Breastfeeding Guidelines for Medically Complex Patients

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This guideline has been developed collaboratively with MFM and neonatology at PFW and Ben Taub Hospital.

Highlights

- Many medications are compatible with breastfeeding and review of available literature is important before counseling a patient who is on any medication
- Readily available evidence-based resources to help guide patient counseling include InfantRisk, E-lactancia, Reprotox, and Lactmed.
- Patients should **never** be told to “pump and dump” or stop breastfeeding based on medication use alone without review of evidence for each individual medication.

How safety of medications in breastfeeding determined

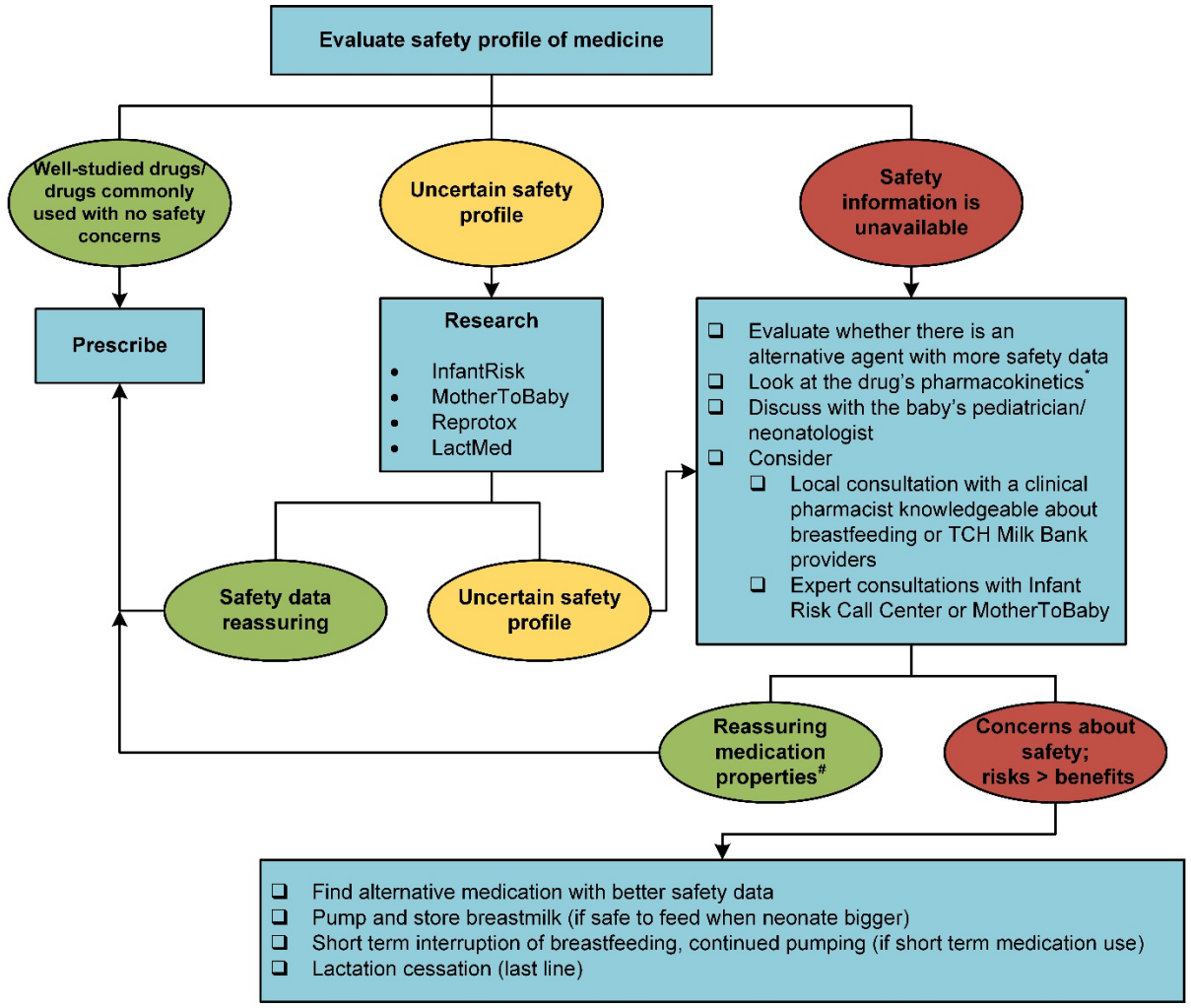
- In general, medications that have a low molecular weight, low protein binding, high lipid solubility, a weak base, have a low volume of distribution, or a high oral bioavailability pass into breastmilk in higher quantities.[1]
- General principals to consider:
    - If something is safe to give to infants by mouth, then even if a small amount is transferred in small amounts through milk, then it should still be safe.
    - Highly protein bound or large molecules do not pass into breastmilk easily.
    - If a medication is not bioavailable when taken orally, then it will not be in an active form in the infant if consumed through breastmilk.

Considerations for Certain Medical Conditions

Breastfeeding is rarely contraindicated based on medical condition. However, in specific conditions where sleep deprivation may affect medical management,

- HIV[2]
  - Evidence-based, patient-centered counseling should be provided to all people living with HIV to support shared decision-making about infant feeding. Counseling should be multi-disciplinary (including obstetric, infectious disease, and pediatric teams) and include information about the importance of achieving and maintaining viral suppression to reduce the chance of lactational transmission to less than 1% but not zero; replacement feeding (formula or donor human breastmilk) eliminates this risk. Counseling should be personalized based on each person's clinical and HIV history. Regardless of infant feeding choice, people who chose to feed their infant breastmilk or formula should be supported in their goals. Engaging Child Protective Services or similar agencies is not an appropriate response to infant feeding choices impacted by HIV. Providers are encouraged to contact the National Perinatal HIV/AIDS Hotline (1-888-448-8765) with HIV-related questions about infant feeding.
- Epilepsy[3]
  - Breastfeeding is often compatible with most anti-seizure medication. While breastfeeding itself does not increase seizure risk, the associated sleep changes and deprivation can increase the risk for seizures.
  - Patients should be encouraged to optimize sleep as much as possible. One option is to prioritize one 4-hour stretch of sleep between feeds overnight with a support person watching and feeding baby during that time.
  - Consider sitting in a low chair or on the floor to breastfeed to reduce the risk of infant falls in the event of a seizure
  - As with all families, parents with epilepsy should be strongly discouraged from co-sleeping.
- Multiple Sclerosis
  - Breastfeeding is protective of MS flares postpartum and is encouraged.
- Cardiomyopathy[4]
  - While breastfeeding is not contraindicated in patients with Cardiomyopathy, certain medications such as Dopamine Antagonists (Bromocriptine) can reduce breastmilk supply. Most other medications utilized in patients with heart failure are safe and compatible with breastfeeding. In this setting the benefits and risks of this medication should be discussed and decision to breastfeed should be individualized based on shared decision making and clinical factors.
- Substance Use Disorder- refer to Substance Use Disorder Perinatal Guideline.
- Patients who desire to breastfeed but encounter challenges or are unable to breastfeed
  - The clinical team staff including lactation specialists, nurses, and physicians from OB/Gyn and Pediatrics teams can help the patient process and determine the best alternative feeding practice for their infant.
  - The patients should be offered supportive services including access to Social Work, Psychology and Psychiatry as this limitation may differ significantly from their postpartum expectations. Breastfeeding challenges have been linked to development of postpartum mood disorders.[5] All care team members should be cognizant and respectful of this association.
- Patients who are critically ill
  - Infant feeding plans should be discussed early in pregnancy, throughout prenatal care, and during the hospital admission process.
  - Patients who are critically ill postpartum may be unable to utilize the breast pump or directly breastfeed for a significant period of time, which may reduce long term success for breastfeeding.
  - For patients who expressed a desire to breastfeed, lactation specialists should be consulted to help provide lactation support. This may include help with assistance with placing the breast pump or manual expression and milk collection for patients who are mechanically ventilated or unable to do so themselves for whatever reason. Pumping may also decrease the risk of postpartum engorgement and/or mastitis (if frequent expression is continued).

Figure 1. Decision algorithm for using medication in lactating patients based on drug data available



*Favorable Pharmacokinetic characteristics include molecular weight > 800 g/mol or Da, shorter half life, > 90% protein binding, high volume of distribution. This information can be found on UpToDate drug information but do not use UpToDate lactation recommendations.
#Dosing strategies to reduce milk transfer include dose immediately after breastfeeding (helps with drugs with shorter half lives); use the lowest dose for shortest duration necessary

Breastfeeding safety resources

When reviewing a medication's safety profile, please consider referring to multiple sources and check the source for when it was most recently updated.

Infant Risk Center
- Free call center for parents and clinicians (0800-1500 CST): 806-352-2519
- Phone applications
  - MommyMeds for Moms
  - InfantRisk for Healthcare Professionals
- https://infantrisk.com/infantrisk-center-resources

Reprotox
- Has summaries on the effects of medications, chemicals, and biologics on pregnancy, fetal development, fertility, and lactation safety
- Paid subscription, but free for trainees (email reprotox@reprotox.org to obtain free subscription for medical students, residents, and fellows).
- https://reprotox.org/

E-Lactancia.org
- Free resource online in English and **Spanish**
- Available to healthcare workers and patients
- Recommended by the Academy of Breastfeeding Medicine
- https://e-lactancia.org/

LactMed
- Has information on medication levels in breastmilk, how much is passed to the infant, and possible adverse effects for the nursing infant. It also suggests therapeutic alternatives for medications that have poor safety data.
- https://www.ncbi.nlm.nih.gov/sites/books/NBK501922/

University of Rochester Lactation Study Center
- Consultation hotline: 585-275-0088
- https://www.urmc.rochester.edu/childrens-hospital/breastfeeding-lactation-medicine/lactation-study-center

Figure 2. Medication Safety by Drug Class

	Antihypertensives	Cardiac Medications	Diabetes	Anticoagulants	Anti-Rheumatic/ Immunosuppresants	Psychiatric	Analgesic	Antibiotics/ Antivirals
Compatible (L1-L2)	Captopril Enalapril Hydralazine Hydrochlorothiazide Labetalol Metoprolol Nifedipine Propranolol Verapamil	Furosemide Metoprolol Digoxin Spironolactone	Glipizide GlyburideInsulin Metformin	Enoxaparin Heparin Warfarin	Etanercept Hydroxychloroquine Prednisone	Amitriptyline Carbamazepine Fluoxetine Heloperidol Lamotrigine Methylphenidate Olanzapine Nortriptyline Paroxetine Quetiapine Risperidone Sertraline Trazodone Venlafaxine	Acetaminophen Gabapentin Hydrocodone Ibuprofen Ketorolac Oxycodone	Acyclovir Azithromycin Aztreonam Cefazolin Ceftriaxone Cephalexin Clindamycin Gentamicin Hydroxyzine[$] Oseltamavir Metronidazole Nitrofurantoin Pip/Tazo Valacyclovir
Likely Compatible (L3)	Amlodipine Atenolol Candesartan Carvedilol Aprosartan Ibesartan Lisinopril Losartan Traimeterine Valsartan		Exenatide Liraglutide Pioglitazone Semiglutide	Dabigatran Rivaroxaban (**Xarelto**)	Azathioprine Cyclosporine Infliximab Rituximab Sulfasalazine Tacrolimus	Aripiprazole[^] Clozapine* Dextroamphetamine Duloxetine Guanfacine* Haloperidol Lurasidone Lorazepam Mirtazapine	Ketamine Pregabalin	Ciprofloxacin Doxycycline Meropenem Paxlovid Trimethoprim/ Sulfamethoxazole[#] Levaquin
Hazardous (L4-L5)	Chlorthalidone Minoxidil Nadolol Nitroprusside Terazosin	Nitroprusside	Canagliflozin Dulaglutide Empagliflozin	Apixaban (Eliquis)	Cyclophosphamide Leflunomide Methotrexate Mycophenolate	Atomoxetine Lithium* Valproic Acid		

	Cold/Flu/Allergy	Other/MISC
Compatible (L1-L2)	Second generation antihistamines (ex Loratadine, cetirizine) Diphenhydramine*	Buprenorphine Methadone
Likely Compatible (L3)	Pseudoephedrine[$] Guaifenesin	Hydroxyurea*
Hazard (L4-L5)	**Benzonatate (Tessalon Perles)[%]**	Chemotherapeutics

Medication Safety Scale adapted from InfantRisk Center

L1 – Compatible
- Extensive data suggest there is little to no risk to a breastfeeding infant. Possiblity of harm is remote.

L2 – Probably Compatible
- Limited to extensive data suggests there are only limited risks to a breastfeeding infant.

L3 – Presumed Compatible (yellow)
- No or limited data suggest this drug may be compatible in breastfeeding mothers. No studies in humans are available. Use only if the risk is justified.

L4 – Possibly Hazardous
- No data to significant data suggests there may be a possible risk to a breastfeeding infant, but the benefits from use in breastfeeding women may be acceptable despite the risk.

L5 – Hazardous
- No data to significant data suggests that this could be potentially harmful to a breastfeeding infant. Avoid if at all possible.

Unknown
- There is no data or information available.

*When used the infant should be monitored for adverse effects. Lithium has been used during lactation with monitoring of neonatal lithium levels and renal function.

[#]Bactrim is compatible in lactation especially if the infant is > 30 days old. Caution recommended in preterm infants or newborns as there is a theoretic risk of hyperbilirubinemia.

[$]Antihistamines and pseudoephedrine are technically safe but can reduce milk supply so they should be used with caution.

^Aripiprazole is technically safe but can significantly reduce milk supply when used during pregnancy or postpartum, so should be used with caution.

[%]Benzonatate (Tessalon Perles) are voltage gated sodium channel blockers and can be toxic and even fatal if children < 2 y/o ingest them. They look like candy so this risk may be higher than with other medications. **Use in breastfeeding is NOT recommended.**

Imaging during lactation

Lactating people may require medical imaging for a variety of reasons. **The vast majority of the time, interruption in breastfeeding, "pumping and dumping", is NOT indicated.** See Table 1 for breastfeeding recommendations based on nuclear medicine study.[6]

Table 1. Common Nuclear Medicine Imaging Agents and Recommendations for Breastfeeding

Imaging agent	*Breastfeeding interruption*
Noncontrast radiographs	No
Nonvascular administration of iodinated contrast	No
CT with iodinated intravenous contrast	No
MRI with gadolinium-based intravenous contrast	No
Nuclear medicine imaging	
PET	No
Bone scan	No
Thyroid imaging	
I-131	Cessation for this infant
I-123	Recommendations vary, up to 3 weeks
Technetium-99m pertechnetate	Up to 24 hours, depending on dose
Renal imaging	
Tc-99m DTPA	No[a]
Tc-99m MAG3	No[a]
Tc-99m DMSA	No[a]
Tc-99m glucoheptonate	No[a]
Cardiac imaging	
Tc-99m Sestamibi	No[a]
Tc-99m Tetrofosmin	No[a]
MUGA	
Tc-99m RBCs in vitro	No[a]
Tc-99m RBCs in vivo	Up to 12 hours, depending on dose
VQ scan	
Tc-99m MAA	12 hours
Breast imaging	
Screening or diagnostic mammography	No
Ultrasound	No
MRI with gadolinium-based intravenous contrast	No

[a]The International Atomic Energy Administration recommends withholding breastfeeding for 4 hours or one feeding to account for any external radiation and free Tc99m pertechnetate in the product.

CT, computed tomography; MRI, magnetic resonance imaging; MUGA, multigated acquisition scan; Tc-99m MAA, technetium-99m macroaggregated albumin; PET, positron emission tomography; Tc-99m MAG3, technetium-99m mertiatide; Tc-99m DMSA, technetium-99m succimer; VQ, ventilation-perfusion.

Contact information for lactation support at PFW and Ben Taub

There is breastfeeding support 24/7 at each hospital.

- At PFW the lactation charge nurse is available 24/7 on the Voalte for questions or support.
- At Ben Taub lactation department support is available in-house from 7a to 11p daily at 713-873-9934 and on call support is available 24/7: ask the 3B charge RN to contact the on call lactation consultant. If higher level of support is needed, lactation will contact the lactation medical director, Dr. Stephanie Deal for additional assistance.

Appendix

Approach to conversations about breastfeeding for medically complex patients

These guidelines are not meant to be an exhaustive list but will include recommended resources for up-to-date information regarding medication safety with lactation. They can be used to provide patients with resources to ensure they are making informed choices regarding their breastfeeding goals.

- Breastfeeding is a personal choice, and as clinicians, we serve an important role in providing patients with accurate information about the benefits of breastfeeding and any potential risks associated with their own health.

- The American Academy of Pediatrics (AAP) recommends exclusive breastfeeding for 6 months. This is followed by the addition of complementary foods at 6 months and continued breastfeeding for up to 2 years or beyond as long as mutually desired by the mother and the child. These recommendations are in alignment with the World Health Organization. [7]

- Breastfeeding has been shown to have many health benefits for the infant and mother: [7-11]
    - Infant: lower rates of respiratory infections, severe diarrheal illness, ear infections, childhood obesity, necrotizing enterocolitis, SIDS.
    - Mother: Decreased rates of hypertension, type 2 diabetes, hyperlipidemia, cardiovascular disease, breast cancer, ovarian cancer. Improved return to pre-pregnancy weight and birth spacing.
    - Both: Increased bonding
    - These benefits must be weighed against a mother's medical comorbidities and medications that are required to help treat maternal conditions.
    - Parent's own milk is like medicine for preterm infants, as it reduces prematurity-related complications and improves survival rates.[7] Parents should be strongly encouraged to express milk, even if they don't plan to directly breastfeed long term.
        - Encourage parent to begin expressing milk within six hours of delivery.
        - Drops of milk are administered to infant in the buccal mucosa as oral immune therapy every 3-6 hours. This provides exposure to protective biofactors which can reduce premature related morbidities such as NEC and late onset sepsis.[12,13]
        - Early feedings promote intestinal maturation and healthy microbiome development in premature infants.

- Risks:
    - All medications pass into breastmilk to some extent. There are factors that increase the amount that passes into breastmilk and increase infant exposure.
    - Certain maternal disease states put the infant at increased risk of exposure through lactation. (Ex. cancer with active chemotherapy treatment).

- Alternatives[7]
    - Store breastmilk and feed when infant is older
    - During an infants' hospitalization, pasteurized donor milk may be available to be given with parental assent to infants while their mothers are pumping and working on their milk supply. Infants are not discharged home on donor milk and have to transition to formula prior to discharge.
        - At PFW donor milk is available for purchase prior to discharge. Families may purchase up to 400 mL with a cost of $10/100 mL. Contact lactation services for assistance with donor milk purchase if desired.
        - At Ben Taub donor milk is only available for infants < 1800g.
    - Formula can be used as an alternative for late preterm and term born infants.

- Formula is not introduced into a preterm infant diet (< 1500 grams birthweight) until 34 weeks postmenstrual age (PMA) due to increased risk of necrotizing enterocolitis. Preterm infants receive donor milk until 34 weeks adjusted. Patients with complex medical comorbidities have been found to have lower rates of breastfeeding initiation and breastfeed for shorter durations.[14]. Studies have shown that concerns related to medication safety during lactation can lead to inappropriate interruption and early cessation of breastfeeding.

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