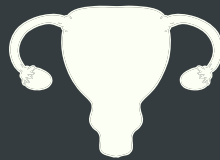


CANNABIS AND PREGNANT WOMEN & INFANTS

- Cannabis is a commonly used drug among pregnant women [1,2].
- There are over 400 active ingredients in cannabis. The main active chemicals are delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD). Both THC and CBD are known to cross the placenta during pregnancy [3,4].
- No matter how cannabis is used (e.g., smoked, vaped, eaten) [5], the developing baby may be adversely affected by any amount of cannabis taken by pregnant or breastfeeding women.
- There is no known safe amount or time for cannabis use in pregnancy and when breastfeeding [5-7].



Long-term use of cannabis may affect the menstrual cycle and lead to a reduction in hormones involved in reproduction and fertility [8-10].



FERTILITY



IMPACT ON FETUS & BIRTH OUTCOMES

Smoking cannabis may increase carbon monoxide levels in the blood, which can decrease the amount of oxygen delivered to the baby [26]. Regular use of cannabis during pregnancy may be associated with increased risk for low birth weight, preterm labour, and stillbirth [7, 19-23].

Maternal cannabis use has been linked to adverse effects on children's brain development including reduced memory function, ability to pay attention, reasoning and problem-solving skills, increased risk of depression or anxiety, hyperactive behaviour and increased risk for future substance use [2, 23-27].



LONGER-TERM DEVELOPMENTAL EFFECTS



BREASTFEEDING

Cannabis constituents are stored in body fat, especially in breastmilk, and can be passed down to the baby through breastmilk [28]. These chemicals are slowly released over time (up to 30 days) [29,30]. This means that "pumping and dumping" breastmilk does not eliminate the risk of exposure to cannabis. One study found that babies exposed to THC through breastmilk had slower motor development, reduced muscular tone and poor suckling [5,31].

While the use of cannabis may relieve reported symptoms of nausea during pregnancy, women should be aware of the potential risks. There are other treatments for morning sickness that are effective and safer to take during pregnancy [11-14].



MORNING SICKNESS



SECOND-HAND SMOKE

Cannabis smoke has many of the same chemicals as tobacco smoke and exposure may increase the chances of the baby having development problems [6, 15-18].

Given what we now know about the short-and long-term effects of cannabis on fetuses and babies, **it is safest for women to avoid using cannabis while pregnant and while breastfeeding** [32,33]. More research is needed, which may provide more specific information about the harms associated with amounts, duration and timing of exposure. Information about cannabis and pregnancy and breastfeeding can be found at

1. Substance Abuse and Mental Health Services Administration. "Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings." Rockville, MD: Substance Abuse and Mental Health Services Administration; 2014. Report No.: NSDUH Series H-48, HHS, Publication No. (SMA) 14-4863 [Internet]. Available from: <http://www.samhsa.gov/data/sites/default/files/NSDUHresultsPDFWHTML2013/Web/NSDUHresults2013.pdf>.
2. Porath-Waller AJ. "Clearing the smoke on cannabis: maternal cannabis use during pregnancy - an update." Canadian Centre on Substance Abuse; 2015.
3. Atakan Z. Cannabis, a complex plant: different compounds and different effects on individuals. *Ther Adv Psychopharmacol*. 2012;2:241-54. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/23983983>.
4. Bar-Oz B, Klein J, Karaskov T, Koren G. Comparison of meconium and neonatal hair analysis for detection of gestational exposure to drugs of abuse. *Arch Dis Child Fetal Neonatal Ed*. 2003;88:F98-F100. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/12598495>.
5. Retail Marijuana Public Health Advisory Committee. "Monitoring Health Concerns Related to Marijuana in Colorado: 2016 Changes in Marijuana Use Patterns, Systematic Literature Review, and Possible Marijuana-Related Health Effects." Colorado: Department of Public Health and Environment. 2017.
6. The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research. The National Academies Collection: Reports funded by National Institutes of Health. Washington (DC)2017.
7. Jaques SC, Kingsbury A, Henshcke P, Chomchai C, Clews S, Falconer J, et al. Cannabis, the pregnant woman and her child: weeding out the myths. *J Perinatol*. 2014;34:417-24. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/24457255>.
8. Brents LK. Marijuana, the Endocannabinoid System and the Female Reproductive System. *Yale J Biol Med*. 2016;89:175-91. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/27354844>.
9. Klonoff-Cohen HS, Natarajan L, Chen RV. A prospective study of the effects of female and male marijuana use on in vitro fertilization (IVF) and gamete intrafallopian transfer (GIFT) outcomes. *Am J Obstet Gynecol*. 2006;194:369-76. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/16458631>.
10. Sharma R, Biedenharn KR, Fedor JM, Agarwal A. Lifestyle factors and reproductive health: taking control of your fertility. *Reprod Biol Endocrinol*. 2013;11:66. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/23870423>.
11. Chandra K, Ho E, Sarkar M, et al. "Characteristics of women using marijuana in pregnancy and their reported effects on symptoms of nausea and vomiting of pregnancy: A prospective, controlled cohort study." *J FAST Int*. 2003;1:e13.
12. Westfall RE, Janssen PA, Lucas P, Capler R. Survey of medicinal cannabis use among childbearing women: patterns of its use in pregnancy and retroactive self-assessment of its efficacy against 'morning sickness'. *Complement Ther Clin Pract*. 2006;12:27-33. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/16401527>.
13. Roberson EK, Patrick WK, Hurwitz EL. Marijuana use and maternal experiences of severe nausea during pregnancy in Hawai'i. *Hawaii J Med Public Health*. 2014;73:283-7. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/25285255>.
14. Volkow ND, Compton WM, Wargo EM. "The risks of marijuana use during pregnancy." *Journal of American Medical Association*. 2016:E1-2.
15. Wu TC, Tashkin DP, Djahed B, Rose JE. Pulmonary hazards of smoking marijuana as compared with tobacco. *N Engl J Med*. 1988;318:347-51. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/3340105>.
16. Gunn JK, Rosales CB, Center KE, Nunez A, Gibson SJ, Christ C, et al. Prenatal exposure to cannabis and maternal and child health outcomes: a systematic review and meta-analysis. *BMJ Open*. 2016;6:e009986. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/27048634>.
17. Moir D, Rickert WS, Levasseur G, Larose Y, Maertens R, White P, et al. A comparison of mainstream and sidestream marijuana and tobacco cigarette smoke produced under two machine smoking conditions. *Chem Res Toxicol*. 2008;21:494-502. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/18062674>.
18. Martinasek MP, McGrogan JB, Maysonet A. A Systematic Review of the Respiratory Effects of Inhalational Marijuana. *Respir Care*. 2016;61:1543-51. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/27507173>.
19. Conner SN, Bedell V, Lipsey K, Macones GA, Cahill AG, Tuuli MG. "Maternal marijuana use and adverse neonatal outcomes: a systematic review and meta-analysis." *Obstet Gynecol*. 2016.
20. Wang GS, Roosevelt G, Heard K. Pediatric marijuana exposures in a medical marijuana state. *JAMA Pediatr*. 2013;167:630-3. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/23712626>.
21. Conner S, Carter E, Tuuli M, Conner, et al. "Maternal Marijuana use and Neonatal Morbidity". *American Journal of Obstetrics and Gynecology*. 2015; 213: 422.e1-422.e4.
22. Huizink AC. Prenatal cannabis exposure and infant outcomes: overview of studies. *Prog Neuropsychopharmacol Biol Psychiatry*. 2014;52:45-52. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/24075896>.
23. Alpar A, Di Marzo V, Harkany T. At the Tip of an Iceberg: Prenatal Marijuana and Its Possible Relation to Neuropsychiatric Outcome in the Offspring. *Biol Psychiatry*. 2016;79:e33-45. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/26549491>.
24. Faden VB, Graubard BI. Maternal substance use during pregnancy and developmental outcome at age three. *J Subst Abuse*. 2000;12:329-40. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/11452837>.
25. Minnes S, Lang A, Singer L. Prenatal tobacco, marijuana, stimulant, and opiate exposure: outcomes and practice implications. *Addict Sci Clin Pract*. 2011;6:57-70. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/22003423>.
26. Sonon KE, Richardson GA, Cornelius JR, Kim KH, Day NL. Prenatal marijuana exposure predicts marijuana use in young adulthood. *Neurotoxicol Teratol*. 2015;47:10-5. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/25446014>.
27. Day NL, Leech SL, Goldschmidt L. The effects of prenatal marijuana exposure on delinquent behaviors are mediated by measures of neurocognitive functioning. *Neurotoxicol Teratol*. 2011;33:129-36. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/21256427>.
28. Perez-Reyes M, Wall ME. Presence of delta9-tetrahydrocannabinol in human milk. *N Engl J Med*. 1982;307:819-20. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/6287261>.
29. Garry A, Rigourd V, Amirouche A, Fauroux V, Aubry S, Serreau R. Cannabis and breastfeeding. *J Toxicol*. 2009;2009:596149. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/20130780>.
30. Bergamaschi MM, Karschner EL, Goodwin RS, Scheidweiler KB, Hirvonen J, Queiroz RH, et al. Impact of prolonged cannabinoid excretion in chronic daily cannabis smokers' blood on per se drugged driving laws. *Clin Chem*. 2013;59:519-26. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/23449702>.
31. Liston J. Breastfeeding and the use of recreational drugs--alcohol, caffeine, nicotine and marijuana. *Breastfeed Rev*. 1998;6:27-30. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/9849117>.
32. Harding KD, Poole N. "CanFASD Issue Paper: Cannabis Use During Pregnancy". Canada Fetal Alcohol Spectrum Disorder Research Network. 2018.
33. Committee opinion summary NO. 722: Marijuana use during pregnancy and lactation. *Obstet Gynecol*. 2017 Oct;130(4):931-2.

