

ACE Inhibitors

Selected References:

- Al-Maawali A, et al. 2012. Taking angiotensin-converting enzyme inhibitors during pregnancy: is it safe? *Can Fam Physician*, 58(1):49-51.
- Bateman BT, et al. 2017. Angiotensin-converting enzyme inhibitors and the risk of congenital malformations. *Obstet Gynecol*, 129:174-184.
- Briggs GG. 2002. Drug effects on the fetus and breast-fed infant. *Clin Obstet Gynecol*, 45(1):6-21.
- Bullo M, et al. 2012. Pregnancy outcome following exposure to angiotensin-converting enzyme inhibitors or angiotensin receptor antagonists: a systematic review. *Hypertension*, 60(2):444-450.
- Cooper WO, et al. 2006. Major congenital malformations after first-trimester exposure to ACE Inhibitors. *The New England Journal of Medicine*, 354(23):2443-2451.
- De-Kun Li, et al. 2011. Maternal exposure to angiotensin converting enzyme inhibitors in the first trimester and risk of malformations in offspring: a retrospective cohort study. *BMJ*, 343:d5931
- Karthikeyan VJ, et al. 2011. Are angiotensin-converting enzyme inhibitors and angiotensin receptor blockers safe in pregnancy: a report of ninety-one pregnancies. *J Hypertens*, 29(2):396-369.
- Hoelzenbein M, et al. 2018. Increased rate of birth defects after first trimester use of angiotensin converting enzyme inhibitors – treatment or hypertension related? An observational cohort study. *Pregnancy Hypertens*, 13:65-71.
- National Heart, Lung and Blood Institute. Accessed May 2015. Available at: <http://www.nhlbi.nih.gov/health/resources/heart/hbp-pregnancy>
- Papadopoulou Z, et al. 2021. In Utero Exposure to Antihypertensive Medication during the First Trimester: Is the Risk Worth Taking?. *Acta Med Acad*, 50(3):372-381.
- Pucci M, et al. 2015. Angiotensin-converting enzyme inhibitors and angiotensin receptor blockers in women of childbearing age: risks versus benefits. *Expert Rev Clin Pharmacol*, 8(2):221-231.
- Quan A. 2006. Fetopathy associated with exposure to angiotensin converting enzyme inhibitors and angiotensin receptor antagonists. *Early Hum Dev*, 82(1):23-28.
- Ruys TP, et al. 2014. Cardiac medication during pregnancy, data from the ROPAC. *Int J Cardiol*, 177(1):124-128.
- Tabacova S, et al. 2003. Adverse pregnancy outcomes associated with maternal enalapril antihypertensive treatment. *Pharmacoepidemiol Drug Saf*, 12(8):633-646.
- Weber-Schoendorfer C, et al. 2020. Fetotoxic risk of AT1 blockers exceeds that of angiotensin-converting enzyme inhibitors: an observational study. *J Hypertens*, 38:133-41.

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ACE Inhibitors

Selected References:

- Abhyankar A, et al. 2013. Meta-analysis: the impact of disease activity at conception on disease activity during pregnancy in patients with inflammatory bowel disease. *Aliment Pharmacol Ther*, 38(5):460-466.
- Afzali A. 2019. Update on Pregnancy in Patients With Inflammatory Bowel Disease. *Gastroenterol Hepatol (NY)*, 15(6):313-315. Andoh A, et al. 2021. Thiopurine pharmacogenomics and pregnancy in inflammatory bowel disease. *J Gastroenterol*, 56(10):881-890
- Avni Biron I, et al. 2023. Pregnancy Outcomes in a Cohort of Patients with Inflammatory Bowel Disease: Data from a Multidisciplinary Clinic in a Tertiary Center. *J Clin Med*, 12(12):4120.
- Ban L, et al. 2014. Limited risks of major congenital anomalies in children of mothers with IBD and effects of medications. *Gastroenterology*, 146(1):76-84.
- Darmadi D, et al. 2023. Inflammatory bowel disease (ulcerative colitis type) severity shows inverse correlation with semen parameter and testosterone levels. *Asian J Androl*, online ahead of print.
- Dominitz JA. 2002. Outcomes of infants born to mothers with inflammatory bowel disease: a population based cohort study. *Am J Gastroenterol*, 97(3):641-648.
- Donovan B & Spiel M. 2023. Inflammatory Bowel Disease in the Childbearing Adult and Newborn. *Neoreviews*, 24(1):10-23.
- Druvefors E, et al. 2022. Minor impact on fertility in men with inflammatory bowel disease: A National Cohort Study from Sweden. *Aliment Pharmacol Ther*, 56(2):292-300.
- Druvefors E, et al. 2023. Female and Male Fertility after Colectomy and Reconstructive Surgery in Inflammatory Bowel Disease: A National Cohort Study from Sweden. *J Crohns Colitis*, 17(10):1631-1638.
- Fabisiak N, et al. 2017. Fat-soluble Vitamin Deficiencies and Inflammatory Bowel Disease: Systematic Review and Meta-Analysis. *J Clin Gastroenterol*, 51(10):878-889.
- Friedman S, et al. 2025. The Consequences of Preterm Birth in the Children of Mothers with Inflammatory Bowel Disease: A Nationwide Cohort Study. *Inflamm Bowel Dis*. 31(9):2400-2407.
- Hirose M, et al. 2001. Active Crohn's disease with maternal vitamin K deficiency and fetal subdural hematoma. *Obstet Gynecol*, 98(5):919-921.
- Innocenti T, et al. 2022. Pregnancy outcomes in inflammatory bowel disease: Data from a large cohort survey. *Journal of digestive diseases*, 23(8-9):473-481.
- Kasper OO, et al. 2002. Ulcerative colitis: female fecundity before diagnosis, during disease, and after surgery compared with a population sample. *Gastroenterology*, 122:15-19.
- Killeen S, et al. 2017. Surgical management of complicated and medically refractory inflammatory bowel disease during pregnancy. *Colorectal Dis*, 19(2):123-138.
- Lee S, et al. 2018. Pregnant Women with Inflammatory Bowel Disease Are at Increased Risk of Vitamin D Insufficiency: A Cross-Sectional Study. *Journal of Crohn's & colitis*, 12(6):702-709.
- Leenhardt R, et al. 2019. Sexual health and fertility for individuals with inflammatory bowel disease. *World J*

Gastroenterol, 25(36):5423-5433.

- Lever G, et al. 2022. Risk of Adverse Pregnancy Outcomes for Women with IBD in an Expert IBD Antenatal Clinic. *Journal of clinical medicine*, 11(10):2919.
- Mahadevan U & Matro R. 2015. Care of the Pregnant Patient With Inflammatory Bowel Disease. *Obstet Gynecol*, 126(2):401-412.
- Malhi G, et al. 2022. Risk Factors for Postpartum Disease Activity in Women With Inflammatory Bowel Disease: A Systematic Review and Meta-analysis. *Inflamm Bowel Dis*, 28(7):1090-1099.
- Maliszewska A, et al. 2017. Inflammatory bowel disease and pregnancy. *Ginekologia Polska*, 88(7):398-403.
- Marild K, et al. 2022. Histological remission in inflammatory bowel disease and risk of adverse pregnancy outcomes. A nationwide study. *E Clinical Medicine*, 53:101722.
- Moens A, et al. 2020. Pregnancy outcomes in inflammatory bowel disease patients treated with vedolizumab, anti-TNF or conventional therapy: results of the European CONCEIVE study. *Aliment Pharmacol Ther*, 51(1):129-138.
- Moffat D, et al. 2009. A population-based study of breastfeeding in inflammatory bowel disease: initiation, duration, and effect on disease in the postpartum period. *The Am J of Gastroenterol*, 104(10):2517-2523.
- Morales M, et al. 2000. Crohn's disease as a risk factor for the outcome of pregnancy. *Hepatogastroenterology*, 47:1595-1598.
- Norgard B, et al. 2000. Birth outcomes of women with ulcerative colitis: a nationwide Danish cohort study. *Am J Gastroenterol*, 95(11):3165-3170.
- Olendzki B, et al. 2023. Dietary Intake of Pregnant Women with and without Inflammatory Bowel Disease in the United States. *Nutrients*, 15(11):2464.
- O'Toole A, et al. 2015. Inflammatory Bowel Disease Increases Risk of Adverse Pregnancy Outcomes: A Meta-Analysis. *Dig Dis Sci*, 60(9):2750-2761.
- Palomba S, et al. 2014. Inflammatory bowel diseases and human reproduction: a comprehensive evidence-based review. *World J Gastroenterol*, 20(23):7123-7136.
- Pervez H, et al. 2019. The Impact of Inflammatory Bowel Disease on Pregnancy and the Fetus: A Literature Review. 11(9): e5648
- Restellini S, et al. 2020. Update on the Management of Inflammatory Bowel Disease during Pregnancy and Breastfeeding. *Digestion*, 8:1-16.
- Shmidt E, & Dubinsky MC. 2022. Inflammatory Bowel Disease and Pregnancy. *The American journal of gastroenterology*, 117(10S), 60-68.
- Sousa P, et al. 2024. Navigating Reproductive Care in Patients With Inflammatory Bowel Disease: A Comprehensive Review. *J Crohns Colitis*;18(Supplement_2):ii16-ii30.
- Szymańska E, et al. 2021. Reproduction and Pregnancy in Inflammatory Bowel Disease – Management and Treatment Based on Current Guidelines. *J Gynecol Obstet Hum Reprod*, 50(3):101777.
- Talavera JIR, et al. 2021. The association between ectopic pregnancy and inflammatory bowel disease, irritable bowel syndrome, and celiac disease: A systematic review. *J Obstet Gynaecol Res*, 47(5):1601-1609.
- Torres J, et al. 2023. European Crohn's and Colitis Guidelines on Sexuality, Fertility, Pregnancy, and Lactation. *J Crohns Colitis*, 17(1):1-27.
- Vestergaard T, et al. 2023. Predictors of disease activity during pregnancy in women with inflammatory bowel disease-a Danish cohort study. *Aliment Pharmacol Ther*, 57(3):335-344.
- Wolf JL. 2002. The impact of surgery for ulcerative colitis on fertility and sexual function in women. *Gastroenterology*, 122(1):226-227.
- Winter R, et al. 2016. Treatment of the Pregnant Patient with Inflammatory Bowel Disease. *Inflamm Bowel Dis*, 22(3):733-744.

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ACE Inhibitors

Selected References:

- Al Hasan S, et al. 2026. Prescription Stimulant Continuation in Pregnancy and Birth Outcomes. *J Atten Disord* 30(3):315-328.
- Aliakbari F, et al. 2022. Relationship between long-term use of Ritalin and semen parameters in patients referred to psychiatric centres. *First International Journal of Andrology*, 54(11):1-6.
- Baker AS, et al. 2018. Management of attention deficit hyperactivity disorder during pregnancy. *Obstet Gynecol Clin North Am*, 45(3):495-509.
- Bateman B, et. al. 2015. Attention deficit hyperactivity medications during pregnancy and the risk of congenital cardiac malformations: A cohort study, abstracts, 368. *Pharmacoepidemiol Drug Saf*, 24:1-587.
- Bello G, et al. 2022. Successful lactation after resuming methylphenidate in a woman with narcolepsy. *J Clin Sleep Med* 18:1891-1894.
- Besag F, 2014. ADHD treatment and pregnancy. *Drug Saf*, 37:397-408.
- Bolea-Alamanac B et. al. 2014. Methylphenidate use in pregnancy and lactation: a systematic review of evidence. *Br J of Clin Pharm*, 77(1):96-101.
- Briggs G, et. al. 2017. *Drugs in pregnancy and lactation: a reference guide to fetal and neonatal risk*. Tenth edition. Philadelphia: Wolters Kluwer/Lippincott Williams & Wilkins Health.
- Bro SP, et. al. 2015. Adverse pregnancy outcomes after exposure to methylphenidate or atomoxetine during pregnancy. *Clinical Epi*, 7:139-147.
- Camacho X, et al. 2023. The association between psychostimulant use in pregnancy and adverse maternal and neonatal outcomes: results from a distributed analysis in two similar jurisdictions. *Int J Epidemiol* 52(1):190-202.
- Cohen JM, et al. 2017. Placental complications associated with psychostimulant use in pregnancy. *Obstet Gynecol*. 130(6):1192-1201.
- Collin-Levesque L, et al. 2018. Infant exposure to methylphenidate and duloxetine during lactation: A case report. *Breastfeed Med* 13:221-225.
- Debooy, VD. 1993. Intravenous pentazocine and methylphenidate abuse during pregnancy. *Am J dis Child* 147(10):1062-1065.
- Diav-Citrin, O et. al. 2016. Methylphenidate

in Pregnancy: A multicenter, prospective, comparative, observational study. *J Clin Psychiatry*, 77(9):1176-1181.

- Dideriksen D, et. al. 2013. First trimester in utero exposure to methylphenidate. *Basic and Clin Pharm and Tox*, 112:73-76.
- 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.
- Hackett LP, et al. 2005. Infant dose and safety of breastfeeding for dexamphetamine and methylphenidate in mothers with attention deficit hyperactivity disorder. *Ther Drug Monit* 27:220-221.
- Hackett LP, et al. 2006. Methylphenidate and breast-feeding. *Ann Pharmacother* 40:1890-1891.
- Haervig KB, et. al. 2014. Use of ADHD medication during pregnancy from 1999-2010: a Danish register-based study. *Pharmacoepidemiol and Drug Saf*, 23:526-533.
- Humphreys C, et. al. 2007. Exposure to attention deficit hyperactivity disorder medications during pregnancy. *Can Fam Physician*, 53:1153-1155.
- Huybrechts KF, et al. 2018. Association between methylphenidate and amphetamine use in pregnancy and risk of congenital malformations: a cohort study from the International Pregnancy Safety Study Consortium. *JAMA Psychiatry*, 75(2):167-175.
- Ilett KF, et. al. 2006. Transfer of dexamphetamine into breast milk during treatment for attention deficit hyperactivity disorder. *Br J of Clin Pharm*, 63(3):371-375.
- Kallen B, et. al. 2013. The use of central nervous system active drugs during pregnancy. *Pharmaceuticals*, 6:1221-1286.
- Kim J, et al. 2025. Managing attention-deficit/hyperactivity disorder in a breastfeeding mother: A case report. *Pharmacotherapy* 45:529-534.
- Louik C, et. al. 2015. Increasing use of ADHD medications in pregnancy. *Pharmacoepidemiol Drug Saf*, 24(2):218-220.
- Madsen KB, et al. 2023. In utero exposure to ADHD medication and long-term offspring outcomes. *Mol Psychiatry*, 28(4):1739-1746.
- Madsen KB, et al. 2025. In utero exposure to methylphenidate, amphetamines and atomoxetine and offspring neurodevelopmental disorders – a population-based cohort study and meta-analysis. *Mol Psychiatry* 30(9): 3885-3894.
- Malo J et. al. 2015. ADHD drugs, pregnancy and lactation—increasing inquiries and need for more safety data. *Birth Def Res Pt A*, 103:458-464.
- Ornoy A, et al. 2020. The effects of drugs used for the treatment of attention deficit hyperactivity disorder (ADHD) on pregnancy outcome and breast feeding: a critical review. *Curr Neuropharmacol*, Online ahead of print.
- Pottegard A, et. al. 2014. First-trimester exposure to methylphenidate: a population-based cohort study. *J Clin Psychiatry*, 75(1):e88-93.
- Spigset O, et. al. 2007. Excretion of methylphenidate in breast milk. *Am J Psychiatry*, 164:348.
- Suarez, EA, et al. 2024. Prescription stimulant use during pregnancy and risk of neurodevelopmental disorders in children. *JAMA Psychiatry*, e235073.
- Szpunar MJ, et al. 2023. Risk of major malformations in infants after first-trimester exposure to stimulants. *J Clin Psychopharmacol*, 43:326-332.
- Upadhyaya HP, et al. 2003. Neuroendocrine and behavioral responses to dopaminergic agonists in adolescents with alcohol abuse. *Psychopharmacology (Berl)* 166:95-101.
- Wajnberg R, et. al. 2011. Pregnancy outcome after in-utero exposure to methylphenidate: a prospective comparative cohort study. *Repro Tox*, 31:255-268.

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ACE Inhibitors

Selected References:

- Diav-Citrin et al. 2003. Pregnancy outcome after gestational exposure to loratadine or antihistamines: a prospective controlled cohort study. *J Allergy Clin Immunol* 111(6):1239-1243.
- Gilboa SM, et al. 2009. National Birth Defects Prevention Study: Use of antihistamine medications during early pregnancy and isolated major malformations. *Birth Defects Res A Clin Mol Teratol* 85(2):137-150.
- Gilboa SM, et al. 2014. Antihistamines and birth defects: a systematic review of the literature. *Expert Opin Drug Saf* 13(12): 1667-1698.
- Gonzalez-Estrada A et al. 2016. Allergy medications during pregnancy. *American J Med Sci* 352(3):326-331.
- Hilbert J, et al. 1988. Excretion of loratadine in human breast milk. *J Clin Pharmacol* 28:234-239.
- Kallen, B. 2005. Methodologic issues in the epidemiologic study of the teratogenicity of drugs. *Congenit Anom (Kyoto)* 45: 44-51.
- Kallen B, Otterblad Olausson P. 2001. Monitoring of maternal drug use and infant congenital malformations. Does loratadine cause hypospadias? *Int J Risk Saf Med* 14(3-4):115-119.
- Kallen B, Otterblad Olausson P. 2006. No increased risk of infant hypospadias after maternal use of loratadine in early pregnancy. *Int J Med Sci* 3(3):106-107.
- Keles N. 2004. Treatment of allergic rhinitis during pregnancy. *Am J Rhinol* 18(1):23-28.
- Li Q, et al. 2013. Assessment of antihistamine use in early pregnancy and birth defects. *J Allergy Clin Immunol Pract.* 1(6):666-74.e1.
- Med Lett Drugs Ther. 2019. OTC drugs for seasonal allergies; 61(1570):57-60.
- Merlob P, Stahl B. 2002. Prospective follow-up of adverse reactions in breast-fed infants exposed to loratadine treatment (1999-2001). *BENTIS Newsletter* Number 10: 43-51.
- Moretti M, et al. 2003. Fetal safety of loratadine use in the first trimester of pregnancy: A multicenter study. *J Allergy Clin Immunol.* 111(3) 479-483.
- Pedersen L, et al. 2006b. Maternal use of loratadine during pregnancy and risk of hypospadias in offspring. *Int J Med Sci* 3(1) 21-25.
- Schwarz EB et al. 2008. Risk of hypospadias in offspring of women using loratadine during pregnancy: a systematic review and meta-analysis. *Drug Saf* 31(9):775-788.

- Werler M, et al. 2004. Evaluation of an association between loratadine and hypospadias – United States, 1997-2001. *MMWR* 53(10):219-221.

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Selected References:

- Bjørk M. et al. 2002. Association of Prenatal Exposure to Antiseizure Medication With Risk of Autism and Intellectual Disability. *JAMA Neurol.* 79(7):672-681. doi:10.1001/jamaneurol.2022.1269
- Blotiere PO. et al. 2020. Risk of early neurodevelopmental outcomes associated with prenatal exposure to the antiepileptic drugs most commonly used during pregnancy: a French nationwide population-based cohort study. *BMJ Open* 10(6).
- Brannon, GE. et al. 2000. Anorgasmia in a patient with bipolar disorder type 1 treated with gabapentin. *J Clin Psychopharmacol.* 20(3):379-81.
- Carrasco M, et al. 2015. Neonatal gabapentin withdrawal syndrome. *Pediatr Neurol.* 53:445-447
- Desrochers, B. et al. 2024. Risks of congenital malformations and neonatal intensive care unit admissions with gabapentin use in pregnancy: A cohort study and scoping review with meta-analysis. *Paediatr Perinat Epidemiol.* 38,6: 486-494. doi:10.1111/ppe.13086
- FDA Drug Label. Gabapentin. Food and Drug Administration. Updated date: 2025-05-23.
- Fujii H. et al. 2013. Pregnancy outcomes following gabapentin use: results of a prospective comparative cohort study. *Neurology.* 80(17):1565-1570. doi:10.1212/WNL.0b013e31828f18c1
- Grant AC. 2002. Gabapentin-induced anorgasmia in women. *Am J Psychiatry.* 159(7):1247.
- Hernandez-Diaz S. et al., 2025. Use of Antiseizure Medications Early in Pregnancy and the Risk of Major Malformations in the Newborn. *Neurology.* 12;105(3): e213786. doi: 10.1212/WNL.0000000000213786.
- Huybrechts, KF. et al. (2017). Risk of neonatal drug withdrawal after intrauterine co-exposure to opioids and psychotropic medications: cohort study. *Bmj.* 2017;358:j3326. doi:10.1136/bmj.j3326.

- Johannessen SI, Helde G, Brodtkorb E. Levetiracetam concentrations in serum and in breast milk at birth and during lactation. *Epilepsia*. 2005;46:775–7.
- Kaufman KR, Struck PJ. 2011. Gabapentin-induced sexual dysfunction. *Epilepsy Behav*. 21(3):324-6.
- Kristensen JH. et al. 2006. Gabapentin and breastfeeding: A case report. *J Hum Lact*. 22:426–8.
- Linnebank M, et al. 2011. Antiepileptic drugs interact with folate and vitamin B12 serum levels. *Ann Neurol*; 69(2):352-9.
- Loudin, S, et al. 2017. An Atypical Withdrawal Syndrome in Neonates Prenatally Exposed to Gabapentin and Opioids. *Clinical and Laboratory Observations*. 181:286-288.
- Ohman I. et al. 2005. Pharmacokinetics of gabapentin during delivery, in the neonatal period, and lactation: Does a fetal accumulation occur during pregnancy? *Epilepsia*. 46:1621–4.
- Ohman I. et al. 2009. Gabapentin kinetics during delivery, in the neonatal period, and during lactation. *Epilepsia*. 50 (Suppl. 10):108. Abstract.
- Pack AM. et al. 2024. Teratogenesis, perinatal, and neurodevelopmental outcomes after in utero exposure to antiseizure medication: practice guideline from the AAN, AES, and SMFM. *Neurology*. 102(11):e209279.
- Patorno E, et al. 2020. Gabapentin in pregnancy and the risk of adverse neonatal and maternal outcomes: A population-based cohort study nested in the US Medicaid Analytic eXtract dataset. *PLoS Med*. 17(9):e1003322.

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