

Nitrofurantoin

Selected References:

- Ailes EC, et al, & The National Birth Defects Prevention Study. 2016. Association between antibiotic use among pregnant women with urinary tract infections in the first trimester and birth defects, National Birth Defects Prevention Study 1997 to 2011. *Birth Defects Res A Clin Mol Teratol*; 106(11):940-949.
- Ansaldi Y, et al. 2023. Urinary tract infections in pregnancy. *Clin Microbiol Infect*; 29(10):1249-1253.
- Ben David S, et al. 1995. The safety of nitrofurantoin during the first trimester of pregnancy: meta-analysis. *Fundam Clin Pharmacol*; 9(5):503-507.
- Boissiere-O'Neill T, et al. 2025. Exposure to Systemic Antimicrobials During Pregnancy and Risk of Miscarriage: A Population-Based Registry Study. *BJOG*: doi: 10.1111/1471-0528.18155. Online ahead of print.
- Bookstaver PB, et al. 2015. A Review of Antibiotic Use In Pregnancy. *Pharmacotherapy*, 35(11):1052-1062.
- Bruel H, et al. 2000. Anémie hémolytique chez un nouveau-né après prise maternelle de nitrofurantoïne en fin de grossesse [Hemolytic anemia in a newborn after maternal treatment with nitrofurantoin at the end of pregnancy]. *Arc Pédiatr*; 7(7):745-747.
- Chang E, et al. 2005. Urinary Tract Infections are Associated with an Increased Risk of Preeclampsia. *American Journal of Obstetrics and Gynecology*, 193(6):S71.
- Christensen B. 2000. Which antibiotics are appropriate for treating bacteriuria in pregnancy? *J Antimicrob Chemother*; 46 Suppl A:29-34.
- Crider KS, et al. 2009. Antibacterial medication use during pregnancy and risk of birth defects: National Birth Defects Prevention Study. *Arch Pediatr Adolesc Med*; 163(11):978-985.
- Czeizel AE, et al. 2001. Nitrofurantoin and congenital abnormalities. *Eur J Obstet Gynecol Rep Biol*; 95(1):119-126.
- Damkier P, et al. 2019. In utero exposure to antibiotics and risk of congenital malformations: a population-based study. *Am J Obstet Gynecol*; 221(6):648.e1-648.e15.
- de Jonge L, et al. 2013. Identifying associations between maternal medication use and birth defects using a case-population approach: an exploratory study on signal detection. *Drug Saf*; 36(11):1069-1078.
- Gardner JS, et al. 1998. Maternal exposure to prescription and non-prescription pharmaceuticals or drugs of abuse and risk of craniosynostosis. *Int J Epidemiol*; 27(1):64-67.
- Gerk PM, et al. 2001. Active transport of nitrofurantoin into human milk. *Pharmacotherapy*; 21(6):669-675.
- Goldberg O, et al. 2013. Exposure to nitrofurantoin during the first trimester of pregnancy and the risk for major malformations. *J Clin Pharmacol*. 53(9):991-995.
- Goldberg O, et al. 2015. Exposure to nitrofurantoin during early pregnancy and congenital malformations: a systematic review and meta-analysis. *J Obstet Gynaecol Can*; 37(2):150-156.
- Hailey FJ, et al. 1983. Foetal safety of nitrofurantoin macrocrystals therapy during pregnancy: a retrospective analysis. *J Int Med Res*; 11(6):364-369.
- Hjorth S, et al. 2022. Prenatal exposure to nitrofurantoin and risk of childhood leukaemia: a registry-based cohort study in four Nordic countries. *Int J Epidemiol*; 51(3):778-788.
- Källén BAJ, Olausson PO. 2003. Maternal drug use in early pregnancy and infant cardiovascular defect. *Rep Toxicol*; 17(3):255-261.
- Källén B, Robert-Gnansia E. 2005. Maternal drug use, fertility problems, and infant craniostenosis. *Cleft Palate Craniofac J*; 42(6):589-593.
- Kass EH. 1960. Bacteriuria and pyelonephritis of pregnancy. *Arch Intern Med*; 105:194-198.
- Laspro M, et al. 2025. Association of commonly prescribed antepartum medications and incidence of orofacial clefting. *Cleft Palate Craniofac J*; 62(7):1164-1174.
- Lenke RR, et al. 1983. Pyelonephritis in pregnancy: a prospective randomized trial to prevent recurrent disease

evaluating suppressive therapy with nitrofurantoin and close surveillance. Am J Obstet Gynecol; 146(8):953-957.

- Lind JN. 2012. Maternal Medication Use and Risk of Hypospadias – An Exposure Spectrum Approach. Georgia State University, Thesis.
- Lumbiganon P, et al. & World Health Organization Asymptomatic Bacteriuria Trial Group. 2009. One-day compared with 7-day nitrofurantoin for asymptomatic bacteriuria in pregnancy: a randomized controlled trial. Obst Gynecol; 113(2 Pt 1):339-345.
- Macrobid® Medication label.
<https://dailymed.nlm.nih.gov/dailymed/fda/fdaDrugXsl.cfm?setid=8f270a9f-12a1-44d4-bc7e-873613555801&type=display>.
- McGrady GA, et al. 1985. Maternal urinary tract infection and adverse fetal outcomes. Am J Epidemiol; 121(3):377-381.
- Miller JE, et al. 2013. Maternal Use of Antibiotics and the Risk of Childhood Febrile Seizures: A Danish Population-Based Cohort. PloS One; 8(4):e61148.
- Nelson WO & Bunge RG. 1957. The effect of therapeutic dosages of nitrofurantoin (furadantin) upon spermatogenesis in man. J Urol; 77(2):275-281.
- Osmundson SS, et al. 2025. First-Trimester Antibiotic Use for Urinary Tract Infection and Risk of Congenital Malformations. JAMA Netw Open; 8(7):e2519544.
- Patel J, et al. & National Birth Defects Prevention Study. 2023. Fever and antibiotic use in maternal urinary tract infections during pregnancy and risk of congenital heart defects: Findings from the National Birth Defects Prevention Study. Birth Defects Res; 116(1):e2281
- Patel J, et al. 2024. Fever and antibiotic use in maternal urinary tract infections during pregnancy and risk of congenital heart defects: Findings from the National Birth Defects Prevention Study. Birth Defects Res; 116(1):e2281.
- Philpot J, et al. 1995. Congenital symmetrical weakness of the upper limbs resembling brachial plexus palsy: a possible sequel of drug toxicity in first trimester of pregnancy? Neuromuscul Disord; 5(1):67-69.
- Puhó EH, et al. 2007. Drug treatment during pregnancy and isolated orofacial clefts in Hungary. Cleft Palate Craniofac J; 44(2):194-202.
- The American College of Obstetrics and Gynecology (ACOG). 2023. Urinary Tract Infections in Pregnant Individuals. Obstet Gynecol; 142(2):435-445.
- Zao J, et al. 2014. Using nitrofurantoin while breastfeeding a newborn. Can Fam Physician; 60(6):539-540.

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Selected References:

- Alzahrani MA, et al. 2023 Effect of St. John's wort (*Hypericum perforatum* L.) on Male Sexual and Reproductive Health: A Narrative Review. *Biomedicines*. 11(10):2800.
- Barrett B, et al. 1999. Assessing the risks and benefits of herbal medicine: An overview of scientific evidence. *Altern Ther Health Med* 5(4):40-49.
- Clauson KA, et al. 2008. Clinically relevant safety issues associated with St. John's wort product labels. *BMC Complement Altern Med*; 8:42.
- Fetrow CW and Avila JR. 1999. *Professional's Handbook of Complementary and Alternative Medicines*. Springhouse, PA: Springhouse Corporation.
- Grush LE, et al. 1998. St. John's wort During Pregnancy. *JAMA* 280(18):1566.
- Kaygusuz M, et al. 2021. TCM use in pregnant women and nursing mothers: A study from Turkey. *Complement Ther Clin Pract*. 42:101300.
- Klier CM, et al. 2006. St. John's wort (*Hypericum perforatum*) and breastfeeding: plasma and breast milk concentrations of hyperforin for 5 mothers and 2 infants. *J Clin Psychiatry*. 67(2):305-309.
- Kolding L, et al. 2015. *Hypericum perforatum* use during pregnancy & pregnancy outcome. *Reprod Toxicol*; 58:234-7.
- LeeA, et al. 2003. The safety of St. John's wort (*Hypericum perforatum*) during Breast-feeding. *J Clin Psychiatry* 64(8):966-968.
- McCloskey LR, et al. 2021. Contraception for Women with Psychiatric Disorders. *Am J Psychiatry*; 178(3):247-255.
- Moretti ME, et al. 2009 Evaluating the safety of St. John's wort in human pregnancy. *Reprod Toxicol*. 28(1):96-99.
- Nordeng H and Havnen GC. 2004. Use of herbal drugs in pregnancy: a survey among 400 Norwegian women. *Pharmacoepidemiol Drug Safety* 13:371-380.
- Ondrizek RR, et al. 1999. Inhibition of human sperm motility by specific herbs used in alternative medicine. *J Assist Reprod Genet* 16(2):87-91.
- Schafer W, et al. 2021. Characterization of pregnancies exposed to St. John's wort and their outcomes: A claims data analysis. *Reprod Toxicol* 102:90-97.
- Spiess D, et al. 2022. Advanced in Vitro Safety Assessment of Herbal Medicines for the Treatment of Non-Psychotic Mental Disorders in Pregnancy. *Front Pharmacol*. 13:882997.
- United States Food and Drug Administration (FDA). 2021. Dietary Supplements. Available at: <https://www.fda.gov/consumers/consumer-updates/dietary-supplements>.
- United States Food and Drug Administration (FDA). 2024. Dietary Supplements. Available at: <https://www.fda.gov/food/dietary-supplements>.

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Nitrofurantoin

Selected References:

- Anderka M, et al. 2012. Medications used to treat nausea and vomiting of pregnancy and the risk of selected birth defects. *Birth Defects Res A Clin Mol Teratol*. Jan;94(1):22-30.
- Bartfai Z, et al. 2008. A population-based case-control teratologic study of promethazine use during pregnancy. *Reprod Toxicol*. 25:276-285.
- Corby DG, Shulman I. 1971. The effects of antenatal drug administration on aggregation of platelets of newborn infants. *J Pediatr*. 79:307-313.
- Czeizel AE, et al. 1999. The effect of diazepam and promethazine treatment during pregnancy on the somatic development of human offspring. *Neurotoxicol Teratol*. 21(2):157-167.
- 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.
- Hall PF. 1987. Use of promethazine (Phenergan) in labour (letter). *Can Med Assoc J*; 136:690-691.
- Heinonen OP, et al. 1997. *Birth Defects and Drugs in Pregnancy*, Littleton, Publishing Sciences Group, pp 323-324, 437.
- Hildebrandt HM. 1999. Maternal perception of lactogenesis time: a clinical report. *J Hum Lact*. 15:317-323.
- Kullander S, Källén B. 1976. A prospective study of drugs and pregnancy. II. Anti-emetic drugs. *Acta Obstet Gynecol Scand*. 55(2):105-111.
- Larrimer MB, et al. 2014. Antiemetic medications in pregnancy: a prospective investigation of obstetric and neurobehavioral outcomes. *Am J Obstet Gynecol* 270: e1-e7.
- Messinis IE, et al. 1985. Histamine H1 receptor participation in the control of prolactin secretion in postpartum. *J Endocrinol Invest*. 8:143-146.
- Ngo E, et al. 2022. Antihistamine use during breastfeeding with focus on breast milk transfer and safety in humans: A systematic literature review. *Basic Clin Pharmacol Toxicol*. 130(1): 171-181.
- Petik D, et al. 2008. A study of the potential teratogenic effect of large doses of promethazine used for a suicide attempt by 32 pregnant women. *Toxicol Ind Health*; 24(1-2):87-96.
- Petik D, et al. 2012. A study of the risk of mental retardation among children of pregnant women who have attempted suicide by means of a drug overdose. *J Inj Violence Res*. Jan;4(1):10-19.
- Schrager NL, et al. 2021. Trends in first-trimester nausea and vomiting of pregnancy and use of select

treatments: Findings from the National Birth Defects Prevention Study. *Paediatr Perinat Epidemiol*. 2021 Jan;35(1):57-64.

- Starke PR, et al. 2005. Boxed warning added to promethazine labeling for pediatric use. *NEJM* 2005;352:2653.
- Whaun JM, et al. 1980. Effect of prenatal drug administration on maternal and neonatal platelet aggregation and PF4 release. *Haemostasis*; 9:226-237.

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Selected References:

- Abheiden CNH, et al. 2024. Systemic lupus erythematosus is associated with an increased frequency of spontaneous preterm births: systematic review and meta-analysis. *Am J Obstet Gynecol*, 231(4):408-416.e21.
- Acevedo M, et al. 2017. Breastfeeding initiation, duration, and reasons for weaning in patients with systemic lupus erythematosus. *Rheumatol Int*, 37(7):1183-1186.
- Akbari A, et al. 2025. Recurrent pregnancy loss and fetal complete heart block as the initial manifestations of maternal systemic lupus erythematosus: a case report on the diagnostic and preventive role of anti-SSA (Ro) antibodies. *BMC Pregnancy Childbirth*, 25(1):731.
- Alamdarloo SM, et al. 2025. Beyond the autoimmune spectrum, evaluating ovarian health in systemic lupus erythematosus patients: a case-control study. *Health Sci Rep*, 8(12):e71597.
- Alonaizan A, et al. 2024. Hyperlipidemia in Saudi Arabian patients with systemic lupus erythematosus. *Cureus*, 16(11):e74653.
- Al Rayes H, et al. 2024. Adverse impact of systemic lupus erythematosus on pregnancy outcomes: a Saudi Arabia retrospective multi-center study. *Open Access Rheumatol*, 16:31-41.
- Alrifai N, et al. 2025. Maternal and fetal outcomes in those with autoimmune connective tissue disease. *Clin Rheumatol*, 44(1):391-401.
- American Institute of Ultrasound in Medicine. 2020. AIUM practice parameter for the performance of fetal

echocardiography. *J Ultrasound Med*, 39(1): E5-16.

- Andreatidis B, et al. 2025. Thrombotic thrombocytopenic purpura in pregnancy: a case report and literature review. *Obstet Med*, 1753495X251338163.
- Arkema EV, et al. 2016. What to expect when expecting with systemic lupus erythematosus (SLE): a population-based study of maternal and fetal outcomes in SLE and pre-SLE. *Arthritis Care Res*, 68:988-994.
- Authreya A J, et al. 2022. Fetal flat-facies on prenatal ultrasound: is it chondrodysplasia punctata? A retrospective chart review of 62 fetuses. *Journal of Fetal Medicine*, 9(02):35-43.
- Bedoya-Loaiza JE, et al. 2025. Maternal and fetal outcomes in pregnant patients with systemic lupus erythematosus: a study from a Latin American developing country. *Lupus*, 34(8):864-873.
- Blask AR. 2018. Severe nasomaxillary hypoplasia (Binder phenotype) on prenatal US/MRI: an important marker for the prenatal diagnosis of chondrodysplasia punctata. *Pediatric radiology*, 48(7):979-991.
- Buyon JP, et al. 2015. Predictors of pregnancy outcomes in patients with lupus: a cohort study. *Ann Intern Med*, 163:153-163.
- Cadir EK, et al. 2024. The effect of lupus on pregnancy and the foetus: should we really be worried? A single-centre retrospective study. *Mediterr J Rheumatol*, 35(3):464-468.
- Carvalheiras G, et al. 2010. Pregnancy and systemic lupus erythematosus: review of clinical features and outcome of 51 pregnancies at a single institution. *Clin Rev Allergy Immunol*, 38(2-3):302-306.
- Cha JH, et al. 2023. The risk of pediatric cardiovascular diseases in offspring born to mothers with systemic lupus erythematosus: a nationwide study. *Front Pediatr*, 11:1294823.
- Clowse ME, et al. 2008. A national study of the complications of lupus in pregnancy. *Am J Obstet Gynecol*, 199:127 e1-6.
- Collison J. 2018. Systemic lupus erythematosus: effects of disease activity on pregnancy outcomes. *Nat Rev Rheumatol*, 14(1):4.
- Cortés-Hernández J, et al. 2002. Clinical predictors of fetal and maternal outcome in systemic lupus erythematosus: a prospective study of 103 pregnancies. *Rheumatology*, 41(6):643-650.
- Davidov D, et al. 2021. Maternal systemic lupus erythematosus (SLE) high risk for preterm delivery and not for long-term neurological morbidity of the offspring. *Journal of Clinical Medicine*, 10(13):2952.
- de Rezende RPV, et al. 2025. Tripled and sustained change in pregnancy-related annual mortality rates with systemic lupus erythematosus involvement: a nationwide temporal trends study, Brazil, 2006-2022. *Adv Rheumatol*, 65(1):12.
- Dhital R, et al. Adverse pregnancy outcomes across SLE subgroups: significance of cardiovascular events. *Lupus Sci Med*, 12(1):e001507.
- Diaz T, et al. 2025. Long-term outcomes of children born to anti-Ro antibody-positive mothers with and without rheumatic disease. *Arthritis Care Res (Hoboken)*, 77(7):848-854.
- Do SC, et al. 2020. Does hydroxychloroquine protect against preeclampsia and preterm delivery in systemic lupus erythematosus pregnancies? *Am J Perinatol*, 37(9):873-880.
- Dong Y, et al. 2019. Preeclampsia in systemic lupus erythematosus pregnancy: a systematic review and meta-analysis. *Clin Rheumatol*, 39(2):319-325.
- Du Y, et al. 2024. Primary ovarian insufficiency consequence of autoimmune diseases: a bidirectional two-sample Mendelian randomization study. *Front Endocrinol (Lausanne)*, 15:1417896.
- Ekblom-Kullberg S, et al. 2009. Reproductive health in women with systemic lupus erythematosus compared to population controls. *Scand J Rheumatol*, 38(5):375-380.
- Elahi T, et al. 2024. Relationship of lupus nephritis and pregnancy: a narrative review. *World J Nephrol*, 13(4):99700.
- Elfving P, et al. 2024. Pregnancies in patients with systemic lupus erythematosus during 2000-2018 in Finland: a case-control study. *Rheumatol Int*, 44(6):1101-1109.
- Fang QY, et al. 2025. Pregnancy outcomes and risk factors for thrombocytopenia in pregnant patients with systemic lupus erythematosus. *BMC Pregnancy Childbirth*, 25(1):344.
- Fu PH, et al. 2024. Neonatal sex and maternal factors associated with small-for-gestational-age neonates: a nationwide population-based study. *Health Sci Rep*, 7(9):e70093.

- Fu W, et al. 2026. Clinical features of non-criteria obstetric antiphospholipid syndrome: a retrospective cohort study on antibody-based risk classification and pregnancy outcomes. *BMC Pregnancy Childbirth*, 26(1):139.
- Giannakaki AG, et al. 2025. Current approaches to the management of rheumatic diseases in pregnancy: risk stratification, therapeutic advances, and maternal-fetal outcomes. *J Pers Med*, 15(9):406.
- Gereade A, et al. 2025. Systemic lupus erythematosus in pregnancy. *Med Sci (Basel)*, 13(3):174.
- Hammam N, et al. 2026. Machine learning-based identification of factors associated with spontaneous abortion in patients with Systemic lupus erythematosus (SLE): Insights from the Egyptian College of Rheumatology (ECR)-SLE cohort. *Lupus*, 9612033261415984.
- Handa R, et al. 2006. Systemic lupus erythematosus and pregnancy. *J Assoc Physicians India*, 54(1):19-21.
- Hartanto AI, et al. 2025. Postpartum uterine atony complicating labor in a patient with systemic lupus erythematosus: a case report. *SAGE Open Med Case Rep*, 13:2050313X251344026.
- He L, et al. 2025. Impact of disease activity on pregnancy outcomes and risk factors for fetal loss in systemic lupus erythematosus: a single-center cohort study. *Ginekol Pol*, 96(8):661-669.
- Hwang YM, et al. 2024. Maternal-fetal outcomes in patients with immune-mediated inflammatory diseases, with consideration of comorbidities: a retrospective cohort study in a large U.S. healthcare system. *EClinicalMedicine*, 68:102435.
- Isojima S, et al. 2024. Pregnancy outcomes in Australian patients with systemic lupus erythematosus. *Intern Med J*, 54(11):1876-1882.
- Khalayli N, et al. 2025. Lupus pneumonitis in neonatal lupus: a case report. *J Med Case Rep*, 19(1):489.
- Khamashta MA. 2006. Systemic lupus erythematosus and pregnancy. *Best Pract Res Clin Rheumatol*, 20(4):685-694.
- Khanmirzaei A, et al. 2025. Diffuse alveolar haemorrhage as the initial presentation of systemic lupus erythematosus possibly triggered by Rhogam injection in a 24-year-old pregnant woman: a case report. *Mod Rheumatol Case Rep*, 9(2):rxaf001.
- Khogali HI, et al. 2023. Maternal and fetal health outcomes in systemic lupus erythematosus pregnancies in the Emirati population: a comparative study. *Lupus*, 32(12):1453-1461.
- Knudsen SS, et al. 2019. Maternal rheumatoid arthritis and systemic lupus erythematosus and risk of cryptorchidism and hypospadias in boys: a Danish nationwide study. *Rheumatology (Oxford)*, 59(8):1871-1877.
- Kothari R, et al. 2016. Reproductive health in systemic lupus erythematosus, an experience from government hospital in Western India. *J Assoc Physicians India*, 64(12):16-20.
- Kumar A, et al. 2025. Postpartum renal cortical necrosis: experience from a tertiary care center in India. *J Nephrol*, 38(6):1609-1618.
- Lang T, et al. 2024. Investigation of the causal relationship between autoimmune diseases and premature ovarian insufficiency. *Reprod Sci*, 32(1):176-186.
- Limquiaco KNY, Salido EO. 2024. Complete congenital heart block in the offspring of an asymptomatic woman with isolated high titer anti-Ro antibody. *Acta Med Philipp*, 58(1):84-89.
- Liu H, et al. 2025. Risk factors for adverse maternal and fetal outcomes in SLE patients: a systematic review and meta-analysis. *Front Med (Lausanne)*, 12:1573573.
- Liu L, et al. 2025. Risk stratification and subgroup analysis of systemic lupus erythematosus patients with pregnancy: based on a 13-year multicenter cohort study. *Clin Rheumatol*, 44(10):3909-3921.
- Lucas AM, et al. 2025. Second trimester kidney function and adverse pregnancy outcomes among patients with lupus. *Kidney360*, 6(6):983-996.
- Ma J, et al. 2024. High-risk groups of neonatal lupus erythematosus in term infants: a birth cohort study. *Eur J Pediatr*, 183(1):149-155.
- Ma J, et al. 2025. Long-term follow-up of offspring of mothers with systemic lupus erythematosus: an observational study. *Clin Rheumatol*, doi: 10.1007/s10067-025-07893-z. Epub ahead of print.
- Madazli R, et al. 2010. Systemic lupus erythematosus and pregnancy. *J Obstet Gynaecol*, 30(1):17-20.
- Marder W. 2014. Increased usage of special educational services by children born to mothers with systemic lupus erythematosus and antiphospholipid antibodies. *Lupus Sci Med*, 1(1):e000034.

- Martín-Portugués M, et al. 2025. Elevated pre-eclampsia risk in lupus nephritis and antiphospholipid syndrome: a nationwide Spanish registry analysis. *Rheumatology (Oxford)*, keaf484.
- Martinez-Rueda JO, et al. 1996. Factors associated with fetal losses in severe systemic lupus erythematosus. *Lupus*, 5(1):113-119.
- Mathesan M, Ethirajan S. 2024. Triumph over adversity: a comprehensive case series on successful pregnancy outcomes in antiphospholipid antibody (APLA)-positive patients. *Cureus*, 16(4):e59088.
- Misztal MC, et al. 2025. Genetics of neonatal lupus erythematosus risk and specific manifestations. *J Rheumatol*, 52(1):52-57.
- Mohan P, et al. 2025. Pregnancy outcomes in women with systemic lupus erythematosus (SLE): a matched-observational study from India. *Int J Rheum Dis*, 28(6):e70328.
- Mok CC, et al. 2001. Pregnancy in systemic lupus erythematosus. *Postgrad Med J*, 77(1):157-165.
- Moyer A, Edens C. 2024. Impact of systemic lupus erythematosus on conception: insights into infertility, fertility preservation, assisted reproductive technology, and pregnancy outcomes. *Semin Reprod Med*, 42(3):209-227.
- Murari K, et al. 2025. Congenital complete heart block requiring temporary pacemaker placement at birth: a case report. *Semin Cardiothorac Vasc Anesth*, 29(3):219-224.
- Murvai VR, et al. 2025. Antiphospholipid syndrome in pregnancy: a comprehensive literature review. *BMC Pregnancy Childbirth*, 25(1):337.
- Nalli C, et al. 2017. Long-term neurodevelopmental outcome of children born to prospectively followed pregnancies of women with systemic lupus erythematosus and/or antiphospholipid syndrome. *Lupus*, 26(5):552-558.
- Ndarugendamwo AM, et al. 2025. Massively elevated sFlt1/PIGF in a pregnant patient with fetal growth restriction and perinatal death in the context of a systemic lupus erythematosus. *BMJ Case Rep*, 18(2):e258131.
- Nossent JC, et al. 2024. Comparison of pregnancy outcomes between indigenous and non-indigenous lupus patients. *Intern Med J*, 54(9):1465-1470.
- Nusbaum J, et al. 2020. Breast feeding in the systemic lupus erythematosus patient. *Lupus*, 29(10):1314-1315..
- Nusbaum JS, et al. 2020. Sex differences in systemic lupus erythematosus: epidemiology, clinical considerations, and disease pathogenesis. *Mayo Clin Proc*, 95(2):384-394.
- Petri M, et al. 1991. Frequency of lupus flare in pregnancy. The Hopkins lupus pregnancy experience. *Arthritis Rheum*, 34(1):1538.
- Petri M. 2000. Systemic lupus erythematosus: women's health issues. *Bull Rheum Dis*, 49(1):1-3.
- Petri M. 2020. Pregnancy and systemic lupus erythematosus. *Best Pract Res Clin Obstet Gynaecol*, 64:24-30.
- Phansenee S, et al. 2018. Pregnancy outcomes among women with systemic lupus erythematosus: a retrospective cohort study from Thailand. *Lupus*, 27(1):158-164.
- Polić A, Običan SG. 2020. Pregnancy in systemic lupus erythematosus. *Birth Defects Res*, 112(15):1115-1125.
- Repicky J, et al. 2025. Spontaneous conversion of fetal heart block to sinus rhythm post externalized pacemaker placement in an undiagnosed mother with lupus antibodies. *J Matern Fetal Neonatal Med*, 38(1):2428390.
- Rezaieyazdi Z, et al. 2024. Clinical and serological findings of patients with antiphospholipid syndrome in Mashhad, Iran, from 2008 to 2018: a retrospective, descriptive, cross-sectional study. *Eur J Rheumatol*, 11(4):390-398.
- Saavedra MÁ, et al. 2024. Active but not quiescent lupus nephritis during pregnancy is associated with a higher rate of adverse obstetric outcomes: analysis of a prospective cohort. *Int J Gynaecol Obstet*, 167(1):420-426.
- Sapantzoglou I, et al. 2023. Congenital heart block and its association with anti-Ro and anti-La antibodies in pregnancy: a case report of a rare entity and a review of the current evidence. *Cureus*, 15(9):e45832.
- Shao S, et al. 2025. The long-term development outcomes of the offspring born to patients with systemic lupus erythematosus: a cross-sectional study. *Eur Child Adolesc Psychiatry*, 34(8):2359-2368.
- Sieiro Santos C, et al. 2025. Pregnancy outcomes in connective tissue diseases: a 30-year study of 465 cases from a single-center Spanish registry with insights on hydroxychloroquine use. *ARP Rheumatol*, 4(1):29-36.

- Silver R, et al. 2023. Society for Maternal-Fetal Medicine Consult Series# 64: Systemic lupus erythematosus in pregnancy. J of Obstet Gynecol, 228(3):B41-B60.
- Silverman E & Jaeggi E. 2010. Non-cardiac manifestations of neonatal lupus erythematosus. Scand J Immunol, 72(3):223-225.
- Singh AG & Chowdhary VR. 2014. Pregnancy-related issues in women with systemic lupus erythematosus. Int J Rheum Dis, 18(2):172-181.
- Skorpen CG, et al. 2018. Influence of disease activity and medications on offspring birth weight, pre-eclampsia and preterm birth in systemic lupus erythematosus: a population-based study. Ann Rheum Dis, 77(2):264-269.
- Smyth A, et al. 2010. A systematic review and meta-analysis of pregnancy outcomes in patients with systemic lupus erythematosus and lupus nephritis. Clin J Am Soc Nephrol, 5:2060-2068.
- Soares PM, et al. 2007. Gonad evaluation in male systemic lupus erythematosus. Arthritis Rheum, 56(7):2352-2361.
- Suehiro RM, et al. 2008. Testicular Sertoli cell function in male systemic lupus erythematosus. Rheumatology (Oxford), 47:1692-1697.
- Sammaritano LR, et al. (2020). 2020 American College of Rheumatology guideline for the management of reproductive health in rheumatic and musculoskeletal diseases. Arthritis care & research, 72(4):461-488.
- Shahwar DE, et al. 2024. A comparison of obstetric outcomes in antiphospholipid syndrome among pregnant women with systemic lupus erythematosus. Cureus, 16(6):e62126.
- Sun C, et al. 2025. Risk factors for adverse pregnancy outcomes in systemic lupus erythematosus: a meta-analysis and systematic review. Arch Gynecol Obstet, 312(4):1025-1036.
- Sun W, et al. 2025. Neonatal lupus erythematosus: an acquired autoimmune disease to be taken seriously. Ann Med, 57(1):2476049.
- Sun W, et al. 2025. IgG-associated hypocomplementemia in neonatal lupus: a retrospective multicenter study. J Inflamm Res, 11:18:3419-3429.
- Sun W, et al. 2025. Neonatal lupus erythematosus presenting with congenital heart block: clinical characteristics and follow-up. Clin Rheumatol, 44(4):1581-1587.
- Tan EM, et al. 1982. The 1982 revised criteria for the classification of systemic lupus erythematosus. Arthritis Rheum, 25(1):1271.
- Tan Z, et al. 2024. Causal pathways in preeclampsia: a Mendelian randomization study in European populations. Front Endocrinol (Lausanne), 15:1453277.
- Tang P, et al. 2025. Case Report: Siblings with neonatal lupus erythematosus. Front Pediatr, 13:1518881.
- Teng YKO, et al. 2018. An evidence-based approach to pre-pregnancy counseling for patients with systemic lupus erythematosus. Rheumatology (Oxford), 57(10):1707-1720.
- Thanh CM, et al. 2025. A multi-institutional case series of neonatal lupus erythematosus without cardiac involvement from Vietnam. Case Rep Pediatr, 2025:5727878.
- Tiseo, BC, et al. 2019. Complete urological evaluation including sperm DNA fragmentation in male systemic lupus erythematosus patients. Lupus, 28(1):59-65.
- Turgay B, et al. 2025. Inflamed pathways to motherhood: evaluating obstetric and neonatal outcomes in rheumatic pregnancies. J Clin Med, 14(16):5692.
- Vinet E. 2014. Neurodevelopmental disorders in children born to mothers with systemic lupus erythematosus. Lupus, 23(11):1099-1104.
- Wang QH, et al. 2026. Current risk factors for male infertility and semen parameters: an umbrella review of systematic reviews and meta-analyses. Asian J Androl, doi: 10.4103/aja202552. Epub ahead of print.
- Wichert-Schmitt B, et al. 2025. Pericardial tamponade in pregnancy due to undiagnosed systemic lupus erythematosus: a case report. Eur Heart J Case Rep, 9(9):ytaf388.
- Xu Y, et al. 2025. Pregnancy characteristics of patients with systemic lupus erythematosus with different onset times and their risk of adverse pregnancy outcomes: a retrospective cohort study. Lupus Sci

Med, 12(1):e001529.

- Xu Y, et al. 2025. Predictors of adverse pregnancy outcomes in systemic lupus erythematosus: a retrospective cohort study. Clin Rheumatol, doi: 10.1007/s10067-025-07882-2. Epub ahead of print.
- Yang MJ, et al. 2015. Pregnancy outcome of systemic lupus erythematosus in relation to lupus activity before and during pregnancy. J Chin Med Assoc, 78(4):235-240.
- Yang X. 2022. Clinical features, autoantibodies, and outcome of neonatal lupus erythematosus. Fetal and Pediatric Pathology, 41(3):436-442.
- Zhang X, et al. 2024. Autoimmune diseases and risk of gestational diabetes mellitus: a Mendelian randomization study. Acta Diabetol, 61(2):161-168.
- Zheng L, et al. 2025. The impact of early pregnancy disease control in systemic lupus erythematosus patients receiving comprehensive pharmaceutical care on pregnancy outcomes and offspring long-term health. BMC Pregnancy Childbirth, 25(1):1035.
- Zhu S, et al. 2024. Systemic lupus erythematosus and pregnancy complications and outcomes: a Mendelian randomization study and retrospective validation. Int J Womens Health, 16:891-902.
- Zhu T, et al. 2024. Causal relationship between systemic lupus erythematosus and adverse pregnancy outcomes: a two-sample Mendelian randomized study. Heliyon, 10(15):e35401.
- Zou X, et al. 2025. Bibliometric analysis of systemic lupus erythematosus during pregnancy from 2003 to 2024. Immunol Med, 48(4):318-334.

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Selected References:

- Almgren M, et al. 2009. Population-based study of antiepileptic drug exposure in utero-influence on head circumference in newborns. *Seizure*, 18(10):672-5.
- Alvarez I, et al. 2025. Breastfed infants exposed to lamotrigine faced a low risk of toxic effects. *Acta Paediatr.* 114(2):346-354. doi:10.1111/apa.17432
- American College of Obstetricians and Gynecologists. 2017. Neural tube defects. Practice Bulletin No. 187. *Obstet Gynecol* 130(6):e279–e290.
- An K, Xu J, Xi Y, et al. 2026. Analysis of ASMs and male infertility using the FDA adverse event reporting system (FAERS). *Front Public Health*. 13:1738546.
- Arfman IJ, et al. 2020. Therapeutic drug monitoring of antiepileptic drugs in women with epilepsy before, during, and after pregnancy. *Clin Pharmacokinet*, 59(4):427-445.
- Asranna A, et al. 2018. Do anti-epileptic drug modifications after first trimester of pregnancy influence fetal malformation or cognitive outcome? *Epilepsy Research*, 146: 121-125.
- Ban L, et al. 2015. Congenital anomalies in children of mothers taking antiepileptic drugs with and without periconceptional high dose folic acid use: a population-based cohort study. *PLoS One*, 10(7): e0131130.
- Battino D, et al. 2024. Risk of Major Congenital Malformations and Exposure to Antiseizure Medication Monotherapy. *JAMA Neurology*. doi:10.1001/jamaneurol.2024.0258.
- Bech LF, et al. 2018. In utero exposure to antiepileptic drugs is associated with learning disabilities among offspring. *Journal of Neurology, Neurosurgery & Psychiatry*, 89(12): 1324-1331.
- Berry-Noronha A, et al. 2025. Risk of adverse pregnancy outcomes associated with antiseizure medications and their indications: A systematic review and meta-analysis. *Neurology*. 104(3):e210233.
- Birnbaum AK, et al. 2020. Antiepileptic drug exposure in infants of breastfeeding mothers with epilepsy. *JAMA Neurology*, 77(4): 441-450.
- Bjork MH, et al. 2022. Association of prenatal exposure to antiseizure medication with low risk of autism and intellectual disability. *JAMA Neurology*, 79(7):672-681.
- Blotière PO, et al. 2019. Risks of 23 specific malformations associated with prenatal exposure to 10 antiepileptic drugs. *Neurology*, 93(2):e167-e180.
- Borthen I. 2015. Obstetrical complications in women with epilepsy. *Seizure*, 28: 32-34.
- Bromley RL, et al. 2013. The prevalence of neurodevelopmental disorders in children prenatally exposed to antiepileptic drugs. *Journal of Neurology, Neurosurgery & Psychiatry*, 84(6): 637-643.
- Bromley RL, et al. 2018. Fetal antiepileptic drug exposure and cognitive outcomes. *Seizure*, 44:225-231.
- Bromley R, et al. 2022. Monotherapy treatment of epilepsy in pregnancy: congenital malformation outcomes in the child. *Cochrane Database of Systematic Reviews*, 8(8):CD010224.
- Bromley RL, et al. 2023. Neurodevelopment of babies born to mothers with epilepsy: a prospective observational cohort study. *Epilepsia*, 64:2454-2471.
- Christensen J, et al. 2024. Dreier JW. Prenatal exposure to antiseizure medications and fetal growth: a population-based cohort study from the Nordic countries. *Lancet Reg Health Eur*. 38:100849.
- Clark CT, Wisner KL. 2018. Treatment of Peripartum Bipolar Disorder. *Obstet Gynecol Clin North Am*, 45(3):403-417.
- Cohen-Israel M, et al. 2018. Short-and long-term complications of in utero exposure to lamotrigine. *British Journal of Clinical Pharmacology*, 84(1): 189-194.
- Cohen JM, et al. 2019. Anticonvulsant mood stabilizer and lithium use and risk of adverse pregnancy outcomes. *J Clin Psych*, 80(4):18m12572.
- Cohen JM, et al. 2023. Comparative safety of antiseizure medication monotherapy for major malformations. *Ann Neurol*, 93:551-562.
- Coste J, et al. 2020. Risk of neurodevelopmental disorders associated with in utero exposure to valproate and other antiepileptic drugs: a nationwide cohort study in France. *Scientific Reports*, 10(1):17362.
- Couper RG, et al. 2025. Effects of antiseizure medications on sexual hormones and functions in males with epilepsy: A systematic review and meta-analysis. *Epilepsia*. 66(8):2639-56.
- Cummings C, et al. 2011. Neurodevelopment of children exposed in utero to lamotrigine, sodium valproate and

carbamazepine. *Archives of Disease in Childhood*, 96(7):643-647.

- den Besten-Bertholee D, et al. 2025. Mian P. Lamotrigine use in lactating women: Passage into breast milk and infant exposure. *Ther Drug Monit*. 47(3):317-319.
- Deshmukh U, et al. 2016. Behavioral outcomes in children exposed prenatally to lamotrigine, valproate, or carbamazepine. *Neurotoxicol Teratol*, 54:5-14.
- Diav-Citrin O, et al. 2017. Is it safe to use lamotrigine during pregnancy? A prospective comparative observational study. *Birth Defects Res* 1,09:1196-1203.
- Dolk H, et al. 2008. Does lamotrigine use in pregnancy increase orofacial cleft risk relative to other malformations? *Neurology*, 71:714-722.
- Dolk H, et al. 2016. Lamotrigine use in pregnancy and risk of orofacial cleft and other congenital anomalies. *Neurology*, 86(18):1716-1725.
- Dreier JW, et al. 2023. Prenatal exposure to antiseizure medication and incidence of childhood- and adolescence-onset psychiatric disorders. *JAMA Neurology*, 80(6):568-577.
- Dudukina E, et al. 2023. Prenatal exposure to pregabalin, birth outcomes and neurodevelopment – a population-based study in four Nordic countries. *Drug Safety*, 46:661-675.
- Fantaneau TA, et al. 2023. Real-world practices for the care of women with epilepsy during pregnancy: a Canadian perspective. *Epilepsy and Behavior*, 148:109468.
- Gerard EE, et al. 2015. An update on maternal use of antiepileptic medications in pregnancy and neurodevelopment outcomes. *Journal of Pediatric Genetics*, 4(2):94-110.
- Gómez-Ramiro M, et al. 2019. Adverse outcomes during pregnancy and major congenital malformations in infants of patients with bipolar and schizoaffective disorders treated with antiepileptic drugs: a systematic review. *Psychiatr Pol*, 53(2):223-244.
- Harden CL, et al. 2009. Practice parameter update: management issues for women with epilepsy—focus on pregnancy (an evidence-based review): vitamin K, folic acid, blood levels, and breastfeeding: report of the Quality Standards Subcommittee and Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology and American Epilepsy Society. *Neurology*, 73:142-149.
- Hernandez-Diaz S, et al. 2017. Fetal growth and premature delivery in pregnant women on antiepileptic drugs. *Ann Neurol*, 82(3):457-465.
- Hernandez-Diaz S, et al. 2025. Use of antiseizure medications early in pregnancy and the risk of major malformations in the newborn. *Neurology*. 105(3):e213786.
- Herzog AG, 2008. Disorders of reproduction in patients with epilepsy: primary neurological mechanisms. *Seizure*, 17(2):101-110.
- Hoeltzenbein M, et al. 2024. Antiepileptic treatment with levetiracetam during the first trimester and pregnancy outcome: an observational study. *Epilepsia*, 65(1):26-36.
- Holmes LB, et al. 2011. Fetal effects of anticonvulsant polytherapies. *Arch Neurol*, 68(10):1275-1281.
- Huber-Mollema Y, et al. 2020. Neurocognition after prenatal levetiracetam, lamotrigine, carbamazepine or valproate exposure. *Journal of Neurology*, 267:1724-1736.
- Huber-Mollema Y, et al. 2019. Behavioral problems in children of mothers with epilepsy prenatally exposed to valproate, carbamazepine, lamotrigine, or levetiracetam monotherapy. *Epilepsia*, 60:1069-1082.
- Husebye ES, et al. 2018. Verbal abilities in children of mothers with epilepsy: association to maternal folate status. *Neurology*, 91:e811-21.
- Jazayeri D, et al. 2018. Outcomes of pregnancies in women taking antiepileptic drugs for non-epilepsy indications. *Seizure*, 56: 111-114.
- Kaciroya I, et al. 2019. A short communication: lamotrigine levels in milk, mothers, and breastfed infants during the first postnatal month. *Therapeutic Drug Monitoring*, 41(3):401-404.
- Kaciroya I, et al. 2022. Monitoring of lamotrigine concentrations in mothers, colostrum, and breastfed newborns during the early postpartum period. *Biomedicine and Pharmacotherapy*, 151:113167.
- Khan SJ, et al. 2016. Bipolar disorder in pregnancy and postpartum: principles of management. *Curr Psychiatry Rep*, 18(2):13.

- Kohn E, et al. 2022. Magnitude of lamotrigine exposure through breastfeeding. *Breastfeeding Medicine*, 17(4):341-348.
- Kuang H, et al. 2024. Reproductive and fetal outcomes in women with epilepsy: a systematic review and meta-analysis. *J Matern Fetal Neonatal Med*. 37(1):2351196.
- Kuczynska J, et al. 2019. Comparison of plasma, saliva, and hair lamotrigine concentrations. *Clinical Biochemistry*. 74:24-30.
- Laspro M, et al. 2025. Association of commonly prescribed antepartum medications and incidence of orofacial Clefting. *Cleft Palate Craniofac J*. 62(7):1164-74
- Larcin L, et al. 2024. Real-world assessment of psychotropic and antiepileptic drug use during pregnancy in Belgium: Trends, predictors, and comparative risk of congenital anomalies (2010-2016). *Pharmacoepidemiol Drug Saf*. 33(10):e70021.
- Leutritz AL, et al. 2022. Psychotropic medication in pregnancy and lactation and development of exposed children. *Br J Clin Pharmacol*, 89(2):737-750.
- Li X, et al. 2024. Drug-associated congenital anomalies of the external ear identified in the United States food and drug administration adverse event reporting system database. *Scientific Rep*. 14(1):23624. doi:10.1038/s41598-024-74744-3
- Li Y, Meador KJ. 2022. Epilepsy and pregnancy. *Continuum (Minneap Minn)*, 28(1):34-54.
- MacEachern DB, et al. 2019. Infertility, impaired fecundity, and live birth/pregnancy ratio in women with epilepsy in the USA: findings of the Epilepsy Birth Control Registry. *Epilepsia*, 60(9):1993-1998.
- McVearry KM, et al. 2009. A prospective study of cognitive fluency and originality in children exposed in utero to carbamazepine, lamotrigine, or valproate monotherapy. *Epilepsy Behav*, 16(4):609-616.
- Meador K, et al. 2011. Foetal antiepileptic drug exposure and verbal versus non-verbal abilities at three years of age. *Brain*, 134:396-404.
- Meador KJ, et al. 2014. Breastfeeding in children of women taking antiepileptic drugs: cognitive outcomes at age 6 years. *JAMA Pediatr*, 168(8):729-736.
- Meador KJ, et al. 2025. Neuropsychological outcomes in 6-year-old children of women with epilepsy: A prospective nonrandomized clinical trial. *JAMA Neurology*. 82(1):30-39.
- Meng Q, et al. 2026. Prenatal exposure to antiseizure medications and risk of autism spectrum disorder in offspring: an integrated pharmacovigilance and two-sample mendelian randomization study. *Epilepsy Res*. 222:107756.
- Montouris G, et al. 2005. Reproductive and sexual dysfunction in men with epilepsy. *Epilepsy & Behavior*, 7:7-14.
- Mostacci B, et al. 2018. Emilia-Romagna study on pregnancy and exposure to antiepileptic drugs (ESPEA): a population-based study on prescription patterns, pregnancy outcomes and fetal health. *J Neurol Neurosurg Psychiatry*, 89:983-988.
- Newport DJ, et al. 2008. Lamotrigine in breast milk and nursing infants: determination of exposure. *Pediatrics*, 122(1):e223-231.
- Nordmo E, et al. 2009. Severe apnea in an infant exposed to lamotrigine in breast milk. *Ann Pharmacother*, 43:1893-1897.
- Ohman I, et al. 2000. Lamotrigine in pregnancy: pharmacokinetics during delivery, in the neonate, and during lactation. *Epilepsia*, 41:709-713.
- Pack AM, et al. 2025. Teratogenesis, perinatal, and neurodevelopmental outcomes after in utero exposure to antiseizure medication. *Epilepsy curr*. 15357597241258514.
- Pariente G, et al. 2017. Pregnancy outcomes following in utero exposure to lamotrigine: a systematic review and meta-analysis. *CNS Drugs*, (6):439-450.
- Paulzen M, et al. 2015. Lamotrigine in pregnancy – therapeutic drug monitoring in maternal blood, amniotic fluid, and cord blood. *Int Clin Psychopharmacol*, 30(5):249-254.
- Pekoz MT, et al. Birth outcomes in pregnant women with epilepsy: A nationwide multicenter study from Türkiye. *Epilepsia*, 64:2310-2321.

- Prakash C, et al. 2016. Maternal and fetal outcomes after lamotrigine use in pregnancy: a retrospective analysis from an urban maternal mental health centre in New Zealand. *Psychopharmacol Bull*, 46(2):63-69.
- Razaz N, et al. 2017. Association between pregnancy and perinatal outcomes among women with epilepsy. *JAMA Neurology*, 74(8):983-991.
- Ren T, et al. 2023. Prenatal carbamazepine exposure and academic performance in adolescents: a population-based cohort study. *Neurology*, 100(7):e728-e738.
- Richards N, et al. 2019. Developmental outcomes at age four following maternal antiepileptic drug use. *Epilepsy & Behavior*, 93:73-79.
- Rihtman T, et al. 2013. Developmental outcomes at preschool age after fetal exposure to valproic acid and lamotrigine: cognitive, motor, sensory and behavioral function. *Reprod Toxicol*, 41:115-125.
- Semet M, et al. 2017. The impact of drugs on male fertility: a review. *Andrology*, 5(4):640-663.
- Schmidt CT, et al. 2023. Transfer of anticonvulsants and lithium into amniotic fluid, umbilical cord blood & breast milk: a systematic review & combined analysis. *Prog Neuropsychopharmacol Biol Psychiatry*, 124:110733.
- Shi X, et al. 2022. Effects of antiepileptic drugs polytherapy on pregnancy outcomes in women with epilepsy: an observation study in northwest China. *Epilepsy Behav*, 135:108904.
- Stjerna S, et al. 2024. Cognitive outcomes after fetal exposure to carbamazepine, lamotrigine, valproate or levetiracetam monotherapy: Data from the EURAP neurocognitive extension protocol. *Epilepsy Behav*. 159:110024.
- Thomas SV, et al. 2017. Malformation risk of antiepileptic drug exposure during pregnancy in women with epilepsy: results from a pregnancy registry in South India. *Epilepsia*, 58:274-281.
- Thomas SV, et al. 2022. Differential impact of antenatal exposure to antiseizure medications on motor and mental development in infants of women with epilepsy. *Discord*, 24(3):531-540.
- Tomson T, et al. 2011. Dose-dependent risk of malformations with antiepileptic drugs: an analysis of data from the EURAP epilepsy and pregnancy registry. *Lancet Neurol*, 10(7):609-617.
- Tomson T, et al. 2018. Comparative risk of major congenital malformations with eight different antiepileptic drugs: a prospective cohort study of the EURAP registry. *Lancet neurol*, 17(6):530-538.
- Tomson T, et al. 2019. Declining malformation rates with changed antiepileptic drug prescribing: an observational study. *Neurology*, 93(9):e831-e840.
- Vajda FJ, et al. 2013. Lamotrigine in epilepsy, pregnancy and psychiatry—a drug for all seasons? *Journal of Clinical Neuroscience*. 20(1):13-16.
- Vajda FJ, et al. 2019. Antiepileptic drugs and foetal malformation: analysis of 20 years of data in a pregnancy register. *Seizure*, 65:6-11.
- Vajda F, et al. 2025. Balancing foetal disadvantage and seizure freedom in women capable of pregnancy – the Australian pregnancy register experience. *Epilepsy Behav*. 172:110663.
- Vajda FJ, et al. 2025. Is lamotrigine a teratogen? *Seizure*. 126:1-5. doi:10.1016/j.seizure.2025.01.019
- Vajda FJE, et al. 2026. Lamotrigine as an antiseizure medication in pregnancy. *Seizure*. 136:18-22.
- Veiby G, et al. 2013. Early child development and exposure to antiepileptic drugs prenatally and through breastfeeding: a prospective cohort study on children of women with epilepsy. *JAMA Neurol*, 70:1367-1374.
- Veiby G, et al. 2015. Epilepsy and recommendations for breastfeeding. *Seizure*, 28:57-65.
- Velez-Ruiz NJ, et al. 2015. Neurodevelopmental effects of fetal antiepileptic drug exposure. *Drug Safety*, 38(3): 271-278.
- Veroniki AA, et al. 2017. Comparative safety of anti-epileptic drugs during pregnancy: a systematic review and network meta-analysis of congenital malformations and prenatal outcomes. *BMC Medicine*, 15(1):95.
- Vieta E, et al. Lamotrigine efficacy, safety, and tolerability for women of childbearing age with bipolar disorder: meta-analysis from four randomized, placebo-controlled maintenance studies. *European Neuropsychopharmacology*, 78:81-92.
- Wakil L, et al. 2009. Neonatal outcomes with the use of lamotrigine for bipolar disorder in pregnancy and breastfeeding: a case series and review of the literature. *Psychopharmacol Bullb* 42:91-98.

- Wang E, et al. 2025. Comparative safety of antipsychotic medications and mood stabilizers during pregnancy: A systematic review and network meta-analysis of congenital malformations and prenatal outcomes. *CNS Drugs*. 39(1):1-22
- Wang Q, et al. 2024. Investigation of spontaneous abortion and stillbirth adverse events in epilepsy patients treated with levetiracetam: A pharmacovigilance study. *Epilepsy Behav*. 160:110077.
- Wiggs KK, et al. 2020. Antiseizure medication use during pregnancy and risk of ASD and ADHD in children. *Neurology*, 95:e3232-e3240.
- Yeh TC, et al. 2021. Bipolar women's antepartum psychotropic exposure and offspring risk of attention-deficit/hyperactivity disorder and autism spectrum disorder. *Journal of Affective Disorders*, 295:1407-1414.
- Zeng Y, et al. 2025. Safety concerns of maternal antiseizure medications exposure on perinatal and offspring outcomes: a disproportionality analysis based on FDA adverse event reporting system. *J Neurol*. 272(6):429.
- Zhao ZL, et al. 2025. Maternal exposure to lamotrigine and the risk of orofacial clefts in offspring: A systematic review and meta-analysis. *Seizure*. 131:67-72. doi:10.1016/j.seizure.2025.06.005.

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