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Breastfeeding and medicines

Courtesy of Produnis, Wikimedia Commons

Breastfeeding has advantages over bottle-feeding. It provides the ideal nutritional formula for a human infant, with maximum bioavailability of nutrients. It also encourages closeness between infant and mother from an early age. Breastfeeding imparts hormones and immunoglobulins to the infant that stimulate its immune system, and protect against infant infection. It may also provide health benefits to the mother in terms of decreased risk of some forms of breast cancer and osteoporosis. It may also provide health benefits to the mother in terms of decreased risk of some forms of breast cancer and osteoporosis, and long-term benefits to the infant, such as a reduced likelihood of type II diabetes. Unlike bottle-feeding, no complex sterilisation procedure is required and it is free.

Some of the benefits of breastfeeding, and misconceptions about it, are reviewed by NHS choices. Also watch this video where specialist midwife Bella Dale explains the practicalities of breastfeeding and what women need to think about when they start to breastfeed for the first time.

However, women need to be careful about taking medicines when they breastfeed, and the rest of the learning materials on this site are concerned with this issue.

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ROYAL PHARMACEUTICAL SOCIETY

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Choosing a medicine

Most medicines are considered compatible with breastfeeding, but there are some exceptions. Almost all medicines pass into breast milk, but the extent to which this occurs varies, as does the ability of a medicine to harm the neonate or affect lactation. It is therefore important to understand the factors that impact on these processes. They include:

Maternal plasma concentration

Drugs with a low maternal plasma concentration are less likely to pose a problem to breastfed infants. Some drugs are not absorbed from the gut at all (e.g. nystatin, Fybogel) or are absorbed very poorly (e.g. oral vancomycin). Others have short half-lives, are cleared very quickly, and are therefore less likely to accumulate in breast milk (e.g. epoprostenol, lidocaine).

Protein binding

Drugs that are highly protein bound are less likely to pass from the bloodstream into breast milk. Highly protein bound drugs include warfarin and propranolol.

Many medicines are compatible with breastfeeding

Acid-base balance

Breast milk is slightly acidic compared to blood. Drugs that are weak bases can become ionised in milk, this makes them more water soluble and so less able to diffuse back out into blood, which can result in accumulation within milk. Examples of weak bases include amoxicillin and dexamfetamine. Conversely, weak acids tend not to accumulate in milk (e.g. ibuprofen, some diuretics).

Fat solubility

Lipophilic drugs preferentially dissolve in the fatty globules in milk. However, as fat is generally a small proportion of the overall milk volume, lipophilicity is not a good predictor of drug accumulation in milk. Fat soluble drugs include benzodiazepines and amitriptyline.

Absorption from infant's gut

Many non-oral drugs given to the mother enter her milk, but due to their physicochemical properties are not significantly absorbed from the infant's gut or are broken down within it. Examples include gentamicin, dopamine and insulin.

Lactation inhibition

Drugs that can inhibit milk production may make breastfeeding difficult or impossible. Examples include bromocriptine, diuretics, anabolic steroids, moderate/heavy regular alcohol intake.

Toxicity of the drug

Some drugs are potentially very toxic to babies, even in small amounts, and must be avoided when breastfeeding (e.g. some cytotoxic agents, cocaine). Others are natural to the body and unlikely to be harmful unless given in huge doses (e.g. iron, potassium, vitamin C). Some drugs are commonly administered uneventfully to full-term neonates in doses much bigger than they could be exposed to via breast milk (e.g. penicillins, aciclovir, fluconazole). In these cases, infants should still be monitored for side effects and alternatives with lower milk penetration chosen if possible.

It is not known whether drugs affecting CNS neurotransmission can cause behavioural or emotional problems in the exposed neonate in later life (e.g. SSRIs, phenothiazines).

Neonatal clearance

If the newborn has already been exposed to a drug in pregnancy without ill effects, this may give healthcare professionals greater confidence in encouraging the mother to breastfeed. However, during pregnancy the *mother* clears all drugs from the infant's circulation; after delivery drug elimination relies solely on the *neonate*'s clearance mechanisms. Therefore, even if a newborn has already been exposed to a drug during pregnancy without ill effect, this is not an indicator of the drug's safety during breastfeeding.

Neonatal kidney and liver function is not optimal at birth, and drugs given via breast milk may accumulate. This is of special concern where drugs have CNS depressant effects (e.g. opioids). This risk of accumulation is greater in premature infants or in those with kidney or liver disease, particularly if the drug has a long half-life as well (e.g. fluoxetine, some antipsychotics). Even in a healthy, full-term infant it might be better to select a shorter acting medicine for use during breastfeeding if you have a choice.

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Reducing risk

The following points should be considered when advising on drug use in a breastfeeding mother:

- If the drug is not essential it should be avoided or a non-pharmacological approach used instead.
- There may be alternative drugs that are safer to use.
- The frequency of breastfeeding of babies varies a lot according to age. For example, a newly-born baby might feed every hour, whereas a one-year-old infant may be feeding only twice a day. This means it's important to ask about the feeding regimen before suggesting how the administration of medicines might fit in. So, it would be pointless suggesting that a mother takes a long-acting medicine at bedtime to reduce infant exposure, if she feeds him throughout the night.
- Similarly, breastfeeding immediately before a dose, in an attempt to reduce exposure to peak plasma levels, is not often a practical option.
- For a *very* short course of treatment (less than 48 hours) breastfeeding could be interrupted temporarily, but longer interruption can make resumption difficult.

- Not all mothers can cope with bottle-feeding (buying, measuring, sterilisation), in which case breastfeeding with limited infant exposure to a drug may be the most acceptable option.
- As in any situation where the risk of side effects must be minimised: avoid multiple therapy where drugs have similar adverse reactions; use minimum doses and dosage forms that limit systemic exposure (e.g. inhalers); avoid new drugs and long-acting preparations if possible.

The UKMi specialist centres for medicines in breastfeeding offer additional guidance on safe use of medicines in breastfeeding here.

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Suggested questions

There's a range of further information you may need before answering a question about use of medicines in a breastfeeding mother. Of course, you'll want to check the patient's drug history and medical history, and if you're being asked about use of a specific medicine you'll need the indication, dose, frequency, route of administration and expected duration of treatment. You'll also need to establish the enquirer's identity if you don't already know it. What else do you need to know that's specific to breastfeeding?

They may not apply to every situation you come across, but here are some questions you should be thinking about in practice.

The Medicine

- What would happen if the medicine is stopped, or not used? Are there non-drug options?
- Have any alternative medicines been considered or tried?
- Has mum already been taking the medicine? Has the infant already been exposed to it in pregnancy or breastfeeding, and if so have any problems been identified? (e.g. possible side effects, withdrawal symptoms)

The Baby

- How old is the infant, and is he/she premature or full-term?
- Is the infant well? Is there anything to suggest that the infant may be at increased risk of drug harm (e.g. kidney or liver dysfunction)?
- How often is the baby being fed, and are they relying exclusively on breast milk?

Going Forward

- Who is in a position to change therapy if necessary or document your advice in the patient's notes? Who else needs to know the answer to this enquiry?

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Information sources

There are many potential sources for clinical questions about breastfeeding; here are some recommended examples:

UKMi offers advice about the safety of medicines in breastfeeding, including many **Medicines Q&As**, on the SPS website. Type the name of a medicine into the search engine and select it from the drop down list, then scroll down to the bottom of the page to look at the 'Lactation Safety Information' section.

Hale's **Medication in Mothers' Milk** is a helpful place to start for most information about most drugs in breastfeeding. It is available online, but you need a subscription to access it. Ask your MI manager for details. This source can be very useful for pharmacokinetic data.

LactMed is the Drugs and Lactation Database. It is a helpful, free, online resource produced by the National Library of Medicine in the US.

Drugs in Pregnancy and Lactation by Briggs et al. may assist you, depending upon the nature of the question you're looking into. It is available online and in a paper format, although the online version is more up-to-date. The book **Drugs During Pregnancy and Lactation** by Schaefer et al. is also very useful. Ask your MI pharmacist about access to both these resources.

SPCs have variable content and often make statements based on legal concerns rather than evidence, but manufacturer's medical information departments can be helpful.

Choose your search terms carefully in **Embase** and **Medline** – you can use the term 'breast feeding' in both databases, but Embase uses 'breast milk' while Medline prefers 'milk,human'. In England, most NHS sites access these databases via Athens. Your library or MI pharmacist will show you how to log in.

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Next steps in learning...

This tutorial has covered the core knowledge you need on this subject, but there are some more in-depth resources which will help extend your knowledge about breastfeeding and the use of medicines in women who breastfeed:

CPPE
CENTRE FOR PHARMACY POSTGRADUATE EDUCATION

The CPPE has a very comprehensive training package aimed at pharmacists entitled Breastfeeding which was developed by NHS Education for Scotland. Site registration is required. This e-learning shows pharmacists how to promote breastfeeding, takes into account common breastfeeding problems, and shows how to promote the safe use of medicines for breastfeeding mothers.

Clinical Knowledge Summaries (CKS) has evidence-based advice on managing various medical concerns in breastfeeding such as nipple soreness and caring for women with a low milk production or excess milk supply.

e-learning

The BMJ provides e-learning on breastfeeding (2011) which looks at the medical advantages of breastfeeding, assessing adequate milk intake, increasing a mother's milk supply, diagnosing and treating medical conditions in breastfeeding, and prescribing safely. A subscription is required unless your institution provides you with access. There is also a helpful BMJ review on how to manage breastfeeding problems in the community (May 2014) that is available via Athens.

The Best Beginnings charity have produced a film From Bump to Breastfeeding, which is endorsed by five Royal Colleges. It aims to motivate the next generation of mothers to make a supported choice to breastfeed. Films can be viewed online in English and several other languages including Urdu, Bengali, Polish and Somali.

The Academy of Breastfeeding Medicine is a worldwide organisation with members from over fifty countries. It has published 25 clinical protocols for managing issues connected with breastfeeding. This includes the management of mastitis, and jaundice in the breastfed infant, as well as the use of galactogogues, antidepressants, analgesics, and contraception.