Temazepam (Restoril®)

Selected References:

- Ban L, et al. 2014. First trimester exposure to anxiolytic and hypnotic drugs and the risks of major congenital anomalies: a United Kingdom population-based cohort study. PLoS One; 9(6):e100996.
- Dusci LJ, et al. 1990. Excretion of diazepam and its metabolites in human milk during withdrawal from combination high dose diazepam and oxazepam. Br J Clin Pharmacol; 29:123-6.
- Kanto JH. 1982. Use of benzodiazepines during pregnancy, labour and lactation, with particular reference to pharmacokinetic considerations. Drugs 23:354-80.
- Kargas GA, et al. 1985. Perinatal mortality due to interaction of diphenhydramine and temazepam. N Eng J Med 313:1417-8.
- Kelly LE, et al. Neonatal benzodiazepines exposure during breastfeeding. J Pediatr. 161:448-51.
- Lebedevs TH, et al. 1992. Excretion of temazepam in breast milk. Br J Clin Pharmacol; 33:204-6.
- Restoril Prescribing Information. Available online at www.accessdata.fda.gov/drugsatfda_docs/label/2016/018163s064lbl.pdf. [Accessed May 2025].
- Sheehy O, et al. 2019. Association between incident exposure to benzodiazepines in early pregnancy and risk of spontaneous abortion. JAMA psychiatry, 76(9): 948-57.
- Szpunar MJ, et al. 2022. Risk of major malformations in infants after first-trimester exposure to benzodiazepines: Results from the Massachusetts General Hospital National Pregnancy Registry for Psychiatric Medications. Depression and Anxiety 39.12: 751-9.

Disclaimer: MotherToBaby Fact Sheets are meant for general information purposes and should not replace the advice of your health care provider. MotherToBaby is a service of the non-profit Organization of Teratology Information Specialists (OTIS). Copyright by OTIS, January 1, 2025.

Temazepam (Restoril®)

Selected References:

- Aldridge TD, et al. 2014. First-trimester antihistamine exposure and risk of spontaneous abortion or preterm birth. Pharmacoepidemiol Drug Saf, 23(10):1043-50.
- Aselton P, et al. 1985. First-trimester drug use and congenital disorders. Obstet Gynecol 65(4):451-455.
- 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.
- Etwel F, et al. 2017. The Risk of Adverse Pregnancy Outcome After First Trimester Exposure to H1 Antihistamines: A Systematic Review and Meta-Analysis. Drug Saf, 40(2):121-132.
- Gilboa SM, et al. 2014. Antihistamines and birth defects: a systematic review of the literature. Expert Opin Drug Saf, 13(12):1667-98.
- 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.
- Hansen C, et al. 2020. Use of antihistamine medications during early pregnancy and selected birth defects: The National Birth Defects Prevention Study, 1997-2011. Birth Defects Res, 112(16):1234-1252.
- Hellbom E. 2005. Chlorpheniramine, selective serotonin-reuptake inhibitors (SSRIs) and over-the-counter (OTC) treatment. Med Hypotheses. ;66(4):689-90.
- Ito S, et al. 1993. Prospective follow-up of adverse reactions in breastfed infants exposed to maternal medication. Am J Obstet Gynecol. 168:1393-1399.
- Jick H, et al. 1981: First-trimester drug use and congenital disorders. JAMA 246(4):343-346.
- Koh YP, et al. 2019. New Change in pregnancy and lactation labeling: Review of dermatologic drugs. Int'l J of Women's Dermatology, 5(4):216-226
- Li Q et al. 2013. Assessment of antihistamine use in early pregnancy and birth defects. J Allergy Clin Immunol Pract. 1(6):666-74.
- Nelson MM and Forfar JJ. 1971. Associations between drugs administered during pregnancy and congenital abnormalities of the fetus. Br Med J. 1;523-527.
- 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.

Questions? Call 866.626.6847 | Text 855.999.3525 | Email or Chat at MotherToBaby.org.

Disclaimer: MotherToBaby Fact Sheets are meant for general information purposes and should not replace the advice of your health care provider. MotherToBaby is a service of the non-profit Organization of Teratology Information Specialists (OTIS). Copyright by OTIS, January 1, 2025.

Temazepam (Restoril®)

Selected References:

- Arango O, et al. 1996. Reversible azoospermia in a patient treated with triazolam. Eur J Contracept Reprod Health Care; 1:293-4.
- Bagger NT, et al. 2023. Perinatal outcomes after therapeutic rest in the latent phase of labor: A cohort study. Acta obstetricia et gynecologica Scandinavica, 102(9), 1210–1218.
- Halcion Prescribing Information. Available online at https://www.accessdata.fda.gov/drugsatfda_docs/label/2016/017892s049lbl.pdf. [Accessed Jan 2025]
- Kallen B, et al. 2013. The use of central nervous system active drugs during pregnancy. Pharmaceuticals 6(10):1221-1286.
- Kelly LE, et al. 2012. Neonatal benzodiazepines exposure during breastfeeding. J Pediatr; 161(3):448-51.
- Matsuo A, et al. 1979. Reproduction studies of triazolam in rats and rabbits. Iyakuhin Kenkyu 10:52-67.
- Noh Y, et al. 2022. First-trimester exposure to benzodiazepines and risk of congenital malformations in offspring: A population-based cohort study in South Korea. PLoS Med; 19(3):e1003945.
- Sakai T, et al. 1996. Triazolam (Halcion) intoxication in a neonate–a first report [letter]. Eur J Pediatr; 155:1065-6.

Questions? Call 866.626.6847 | Text 855.999.3525 | Email or Chat at MotherToBaby.org.

Disclaimer: MotherToBaby Fact Sheets are meant for general information purposes and should not replace the advice of your health care provider. MotherToBaby is a service of the non-profit Organization of Teratology Information Specialists (OTIS). Copyright by OTIS, January 1, 2025.

Temazepam (Restoril®)

Selected References:

- Aselton P, et al. 1984. First-trimester drug use and congenital disorders. Obstet Gynecol,65(4):451- 455.
- Brigstocke S, et.al 2022. Review of the Safety Profiles of Laxatives in Pregnant Women. J Clin Gastroenterol, 56(3):197-203.
- Greenhalf JO, Leonard HS. 1973. Laxatives in the treatment of constipation in pregnant and breast-feeding mothers. Practitioner; 210:259-63.
- Hale, TW. 2012. Medications and Mothers' Milk. Fifteenth Edition. Amarillo, TX: Hale Publishing L.P.
- Heinonen OP, et al. 1977. Birth Defects and Drugs in Pregnancy. Littleton, Mass.: John Wright-PSG, pp 385, 442.
- Jick H, et al. 1981. First-trimester drug use and congenital disorders. JAMA,246(4):343-346.
- Laden S. 2019. OTC Medication Use in Pregnancy and Breastfeeding. US Pharmacist, 44(9):16-19
- Lameris AL, et al. 1979. Drug induced alterations in Mg2+ homeostasis. Clinical Science,123(1):1.
- MacKenzie K, et al. 1990. Three-generation reproduction study with dioctyl sodium sulfosuccinate in rats. Fundam Appl Toxicol,15:53-62.
- Mahadevan U, & Kane S. 2006. American Gastroenterological Association Institute technical review on the use of gastrointestinal medications in pregnancy. Gastroenterology,131(1):283-311.
- Rungsiprakarn P, et al. 2015. Interventions for treating constipation in pregnancy. Cochrane Database Syst Rev, Sep 4;2015(9):CD011448
- Schindler AM. 1984. Isolated neonatal hypomagnesaemia associated with maternal overuse of stool softener. Lancet,2:822.
- Thorpe PG, et al. 2013. Medications in the first trimester of pregnancy: most common exposures and critical gaps in understanding fetal risk. Pharmacoepidemiol Drug Safe, 22(9): 1013-1018.
- Zielinski R, et al. 2015. Gastrointestinal distress in pregnancy: prevalence, assessment, and treatment of 5 common minor discomforts. J Perinat Neonatal Nurs, 29(1):23-31.

Disclaimer: MotherToBaby Fact Sheets are meant for general information purposes and should not replace the advice of your health care provider. MotherToBaby is a service of the non-profit Organization of Teratology Information Specialists (OTIS). Copyright by OTIS, January 1, 2025.

Temazepam (Restoril®)

Selected References:

- American Academy of Pediatrics. 2008. Maternal phenylketonuria. Committee on Genetics. Pediatrics;122:445–9.
- American College of Obstetricians and Gynecologists Committee on Genetics. 2020. ACOG Committee Opinion 802: Management of Women With Phenylalanine Hydroxylase Deficiency (Phenylketonuria). Obstet Gynecol. 135(4):e167-e170.
- Aldámiz-Echevarría L,et al. 2014. A new case of maternal phenylketonuria treated with sapropterin dihydrochloride. Gynecol Endocrinol. 13:1-3.
- Banta-Wright SA, et al. 2014. Breastfeeding infants with phenylketonuria in the United States and Canada. Breastfeeding Medicine, 9(3), 142-148.
- Burgard P, et al. 1997. Neuropsychologic functions of early treated patients with phenylketonuria, on and off Diet: Results of a cross-national and cross-sectional study. Pediatr Res 41(3):368-374.
- Camp KM, et al. 2014. Phenylketonuria Scientific Review Conference: state of the science and future research needs. Mol Genet Metab. 112(2):87-122.
- Cetin I, et al. 1990. Umbilical amino acid concentration in normal and growth-retarded fetuses sampled in utero by cordocentesis. Am J Obstet Gynecol; 162(1):253–261.
- Feillet F, et al. 2014. Use of sapropterin dihydrochloride in maternal phenylketonuria. A European experience of eight cases.J Inherit Metab Dis.
- Fisch RO, et al. 1991. Children of fathers with phenylketonuria: An international survey. J Pediatr 118(5): 39-741.
- Fox-Bacon C, et al. 1997. Maternal PKU and breastfeeding: case report of identical twin mothers. Clin Pediatr 36(9):539-542.
- Grange DK,et al. 2014. Sapropterin dihydrochloride use in pregnant women with phenylketonuria: an interim report of the PKU MOMS sub-registry. Phenylketonuria Demographics Outcomes and Safety (PKUDOS) registry; Maternal Phenylketonuria Observational Program (PKU MOMS) sub-registry. Mol Genet Metab. 112(1):9-16.
- Grohmann-Held K, et al. 2022. Impact of pregnancy planning and preconceptual dietary training on metabolic control and offspring's outcome in phenylketonuria. J Inherit Metab Dis; 45(6): 1070- 1081.
- Güttler F, et al. 1990. Cognitive development in offspring of untreated and preconceptionally treated maternal phenylketonuria. J Inherit Metab Dis. 13(4):665-71.
- Kenneson A, Borth MI, et al. 2024. Characteristics and outcomes of pregnancies among women with phenylketonuria from the NBS Connect registry. Mol Genet Metab Rep; 39:101092.
- Koch R, et al. 2003. The Maternal Phenylketonuria International Study: 1984–2002. Pediatrics 112(suppl): 1523-1529.
- Koch R, el al. 2005. Tetrahydrobiopterin and maternal PKU. Mol Gen Met 86: S139-S141.
- Koch R, et al. 2010. Psychosocial issues and outcomes in maternal PKU. Mol Genet Metab. 99 Suppl 1:S68-74.
- Kose E, et al. 2017. The effects of breastfeeding in infants with Phenylketonuria. J Pediatr Nurs; 38:27-32.
- Lenke RR and Levy HL. 1980. Maternal phenylketonuria and hyperphenylalanemia: An international survey of the outcome of untreated and treated pregnancies. NEJM 303(21):1202-1208.
- Levy HL, et al. 1991. Paternal phenylketonuria. J Pediatr 118(5):741-743.
- Levy HL, et al. 1996. Fetal ultrasonagraphy in maternal PKU. Prenat Diagn 16:599-604.
- Levy HL & Ghavami M. 1996. Maternal phenylketonuria: a metabolic teratogen. Teratology. 53(3):176-84.
- Lichter-Konecki, U, et al. 2019. Phenylketonuria: Current Treatments and Future Developments. Drugs 79,

495–500

- Maillot, F, et al. 2007. A practical approach to maternal phenylketonuria management. J Inherit Metab Dis. 30, 198–201.
- Michals-Matalon K et al. 2003. Role of nutrition in pregnancy with phenylketonuria and birth defects. Pediatrics 112(suppl): 1534-1536.
- Nielsen MR, Jørgensen C, et al. 2023. The impact of phenylalanine levels during pregnancy on birth weight and later development in children born to women with phenylketonuria. J Inherit Metab Dis; 46(4):586-594.
- Platt LD, et al. 2000. The international study of pregnancy outcome in women with maternal phenylketonuria: report of a 12-year study. American journal of obstetrics and gynecology, 182(2), 326-333.
- Prick BW, et al. 2012. Maternal phenylketonuria and hyperphenylalaninemia in pregnancy: pregnancy complications and neonatal sequelae in untreated and treated pregnancies. Am J Clin Nutr 95:374–382.
- Rouse B, et al. 1997. Maternal phenylketonuria Collaborative Study (MPUCS) offspring: Facial anomalies, malformations, and early neurological sequelae. Am J Med Genet 69:89-95.
- Rouse B & Azen C. 2004. Effect of high maternal blood phenylalanine on offspring congenital anomalies and developmental outcome at ages 4 and 6 years: the importance of strict dietary control preconception and throughout pregnancy. J Pediatr 144:235–239.
- Schmidt E, et al. 1994. Sustained attention in adult phenylketonuria: the influence of the concurrent phenylalanine-blood level. J Clin Exp Neuropsych 16(5):681-688.
- Singh RH, et al. 2014. Recommendations for the nutrition management of phenylalanine hydroxylase deficiency. Genet Med 16:121–123.
- Smith WE, Berry SA, et al. 2025. Phenylalanine hydroxylase deficiency diagnosis and management: A 2023 evidence-based clinical guideline of the American College of Medical Genetics and Genomics (ACMG). ***Genet*** Med; 27(1):101289.
- Teissier R, et al. 2012. Maternal phenylketonuria: low phenylalaninemia might increase the risk of intra uterine growth retardation. AFDPHE (Association Française pour le Dépistage et la Prévention des Handicaps de l'Enfant). J Inherit Metab Dis ;35:993–9.
- Trefz FK, et al. 2003. Potential role of tetrahydrobiopterin in the treatment of maternal phenylketonuria. Pediatrics 112(suppl): 1566-1569.
- Van Rijn M, et al. 2003. A different approach to breast-feeding of the infant with phenylketonuria. Eur J Pediatr 162:323-326.
- van Wegberg, A.M.J., et al. 2017. The complete European guidelines on phenylketonuria: diagnosis and treatment. Orphanet J Rare Dis (12) 162.
- Vockley J, et al. 2014. Phenylalanine hydroxylase deficiency: diagnosis and management guideline. Genetics in Medicine, 16(2), 188.
- Waisbren SE, et al. 2014. Maternal phenylketonuria: long-term outcomes in offspring and post-pregnancy maternal characteristics. In JIMD Reports, Volume 21 (pp. 23-33).
- Wambach K & Riordan J. 2016. Breastfeeding and human lactation. Jones & Bartlett Learning.
- Weglage J, et al. 2001. Normal clinical outcome in untreated subjects with mild hyperphenylalaninemia. Pediatr Res 49:532–536.
- Widaman KF, Azen C. 2003. Relation of prenatal phenylalanine exposure to infant and childhood cognitive outcomes: results from the International Maternal PKU Collaborative Study. Pediatrics;112:1537–43.

Disclaimer: MotherToBaby Fact Sheets are meant for general information purposes and should not replace the advice of your health care provider. MotherToBaby is a service of the non-profit Organization of Teratology Information Specialists (OTIS). Copyright by OTIS, January 1, 2025.