



Compiled by Genester Wilson-King, MD, from her presentation
Cannabis Use in Pregnancy and Breastfeeding
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- Astley, S. J., Clarren, S. K., Little, R. E., Sampson, P. D., & Daling, J. R. (1992). Analysis of facial shape in children gestationally exposed to marijuana, alcohol, and/or cocaine. *Pediatrics*, 89(1), 67–77. <http://www.ncbi.nlm.nih.gov/pubmed/1728025>
- Baker, T., Datta, P., Rewers-Felkins, K., Thompson, H., Kallem, R. R., & Hale, T. W. (2018). Transfer of inhaled cannabis into human breast milk. *Obstetrics and Gynecology*, 131(5), 783–788. <https://doi.org/10.1097/AOG.0000000000002575>
- Bayrampour, H., Zahradnik, M., Lisonkova, S., & Janssen, P. (2019). Women's perspectives about cannabis use during pregnancy and the postpartum period: An integrative review. *Preventive Medicine*, 119, 17–23. <https://doi.org/10.1016/j.ypmed.2018.12.002>
- 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. <https://doi.org/10.1542/peds.2018-1076>
- Budde, M. P., De Lange, T. E., Dekker, G. A., Chan, A., & Nguyen, A.-M. T. (2007). Risk factors for placental abruption in a socio-economically disadvantaged region. *The Journal of Maternal-Fetal & Neonatal Medicine*, 20(9), 687–693. <https://doi.org/10.1080/14767050701482738>
- Chabarria, K. C., Racusin, D. A., Antony, K. M., Kahr, M., Suter, M. A., Mastrobattista, J. M., & Aagaard, K. M. (2016). Marijuana use and its effects in pregnancy. *American Journal of Obstetrics and Gynecology*, 215(4), 506.e1–506.e7. <https://doi.org/10.1016/j.ajog.2016.05.044>
- Chakraborty, A., Anstice, N. S., Jacobs, R. J., LaGasse, L. L., Lester, B. M., Wouldes, T. A., & Thompson, B. (2015). Prenatal exposure to recreational drugs affects global motion perception in preschool children. *Scientific Reports*, 5(1), 16921. <https://doi.org/10.1038/srep1692>

- 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. <https://doi.org/10.1097/AOG.0000000000001649>
- Day, N. L., Cottreau, C. M., & Richardson, G. A. (1993). The epidemiology of alcohol, marijuana, and cocaine use among women of childbearing age and pregnant women. *Clinical Obstetrics and Gynecology*, 36(2), 232–245. <http://www.ncbi.nlm.nih.gov/pubmed/8513621>
- Day, N. L., & Richardson, G. A. (1991). Prenatal marijuana use: Epidemiology, methodologic issues, and infant outcome. *Clinics in Perinatology*, 18(1), 77–91. <http://www.ncbi.nlm.nih.gov/pubmed/2040119>
- Dreher, M. C., Nugent, K., & Hudgins, R. (1994). Prenatal marijuana exposure and neonatal outcomes in Jamaica: An ethnographic study. *Pediatrics*, 93(2), 254–260. <http://www.ncbi.nlm.nih.gov/pubmed/8121737>
- Fairbrother, N., Young, A. H., Janssen, P., Antony, M. M., & Tucker, E. (2015). Depression and anxiety during the perinatal period. *BMC Psychiatry*, 15(1), 206. <https://doi.org/10.1186/s12888-015-0526-6>
- Fergusson, D. M., Horwood, L. J., Northstone, K., & ALSPAC Study Team. Avon Longitudinal Study of Pregnancy and Childhood. (2002). Maternal use of cannabis and pregnancy outcome. *BJOG : An International Journal of Obstetrics and Gynaecology*, 109(1), 21–27. <http://www.ncbi.nlm.nih.gov/pubmed/11843371>
- Frank, D. A., Bauchner, H., Parker, S., Huber, A. M., Kyei-Aboagye, K., Cabral, H., & Zuckerman, B. (1990). Neonatal body proportionality and body composition after in utero exposure to cocaine and marijuana. *The Journal of Pediatrics*, 117(4), 622–626. <http://www.ncbi.nlm.nih.gov/pubmed/2213392>
- Fride, E. (2008). Multiple roles for the endocannabinoid system during the earliest stages of life: pre- and postnatal development. *Journal of Neuroendocrinology*, 20(Suppl 1), 75–81. <https://doi.org/10.1111/j.1365-2826.2008.01670.x>
- Fride, E., Foux, A., Rosenberg, E., Faigenboim, M., Cohen, V., Barda, L., ... Mechoulam, R. (2003). Milk intake and survival in newborn cannabinoid CB1 receptor knockout mice: Evidence for a "CB3" receptor. *European Journal of Pharmacology*, 461(1), 27–34. <http://www.ncbi.nlm.nih.gov/pubmed/12568912>
- Fried, P. A. (1995). Prenatal exposure to marijuana and tobacco during infancy, early and middle childhood: Effects and an attempt at synthesis. *Archives of Toxicology. Supplement. = Archiv Fur Toxikologie. Supplement*, 17, 233–260. <http://www.ncbi.nlm.nih.gov/pubmed/7786162>

- Fried, P. A. (1995). The Ottawa Prenatal Prospective Study (OPPS): Methodological issues and findings—It's easy to throw the baby out with the bath water. *Life Sciences*, 56(23–24), 2159–2168. <http://www.ncbi.nlm.nih.gov/pubmed/7539879>
- Fried, P. A. (2002). Adolescents prenatally exposed to marijuana: Examination of facets of complex behaviors and comparisons with the influence of in utero cigarettes. *Journal of Clinical Pharmacology*, 42(Suppl 1), 97S–102S. <http://www.ncbi.nlm.nih.gov/pubmed/12412842>
- Fried, P. A., O'Connell, C. M., & Watkinson, B. (1992). 60- and 72-month follow-up of children prenatally exposed to marijuana, cigarettes, and alcohol: cognitive and language assessment. *Journal of Developmental and Behavioral Pediatrics*, 13(6), 383–391. <http://www.ncbi.nlm.nih.gov/pubmed/1469105>
- Fried, P. A., & Smith, A. M. (2001). A literature review of the consequences of prenatal marijuana exposure. An emerging theme of a deficiency in aspects of executive function. *Neurotoxicology and Teratology*, 23(1), 1–11. <http://www.ncbi.nlm.nih.gov/pubmed/11274871>
- Fried, P. A., Watkinson, B., & Gray, R. (1992). A follow-up study of attentional behavior in 6- year-old children exposed prenatally to marijuana, cigarettes, and alcohol. *Neurotoxicology and Teratology*, 14(5), 299–311. <http://www.ncbi.nlm.nih.gov/pubmed/1454038>
- Goldschmidt, L., Day, N. L., & Richardson, G. A. (2000). Effects of prenatal marijuana exposure on child behavior problems at age 10. *Neurotoxicology and Teratology*, 22(3), 325–336. <http://www.ncbi.nlm.nih.gov/pubmed/10840176>
- Goldschmidt, L., Richardson, G. A., Cornelius, M. D., & Day, N. L. (2004). Prenatal marijuana and alcohol exposure and academic achievement at age 10. *Neurotoxicology and Teratology*, 26(4), 521–532. <https://doi.org/10.1016/j.ntt.2004.04.003>
- Goldschmidt, L., Richardson, G. A., Larkby, C., & Day, N. L. (2016). Early marijuana initiation: The link between prenatal marijuana exposure, early childhood behavior, and negative adult roles. *Neurotoxicology and Teratology*, 58, 40–45. <https://doi.org/10.1016/j.ntt.2016.05.011>
- Goldschmidt, L., Richardson, G. A., Willford, J., & Day, N. L. (2008). Prenatal marijuana exposure and intelligence test performance at age 6. *Journal of the American Academy of Child & Adolescent Psychiatry*, 47(3), 254–263. <https://doi.org/10.1097/CHI.0b013e318160b3f0>

- Goldschmidt, L., Richardson, G. A., Willford, J. A., Severtson, S. G., & Day, N. L. (2012). School achievement in 14-year-old youths prenatally exposed to marijuana. *Neurotoxicology and Teratology*, *34*(1), 161–167. <https://doi.org/10.1016/j.ntt.2011.08.009>
- Gray, T. R., Eiden, R. D., Leonard, K. E., Connors, G. J., Shisler, S., & Huestis, M. A. (2010). Identifying prenatal cannabis exposure and effects of concurrent tobacco exposure on neonatal growth. *Clinical Chemistry*, *56*(9), 1442–1450. <https://doi.org/10.1373/clinchem.2010.147876>
- Gunn, J. K. L., Rosales, C. B., Center, K. E., Nuñez, A., Gibson, S. J., Christ, C., & Ehiri, J. E. (2016). Prenatal exposure to cannabis and maternal and child health outcomes: A systematic review and meta-analysis. *BMJ Open*, *6*(4), e009986. <https://doi.org/10.1136/bmjopen-2015-009986>
- Gunn, J. K. L., Rosales, C. B., Center, K. E., Nuñez, A. V, Gibson, S. J., & Ehiri, J. E. (2015). The effects of prenatal cannabis exposure on fetal development and pregnancy outcomes: A protocol. *BMJ Open*, *5*(3), e007227. <https://doi.org/10.1136/bmjopen-2014-007227>
- Hall, W., & Degenhardt, L. (2009). Adverse health effects of non-medical cannabis use. *The Lancet*, *374*(9698), 1383–1391. [https://doi.org/10.1016/S0140-6736\(09\)61037-0](https://doi.org/10.1016/S0140-6736(09)61037-0)
- Hatch, E. E., & Bracken, M. B. (1986). Effect of marijuana use in pregnancy on fetal growth. *American Journal of Epidemiology*, *124*(6), 986–993. <http://www.ncbi.nlm.nih.gov/pubmed/3776981>
- Hayatbakhsh, M. R., Flenady, V. J., Gibbons, K. S., Kingsbury, A. M., Hurrion, E., Mamun, A. A., & Najman, J. M. (2012). Birth outcomes associated with cannabis use before and during pregnancy. *Pediatric Research*, *71*(2), 215–219. <https://doi.org/10.1038/pr.2011.25>
- Hill, M., & Reed, K. (2013). Pregnancy, Breast-feeding, and Marijuana. *Obstetrical & Gynecological Survey*, *68*(10), 710–718. <https://doi.org/10.1097/01.ogx.0000435371.51584.d1>
- Huizink, A. C. (2014). Prenatal cannabis exposure and infant outcomes: Overview of studies. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, *52*, 45–52. <https://doi.org/10.1016/j.pnpbp.2013.09.014>
- Jansson, L. M., Jordan, C. J., & Velez, M. L. (2018). Perinatal marijuana use and the developing child. *JAMA*, *320*(6), 545. <https://doi.org/10.1001/jama.2018.8401>
- Keimpema, E., Mackie, K., & Harkany, T. (2011). Molecular model of cannabis sensitivity in developing neuronal circuits. *Trends in Pharmacological Sciences*, *32*(9), 551–561. <https://doi.org/10.1016/j.tips.2011.05.00>

- Ko, J. Y., Farr, S. L., Tong, V. T., Creanga, A. A., & Callaghan, W. M. (2015). Prevalence and patterns of marijuana use among pregnant and nonpregnant women of reproductive age. *American Journal of Obstetrics and Gynecology*, 213(2), 201.e1-201.e10. <https://doi.org/10.1016/j.ajog.2015.03.021>
- 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. <https://doi.org/10.1016/j.drugalcdep.2018.02.017>
- Leemaqz, S. Y., Dekker, G. A., McCowan, L. M., Kenny, L. C., Myers, J. E., Simpson, N. A. B., ... SCOPE Consortium. (2016). Maternal marijuana use has independent effects on risk for spontaneous preterm birth but not other common late pregnancy complications. *Reproductive Toxicology*, 62, 77–86. <https://doi.org/10.1016/j.reprotox.2016.04.021>
- Levinson-Castiel, R., Merlob, P., Linder, N., Sirota, L., & Klinger, G. (2006). Neonatal Abstinence syndrome after in utero exposure to selective serotonin reuptake inhibitors in term infants. *Archives of Pediatrics & Adolescent Medicine*, 160(2), 173. <https://doi.org/10.1001/archpedi.160.2.173>
- Linn, S., Schoenbaum, S. C., Monson, R. R., Rosner, R., Stubblefield, P. C., & Ryan, K. J. (1983). The association of marijuana use with outcome of pregnancy. *American Journal of Public Health*, 73(10), 1161–1164. <http://www.ncbi.nlm.nih.gov/pubmed/6604464>
- Mark, K., Desai, A., & Terplan, M. (2016). Marijuana use and pregnancy: Prevalence, associated characteristics, and birth outcomes. *Archives of Women's Mental Health*, 19(1), 105–111. <https://doi.org/10.1007/s00737-015-0529-9>
- Mark, K., & Terplan, M. (2017). Cannabis and pregnancy: Maternal child health implications during a period of drug policy liberalization. *Preventive Medicine*, 104, 46–49. <https://doi.org/10.1016/j.yjmed.2017.05.012>
- Matthews, A., Haas, D. M., O'Mathúna, D. P., & Dowswell, T. (2015). Interventions for nausea and vomiting in early pregnancy. *Cochrane Database of Systematic Reviews*, (9), CD007575. <https://doi.org/10.1002/14651858.CD007575.pub4>
- Meier, M. H., Caspi, A., Danese, A., Fisher, H. L., Houts, R., Arseneault, L., & Moffitt, T. E. (2018). Associations between adolescent cannabis use and neuropsychological decline: A longitudinal co-twin control study. *Addiction*, 113(2), 257–265. <https://doi.org/10.1111/add.13946>
- Mourh, J., & Rowe, H. (2017). Marijuana and Breastfeeding: Applicability of the current literature to clinical practice. *Breastfeeding Medicine*, 12(10), 582–596. <https://doi.org/10.1089/bfm.2017.0020>

- 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. <https://doi.org/10.17226/24625>
- O'Connell, C. M., & Fried, P. A. (1991). Prenatal exposure to cannabis: A preliminary report of postnatal consequences in school-age children. *Neurotoxicology and Teratology*, 13(6), 631–639. <http://www.ncbi.nlm.nih.gov/pubmed/1779951>
- Pepper, G. V., & Craig Roberts, S. (2006). Rates of nausea and vomiting in pregnancy and dietary characteristics across populations. *Proceedings of the Royal Society B: Biological Sciences*, 273(1601), 2675–2679. <https://doi.org/10.1098/rspb.2006.3633>
- Porath, A., & Fried, P. (2005). Effects of prenatal cigarette and marijuana exposure on drug use among offspring. *Neurotoxicology and Teratology*, 27(2), 267–277. <https://doi.org/10.1016/j.ntt.2004.12.003>
- Proal, A. C., Fleming, J., Galvez-Buccollini, J. A., & DeLisi, L. E. (2014). A controlled family study of cannabis users with and without psychosis. *Schizophrenia Research*, 152(1), 283–288. <https://doi.org/10.1016/j.schres.2013.11.014>
- Russo, E., Dreher, M. C., & Mathre, M. L. (2002). Chapter—Cannabis treatments in obstetrics and gynecology: A historical review. Chapter—The consequences of marijuana use in pregnancy. In *Women and cannabis: Medicine, science, and sociology*. Binghamton, NY: Haworth Integrative Healing Press. <http://www.worldcat.org/oclc/1068962496>
- Ryan, S. A., Ammerman, S. D., O'Connor, M. E., Committee on Substance Use and Prevention, & Section on Breastfeeding. (2018). Marijuana use during pregnancy and breastfeeding: Implications for neonatal and childhood outcomes. *Pediatrics*, 142(3), e20181889. <https://doi.org/10.1542/peds.2018-1889>
- Shiono, P. H., Klebanoff, M. A., Nugent, R. P., Cotch, M. F., Wilkins, D. G., Rollins, D. E., ... Behrman, R. E. (1995). The impact of cocaine and marijuana use on low birth weight and preterm birth: A multicenter study. *American Journal of Obstetrics and Gynecology*, 172(1 Pt 1), 19–27. <http://www.ncbi.nlm.nih.gov/pubmed/7847533>
- Tennes, K., Avitable, N., Blackard, C., Boyles, C., Hassoun, B., Holmes, L., & Kreye, M. (1985). Marijuana: Prenatal and postnatal exposure in the human. *NIDA Research Monograph*, 59, 48–60. <http://www.ncbi.nlm.nih.gov/pubmed/3929132>

- Tennes, K., & Blackard, C. (1980). Maternal alcohol consumption, birth weight, and minor physical anomalies. *American Journal of Obstetrics and Gynecology*, 138(7 Pt 1), 774–780. <http://www.ncbi.nlm.nih.gov/pubmed/7446609>
- Torres, C. A., & Hart, C. L. (2017). Prenatal cannabis exposure and cognitive functioning: A critical review. *Drug and Alcohol Dependence*, 171, e204. <https://doi.org/10.1016/J.DRUGALCDEP.2016.08.557>
- Tortoriello, G., Morris, C. V, Alpar, A., Fuzik, J., Shirran, S. L., Calvigioni, D., ... Harkany, T. (2014). Miswiring the brain: Δ 9-tetrahydrocannabinol disrupts cortical development by inducing an SCG10/stathmin-2 degradation pathway. *The EMBO Journal*, 33(7), 668–685. <https://doi.org/10.1002/emj.201386035>
- Warshak, C. R., Regan, J., Moore, B., Magner, K., Kritzer, S., & Van Hook, J. (2015). Association between marijuana use and adverse obstetrical and neonatal outcomes. *Journal of Perinatology*, 35(12), 991–995. <https://doi.org/10.1038/jp.2015.120>
- Witter, F., & Niebyl, J. (1990). Marijuana use in pregnancy and pregnancy outcome. *American Journal of Perinatology*, 7(01), 36–38. <https://dx.doi.org/10.1055/s-2007-999442>
- Wu, T. C., Tashkin, D. P., Djahed, B., & Rose, J. E. (1988). Pulmonary hazards of smoking marijuana as compared with tobacco. *The New England Journal of Medicine*, 318(6), 347–351. <https://doi.org/10.1056/NEJM198802113180603>
- Zimmer, L. E., & Morgan, J. P. (1997). *Marijuana myths, marijuana facts: A review of the scientific evidence*. <http://www.worldcat.org/oclc/833157457>
- Zuckerman, B., Frank, D. A., Hingson, R., Amaro, H., Levenson, S. M., Kayne, H., ... Bauchner, H. (1989). Effects of maternal marijuana and cocaine use on fetal growth. *New England Journal of Medicine*, 320(12), 762–768. <https://doi.org/10.1056/NEJM198903233201203>