

Miconazole

Selected References:

- Bender EA, et al. 2021. Treatment methods for vulvovaginal candidiasis in pregnancy. *J Mycol Med.* 31(3):101138.
- Butler DC, et al. 2014. Safety of dermatologic medications in pregnancy and lactation: Part II. Lactation. *J Am Acad Dermatol.* 70(3):417 e1-10.
- Carter TC, et al. 2008. Antifungal drugs and the risk of selected birth defects. *Am J Obstet Gynecol.* 198:191-193.
- Czeizel AE, et al. 2004. Population-based case-control teratologic study of topical miconazole. *Congenit Anom.* 44(1):41-45.
- Daniel S, et al. 2018. Vaginal antimycotics and the risk for spontaneous abortions. *Am J Obstet Gynecol.* 218(6):601.e1-601.e7.
- Giavini E, et al. 2010. Are azole fungicides a teratogenic risk for human conceptus? *Toxicol Lett.* 198(2):106-111.
- Kazy Z, et al. 2005. The possible association between the combination of vaginal metronidazole and miconazole treatment and poly-syndactyly population-based case-control teratologic study. *Reprod Toxicol.* 20(1):89-94.
- Maftai NM, et al. 2023. Vulvovaginal Candidiasis in Pregnancy-Between Sensitivity and Resistance to Antimycotics. *J Xenobiot.* 13(3):312-322.
- Mendling W, et al. 2012. Guidelines vulvovaginal candidosis (2010) of the German Society for Gynecology and Obstetrics, the Working Group for Infections and Infectimmunology in Gynecology and Obstetrics, the German Society of Dermatology, the Board of German Dermatologists and German speaking Mycological Society. *Mycoses.* Jul;(55) Suppl 3:1-13.
- Murase JE, et al. 2014. Safety of dermatologic medications in pregnancy and lactation: Part 1 Pregnancy. *J Am Acad Dermatol.* 70(3):401.e1-14.
- Patel VM, et al. 2017. Topical antiviral and antifungal medications in pregnancy: a review of safety profiles. *J Eur Acad Dermatol Venereol.* 31(9):1440-1446.
- Rotem R, et al. 2018. Risk of major congenital malformations following first-trimester exposure to vaginal azoles used for treating vulvovaginal candidiasis: a population-based retrospective cohort study. *BJOG.* 125(12):1550-1556.
- Stevens RE, et al. 2002. Bioavailability study of a 1200 mg miconazole nitrate vaginal ovule in healthy female adults. *J Clin Pharmacol.* 42(1):52-60.
- Tiboni GM, et al. 2008. Teratogenic effects in mouse fetuses subjected to the concurrent in utero exposure to miconazole and metronidazole. *Reprod Toxicol.* 26(3-4):254-261.

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Miconazole

Selected References:

- Butler DC, et al. 2014. Safety of dermatologic medications in pregnancy and lactation: Part II. Lactation. J Am Acad Dermatol. 70(3):417 e1-10.
- Carter TC, et al. 2008. Antifungal drugs and the risk of selected birth defects. Am J Obstet Gynecol. 198:191-193.
- Cervi VF, et al. 2022. A novel nanotechnological mucoadhesive and fast-dissolving film for vaginal delivery of clotrimazole: design, characterization, and in vitro antifungal action. Drug Deliv Transl Res. 12(12):2907-2919.
- Daniel S, et al. 2018. Vaginal antimycotics and the risk for spontaneous abortions. Am J Obstet Gynecol. 218(6):601.e1-601.e7.
- FDA 2006. Clotrimazole Approval Package. https://www.accessdata.fda.gov/drugsatfda_docs/nda/2004/076387_Clotrimazole%20LozengesTOC.cfm
- Frerich W, et al. 1977. The frequency of Candida infections in pregnancy and their treatment with clotrimazole. Curr Med Res Opin. 4(9):640-4.
- Giavini E, et al. 2010. Are azole fungicides a teratogenic risk for human conceptus? Toxicol Lett. 198(2):106-111.
- Johnstone HA, et al. 1990. Candidiasis in the breastfeeding mother and infant. J Obstet Gynecol Neonatal Nurs. 19(2):171-3.
- Maftai NM, et al. 2023. Vulvovaginal Candidiasis in Pregnancy-Between Sensitivity and Resistance to Antimycotics. J Xenobiot. 13(3):312-322.
- Mendling W, et al. 2012. Guidelines vulvovaginal candidosis (2010) of the German Society for Gynecology and Obstetrics, the Working Group for Infections and Infectimmunology in Gynecology and Obstetrics, the German Society of Dermatology, the Board of German Dermatologists and the German Speaking Mycological Society. Mycoses. Jul;55 Suppl 3:1-13.
- Müllegger RR, et al. 2016. Skin infections in pregnancy. Clin Dermatol. 34(3):368-77.
- Murase JE, et al. 2014. Safety of dermatologic medications in pregnancy and lactation: Part 1 Pregnancy. J Am Acad Dermatol. 70(3):401.e1-14.
- Patel VM, et al. 2017. Topical antiviral and antifungal medications in pregnancy: a review of safety profiles. J Eur Acad Dermatol Venereol. 31(9):1440-1446.
- Quindós G, et al. 2025. The future of non-invasive azole antifungal treatment options for the management of vulvovaginal candidiasis. Expert Rev Anti Infect Ther. 23(8):571-584.
- Rotem R, et al., 2018. Risk of major congenital malformations following first-trimester exposure to vaginal azoles used for treating vulvovaginal candidiasis: a population-based retrospective cohort study. BJOG. 125(12):1550-1556.

- Wu J, et al. 2025. Effects of bacterial vaginosis treatment during pregnancy on maternal-fetal outcome: A systematic review and network meta-analysis. Eur J Obstet Gynecol Reprod Biol. 307:175-183.

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Miconazole

Selected References:

- Centers for Disease Control and Prevention. 2024. Vibrio Infection. [Accessed January 2026]. Available at URL: <https://www.cdc.gov/vibrio/hcp/clinical-overview/index.html>
- Ciccarelli S, et al. 2013. Management strategies in the treatment of neonatal and pediatric gastroenteritis. Infect Drug Resist 6:133-61.
- Ciglenecki I, et al. 2013. Cholera in pregnancy: Outcomes from a specialized cholera treatment unit for pregnant women in Léogâne, Hati. PLoS Negl Trop Dis 7(8): e2368.
- Holmgren J, et al. 1983. Receptor-like glycoproteins in human milk that inhibit classical and El Tor Vibrio cholerae cell adherence (hemagglutination). Infect Immun 39(1):147-154.
- Khan AI, et al. 2015. Cholera in pregnancy: Clinical and immunological aspects. Internal J of Infect Dis. 39:20-4
- Panya M, et al. 2016. Isolation, identification, and evaluation of novel probiotic strains isolated from feces of breast-fed infants. J Med Assoc Thai 99(Suppl.1):S28-S34.
- Qureshi K, et al. 2006. Breast milk reduces the risk of illness in children of mothers with cholera: observations from an epidemic of cholera in Guinea-Bissau. Pediatr Infect Dis J 25(12):1163-1166.

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Miconazole

Selected References:

- Ades AE, et al. 2021. Vertical transmission of Zika virus and its outcomes: a Bayesian synthesis of prospective studies. *Lancet Infect Dis*. 21(4):537-545. doi: 10.1016/S1473-3099(20)30432-1.
- Acosta Pérez E, et al. 2025. Adverse fetal and perinatal outcomes associated with Zika virus infection during pregnancy: an individual participant data meta-analysis. *eClinicalMedicine*, Volume 83, 103231
- Alger J, et al. 2024. Neurodevelopmental assessment of normocephalic children born to Zika virus exposed and unexposed pregnant people. *Pediatric Research*, 95(2):566-572.
- Antoniou E, et al. 2023. Congenital Zika Syndrome and Disabilities of Feeding and Breastfeeding in Early Childhood: A Systematic Review. *Viruses*, 15(3):601.
- Blackmon K, et al. 2020. Epilepsy surveillance in normocephalic children with and without prenatal Zika virus exposure. *PLoS Negl Trop Dis*, 14:e0008874.
- Brasil P, et al. 2016. Zika Virus Infection in Pregnant Women in Rio de Janeiro. *N Engl J Med*. 375(24):2321-2334. doi: 10.1056/NEJMoa1602412. Epub 2016 Mar 4. PMID: 26943629; PMCID: PMC5323261.
- Cavalcante TB, et al. 2022. Characteristics associated with drug resistant epilepsy in children up to 36 months old with Congenital Zika Syndrome. *Seizure*, 103:92-98.
- Cardoso TF, et al. 2019. Congenital Zika infection: neurology can occur without microcephaly. *Archives of Disease in Childhood*, 104:199-200.
- Centeno-Tablante E, et al. 2021. Update on the transmission of Zika virus through breast milk and breastfeeding: a systematic review of the evidence. *Viruses*, 13(1):123.
- Centers for Disease Control and Prevention. 2025. Zika Virus. Available at URL: <https://www.cdc.gov/zika/index.html>.
- Christie C, et al. 2023. Dengue, chikungunya and zika arbovirus infections in Caribbean children. *Current Opinion in Pediatrics*, 35(2):155-165.
- Delaney A, et al. 2018. Population-based surveillance of birth defects potentially related to Zika virus infection — 15 states and U.S. territories, 2016. *MMWR Morb Mortal Wkly Rep* 2018, 67:91-96.
- Díaz C, et al. 2023. Craniofacial and dental features in children aged 3-5 years with congenital Zika syndrome. *Clin Oral Investig*, 27(9):5181-5188.

- Fernandes M, et al. 2023. Does Intra-Uterine Exposure to the Zika Virus Increase Risks of Cognitive Delay at Preschool Ages? Findings from a Zika-Exposed Cohort from Grenada, West Indies. *Viruses*, 15(6):1290.
- Joguet G, et al. 2017. Effect of acute Zika virus infection on sperm and virus clearance in body fluids: a prospective observational study. *Lancet Infect Dis*, 17(11):1200-1208.
- Martins MM, et al. 2021. Fetal, neonatal, and infant outcomes associated with maternal Zika virus infection during pregnancy: a systematic review and meta-analysis. *PLOS ONE*, 16(2): e0246643.
- Mercado-Reyes M, et al. 2021. Pregnancy, birth, infant, and early childhood neurodevelopmental outcomes among a cohort of women with symptoms of Zika virus disease during pregnancy in three surveillance sites, Project Vigilancia de Embarazadas con Zika (VEZ), Colombia, 2016–2018. *Trop Med Infect. Dis*, 6(4):183.
- Paixao ES, et al. 2022. Mortality from Congenital Zika Syndrome – Nationwide Cohort Study in Brazil. *N Engl J Med*. 386(8):757-767. doi: 10.1056/NEJMoa2101195. PMID: 35196428; PMCID: PMC7612437.
- Polen KD, et al. 2018. Update: interim guidance for preconception counseling and prevention of sexual transmission of Zika virus for men with possible Zika virus exposure – United States, August 2018. *MMWR Morb Mortal Wkly Rep*. 2018 Aug 10, 67(31):868-871.
- Rasmussen SA, et al. 2016. Zika virus and birth defects –reviewing the evidence for causality. *N Engl J Med*, 374:1981-1987.
- Rice ME, et al. 2018. Vital signs: Zika-associated birth defects and neurodevelopmental abnormalities possibly associated with congenital Zika virus infection — U.S. territories and freely associated states, 2018. *MMWR Morb Mortal Wkly Rep* 201, 67:858-867.
- Rua EC, et al. 2022. Two-year follow-up of children with congenital Zika syndrome: the evolution of clinical patterns. *Eur J Pediatr*, 181(3):991-999.
- Shapiro-Mendoza CK, et al. 2017. Pregnancy Outcomes After Maternal Zika Virus Infection During Pregnancy — U.S. Territories, January 1, 2016–April 25, 2017. *MMWR Morb Mortal Wkly Rep* 2017, 66:615-621.
- Smoots AN, et al. 2020. Population-based surveillance for birth defects potentially related to Zika virus infection — 22 states and territories, January 2016–June 2017. *MMWR Morb Mortal Wkly Rep* 2020, 69:67–71.
- Foo SS, et al. 2024. Sustained chronic inflammation and altered childhood vaccine responses in children exposed to Zika virus. *EBioMedicine*. 106:105249. doi: 10.1016/j.ebiom.2024.105249. PMID: 39024898; PMCID: PMC11304698.
- Valdes V, et al. 2019. Cognitive development of infants exposed to the Zika Virus in Puerto Rico. *JAMA Netw Open*, 2:e1914061.
- Venancio FA, et al. 2025. Early and Long-Term Adverse Outcomes of In Utero Zika Exposure. *Pediatrics*. 155(2):e2024067552. doi: 10.1542/peds.2024-067552. PMID: 39814049; PMCID: PMC11832048.
- World Health Organization. 2016. Infant feeding in areas of Zika virus transmission. Available at URL: https://reliefweb.int/sites/reliefweb.int/files/resources/WHO_ZIKV_MOC_16%205_eng.pdf.

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Miconazole

Selected References:

- Andersson NW et al. Association between fexofenadine use during pregnancy and fetal outcomes. JAMA Pediatr Aug 1;174(8):e201316. Erratum in: JAMA Pediatr 2020 Sep 1;174(9):913.
- Craig-McFeely PM, et al. 2001. Evaluation of the safety of fexofenadine from experience gained in general practice use in England in 1997. Eur J Clin Pharmacol 57(4):313-320.
- Diav-Citrin O, 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.
- Ito S, et al. 1993. Prospective follow-up of adverse reactions in breast-fed infants exposed to maternal medication. Am J Obstet Gynecol. 168:1393-9.
- Kallen B. 2002. Use of antihistamine drugs in early pregnancy and delivery outcome. J Matern Fetal Neonatal Med 11:146-152.
- Loebstein R, et al. 2000. Pregnancy outcome after gestational exposure to terfenadine: A multicenter, prospective controlled study. Immunology and Allergy Clinics of North America 20(4):807-30.
- Lucas BD Jr, et al. 1995. Terfenadine pharmacokinetics in breast milk in lactating women. Clin Pharmacol Ther. Apr; 57(4):398-402.
- Schatz M, Petitti D. 1997. Antihistamines and pregnancy. Ann Allergy Asthma Immunol 78:157-159.

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