

Medicines and breastfeeding

The advantages of breastfeeding to a mother and her infant are widely recognised, and the practice is encouraged. Although most medications cross into breast milk, most do so in clinically insignificant amounts. For many drugs, there are published data on transfer into breast milk, levels in plasma of exposed infants and adverse effects or lack thereof in exposed infants. An individual risk–benefit analysis of the safety of breastfeeding while taking medication should be undertaken with the mother, her partner and her medical practitioner. In most cases the benefit to the mother–baby pair of breastfeeding outweighs the possible adverse effects on the infant of the drug ingested via milk. However, mothers should be advised to observe their infants carefully after any exposure to medication via breast milk and to discuss any unusual or adverse reactions with their doctor or pharmacist.

Factors determining infant exposure to medicines in breast milk

The following parameters may be used to determine infant exposure to a drug via breast milk:

- **Absolute infant dose.** This is the total amount of drug ingested via breast milk over 24 hours. It may be compared directly with known safe doses of a drug in infants or neonates.
- **Relative infant dose (RID).**

$$\text{RID} = \frac{\text{Absolute infant dose (mg/kg/day)}}{\text{Maternal dose (mg/kg/day)}} \times 100$$

Values <10% are generally considered safe if the drug is without serious side effects and is taken within the usual dose range. The 10% notional level of concern is less in preterm infants with reduced clearance capacities.

- **Drug concentration in infant plasma.** Expressed as a percentage of known therapeutic concentrations of a particular drug, this figure may give an estimation of likely drug effects in the infant.
- **Reported adverse effects after breast milk ingestion.** A literature search can be undertaken to determine if adverse effects to a drug have been reported after an infant has ingested a drug via breast milk.
- **Milk to plasma ratio.** This is the ratio of the concentration of a drug in milk to that in the maternal plasma. It has little value in assessing safety of a drug in breastfeeding, although it can be used

to calculate milk drug concentration when maternal plasma concentration is known.

Factors determining drug transfer into breast milk and infant exposure

Drugs mostly transfer to breast milk by passive diffusion. As the drug is metabolised by the mother and her plasma drug concentration falls, the drug may then diffuse back from the breast milk into the mother's plasma.

Factors affecting drug transfer

- **Maternal plasma concentration of drug.** This is determined by the dose administered to the mother and maternal pharmacokinetics.
- **The pKa of drug and the pH of milk.** Only unionised drug can diffuse into milk. Ion trapping of basic drugs may occur as milk is 0.2 pH units less than plasma.
- **Lipid solubility and fat content of milk.** Fat enhances transfer of highly lipid soluble drugs and often results in higher drug concentrations in hind-milk compared with fore-milk.
- **Molecular mass.** Large polypeptides and proteins generally do not transfer into milk.
- **Plasma protein binding.** Highly protein bound drugs have restricted transfer to breast milk.

Factors affecting infant exposure

- **Volume of milk ingested by infant each day.** An estimate of this volume in a fully breast fed baby is 150 mL/kg/day. Exclusivity of breastfeeding is an important consideration in assessment of exposure.
- **Gestational and postnatal age of baby.** The ability of infants to metabolise and excrete drugs increases from about 33% at birth to 100% at 7–8 months of age.
- **Oral bioavailability of drug in the infant.**

Minimising transfer of medicine to an infant

- Consider alternative routes of medicine administration and alternative products—e.g. nasal drops in preference to an oral decongestant; a topical non-steroidal anti-inflammatory instead of oral; or a poorly absorbed laxative such as a bulk-forming agent instead of a stimulant cathartic.