plasma and breast milk of breastfeeding mothers. *Pediatric research*, 90(4), 861-868.
- National Academies of Sciences, Engineering, and Medicine. 2017. The health effects of cannabis and cannabinoids: The current state of evidence and recommendations for research. Washington, DC: The National Academies Press. doi: 10.17226/24625.
- National Institute on Drug Abuse. NIDA Website DrugFacts: Marijuana. Accessed July 1, 2019. <http://www.drugabuse.gov/publications/drugfacts/marijuana>
- Perez-Reyes M, Wall ME. Presence of delta9-tetrahydrocannabinol in human milk [letter]. *N Engl J Med* 1982;307(13):819-20.
- Public Health Ontario. Health Effects of Cannabis Exposure in Pregnancy and Breastfeeding. November, 2018. <https://www.publichealthontario.ca/-/media/documents/eb-cannabis-pregnancy-breastfeeding.pdf?la=en>



Up In Smoke: The Potential Health Impact of Cannabis Use During Pregnancy and Lactation on the Baby

Subject

The Potential Impact of Cannabis Use During Pregnancy and Lactation on the Baby.

References

- Raber, Jeffrey C., Sytze Elzinga, and Charles Kaplan. "Understanding dabs: contamination concerns of cannabis concentrates and cannabinoid transfer during the act of dabbing." *The Journal of toxicological sciences* 40.6 (2015): 797-803.
- Rigucci, s. et al. Effect of high-potency cannabis on corpus callosum microstructure. *Psychological Medicine*. Cambridge University Press. 2015. doi:10.1017/S0033291715002342
- RobersonEK, PatrickWK, HurwitzEL. Marijuana use and maternal experiences of severe nausea during pregnancy in Hawai'i. *Hawaii J Med Public Health*.2014;73(9):283-287.
- Rogers, M. J., Rajanahally, S., Brisbane, W. G., Ostrowski, K., Lendvay, T. S., & Walsh, T. J. (2017). Relationship between cannabis and male reproductive health: a systematic review. *Fertility and Sterility*, 108(3), e131-e132.
- Ryan, S. A., Ammerman, S. D., O'Connor, M. E., Gonzalez, L., Patrick, S. W., Quigley, J., ... & Ware, J. (2018). Marijuana use during pregnancy and breastfeeding: implications for neonatal and childhood outcomes. *Pediatrics*, 142(3).
- Ryan, S. A. (2018). A Modern Conundrum for the Pediatrician: The Safety of Breast Milk and the Cannabis-Using Mother. *Pediatrics*, 142(3), e20181921. <http://pediatrics.aappublications.org/content/142/3/e20181921>
- Ryan, S. A., Ammerman, S. D., & O'Connor, M. E. (2018). Marijuana use during pregnancy and breastfeeding: implications for neonatal and childhood outcomes. *Pediatrics*, 142(3), e20181889.
- Schrott, R., Acharya, K., Itchon-Ramos, N., Hawkey, A. B., Pippen, E., Mitchell, J. T., ... & Murphy, S. K. (2019). Cannabis use is associated with potentially heritable widespread changes in autism candidate gene DLGAP2 DNA methylation in sperm. *Epigenetics*, 1-13.
- Smith, C. B., Schmidt, J., Holdsworth, E. A., Caffé, B., Brooks, O., Williams, J. E., ... & Meehan, C. L. (2024). Cannabis use, decision making, and perceptions of risk among breastfeeding individuals: the Lactation and Cannabis (LAC) Study. *Journal of Cannabis Research*, 6(1), 6.
- Stadterman JM, Hart CL. Screening women for marijuana use does more harm than good. *Am J Obstet Gynecol* 2015;213:598-9.
- Taylor, A., & Birkett, J. W. (2020). Pesticides in cannabis: a review of analytical and toxicological considerations. *Drug testing and analysis*, 12(2), 180-190.
- Torres, C. A., Medina-Kirchner, C., O'malley, K. Y., & Hart, C. L. (2020). Totality of the Evidence Suggests Prenatal Cannabis Exposure Does Not Lead to Cognitive Impairments: A Systematic and Critical Review. *Frontiers in Psychology*, 11, 816.
- Torres CA, Curley JP, Hart CL. Prenatal cannabis exposure and cognitive functioning: a systematic and critical review. *Drug Alcohol Depend* 2017;171:e204.
- Volkow ND, Compton WM, Wargo EM. The Risks of Marijuana Use During Pregnancy. *JAMA*. 2017;317(2):129-130. doi:10.1001/jama.2016.18612
- Wallman, C., Baessler, C., Hoffman, J., Meier, S. (2020). Marijuana, Breastfeeding, and the Use of Human Milk Position Statement #3071. National Association of Neonatal Nurses. http://nann.org/uploads/About/PositionPDFS/Marijuana_Breastfeeding_and_the_Use_of_Human_Milk_Position_Statement_FINAL.pdf
- Wei, Binnian, et al. "Sensitive Quantification of Cannabinoids in Milk by Alkaline Saponification-Solid Phase Extraction Combined with Isotope Dilution UPLCMS/MS." *ACS Omega* 1.6 (2016): 1307-1313.
- Wise LA, Wesselink AK, Hatch EE, Rothman KJ, Mikkelsen EM, Sørensen HT, Mahalingaiah S. Marijuana use and fecundability in a North American preconception cohort study. *J Epidemiol Community Health*. 2018;72:208-215.
- Wymore, E. M., Palmer, C., Wang, G. S., Metz, T. D., Bourne, D. W., Sempio, C., & Bunik, M. (2021). Persistence of Δ -9-Tetrahydrocannabinol in Human Breast Milk. *JAMA pediatrics*.
- Thomson, Dennis. Frequent Male Pot Use Linked to early Miscarriages. *US News and World report* (online). October 14, 2019. (Alyssa Harlow lead researcher from Boston University, prepublication). <https://www.usnews.com/news/health-news/articles/2019-10-14/frequent-male-pot-use-linked-to-early-miscarriages>
- Wylie, P. L., Westland, J., Wang, M., Radwan, M. M., Majumdar, C. G., & ElSohly, M. A. (2020). Screening for More than 1,000 pesticides and environmental contaminants in cannabis by GC/Q-TOF. *Medical Cannabis and Cannabinoids*, 3(1), 14-24.
- Yeung, C. H., Bertrand, K. A., Best, B. M., Capparelli, E., Chambers, C. D., Hajducek, D. M., ... & Edginton, A. N. (2023). Cannabidiol Exposure Through Maternal Marijuana Use: Predictions in Breastfed Infants. *Clinical pharmacokinetics*, 62(11), 1611-1619.
- Young-Wolff, K. C., Sarovar, V., Tucker, L. Y., Conway, A., Alexeeff, S., Weisner, C., ... & Goler, N. (2019). Self-reported daily, weekly, and monthly cannabis use among women before and during pregnancy. *JAMA Network Open*, 2(7), e196471-e196471.



Up In Smoke: The Potential Health Impact of Cannabis Use During Pregnancy and Lactation on the Baby

Notes