Metformin

Selected References:

- Abolhassani N, et al. 2023. Major malformations risk following early pregnancy exposure to metformin: a systematic review and meta-analysis. BMJ Open Diab Res Care: 11(1):e002919.
- Bhorat I, et al. 2019. Assessment of the fetal myocardial performance index in well-controlled gestational diabetics & to determine whether it is predictive of adverse perinatal outcome. Pediatr Cardiol. 40(7):1460–1467.
- Boggess KA, et al. 2023. Metformin plus insulin for preexisting diabetes or gestational diabetes in early pregnancy: The MOMPOD randomized clinical trial. JAMA. 330(22):2182-2190.
- Brand KMG, et al. 2022. Metformin in pregnancy and risk of adverse long-term outcomes: a register-based cohort study. BMJ Open Diab Res Care. 10(1): e002363.
- Brand KM, et al. 2022. Metformin in pregnancy and risk of abnormal growth outcomes at birth: a register-based cohort study. BMJ Open Diab Res Care: 10(6), e003056.
- Briggs GG, et al. 2005. Excretion of metformin into breast milk and the effect on nursing infants. Obstet Gynecol 105(6):1437-1441.
- Cassina M, et al. 2014. First-trimester exposure to metformin and risk of birth defects: a systematic review and meta-analysis. Hum Reprod Update. 20(5):656-669.
- Coetzee EJ, et al. 1980. Pregnancy in established non-insulin-dependent diabetics: A five-and-a-half year study at Groote Schuur Hospital. S Afr Med J. 58(20):795-802.
- Coetzee EJ, et al. 1984. Oral hypoglycaemics in the first trimester and fetal outcome. S Afr Med J. 65(16):635-637.
- Dhulkotia JS, et al. 2010. Oral hypoglycemic agents vs insulin in management of gestational diabetes: a systematic review and metaanalysis. Am J Obstet Gynecol. 203(5):457.e1-9.
- Diav-Citrin O, et al. 2018. In-utero exposure to metformin for type 2 diabetes or polycystic ovary syndrome: A prospective comparative observational study. Reprod Toxicol. 80:85-91.
- Farladansky-Gershnabel S, et al. 2025. Predictors of small-for-gestational-age infants in gestational diabetes mellitus: the impact of metformin use. Arch Gynecol Obstet. 312(2):445-450.
- Feig DS, et al. 2007. Oral antidiabetic agents in pregnancy and lactation: a paradigm shift? Ann Pharmacother. 41(7):1174-1180.
- Feig DS, et al. 2023. Outcomes in children of women with type 2 diabetes exposed to metformin versus placebo during pregnancy (MiTy Kids): a 24-month follow-up of the MiTy randomised controlled trial. Lancet Diabetes Endocrinol. 11(3):191–202.
- Filippi-Arriaga F, et al. 2025. EASO Position Statement: Women with Obesity across the Reproductive Life – Fertility, Preconception, Pregnancy, Postpartum, and Breastfeeding. Obes Facts. 18(6):625-639.
- Fornes R, et al. 2022. Pregnancy, perinatal and childhood outcomes in women with and without polycystic ovary syndrome and metformin during pregnancy: a nationwide population-based study. Reprod Biol Endocrinol. 20(1):30.
- Gardiner SJ, et al. 2003. Transfer of metformin into human milk. Clin Pharmacol Ther. 73(1):71-77.
- Ghazeeri GS, et al. 2012. Pregnancy outcomes and effect of metformin treatment in women with polycystic ovary syndrome: an overview. Acta Obstet Gynecol Scand. 91(6):658–678.
- Gilbert C, et al. 2006. Pregnancy outcome after first-trimester exposure of metformin: a meta-analysis. Fertil Steril. 86(3):658-663.
- Glueck CJ, et al. 2001. Continuing metformin throughout pregnancy in women with polycystic ovary syndrome appears to safely reduce first-trimester spontaneous abortion: a pilot study. Fertil Steril. 75(1):46-52.
- Glueck CJ, et al. 2002. Pregnancy outcomes among women with polycystic ovary syndrome treated with metformin. Hum Reprod 17(11):2858-2864.

- Glueck CJ, et al. 2004. Height, weight, and motor-social development during the first 18 months of life in 126 infants born to 109 mothers with polycystic ovary syndrome who conceived on and continued metformin through pregnancy. Hum Reprod. 19(6):1323-1330.
- Glueck CJ, et al. 2006. Growth, motor, and social development in breast- and formula-fed infants of metformin-treated women with polycystic ovary syndrome. J Pediatr 148(5):628-632.
- Glueck CJ et al. 2008. Prevention of gestational diabetes by metformin plus diet in patients with polycystic ovary syndrome. Fertil Steril 89:625-634.
- Glueck CJ, et al. 2013. Effects of metformin-diet intervention before and throughout pregnancy on obstetric and neonatal outcomes in patients with polycystic ovary syndrome. Current Med Res Opin. 29(1): 55-62.
- Greger HK, et al. 2020. Cognitive function in metformin exposed children, born to mothers with PCOS-follow-up of an RCT. BMC Pediatr. 20(1):60.
- Gordon HG, et al. 2024. Metformin in pregnancy and childhood neurodevelopmental outcomes: a systematic review and meta-analysis. Am J Obstet Gynecol. 231(3):308-314.
- Jakubowicz D, et al.. 2002. Effects of metformin on early pregnancy loss in the polycystic ovary syndrome, J Clin Endocrinol Metab. 87(2): 524-529.
- Meek CL. 2023. An unwelcome inheritance: childhood obesity after diabetes in pregnancy. Diabetologia, 66(11), 1961-1970.
- Newman C, et al.. 2022. Metformin for pregnancy and beyond: the pros and cons. Diabet Med. 39(3):e14700.
- Newman C, et al. 2024. Treatment of diabetes in pregnancy with metformin. Obstet Gynecol. 144(5):660-669.
- Panchaud A, et al. 2018. Pregnancy outcomes in women on metformin for diabetes or other indications among those seeking teratology information services. Br J Clin Pharmacol. 84(3):568-578.
- Paschou SA, et al. 2024. Efficacy and safety of metformin during pregnancy: an update. Endocrine. 83(2):259-269.
- Picon-Cesar MJ, et al 2021. Metformin for gestational diabetes study: metformin vs insulin in gestational diabetes: glycemic control and obstetrical and perinatal outcomes: randomized prospective trial. Am J Obstet Gynecol. 225(5):517.e1-517.e17.
- Rotem RS, et al. 2024. paternal use of metformin during the sperm development period preceding conception and risk for major congenital malformations in newborns. Ann Intern Med. 177(7):851-861.
- Tarry-Adkins J, et al. 2019. Neonatal, infant, and childhood growth following metformin versus insulin treatment for gestational diabetes: A systemic review and meta-analysis. PLoS Med. 16(8): e1002848.
- Tavlo M, et al. 2022. Hypothesis: Metformin is a potential reproductive toxicant. Front Endocrinol (Lausanne). 13: 1000872.
- Tosti G, et al. 2023. Lights and shadows on the use of metformin in pregnancy: from the preconception phase to breastfeeding and beyond. Front Endocrinol (Lausanne). 14: 1176623.
- Tseng CH. 2022. The effect of metformin on male reproductive function and prostate: An updated review. World J Mens Health. *40*(1): 11-29.
- Wensink MJ, et al. Preconception antidiabetic drugs in men and birth defects in offspring: a nationwide cohort study. Ann Intern Med. 2022;175(5):665-673.
- Wouldes TA, et al. 2016 Neurodevelopmental outcome at 2 years in offspring of women randomised to metformin or insulin treatment for gestational diabetes. Arch Dis Child Fetal Neonatal Ed. 101(6):F488-F493.
- Yanachkova VE, et al. 2024. Metformin-associated maternal and neonatal outcomes in women with gestational diabetes – a retrospective cohort study. Ginekol Pol. 95(4):259-265.
- Yland JJ, et al. 2024. Perinatal outcomes associated with metformin use during pregnancy in women with pregestational type 2 diabetes mellitus. Diabetes Care. 47(9):1688-1695.
- Yu YH, et al. 2025. Metformin and risk of adverse pregnancy outcomes among pregnant women with gestational diabetes in the United Kingdom: A population-based cohort study. Diabetes Obes Metab. 27(2):976-986.

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Metformin

Selected References:

- Bellomo C, et al. 2019. A newborn infected by Andes virus suggests novel routes of hantavirus transmission: a case report. Clin Microbiol Infect; 26(1):130-131.
- Centers for Disease Control and Prevention. 2024. About Hantavirus. Available at: https://www.cdc.gov/hantavirus/about/index.html. [Accessed May 7, 2026].
- Centers for Disease Control and Prevention. 2026. Clinician Brief: Hantavirus Pulmonary Syndrome (HPS). Available at: https://www.cdc.gov/hantavirus/hcp/clinical-overview/hps.html. [Accessed May 31, 2026].
- Centers for Disease Control and Prevention. 2024. Hantavirus Prevention. Available at: https://www.cdc.gov/hantavirus/prevention/index.html. [Accessed May 7, 2026].
- Centers for Disease Control and Prevention. 2026. About Andes Virus. Available at: https://www.cdc.gov/hantavirus/about/andesvirus.html. [Accessed May 13, 2026].
- Douglas KO, Gittens-St Hilaire M. 2024. First clinical reports of acute hantavirus and dengue infections among pregnant women in the Caribbean. Infect Dis (Lond); 56(7):564-574.
- Ferrés M, et al. 2020. Mother-to-Child Transmission of Andes Virus through Breast Milk, Chile1. Emerg Infect Dis;'. (8):1885-1888.
- Führer A, et al. 2012. Hantavirusinfektion durch Dobrava-Belgrad-Virus bei einer schwangeren Patientin im 3. Trimenon [Hantavirus infection due to Dobrava-Belgrade virus in a third trimester pregnant woman]. Dtsch Med Wochenschr. 137(46):2369-72. German.
- Georges CG, et al. 2008. Nephropathia epidemica als Folge einer Puumala-Virus-Infektion bei einer schwangeren Patientin [Nephropathia epidemica as the result of a Puumala virus infection in a pregnant patient]. Dtsch Med Wochenschr. 133(37):1830-2. German.
- Gilson GJ, et al. 1994. Hantavirus pulmonary syndrome complicating pregnancy. Am J Obstet Gynecol. 171(2):550-4.
- Hofmann J, et al. 2012. Hantavirus infections by Puumala or Dobrava-Belgrade virus in pregnant women. J Clin Virol; 55(3):266-9, 2012
- Howard MJ, et al. 1999. Hantavirus pulmonary syndrome in pregnancy. Clin Infect Dis; 29(6):1538-44.
- Janwadkar RS, et al. 2025. Unexpected Challenges: A Case Report of Hantavirus Infection in a Pregnant Patient in a Rural Emergency Department. J Emerg Med; 77:84-88.

- Ji F, et al. 2017. Hemorrhagic fever with renal syndrome caused by Hantaan virus infection in four pregnant Chinese women. J Med Virol. 89(10):1865-1870.
- Kim BN, Choi BD. 2006. Hemorrhagic fever with renal syndrome complicated with pregnancy: a case report. Korean J Intern Med. Jun;21(2):150-3.
- Latus J, et al. 2013. The case: fever, myalgia, visual disorders, and acute kidney failure in a pregnant woman. Diagnosis: Severe acute hantavirus infection. Kidney Int. 84(3):629-31.
- Liu XL, et al. 2017. Epidemic hemorrhagic fever complicated with late pregnancy: A case report. Medicine (Baltimore); 96(40):e8137.
- Lu DH, et al. 2021. Hantavirus infection during pregnancy. Virol Sin 36(3):345-353. Erratum in: Virol Sin; 36(4):829.
- Lu DH, et al. 2021. Correction to: Hantavirus infection during pregnancy. Virol Sin; 36(4):829.
- Ma RM, et al. 2003. Hemorrhagic fever with renal syndrome presenting with intrauterine fetal death. A case report. J Reprod Med. 48(8):661-4.
- Macé G, et al. 2013. Severe Seoul hantavirus infection in a pregnant woman, France, October 2012. Euro Surveill; 18(17):20464.Silberberg L, et al. 1993. Haemorrhagic fever with renal syndrome and pregnancy: a case report. Trans R Soc Trop Med Hyg; 87(1):65.
- Todorović Z, et al. 2010. Hemorrhagic fever with renal syndrome during pregnancy: case report. Med Pregl; 63(3-4):280-4.
- Ying X, et al. 2020. Continuous renal replacement therapy rescues severe haemorrhagic fever with renal syndrome in pregnancy: a case report. BMC Infect Dis. 20(1):920.
- Züst, R., et al. 2023. Presence and persistence of Andes Virus RNA in human semen. Viruses, 15(11), 2266.

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Metformin

Selected References:

- Andrade C. 2020. Major Congenital Malformation Risk After First Trimester Gestational Exposure to Oral or Intravenous Ondansetron. J Clin Psychiatry;81(3):20f13472
- 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; 94(1):22–30.
- Briggs GG, Freeman RK. 2014. Drugs in Pregnancy and Lactation. 10th edition. Philadelphia, PA: Wolters Kluwer (online version).
- Cao X, et al. 2022. Risk of abnormal pregnancy outcomes after using ondansetron during pregnancy: A systematic review and meta-analysis. Front Pharmacol, 13(951072).
- Cohen R, et al. 2014. Intestinal obstruction in pregnancy by ondansetron. Reprod Toxicol. 2014 Oct 24;50C:152-153.
- Cho Y,et al. 2025. Antiemetic use during pregnancy and child neurodevelopment: population-based birth cohort study. BMC medicine, *23*(1), 667.
- Colvin L, et al. 2013. Off-label use of ondansetron in pregnancy in Western Australia. Biomed Res Int. 2013:909860.
- Danielsson B, Wikner BN, Kallen B. 2014. Use of ondansetron during pregnancy and congenital malformations in the infant. Reprod Toxicol 50:134-7.
- Diav-Citrin O, et al. 2017. Pregnancy outcome following in utero exposure to ondansetron: A prospective comparative, observational cohort study. Reprod Toxicol; 72:203.
- Dormuth CR, et al; Canadian Network for Observational Drug Effect Studies (CNODES) Investigators. 2021. Comparison of Pregnancy Outcomes of Patients Treated with Ondansetron vs Alternative Antiemetic Medications in a Multinational, Population-Based Cohort. JAMA Netw Open; 4(4):e215329.
- Einarson AK, et al. 2004. The safety of ondansetron for nausea and vomiting of pregnancy: a prospective comparative study. BJOG;111:940-3.
- Elkomy MH, et al. 2015. Ondansetron pharmacokinetics in pregnant women and neonates: towards a new treatment for neonatal abstinence syndrome. Clin Pharmacol Ther. 97:167-76.
- Fejzo MS, et al. 2016. Ondansetron in pregnancy and risk of adverse fetal outcomes in the United States. Reprod Toxicol 62: 87-91.
- Food and Drug Administration. 2012. FDA Drug Safety Communication: New information regarding QT prolongation with ondansetron (Zofran). https://downloads.regulations.gov › FDA-2016-N-2462-0013 › content.pdf. Accessed 2018, 2022, and 2026.
- Huybrechts KF, et al. 2018. Association of Maternal First-Trimester Ondansetron Use With Cardiac Malformations and Oral Clefts in Offspring. JAMA, *320*(23), 2429–2437.
- Jelting Y, et al. 2017. Preventing nausea and vomiting in women undergoing regional anesthesia for cesarean section: Challenges and solutions. Local Reg Anesth, 10:83–90.
- Kaplan YC, et al. 2019. Use of ondansetron during pregnancy and the risk of major congenital malformations: A systemic review and meta-analysis. Reprod Toxicol; 86 Jun:1-13.
- Larrimer MB, et al. 2014. Antiemetic medications in pregnancy: a prospective investigation of obstetric and neurobehavioral outcomes. Am J Obstet Gynecol 210 (3): 270. e1-7
- Laspro M, et al. 2025. Association of Commonly Prescribed Antepartum Medications and Incidence of Orofacial Clefting. The Cleft palate-craniofacial journal : official publication of the American Cleft Palate-Craniofacial Association, *62*(7), 1164–1174
- Lavecchia M, et al. 2018. Ondansetron in Pregnancy and the Risk of Congenital Malformations: A Systematic Review. J Obstet Gynaecol Can. 40(7):910-918.
- Lemon LS, et al. 2020. Ondansetron use in the first trimester of pregnancy and the risk of neonatal ventricular

septal defect. Int J Epidemiol;49(2):648-656.

- Masarwe S, et al. 2023. Ondansetron use during pregnancy: Birth defects and obstetric outcomes. Clin Nurs Res, 32(4):705-711.
- Pasternak B. 2013. Ondansetron in pregnancy and risk of adverse fetal outcomes. N Engl J Med 368:814-823.
- Picot C, et al. 2020. Risk of malformation after ondansetron in pregnancy: An updated systemic review and meta-analysis. Birth Defects Res;112(13):996-1013.
- Reis ACC, et al. 2023. Safety evaluation of ondanstron after gestational exposure on male reproductive parameters in rats. Regul Toxicol Pharmacol, 137:105302.
- Sakran R, et al. 2021. Pregnancy outcome following in-utero exposure to ondansetron: A prospective comparative observational study. Reprod Toxicol; 99:9-14.
- Schrager NL, et al. 2023. The association of nausea and vomiting of pregnancy, its treatments, and select birth defects: Findings from the National Birth Defect Prevention Study. Birth Defects Res, 115(3):275-289.
- Sillis L, et al.2026. Medications for Nausea and Vomiting of Pregnancy and the Risks for Adverse Birth Outcomes. Pharmacoepidemiology and drug safety, *35*(4), e70367.
- Suarez EA, et al. 2021. Ondansetron use in early pregnancy and the risk of late pregnancy outcomes. Pharmacoepidemiol Drug Saf; 30(2):114-125.
- Suarez EA, et al. 2021. Ondansetron use in early pregnancy and the risk of miscarriage. Pharmacoepidemiol Drug Saf; 30(2):103-113.
- Tolchinsky I, et al. 2026 Another prospective study on the safety of ondansetron for nausea and vomiting of pregnancy: addressing ongoing concerns. Front. Pharmacol. 17:1783632.
- Yang J, 2026. Ondansetron Use for Women With Hyperemesis Gravidarum and Risks of Spontaneous Abortion and Stillbirth: A Retrospective Cohort Study. Pharmacoepidemiology and drug safety, *35*(2), e70335.
- Zhao W, et al. 2020. Retrospective comparison of the safety and effectiveness of dexmedetomidine versus standard of care before and during cesarean delivery in a maternity unit in Zhengzhou, China. Med Sci Monit, 26:e925709.

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Metformin

Selected References:

- Andersen JB, et al. 2023. Pregnancy outcomes after early fetal exposure to injectable first-line treatments, dimethyl fumarate, or natalizumab in Danish women with multiple sclerosis. European journal of neurology; 30(1), 162–171.
- Bast N, et al. 2024. Impact of disease-modifying therapies on pregnancy outcomes in multiple sclerosis: a prospective cohort study from the German multiple sclerosis and pregnancy registry. Lancet Reg Health Eur; 48: 101137.
- Ciplea AI, et al. 2020. Exposure to natalizumab during pregnancy and lactation is safe -Commentary. Multiple sclerosis (Houndmills, Basingstoke, England); 26(8), 892–893.
- D'Amico E, et al. 2021. Male fertility in relapsing-remitting multiple sclerosis patients treated with natalizumab and ocrelizumab: A prospective case-control study. Multiple sclerosis (Houndmills, Basingstoke, England); *27*(14), 2284–2287.
- Demortiere S, et al. 2021. Maintenance of natalizumab during the first trimester of pregnancy in active multiple sclerosis. Mult Scler; 27(5):712-718.
- Ebrahimi N, et al. 2015. Pregnancy and fetal outcomes following natalizumab exposure in pregnancy. A prospective, controlled observational study. Mult Scler; 21(2):198-205.
- Friend S, et al. 2016. Evaluation of pregnancy outcomes from the Tysabri (natalizumab) pregnancy exposure registry: a global, observational, follow-up study. BMC Neurol; 16(1):150
- Gklinos P, et al. 2023. Monoclonal Antibodies in Pregnancy and Breastfeeding in Patients with Multiple Sclerosis: A Review and an Updated Clinical Guide.Pharmaceuticals (Basel, Switzerland); 16(5),770.
- Godano E, et al. 2021. Erythropoietin therapy in a case of neonatal anemia after exposure to natalizumab throughout pregnancy. Ital J Pediatr; 47, 69.
- Guilloton L, et al. 2017. Neonatal pancytopenia in a child, born after maternal exposure to natalizumab throughout pregnancy. J Gynecol Obstet Hum Reprod; 46(3): 301-302.
- Haghikia A, et al. 2014. Natalizumab use during the third trimester of pregnancy. JAMA Neurol; 71(7): 891-895.
- Krysko KM, et al. 2023. Family planning considerations in people with multiple sclerosis. Lancet Neurol; 2023;22:350–66.
- Landi D, et al. 2022. Exposure to natalizumab throughout pregnancy: effectiveness and safety in an Italian cohort of women with multiple sclerosis. J Neurol Neurosurg Psychiatry jnnp-2022-329657.
- Mahadevan U, et al. 2019. Inflammatory bowel disease in pregnancy clinical care pathway: a report from the American Gastroenterological Association IBD Parenthood Project Working Group. Gastroenterology; 156(5):1508-1524.
- Mahadevan U, et al. 2023. Global consensus statement on the management of pregnancy in inflammatory bowel disease. *Clin Gastroenterol Hepatol* 2025;23(Suppl 11):S1–S60.
- Matro R, et al. 2018. Exposure concentrations of infants breastfed by women receiving biologic therapies for inflammatory bowel diseases and effects of breastfeeding on infections and development. Gastroenterology; 155:696–704.
- Massarotti C, et al. 2021. Effect of Multiple Sclerosis and Its Treatments on Male Fertility: Cues for Future Research. Journal of clinical medicine; 10(22), 5401
- O'Leary S, et al. 2023. Practical Clinical Guidelines for Natalizumab Treatment in Patients With Relapsing Multiple Sclerosis. Journal of infusion nursing: the official publication of the Infusion Nurses Society; 46(6), 347–359.
- Oreja-Guevara C, et al. 2023. Family Planning in Fertile-Age Patients With Multiple Sclerosis (MS) (ConPlanEM Study): Delphi Consensus Statements. Cureus; 15(8), e44056
- Peng A, et al. 2018. Natalizumab exposure during pregnancy in multiple sclerosis: a systematic review. J Neurol

Sci; 396:202-205.

- Portaccio E, et al. 2018. Pregnancy decision-making in women with multiple sclerosis treated with natalizumab: I: Fetal risks. Neurology; *90*(10), e823–e831.
- Portaccio E, et al. 2022. Natalizumab treatment and pregnancy in multiple sclerosis: A reappraisal of maternal and infant outcomes after 6 years. Mult Scler; 28(13):2137-2141.
- Simone IL, et al. 2021. Influence of Pregnancy in Multiple Sclerosis and Impact of Disease-Modifying Therapies. Frontiers in neurology; 12, 697974.
- Ramesh V, et al. 2022. Adverse Obstetric Outcomes in Pregnant Women Using Natalizumab for the Treatment of Multiple Sclerosis: A Systematic Review. Cureus; 14(10), e29952
- Shipley J, et al. 2025. Consensus recommendations on multiple sclerosis management in Australia and New Zealand: part 2. Med J Aust; 222:365–71.
- Siracusano M, et al. 2025. Maternal multiple sclerosis and offspring's developmental and behavioral profile: a case-control study. Curr Neuropharmacol; doi: 10.2174/011570159X370866250416103923. Epub ahead of print.
- Thiel S, et al. 2024. Disease activity and neonatal outcomes after exposure to natalizumab throughout pregnancy. J Neurol Neurosurg Psychiatry; 95(6): 561-570.
- U.S. Food and Drug Administration. 2025. Tysabri (natalizumab) injection, for intravenous use: Prescribing information. https://www.accessdata.fda.gov/drugsatfda_docs/label/2025/125104s984lbl.pdf
- Yeh WZ, et al. 2021. MSBase Study Group. Natalizumab, fingolimod and dimethyl fumarate use and pregnancy-related relapse and disability in women with multiple sclerosis. Neurology; 96(24):e2989-3002.

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Metformin

Selected References:

- Biocon Biologics Inc. 2025. Semglee Product Label. National Institute of Health DailyMed database. Available

at: https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?. Accessed May 2025.

- Bruttomesso D, et al. 2011. Type 1 diabetes control and pregnancy outcomes in women treated with continuous subcutaneous insulin infusion (CSII) or with insulin glargine and multiple daily injections of rapid-acting insulin analogues (glargine-MDI). Diabetes Metab; 37(5):426-431.
- Callesen NF, et al. 2013. Treatment with the long-acting insulin analogues detemir or glargine during pregnancy in women with type 1 diabetes: comparison of glycaemic control and pregnancy outcome. J Matern Fetal Neonatal Med; 26(6):588-592.
- Chico A, et al. 2016. Glycemic control and maternal and fetal outcomes in pregnant women with type 1 diabetes according to the type of basal insulin. Eur J Obstet Gynecol Reprod Biol; 206: 84-91.
- de Jong J, et al. 2016. Insulin analogues in pregnancy and specific congenital anomalies: a literature review. Diabetes Metab Res Rev; 32(4): 366-375.
- Di Cianni G, et al. 2005. Use of insulin glargine during the first weeks of pregnancy in five type 1 diabetic women. Diabetes Care; 28:982-983.
- Di Cianni G, et al. 2008. Perinatal outcomes associated with the use of glargine during pregnancy. Diabet Med; 25(8):993-996.
- Dolci M, et al. 2005. Use of glargine insulin before and during pregnancy in a woman with type 1 diabetes and Addison's Disease. Diabetes Care; 28:2084-2085.
- Eli Lilly and Company. 2025. Basaglar Product Label. National Institute of Health DailyMed database. Available at: https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?. Accessed May 2026.
- Gallen IW, et al. 2008. Survey of glargine use in 115 pregnant women with Type 1 diabetes. Diabet Med;. 25(2):165-169.
- Holstein A, et al. 2003. Use of insulin glargine during embryogenesis in a pregnant woman with type 1 diabetes. Diabet Med; 20:779-780.
- Imbergamo MP, et al. 2008. Use of glargine in pregnant women with type 1 diabetes mellitus: a case-control study. Clin Ther; 30(8):1476-1484.
- Lapolla A, et al. 2005. Insulin therapy in pregnancy complicated by diabetes: are insulin analogs a new tool? Diabetes Metab Res Rev; 21:241-52.
- Lepercq J, et al. 2010. Use of insulin glargine throughout pregnancy in 102 women with type 1 diabetes. Diabetes Metab; 36(3):209-212.
- Negrato CA, et al. 2010. Glargine vs. NPH insulin therapy in pregnancies complicated by diabetes: an observational cohort study. Diabetes Res Clin Pract; 89(1):46-51.
- Pantalone KM, et al. 2011. Glargine vs. NPH insulin therapy in pregnancies complicated by diabetes: an observational cohort study–comment on Negrato et al. Diabetes Res Clin Pract; 93(1):e9-10.
- Pantalone KM, et al. 2011. Insulin glargine use during pregnancy. Endocr Pract; 17(3):448-55.
- Pollex E, et al. 2011. Safety of insulin glargine use in pregnancy: a systematic review and meta-analysis. Ann Pharmacother; 45(1):9-16.
- Price N, et al. 2007. Use of insulin glargine during pregnancy: a case-control pilot study. BJOG; 114(4):453-457.
- Sanofi-Aventis U.S. 2023. Lantus Product Label. National Institute of Health DailyMed database. Available at: https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?. Accessed May 2026.
- Sonfi-Aventus U.S. 2025. Toujeo Product Label. National Institute of Health DailyMed database. Available at: https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?. Accessed May 2026.
- Torlone E, et al. 2007. Successful use of insulin glargine during entire pregnancy until delivery in six Type 1 diabetic women. Eur J Obstet Gynecol Reprod Biol; 132(2):238-239.
- Westerbacka J, et al. 2025. Insulin glargine 300 U/mL safety data in pregnancy. Diabetes Obes Metab; 27(5):2322-2325.
- Woolderink JM, et al. 2005. Use of insulin glargine during pregnancy in seven type 1 diabetic women. Diabetes Care; 28:2594-2595.

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