

Perchloroethylene (PCE, PERC)

Selected References:

- Agency for Toxic Substances and Disease Registry (ATSDR). 2020. Toxicological Profile for Tetrachloroethylene. <https://wwwn.cdc.gov/TSP/ToxFAQs/ToxFAQsDetails.aspx?faqid=264&toxid=48>. Accessed 29 July 2025.
- Aschengrau A, et al. 2020. Reproductive and developmental health effects of prenatal exposure to tetrachloroethylene-contaminated drinking water. *Environ Sci Process Impacts*; 22(3):555-566.
- Aschengrau A, et al. 2018. Modeled exposure to tetrachloroethylene-contaminated drinking water and the occurrence of birth defects: a case-control study from Massachusetts and Rhode Island. *Environ Health*; 17(1):75.
- Aschengrau A, et al. 2015. Long-term health effects of early life exposure to tetrachloroethylene (PCE)-contaminated drinking water: a retrospective cohort. *Environ Health*; 14:36.
- Aschengrau A, et al. 2009. Prenatal exposure to tetrachloroethylene-contaminated drinking water and the risk of congenital anomalies: a retrospective cohort study. *Environ Health*; 8:44.
- Bagnell PC and Ellenberger HA. 1977. Obstructive jaundice due to a chlorinated hydrocarbon in breast milk. *Can Med Assoc J*; 117:1047-1104.
- Bosco MG, et al. 1987. Health and reproductive status of female workers in dry cleaning shops. *Int Arch Occup Environ Health*; 59:295-301.
- Brown Dzubow R, et al. 2010. Early life stage exposure and potential developmental susceptibility to tetrachloroethylene. *Birth Defects Res B Dev Reprod Toxicol*; 89(1):50-65.
- Bukowski JA. 2011. Review of the epidemiologic literature on residential exposure to perchloroethylene. *Crit Rev Toxicol*; 41(9):771-82.
- Ceballos DM, et al. 2021. Perchloroethylene and Dry Cleaning: It's Time to Move the Industry to Safer Alternatives. *Front Public Health*; 9:638082.
- Centers for Disease Control and Prevention (CDC). 2025. Breastfeeding and special circumstances- occupational exposures. Available at URL: <https://www.cdc.gov/breastfeeding-special-circumstances/hcp/exposures/occupational.html>. Accessed May 2026.
- Centers for Disease Control and Prevention. (CDC). 2019. NIOSH Pocket Guide to Chemical Hazards: Tetrachloroethylene. <https://www.cdc.gov/niosh/npg/npgd0599.html> Accessed May 2026.
- Doyle P, et al. 1997. Spontaneous abortion in dry cleaning workers potentially exposed to perchloroethylene. *Occup Environ Med*; 54(12):848-853. Eskenazi B, et al.
- 1991. A study of the effect of perchloroethylene exposure on semen quality in dry cleaning workers. *Am J Ind Med*; 20:575-591.
- Fisher J, et al. 1997. Lactational transfer of volatile chemicals in breast milk. *Am Ind Hyg Ass J*; 58:425-431.
- Forand SP, et al. 2012. Adverse birth outcomes & maternal exposure to trichloroethylene & tetrachloroethylene through soil vapor intrusion in New York State. *Env Health Persp*; 120(4):616-621.
- Ghahri A, et al. 2022. The perchloroethylene-induced toxicity in dry cleaning workers lymphocytes through induction of oxidative stress. *J Biochem Mol Toxicol*; 36(4):e23000.
- Getz KD, et al. 2012. Prenatal and early childhood exposure to tetrachloroethylene and adult vision. *Environ Health Perspect*; 120:1327-1332.
- Janulewicz PA, et al. 2008. Risk of learning and behavioral disorders following prenatal and early postnatal exposure to tetrachloroethylene (PCE)-contaminated drinking water. *Neurotoxicol Teratol*; 30(3):175-185.
- Janulewicz PA, et al. 2012. Adult neuropsychological performance following prenatal and early postnatal exposure to tetrachloroethylene (PCE)-contaminated drinking water. *Neurotoxicol Teratol*; 34(3):350-359.

- Kyyrönen P, et al. 1989. Spontaneous abortions and congenital malformations among women exposed to tetrachloroethylene in dry cleaning. J Epidemiol Community Health; 43(4):346-351.
- Laumon B, et al. 1996. Exposure to organic solvents during pregnancy and oral clefts: a case-control study. Reprod Toxicol; 10:15-19.
- Mirazi N, et al. 2023. Maternal long-term inhalation exposure to perchloroethylene and prenatal teratogenicity: morphometric, hormonal, and histological study. Toxicol Mech Methods; 33(3):206-214.
- Modenese A, et al. 2019. Evaluation of occupational exposure to perchlorethylene in a group of Italian dry cleaners using noninvasive exposure indices. Int J Environ Res Public Health; 16(16):2832.
- Nijhuis N, et al. 2010. Tetrachloroethylene. In: WHO Guidelines for Indoor Air Quality: Selected Pollutants. Geneva: World Health Organization; <https://www.who.int/publications/i/item/9789289002134>. [Last Accessed May 2026]
- Nickerson K. 2006. Environmental contaminants in breast milk. J Midwifery Womens Health, 51(1):26-34.
- Occupational Safety and Health Administration (OSHA). 2005. Reducing Worker Exposure to Perchloroethylene in Dry Cleaning. <https://www.osha.gov/sites/default/files/publications/OSHA3253.pdf> Accessed May 2026.
- Ruckart PZ, et al. 2013. Evaluation of exposure to contaminated drinking water and specific birth defects and childhood cancers at Marine Corps Base Camp Lejeune, North Carolina: a case-control study. Environ Health; 12:104.
- Sallmen M, et al. 1995. Reduced fertility among women exposed to organic solvents. Am J Ind Med; 27:699-713.
- United States Environmental Protection Agency (EPA). 2023. Final Risk Evaluation for Perchloroethylene (PCE). <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/final-risk-evaluation-perchloroethylene-pce>. [Last accessed May 2026].
- United States Environmental Protection Agency (EPA). 2012. Toxicological review of tetrachloroethylene (perchloroethylene). [EPA/6363/R-08/011F Feb 2012]. https://cfpub.epa.gov/ncea/iris/iris_documents/documents/toxreviews/0106tr.pdf [Last accessed May 2026].
- Zielhuis GA, et al. 1989. Menstrual disorders among dry-cleaning workers. Scand J Work Environ Health; 15:238.

问题？致电 866.626.6847 | 短信 855.999.3525 | 在 [MotherToBaby.org](https://www.mothertobaby.org) 上发送电子邮件或聊天。

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, 2026年5月1日.

Perchloroethylene (PCE, PERC)

Selected References:

- Carmichael SL, et al. 2007. Maternal corticosteroid use & orofacial clefts. *Am J Obstet Gynecol*; 197(6):585.e1-585.e7.
- Constantinescu S, et al. 2014. Breast-feeding after transplantation. *Best Pract Res Clin Obstet Gynaecol*; 28(8):1163-1173.
- Fitzsimons R, et al. 1986. Outcome of pregnancy in women requiring corticosteroids for severe asthma. *J Allergy Clin Immunol*; 78(2):349-353.
- Florentien D, et al. 2023. Does prednisone use in pregnant women with rheumatoid arthritis induce insulin resistance in the offspring? *Clin Rheumatol*; 42(1):47-54.
- Gomaa MF, et al. 2014. Combined oral prednisolone and heparin versus heparin: the effect on peripheral NK cells and clinical outcome in patients with unexplained recurrent miscarriage. A double-blind placebo randomized controlled trial. *Arch Gynecol Obstet*; 290:757-762.
- Gur C, et al. 2004. Pregnancy outcome after first trimester exposure to corticosteroids: a prospective controlled study. *Reprod Toxicol*; 18(1):93-101.
- Hendry WF, et al. 1990. Comparison of prednisolone and placebo in subfertile men with antibodies to spermatozoa. *Lancet*; 335:85-88.
- Ito S, et al. 1993. Prospective follow-up of adverse reactions in breast-fed infants exposed to maternal medication. *Am J Obstet Gynecol*; 168:1393-1399.
- Liauw J, 2025. Antenatal Corticosteroids and Child Neurodevelopment: A Systematic Review and Meta-analysis. *Obstetrics and gynecology*; 146(3), 360-376.
- Ma N, et al. 2022. Oral immunosuppressants improve pregnancy outcomes in women with idiopathic recurrent miscarriage: A meta-analysis. *J Clin Pharm Ther*; 47:870-878.
- Man YA, et al. 2009. Association of higher rheumatoid arthritis disease activity during pregnancy with lower birth weight: results of a national prospective study. *Arthritis Rheum*; 60(11):3196-3206.
- Marzec I, et al. 2021. Pregnancy after liver transplant: maternal and perinatal outcomes. *BMC Pregnancy Childbirth*; 21: 627.
- McGuire E. 2012. Sudden loss of milk supply following high-dose triamcinolone (Kenacort) injection. *Breastfeed Rev*; 20:32-34.
- National Institute of Child Health and Human Development. 2024. Prednisolone. *Drugs and Lactation Database (LactMed)*.
- Nørgård B, et al. 2007. Therapeutic drug use in women with Crohn's disease and birth outcomes: a Danish nationwide cohort study. *Am J Gastroenterol*; 102:1406-1413. Nyberg
- G, et al. 1998. Breast-feeding during treatment with cyclosporine. *Transplantation*; 65:253-255.
- Ost L, et al. 1985. Prednisolone excretion in human milk. *J Pediatr*; 106:1008-1011.
- Palmsten K, et al. 2020. Oral corticosteroid use during pregnancy and risk of preterm birth. *Rheumatology (Oxford)*; 59(6):1262-1271.
- Park-Wyllie L, et al. 2000. Birth defects after maternal exposure to corticosteroids: prospective cohort study and meta-analysis of epidemiological studies. *Teratology*; 62(6):385-392.
- Petri M, et al. 1992. The Hopkins Lupus Pregnancy Center: 1987-1991 update. *Am J Reprod Immunol*; 28(3-4):188-191.
- Pradat P, et al. 2003. First trimester exposure to corticosteroids & oral clefts. *Birth Defects Res A Clin Mol Teratol*; 67(12):968-970.
- Rodríguez-Pinilla E & Martínez-Frías ML. 1998. Corticosteroids during pregnancy & oral clefts: a case-control study. *Teratology*; 58(1):2-5.

- Ryu RJ, et al. 2018. Prednisone pharmacokinetics during pregnancy & lactation. J Clin Pharmacol; 58(9):1223-1232.
- Silver RK, et al. 1993. Comparative trial of prednisone plus aspirin versus aspirin alone in the treatment of anticardiolipin antibody – positive obstetrics patients. Am J Obstet Gynecol; 169(6):1411-1417.
- Skuladottir H, et al. 2014. Corticosteroid use and risk of orofacial clefts. Birth Defects Res (Part A); 100: 499-506.
- Slob E, et al. 2023. Safety of antenatal predniso(lo)ne and dexamethasone on fetal, neonatal and childhood outcomes: a systematic review. The J of Clin Endocr & Metab; 109(4):e1328-e1335.
- Tata LJ, et al. 2008. Effects of maternal asthma, exacerbations and asthma medication use on congenital malformations in offspring: a UK population-based study. Thorax; 63(11):981-987.
- Van Zutphen AR, et al, National Birth Defects Prevention Study. 2015. Maternal asthma medication use during pregnancy and risk of congenital heart defects. Birth Defects Res A Clin Mol Teratol; 103(11):951-961.
- Viktil KK, et al. 2012. Outcomes after anti-rheumatic drug use before and during pregnancy: a cohort study among 150,000 pregnant women and expectant fathers. Scand J Rheumatol; 41(3):196-2012.
- Xu L, et al. 2009. The influence of immunosuppressants on the fertility of males who undergo renal transplantation and on the immune function of their offspring. Transpl Immunol; 22(1-2):28-31

问题？致电 866.626.6847 | 短信 855.999.3525 | 在 [MotherToBaby.org](https://www.MotherToBaby.org) 上发送电子邮件或聊天。

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, 2026年5月1日.

Perchloroethylene (PCE, PERC)

Selected References:

- Alano MA, et al. 2001. Analysis of nonsteroidal anti-inflammatory drugs in meconium and its relation to persistent pulmonary hypertension of the newborn. Pediatrics; 107:519-523.
- Center for Drug Evaluation and Research. (n.d.). NSAIDs may cause rare kidney problems in unborn babies. Retrieved October 16, 2020, from <https://www.fda.gov/drugs/drug-safety-and-availability/fda-recommends-avoiding-use-nsaids-pregnancy-20>

-weeks-or-later-because-they-can-result-low-amniotic

- Chen X, et al. 2024. Pregnancy outcomes and birth defects in offspring following non-steroidal anti-inflammatory drugs exposure during pregnancy: A systematic review and meta-analysis. *Reproductive Toxicology*; 125, 108561.
- Choi EY, et al. 2023. Neonatal and maternal adverse outcomes and exposure to nonsteroidal anti-inflammatory drugs during early pregnancy in South Korea: A nationwide cohort study, *PLoS Med*; 20(2):1-19.
- Delker E, et al. 2023. Associations of prenatal exposure to non-steroidal anti-inflammatory drugs with preterm birth and small for gestational age infants among women with autoimmune disorders, *Pharmacoepidemiol Drug Saf*; 32:225-237.
- Ericson A & Kallen BA. 2001. Nonsteroidal anti-inflammatory drugs in early pregnancy. *Reproductive Toxicology*; 15:371-375.
- Esposito DB, et al. 2021. Periconceptional nonsteroidal anti-inflammatory drug use, folic acid intake, and the risk of spina bifida. *Birth Defects Res*; 113(17):1257-1266.
- Hernandez RK, et al. 2012. Nonsteroidal antiinflammatory drug use among women and the risk of birth defects. *Am J Obstet Gynecol*; 206(3):228.e1-8.
- Hultzsich S, et al. 2021. First trimester naproxen exposure and outcome of pregnancy – a German case series. *Reprod Toxicol*; 103:51-57.
- Ito S, et al. 1993. Prospective follow-up of adverse reactions in breast-fed infants exposed to maternal medication. *Am J Obstet Gynecol*; 168(5):1393-1399.
- Janssen NM & Genta MS. 2000. The effects of immunosuppressive and anti-inflammatory medications on fertility, pregnancy, and lactation. *Arch Intern Med*; 160(5):610-619.
- Kabir Chowdhury MA, et al. 2023. Relationship of nonsteroidal anti-inflammatory drug use during pregnancy with autism spectrum disorder and intellectual disability among offspring. *Journal of Women's Health*; 32(3):356-365.
- Kallen BA. 2003. Maternal drug use and infant cleft lip/palate with special reference to corticoids. *Cleft Palate Craniofac J*; 40(6):624-628.
- Kallen BA & Olausson PO. 2003. Maternal drug use in early pregnancy and infant cardiovascular defect. *Reprod Toxicol*; 17(3):255-261.
- Koren G et al. 2006. Nonsteroidal antiinflammatory drugs during third trimester and the risk of premature closure of the ductus arteriosus: a meta-analysis. *The Annals of Pharmacotherapy*; 40:824-829.
- Malm H & Borish C. 2015. Non-steroidal anti-inflammatory drugs and antirheumatic drugs. In C Schaefer, P Peters, R Miller (Eds.), *Drugs During Pregnancy and Lactation: Treatment Options and Risk Assessment*, 3rd ed. P. 41-45. London: Elsevier.
- Markovic M, et al. 2019. Prenatal exposure to non-steroidal anti-inflammatory drugs (NSAIDs) and neurodevelopmental outcomes in children. *Pharmacoepidemiology and Drug Safety*; 28(4):452-459.
- McInerney KA, et al. 2017. Preconception use of pain-relievers and time-to-pregnancy: a prospective cohort study. *Hum Reprod*; 32(1):103-111.
- Nakhai-Pour HR, et al. 2011. Use of nonaspirin nonsteroidal anti-inflammatory drugs during pregnancy and the risk of spontaneous abortion. *CMAJ*; 183(15):1713-1720.
- Nielsen GL, et al. 2001. Risk of adverse birth outcome and miscarriage in pregnant users of non-steroidal anti-inflammatory drugs: population based observational study and case control study. *BMJ*; 322(7281):266-270.
- Li D, et al. 2003. Exposure to non-steroidal anti-inflammatory drugs during pregnancy and risk of miscarriage: population based cohort study. *BMJ*; 327:1-5.
- Li DK, et al. 2018. Use of non-steroidal anti-inflammatory drugs during pregnancy and the risk of miscarriage. *Am J Obstet Gynecol*; 219(3):275.e1-275.e8.
- Ofori B, et al. 2006. Risk of congenital anomalies in pregnant users of non-steroidal anti-inflammatory drugs: a nested case-control study. *Birth Defects Res B Dev Reprod Toxicol*; 77(4):268-279.
- Ostensen M & Ostensen H. 1996. Safety of nonsteroidal antiinflammatory drugs in pregnant patients with rheumatic disease. *J Rheumatol*; 23(6):1045-1049.

- Spencer JP, et al. 2001. Medications in the breast-feeding mother. Am Fam Physician; 64(1):119-127.
- Tanaka S, et al. 2016. Prediction of fetal ductus arteriosus constriction by systemic and local dermatological formulations of NSAIDs based on PK/PD analysis. In J Clin Pharmacol Ther; 54(10):782-794.

问题？致电 866.626.6847 | 短信 855.999.3525 | 在 [MotherToBaby.org](https://www.MotherToBaby.org) 上发送电子邮件或聊天。

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, 2026年5月1日。

Perchloroethylene (PCE, PERC)

Selected References:

- Ahlqvist VH, et al. 2024. Acetaminophen Use During Pregnancy and Children's Risk of Autism, ADHD, and Intellectual Disability. JAMA, 331(14):1205-1214.
- Alwan S, et al. 2022. Paracetamol use in pregnancy – caution over causal inference from available data. Nat Rev Endocrinol, 18(3):190.
- American College of Obstetricians and Gynecologists (ACOG). 2025. Acetaminophen Use in Pregnancy and Neurodevelopmental Outcomes. Practice Advisory, ACOG. <https://www.acog.org/clinical/clinical-guidance/practice-advisory/articles/2025/09/acetaminophen-use-in-pregnancy-and-neurodevelopmental-outcomes>
- Andrade C. 2016. Use of acetaminophen (paracetamol) during pregnancy and the risk of autism spectrum disorder in the offspring. J Clin Psychiatry; 77(2):e152-4. Arneja J, et al. 2020. Association between maternal acetaminophen use and adverse birth outcomes in a pregnancy and birth cohort. Pediatr Res; 87(7):1263-1269.
- Aselton P, et al. 1985. First-trimester drug use and congenital disorders. Obstet Gynecol 65:451-5.
- Aw M, et al. 1999. Neonatal paracetamol poisoning. Arch Dis Child Fetal Neonatal Ed; 81(1):F78.
- Baker BH, et al. 2020. Association of Prenatal Acetaminophen Exposure Measured in Meconium With Risk of Attention-Deficit/Hyperactivity Disorder Mediated by Frontoparietal Network Brain Connectivity. JAMA pediatrics, 174(11):1073-1081.
- Bauer AZ, et al. 2018. Prenatal paracetamol exposure and child neurodevelopment: A review. Hormones Behav 101:125-147.

- Baur AZ, et al. 2021. Paracetamol use during pregnancy – a call for precautionary action. *Nat Rev Endocrinol*, 17(12):757-766.
- Bornehag CG, et al. 2018. Prenatal exposure to acetaminophen and children’s language development at 30 months. *Eur Psychiatry*, in press.
- Bornehag CG, et al. 2018. Reply to: Shukla et al., Commentary on: Prenatal exposure to acetaminophen and children’s language development at 30 months. *Eur Psychiatry* 51:86.
- Brandlistuen RE, et al. 2013. Prenatal paracetamol exposure and child neurodevelopment: a sibling-controlled cohort study. *Int J Epidemiol*; 42(6):1702-13.
- Castro CT, et al. 2022. Effect of Acetaminophen use during pregnancy on adverse pregnancy outcomes: a systematic review and meta-analysis. *Expert Opin Drug Saf*, 21(2):241-251.
- D’Antonio F, et al. 2026. Prenatal paracetamol exposure and child neurodevelopment: a systematic review and meta-analysis. *The Lancet Obstetrics, Gynaecology, & Women’s Health*; 2, e190-e198.
- Damker P, et al. 2022. Handle with care – interpretation, synthesis and dissemination of data on paracetamol in pregnancy. *Nat Rev Endocrinol*, 18:191.
- Damkier P, et al. 2025. Acetaminophen in Pregnancy and Attention-Deficit and Hyperactivity Disorder and Autism Spectrum Disorder. *Obstetrics and Gynecology*, 145(2):168-176.
- Feldkamp ML, et al. 2010. Acetaminophen use in pregnancy and risk of birth defects. *Obstet Gynecol*;
- Golding J, et al. 2020. Associations between paracetamol (acetaminophen) intake between 18 and 32 weeks gestation and neurocognitive outcomes in the child: A longitudinal cohort study. *Paediatr Perinat Epidemiol*; 34(3):257-266.
- Harvard Health Publishing. 2017. Acetaminophen safety: Be cautious but not afraid. <https://www.health.harvard.edu/pain/acetaminophen-safety-be-cautious-but-not-afraid> [Accessed 5/18]115(1):109-15.
- Jick H, et al. 1981. First-trimester drug use and congenital disorders. *JAMA*; 246(4):343-6.
- Li DK, et al. 2003. Exposure to non-steroidal anti-inflammatory drugs during pregnancy and risk of miscarriage: population-based cohort study. *BMJ*, 327(7411):368. doi: 10.1136/bmj.327.7411.368.
- Li D, et al. 2018. Use of nonsteroidal anti-inflammatory drugs during pregnancy and risk of miscarriage. *Am J Obstet Gynecol*; 219(3):275.e1-275.e8.
- Kang EM, et al. 2009. Prenatal exposure to acetaminophen and asthma in children. *Obstet Gynecol*; 114(6):1295-1306.
- Liew Z, et al. 2019. Use of negative control exposure analysis to evaluate confounding: An example of acetaminophen exposure and attention-deficit/hyperactivity disorder in Nurses’ Health Study II. *Am J Epidemiol* 188(4): 768-775.
- Liew Z, et al. 2014. Acetaminophen use during pregnancy, behavioral problems, and hyperkinetic disorders. *JAMA Pediatr*;168(4):313-20.
- Marsh CA, et al. 2014. Case-control analysis of maternal prenatal analgesic use and cardiovascular malformations: Baltimore-Washington Infant Study. *Am J Obstet Gynecol*; 211(4):404.e1-9.
- McElhatton PR, et al. 1997. Paracetamol overdose in pregnancy analysis of the outcomes of 300 cases referred to the Teratology Information Service. *Reprod Toxicol*; 11(1):85-94.
- Niederhoff H and Zahradnik HP 1983. Analgesics during pregnancy. *Am J Med*; 75:117-120.
- Ricci C et al. 2023. In utero acetaminophen exposure and child neurodevelopmental outcomes: Systematic review and meta-analysis. *Paediatric and perinatal epidemiology*, 37(5):473-484.
- Riggs BS, et al. 1989. Acute acetaminophen overdose during pregnancy. *Obstet Gynecol*; 74(2):247-53.
- Rosevear SK and Hope PL. 1989. Favourable neonatal outcome following maternal paracetamol overdose and severe fetal distress. Case report. *Br J Obstet Gynaecol*; 96(4):491-3.
- Smarr MM, et al. 2016. Urinary paracetamol and time-to-pregnancy. *Hum Reprod*, 31(9):2119-2127.
- Wesselink AK, et al. 2020. Association Between Male Use of Pain Medication and Fecundability. *Am J Epidemiol*, 189(11):1348-1359.
- Zafeiri A, et al. 2022. Maternal over-the-counter analgesics use during pregnancy and adverse perinatal

outcomes: cohort study of 151,141 singleton pregnancies. BMJ Open, 12:e048092.

问题？致电 866.626.6847 | 短信 855.999.3525 | 在 [MotherToBaby.org](https://www.MotherToBaby.org) 上发送电子邮件或聊天。

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, 2026年5月1日.

Perchloroethylene (PCE, PERC)

Selected References:

- ACOG Committee on Health Care for Underserved Women. 2011 (reaffirmed 2021). Committee Opinion No. 479: Methamphetamine abuse in women of reproductive age. Obstet Gynecol; 117:751-5.
- Ajayi AF et al. 2020. The physiology of male reproduction: Impact of drugs and their abuse on male fertility. Andrologia; 52(9): e13672.
- Brecht ML, Herbeck DM. 2014. Pregnancy and fetal loss reported by methamphetamine-using women. Subst Abuse; 8:25-33.
- Chang L, et al. 2004. Smaller subcortical volumes and cognitive deficits in children with prenatal methamphetamine exposure. Psych Res:Neuroimaging; 132:95-106.
- Chomchai C, et al. 2016. Transfer of methamphetamine (MA) into breast milk and urine of postpartum women who smoked MA tablets during pregnancy: Implications for initiation of breastfeeding. J Hum Lact; 32:333-9.
- Chu EK, et al. 2020. Behavior Problems During Early Childhood in Children With Prenatal Methamphetamine Exposure. Pediatrics; 146(6):e20190270.
- Cohen JM, et al. 2017. Placental complications associated with psychostimulant use in pregnancy. Obstet Gynecol; 130(6):1192-201.

- Courtney KE, Ray LA. 2014. Methamphetamine: an update on epidemiology, pharmacology, clinical phenomenology, and treatment literature. *Drug Alcohol Depend*; 1;143:11-21.
- Derauf C, et al. 2012. Prenatal methamphetamine exposure and inhibitory control among young school-age children. *J Pediatr*; 161(3):452-9.
- Dinger J, et al. 2017. Methamphetamine consumption during pregnancy – effects on child health. *Pharmacopsychiatry*; 50(3):107-113.
- Dyk JV, et al. 2014. Maternal methamphetamine use in pregnancy and long-term neurodevelopmental and behavioral deficits in children. *J Popul Ther Clin Pharmacol*; 21(2):e185-96.
- Eriksson M, et al. 1981. Amphetamine addiction and pregnancy II. Pregnancy, delivery and the neonatal period. Socio-medical aspects. *Acta Obstet Gynecol Scand*; 60:253-259, 1981.
- Garey JD, et al. 2020 Teratogen update: Amphetamines. *Birth Defects Res*; 112(15):1171-1182.
- Golub M, et al. 2005. NTP CERHR Expert Panel Report on the reproductive and developmental toxicity of amphetamine and methamphetamine. *Birth Defects Res B Dev Reprod Toxicol*; 74(6):471-584.
- Good MM, et al. 2010. Methamphetamine use during pregnancy: maternal and neonatal implications. *Obstet Gynecol*; 116(2 Pt 1):330-4.
- Gorman MC, et al. 2014. Outcomes in pregnancies complicated by methamphetamine use. *Am J Obstet Gynecol*; 211(4):429.e1-7.
- Hamed M, et al. 2023. Psychoactive drugs and male fertility: impacts and mechanisms. *Reprod Biol Endocrinol*; 21,69.
- Harst L, et al. 2021. Prenatal Methamphetamine Exposure: Effects on Child Development-A Systematic Review. *Dtsch Arztebl Int*. 7;118(18):313-319
- Hayer S, et al. 2024. Prenatal methamphetamine use increases risk of adverse maternal and neonatal outcomes. *American journal of obstetrics and gynecology*; 231(3),356.e1-356.e15.
- Heinonen OP, et al. 1977. *Birth Defects and Drugs in Pregnancy*. Littleton, MA: John Wright-PSG, pp 346-347, 439.
- LaGasse LL, et al. 2011. Prenatal methamphetamine exposure and neonatal neurobehavioral outcome in the USA and New Zealand. *Neurotoxicol Teratol*; 33(1):166-75.
- LaGasse LL, et al. 2012. Prenatal methamphetamine exposure and childhood behavior at 3 and 5 years of age. *Pediatrics*; 129(4):681-688.
- Little BB, et al. 1988. Methamphetamine abuse during pregnancy: outcome and fetal effects. *Obstet Gynecol*; 72:541-4.
- Kalaitzopoulos DR, et al. 2018. Effect of methamphetamine hydrochloride on pregnancy outcome: A systematic review and meta-analysis. *J Addict Med*; 12(3):220-226.
- Kittirattanapaiboon P, et al. 2017. Methamphetamine use and dependence in vulnerable female populations. *Curr Opin Psychiatry*; 30(4):247-252.
- Kwiatkowski MA, et al. 2018. Cognitive outcomes in prenatal methamphetamine exposed children aged six to seven years. *Compr Psychiatry*; 80:24-33.
- Newport DJ, et al. 2016. Prenatal psychostimulant and antidepressant exposure and risk of hypertensive disorders of pregnancy. *J Clin Psychiatry*; 77(11):1538-45.
- Nguyen D, et al. 2010. Intrauterine growth of infants exposed to prenatal methamphetamine: results from the infant development, environment, and lifestyle study. *J Pediatr*; 157(2):337-9.
- Ornoy A. 2018. Pharmacological treatment of attention deficit hyperactivity disorder during pregnancy and lactation. *Pharm Res*; 35:46.
- Pentecost R, et al. 2021. Scoping Review of the Associations Between Perinatal Substance Use and Perinatal Depression and Anxiety. *J Obstet Gynecol Neonatal Nurs*; 50(4):382-391
- Pflügner A, et al. 2018. [Methamphetamine consumption during pregnancy and its effects on neonates]. *Klin Padiatr*; 230(1):31-38.
- Pierce SL, et al. 2019. Methamphetamine-associated cardiomyopathy in pregnancy. *Mayo Clinic Proc*; 94(3):551-554.

- Rastegar-Pouyani N, et al. 2025. Prenatal Exposure to Methamphetamine and Its Association With Birth Outcomes: A Meta-Analysis. Birth defects research; 117(7), e2488.
- Roussotte FF, et al. 2012. Frontostriatal connectivity in children during working memory and the effects of prenatal methamphetamine, alcohol, and polydrug exposure. Dev Neurosci; 34(1):43-57.
- Sanjari Moghaddam H, et al. 2021. Effects of Prenatal Methamphetamine Exposure on the Developing Human Brain: A Systematic Review of Neuroimaging Studies. ACS Chem Neurosci. 4;12(15):2729-2748.
- Sankaran, D, et al. 2021. Methamphetamine: burden, mechanism and impact on pregnancy, the fetus, and newborn. J Perinatol.
- Shah R, et al. 2012. Prenatal methamphetamine exposure and short-term maternal and infant medical outcomes. Am J Perinatol; 29(5):391-400.
- Smid MC, et al. 2019. Stimulant use in pregnancy: An under-recognized epidemic among pregnant women. Clin Obstet Gynecol; 62(1):168-184.
- Smith LM, et al. 2003. Effects of prenatal methamphetamine exposure on fetal growth and drug withdrawal symptoms in infants born at term. J Dev Behav Pediatr; 24(1):17-23.
- Smith LM, et al. 2006. The infant development, environment, and lifestyle study: effects of prenatal methamphetamine exposure, polydrug exposure, and poverty on intrauterine growth. Pediatrics; 118(3):1149-56.
- Smith LM, et al. 2008. Prenatal methamphetamine use and neonatal neurobehavioral outcome. Neurotoxicol Teratol; 30(1):20-28.
- Smith LM, et al. 2011. Motor and cognitive outcomes through three years of age in children exposed to prenatal methamphetamine. Neurotoxicol Teratol; 33(1):176-84.
- Stewart JL, Meeker JE. 1997. Fetal and infant deaths associated with maternal methamphetamine abuse. J Anal Toxicol; 21(6):515-7.
- Twomey J, et al. 2013. Prenatal methamphetamine exposure, home environment, and primary caregiver risk factors predict child behavioral problems at 5 years. The American journal of orthopsychiatry; 83(1):64-72.
- Woudes TA, et al. 2014. Prenatal methamphetamine exposure and neurodevelopmental outcomes in children from 1 to 3 years. Neurotoxicol Teratol; 42:77-84.
- Woudes TA, Lester BM. 2023. Opioid, methamphetamine, and polysubstance use: perinatal outcomes for the mother and infant. Front Pediatr. 1:1305508.
- Wright TE, et al. 2015. Methamphetamines and pregnancy outcomes. J Addict Med; 9(2):111-7.

问题？致电 866.626.6847 | 短信 855.999.3525 | 在 [MotherToBaby.org](https://www.MotherToBaby.org) 上发送电子邮件或聊天。

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, 2026年5月1日.