

Methamphetamine

Selected References:

- ACOG Committee on Health Care for Underserved Women. 2011 (reaffirmed 2021). Committee Opinion No. 479: Methamphetamine abuse in women of reproductive age. *Obstet Gynecol*; 117:751-5.
- Ajayi AF et al. 2020. The physiology of male reproduction: Impact of drugs and their abuse on male fertility. *Andrologia*; 52(9): e13672.
- Brecht ML, Herbeck DM. 2014. Pregnancy and fetal loss reported by methamphetamine-using women. *Subst Abuse*; 8:25-33.
- Chang L, et al. 2004. Smaller subcortical volumes and cognitive deficits in children with prenatal methamphetamine exposure. *Psych Res:Neuroimaging*; 132:95-106.
- Chomchai C, et al. 2016. Transfer of methamphetamine (MA) into breast milk and urine of postpartum women who smoked MA tablets during pregnancy: Implications for initiation of breastfeeding. *J Hum Lact*; 32:333-9.
- Chu EK, et al. 2020. Behavior Problems During Early Childhood in Children With Prenatal Methamphetamine Exposure. *Pediatrics*; 146(6):e20190270.
- Cohen JM, et al. 2017. Placental complications associated with psychostimulant use in pregnancy. *Obstet Gynecol*; 130(6):1192-201.
- Courtney KE, Ray LA. 2014. Methamphetamine: an update on epidemiology, pharmacology, clinical phenomenology, and treatment literature. *Drug Alcohol Depend*; 1;143:11-21.
- Derauf C, et al. 2012. Prenatal methamphetamine exposure and inhibitory control among young school-age children. *J Pediatr*; 161(3):452-9.
- Dinger J, et al. 2017. Methamphetamine consumption during pregnancy – effects on child health. *Pharmacopsychiatry*; 50(3):107-113.
- Dyk JV, et al. 2014. Maternal methamphetamine use in pregnancy and long-term neurodevelopmental and behavioral deficits in children. *J Popul Ther Clin Pharmacol*; 21(2):e185-96.
- Eriksson M, et al. 1981. Amphetamine addiction and pregnancy II. Pregnancy, delivery and the neonatal period. Socio-medical aspects. *Acta Obstet Gynecol Scand*; 60:253-259, 1981.
- Garey JD, et al. 2020 Teratogen update: Amphetamines. *Birth Defects Res*; 112(15):1171-1182.
- Golub M, et al. 2005. NTP CERHR Expert Panel Report on the reproductive and developmental toxicity of amphetamine and methamphetamine. *Birth Defects Res B Dev Reprod Toxicol*; 74(6):471-584.
- Good MM, et al. 2010. Methamphetamine use during pregnancy: maternal and neonatal implications. *Obstet Gynecol*; 116(2 Pt 1):330-4.
- Gorman MC, et al. 2014. Outcomes in pregnancies complicated by methamphetamine use. *Am J Obstet Gynecol*; 211(4):429.e1-7.
- Hamed M, et al. 2023. Psychoactive drugs and male fertility: impacts and mechanisms. *Reprod Biol Endocrinol*; 21,69.
- Harst L, et al. 2021. Prenatal Methamphetamine Exposure: Effects on Child Development–A Systematic Review. *Dtsch Arztebl Int*. 7;118(18):313-319
- Hayer S, et al. 2024. Prenatal methamphetamine use increases risk of adverse maternal and neonatal outcomes. *American journal of obstetrics and gynecology*; 231(3),356.e1-356.e15.
- Heinonen OP, et al. 1977. *Birth Defects and Drugs in Pregnancy*. Littleton, MA: John Wright-PSG, pp 346-347, 439.
- LaGasse LL, et al. 2011. Prenatal methamphetamine exposure and neonatal neurobehavioral outcome in the USA and New Zealand. *Neurotoxicol Teratol*; 33(1):166-75.
- LaGasse LL, et al. 2012. Prenatal methamphetamine exposure and childhood behavior at 3 and 5 years of age. *Pediatrics*; 129(4):681-688.

- Little BB, et al. 1988. Methamphetamine abuse during pregnancy: outcome and fetal effects. *Obstet Gynecol*; 72:541-4.
- Kalaitzopoulos DR, et al. 2018. Effect of methamphetamine hydrochloride on pregnancy outcome: A systematic review and meta-analysis. *J Addict Med*; 12(3):220-226.
- Kittirattanapaiboon P, et al. 2017. Methamphetamine use and dependence in vulnerable female populations. *Curr Opin Psychiatry*; 30(4):247-252.
- Kwiatkowski MA, et al. 2018. Cognitive outcomes in prenatal methamphetamine exposed children aged six to seven years. *Compr Psychiatry*; 80:24-33.
- Newport DJ, et al. 2016. Prenatal psychostimulant and antidepressant exposure and risk of hypertensive disorders of pregnancy. *J Clin Psychiatry*; 77(11):1538-45.
- Nguyen D, et al. 2010. Intrauterine growth of infants exposed to prenatal methamphetamine: results from the infant development, environment, and lifestyle study. *J Pediatr*; 157(2):337-9.
- Ornoy A. 2018. Pharmacological treatment of attention deficit hyperactivity disorder during pregnancy and lactation. *Pharm Res*; 35:46.
- Pentecost R, et al. 2021. Scoping Review of the Associations Between Perinatal Substance Use and Perinatal Depression and Anxiety. *J Obstet Gynecol Neonatal Nurs*; 50(4):382-391
- Pflügner A, et al. 2018. [Methamphetamine consumption during pregnancy and its effects on neonates]. *Klin Padiatr*; 230(1):31-38.
- Pierce SL, et al. 2019. Methamphetamine-associated cardiomyopathy in pregnancy. *Mayo Clinic Proc*; 94(3):551-554.
- Rastegar-Pouyani N, et al. 2025. Prenatal Exposure to Methamphetamine and Its Association With Birth Outcomes: A Meta-Analysis. *Birth defects research*; 117(7), e2488.
- Roussotte FF, et al. 2012. Frontostriatal connectivity in children during working memory and the effects of prenatal methamphetamine, alcohol, and polydrug exposure. *Dev Neurosci*; 34(1):43-57.
- Sanjari Moghaddam H, et al. 2021. Effects of Prenatal Methamphetamine Exposure on the Developing Human Brain: A Systematic Review of Neuroimaging Studies. *ACS Chem Neurosci*. 4;12(15):2729-2748.
- Sankaran, D, et al. 2021. Methamphetamine: burden, mechanism and impact on pregnancy, the fetus, and newborn. *J Perinatol*.
- Shah R, et al. 2012. Prenatal methamphetamine exposure and short-term maternal and infant medical outcomes. *Am J Perinatol*; 29(5):391-400.
- Smid MC, et al. 2019. Stimulant use in pregnancy: An under-recognized epidemic among pregnant women. *Clin Obstet Gynecol*; 62(1):168-184.
- Smith LM, et al. 2003. Effects of prenatal methamphetamine exposure on fetal growth and drug withdrawal symptoms in infants born at term. *J Dev Behav Pediatr*; 24(1):17-23.
- Smith LM, et al. 2006. The infant development, environment, and lifestyle study: effects of prenatal methamphetamine exposure, polydrug exposure, and poverty on intrauterine growth. *Pediatrics*; 118(3):1149-56.
- Smith LM, et al. 2008. Prenatal methamphetamine use and neonatal neurobehavioral outcome. *Neurotoxicol Teratol*; 30(1):20-28.
- Smith LM, et al. 2011. Motor and cognitive outcomes through three years of age in children exposed to prenatal methamphetamine. *Neurotoxicol Teratol*; 33(1):176-84.
- Stewart JL, Meeker JE. 1997. Fetal and infant deaths associated with maternal methamphetamine abuse. *J Anal Toxicol*; 21(6):515-7.
- Twomey J, et al. 2013. Prenatal methamphetamine exposure, home environment, and primary caregiver risk factors predict child behavioral problems at 5 years. *The American journal of orthopsychiatry*; 83(1):64-72.
- Woudes TA, et al. 2014. Prenatal methamphetamine exposure and neurodevelopmental outcomes in children from 1 to 3 years. *Neurotoxicol Teratol*; 42:77-84.
- Woudes TA, Lester BM. 2023. Opioid, methamphetamine, and polysubstance use: perinatal outcomes for the mother and infant. *Front Pediatr*. 1:1305508.

- Wright TE, et al. 2015. Methamphetamines and pregnancy outcomes. J Addict Med; 9(2):111-7.

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Selected References:

- Ali, R, et al. 2022. Review of recent evidence on the management of heartburn in pregnant and breastfeeding women. BMC gastroenterology; 22.1: 1-10.
- Anderka M, et al. 2012. National Birth Defects Prevention Study. Medications used to treat nausea and vomiting of pregnancy and the risk of selected birth defects. Birth Defects Res A Clin Mol Teratol; 94:22-30.
- Andersen ABT, et al. 2012. Prenatal exposure to acid-suppressive drugs and the risk of toddler asthma: a population-based Danish cohort study. Alim Pharmacol Ther; 35:1190-1198.
- Anderson P. 2018. Treating gastroesophageal reflux and heartburn while breastfeeding. Breastfeed Med;13(7):463-4.
- Bank, T, et al. 2024. Challenges in Conducting Clinical Trials for Preeclampsia. Curr Hypertens Rep 26, 59-68.
- Bor S, et al. 2017. The levels of pantoprazole in human breast milk and plasma: two compartment model. Neurogastroenterol Motil; 29:79-80.
- Dehlink E, et al. 2009. First evidence of a possible association between gastric acid suppression during pregnancy and childhood asthma: a population-based register study. Clin Exp Allergy 39:246-53.
- Diav-Citrin O, et al. 2005. The safety of proton pump inhibitors in pregnancy: a multicentre prospective controlled study. Aliment Pharmacol Ther; 21:269-75.
- Erichsen R, et al. 2014. Maternal use of proton pump inhibitors during early pregnancy and the prevalence of hypospadias in male offspring. Am J Ther; 21: 254-259.
- Gill SK et al. 2009. The safety of proton pump inhibitors (PPIs) in pregnancy: a meta-analysis. Am J Gastroenterol; 104(6): 1541-1545.

- Hastie R, et al. 2019. Proton pump inhibitors and preeclampsia risk among 157 720 women: a Swedish population register-based cohort study. *Hypertension*; 73(5):1097-103.
- Huijgen NA. 2016. Are proton-pump inhibitors harmful for the semen quality of men in couples who are planning pregnancy? *Fertility and Sterility*, 106(7), 1666-1672.
- Kallen B. 1998. Delivery outcome after the use of acid-suppressing drugs in early pregnancy with special reference to omeprazole. *Br J Obstet Gynaecol*; 105:877-881.
- Kallen B. 2001. Use of omeprazole during pregnancy—no hazard demonstrated in 955 infants exposed during pregnancy. *Eur J Obstet Gynecol Reprod Biol*; 96:63-68.
- Keihani, S. et al. 2018. Proton-pump inhibitor use does not affect semen quality in subfertile men. *Asian journal of andrology*, 20(3), 290.
- Lalkin A, et al. 1998. The safety of omeprazole during pregnancy: a multicenter prospective controlled study. *Am J Obstet Gynecol*; 179(3 Pt 1): 727-730.
- Li, C, et al. 2020. Systematic review with meta-analysis: the risks of proton pump inhibitors during pregnancy. *Alimentary pharmacology & therapeutics*; 51.4: 410-420.
- Mahadevan, Uma. 2007. "Gastrointestinal Medications in Pregnancy." *Best Practice & Research Clinical Gastroenterology*; 21(5): 849-77.
- Majithia, R., & Johnson, D. A. (2012). Are Proton Pump Inhibitors Safe during Pregnancy and Lactation? 10.
- Marshall JK, et al. 1998. Omeprazole for refractory gastroesophageal reflux disease during pregnancy and lactation. *Can J Gastroenterol*; 12: 225-227.
- Matok I, et al. 2012. The safety of fetal exposure to proton-pump inhibitors during pregnancy. *Dig Dis Sci*; 57:699-705.
- Mills K, et al. 2024. The effects of proton pump inhibitors during pregnancy on treatment of preeclampsia and related outcomes: a systematic review and meta-analysis. *Am J Obstet Gynecol MFM*; 6(10):101478.
- Mumtaz, N, et al. 2022. Harmful Consequences of Proton Pump Inhibitors on Male Fertility: An Evidence from Subchronic Toxicity Study of Esomeprazole and Lansoprazole in Wistar Rats. *International Journal of Endocrinology*; 2022:4479261.
- Nikfar S, et al. 2002. Use of proton pump inhibitors during pregnancy and rates of major malformations: a meta-analysis. *Dig Dis Sci*; 47:1526-9.
- Neuman R, et al. 2022. Omeprazole Administration in Preterm Preeclampsia: a Randomized Controlled Trial to Study Its Effect on sFlt-1 (Soluble Fms-Like Tyrosine Kinase-1), PlGF (Placental Growth Factor), and ET-1 (Endothelin-1). *Hypertension*; 79(6):1297-1307.
- Pasternak B, Hviid A. 2010. Use of proton-pump inhibitors in early pregnancy and the risk of birth defects. *N Engl J Med*; 363:2114-2123.
- Saito J, et al. 2020. Esomeprazole During Pregnancy and Lactation: Esomeprazole Levels in Maternal Serum, Cord Blood, Breast Milk, and the Infant's Serum. *Breastfeeding Medicine*; 15(9):598-601.
- Thélin CS, & Richter JE. 2020. Review article: the management of heartburn during pregnancy and lactation. *Alimentary Pharmacology & Therapeutics*; 51(4), 421-434.
- Yitshak-Sade M, et al. 2016. Prenatal exposure to H2 blockers and to proton pump inhibitors and asthma development in offspring. *J Clinic Pharmacol*; 56: 116-123.

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Methamphetamine

Selected References:

- Amstrong, C. 2008. ACOG Guidelines on Psychiatric Medication Use During Pregnancy and Lactation. *Am Fam Physician*; 78(6):772-778.
- Eberhard-Gran MM, et al. 2006. Use of psychotropic medications in treating mood disorders during lactation: practical recommendations. *CNS Drugs*; 20(3):187-98.
- Frey OR, et al. 1999. Adverse effects in a newborn infant breast-fed by a mother treated with doxepin. *Ann Pharmacother*; 33(6):690-3.
- Iqbal M. 1999. Effects of Antidepressants During Pregnancy and Lactation. *Ann Clin Psychiatry*; 11(4):237-56.
- Kemp J, et al. 198. Excretion of doxepin and N-desmethyldoxepin in human milk. *Br J Clin Pharmacol* 20:497-9.
- Kirchheiner J, et al. 2005. Impact of the CYP2D6 ultra-rapid metabolizer genotype on doxepin pharmacokinetics and serotonin in platelets. *Pharmacogenet Genomics*; 15(8):579-87.
- Matheson I, et al. 1985. Respiratory depression caused by N-desmethyldoxepin in breast milk. *Lancet* 2: 1124.
- McElhatton PR, et al. 1996. The outcome of pregnancy in 689 women exposed to therapeutic doses of antidepressants. A collaborative study of the European Network of Teratology Information Services (ENTIS). *Reprod Toxicol*; 10:285-94.
- Miller M, et al. 2020. Sleep Pharmacotherapy for Common Sleep Disorders in Pregnancy and Lactation. *Chest*; 157(1):184-197.
- Nulman I, et al. 1997. Neurodevelopment of children exposed in utero to antidepressant drugs. *N Engl J Med*; 336:258-62.
- Steiner M. 2012. Prenatal exposure to antidepressants: how safe are they? *Am J Psychiatry*; 169(11): 1130-1132.
- Venkatesh KK, et al. 2017. Impact of antidepressant treatment during pregnancy on obstetric outcomes among women previously treated for depression: an observational cohort study. *J Perinatol*; 37(9):1003-1009.

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Methamphetamine

Selected References:

- Benyamini L, et al. 2005. The safety of amoxicillin/clavulanic acid and cefuroxime during lactation. *Ther Drug Monit.* 27(4):499-502.
- Boissiere-O'Neill T, et al. 2026. Exposure to Systemic Antimicrobials During Pregnancy and Risk of Miscarriage: A Population-Based Registry Study. *BJOG* 133(7):1394-1404.
- Chu YN, et al. 2019. Toxic epidermal necrolysis in an infant induced by drug intake through breast milk. *Dermatologica Sinica.* 37(2):86-89.
- Crider KS, et al. 2009. Antibacterial medication use during pregnancy and risk of birth defects: National Birth Defects Prevention Study. *Archives of Pediatrics & Adolescent Medicine,* 163(11), 978-985.
- Czeizel AE, et al. 2001. Use of cephalosporins during pregnancy and in the presence of congenital anomalies: a population-based, case-control study. *Am J Obstet Gynecol.* 184(6):1289-1896.
- Ilett KF, et al. 2006. Transfer of probenecid and cephalixin into breast milk. *Ann Pharmacother.* 40(5):986-989.
- Ito S, et al. 1993. Prospective follow-up of adverse reactions in breast-fed infants exposed to maternal medication. *Am J Obstet Gynecol.* 168(5):1393-1399.
- Kafetzi D, et al. 1981. Passage of cephalosporins and amoxicillin into the breast milk. *Acta Paediatr Scand.* 70(3):285-288.
- Rau A, et al. 2024. Management of Acne in Pregnancy, *Am J Clin Dermatol.* 25(3):465-471.
- Saad AF, et al. 2025. Prophylactic Oral Cephalexin and Metronidazole Compared With Placebo After Cesarean Delivery to Reduce Infection Complications in Women With Obesity: A Randomized Controlled Trial. *Obstet Gynecol.* 146(1):113-120.
- Teva Pharmaceuticals. 2020. Cephalexin product label. Available at: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=19307ff0-71de-477b-965d-ea243e5ede3a>. [Accessed April 4 2026]

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Methamphetamine

Selected References:

- Anderson PO. 2021. Monoclonal antibodies during breastfeeding. *Breastfeeding Medicine*. 16(8): 591-93.
- Nosedá R, et al. 2024. Safety of Monoclonal Antibodies Inhibiting PCSK9 in Pregnancy: Disproportionality Analysis in VigiBase®. *Clin Pharmacol Ther*. 116(2)346-350.
- Praluent® Prescribing Information. Available online at: https://www.regeneron.com/downloads/praluent_pi.pdf. Accessed April 1, 2026
- Vuignier Y, et al. 2021. Exposure to alirocumab during the first trimester of pregnancy: A case report. *Birth Defects Research*. 113(15): 1156-60.

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