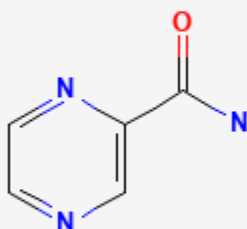




## Pyrazinamide

Revised: May 15, 2023.

CASRN: 98-96-4



## Drug Levels and Effects

### Summary of Use during Lactation

Limited information indicates that maternal pyrazinamide therapy produces potentially substantial levels in milk. Exclusively breastfed infants should be monitored for rare cases of jaundice, hepatitis and arthralgia if this drug is used during lactation.[1] The amount of pyrazinamide in milk is probably insufficient to treat tuberculosis in the breastfed infant, but if both the mother and breastfed infant are receiving the drug, infant serum levels could be monitored to assess for excessive infant serum concentrations. The Centers for Disease Control and Prevention and other professional organizations state that breastfeeding should not be discouraged in women taking pyrazinamide.[2]

**Disclaimer:** Information presented in this database is not meant as a substitute for professional judgment. You should consult your healthcare provider for breastfeeding advice related to your particular situation. The U.S. government does not warrant or assume any liability or responsibility for the accuracy or completeness of the information on this Site.

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## Drug Levels

*Maternal Levels.* One woman who was lactating, but not breastfeeding (time postpartum not stated) was given a single oral dose of 1 gram of pyrazinamide. A peak milk level of 1.5 mg/L occurred 3 hours after the dose. The half-life of the drug in milk was estimated to be 9 hours.[1] Using these data, a fully breastfed infant would receive a maximum of about 1.4% of the maternal weight-adjusted dosage.

Two breastfeeding women with tuberculosis were receiving pyrazinamide as well as at least 4 other antituberculars donated 1 mL breastmilk samples by manual expression at approximately 6 weeks postpartum. Samples were obtained immediately prior to a dose and 2, 4, and 6 hours after a dose of 1750 mg of pyrazinamide. Peak milk pyrazinamide concentrations of 38.4 and 59.2 mg/L occurred at about 4 hours after a dose. The authors used the peak concentrations to calculate infant daily dosages of 5.76 and 8.88 mg/kg, which ranged from 14 to 30% of the infant dosage and 17 to 28% of the maternal weight-adjusted dosage. These values may be overestimates because peak milk concentrations were used rather than average concentrations.[3] Another group of authors used data from this study and other pharmacokinetic studies to estimate infant dosages of 7.1 and 10.9 mg/kg daily in these patients which represent 47% and 73% of the infant dosage. However, the authors used a nonstandard milk volume in their calculation. Using the standard 150 mL/kg daily, the estimated infant dosages would be 5.8 and 8.8 mg/kg daily in these patients, which represent 38% and 59% of the infant dosage.[4]

*Infant Levels.* Relevant published information was not found as of the revision date.

## Effects in Breastfed Infants

Pyrazinamide was used as part of multi-drug regimens to treat 2 pregnant women with multidrug-resistant tuberculosis throughout pregnancy and postpartum. Their two infants were breastfed (extent and duration not stated). At age 1.25 and 5.1 years, the children were developing normally.[5]

Two mothers in Turkey were diagnosed with tuberculosis at the 30th and 34th weeks of pregnancy. They immediately started isoniazid 300 mg, rifampin 600 mg, pyridoxine 50 mg daily for 6 months, plus pyrazinamide 25 mg/kg and ethambutol 25 mg/kg daily for 2 months. Both mothers breastfed their infants (extent not stated). Their infants were given isoniazid 5 mg/kg daily for 3 months prophylactically. Tuberculin skin tests were negative after 3 months and neither infant had tuberculosis at 1 year of age. No adverse effects of the drugs were mentioned.[6]

## Effects on Lactation and Breastmilk

Relevant published information was not found as of the revision date.

## References

1. Holdiness MR. Antituberculosis drugs and breast-feeding. Arch Intern Med. 1984;144:1888. [Letter].
2. Nahid P, Dorman SE, Alipanah N, et al. Official American Thoracic Society/Centers for Disease Control and Prevention/Infectious Diseases Society of America Clinical Practice Guidelines: Treatment of Drug-Susceptible Tuberculosis. Clin Infect Dis. 2016;63:e147–e195. PubMed PMID: 27516382.
3. Zuma P, Joubert A, van der Merwe M, et al. Validation and application of a quantitative LC-MS/MS assay for the analysis of first-line anti-tuberculosis drugs, rifabutin and their metabolites in human breast milk. J Chromatogr B Analyt Technol Biomed Life Sci. 2022;1211:123489.
4. Algharably EA, Kreutz R, Gundert-Remy U. Infant exposure to antituberculosis drugs via breast milk and assessment of potential adverse effects in breastfed infants: Critical review of data. Pharmaceutics. 2023;15:1228. PubMed PMID: 37111713.

5. Drobac PC, del Castillo H, Sweetland A, et al. Treatment of multidrug-resistant tuberculosis during pregnancy: Long-term follow-up of 6 children with intrauterine exposure to second-line agents. Clin Infect Dis. 2005;40:1689–92. PubMed PMID: 15889370.
6. Keskin N, Yilmaz S. Pregnancy and tuberculosis: To assess tuberculosis cases in pregnancy in a developing region retrospectively and two case reports. Arch Gynecol Obstet. 2008;278:451–5. PubMed PMID: 18273625.

## Substance Identification

### Substance Name

Pyrazinamide

### CAS Registry Number

98-96-4

### Drug Class

Breast Feeding

Lactation

Milk, Human

Anti-infective Agents

Antitubercular Agents