Practice Point

Maternal infectious diseases, antimicrobial therapy or immunizations: Very few contraindications to breastfeeding

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Posted: Oct 1 2006 **Updated:** Jan 4 2016 **Reaffirmed:** Feb 1 2016

Originally published: Paediatr Child Health 2006; 11(8):489-91

The Canadian Paediatric Society, Health Canada, the Dietitians of Canada and the Breastfeeding Committee for Canada, as well as the American Academy of Pediatrics, all recommend exclusive breastfeeding as the optimal method of infant feeding for the first six months of life for healthy, term infants.[1][2] There are many benefits associated with breastfeeding: nutritional, immunological, psychological, developmental, environmental, social, economic and health-related (eg, a decreased risk of infectious diseases). [1][2] To support breastfeeding, every effort must be made to minimize contraindications to breastfeeding, particularly unnecessary ones. The present article summarizes:

- the maternal infectious diseases for which continuing to breastfeed is recommended,
- the very few infectious diseases for which breastfeeding is not recommended,
- the rare instances where maternal antimicrobial therapy indicates a caution for breastfeeding, and
- when to continue breastfeeding as a mother, or her infant, receives a routine recommended immunization.

Maternal infectious diseases and breastfeeding

Almost immediately after birth, infants acquire intestinal flora that are seeded from their mother's microbiota. An infant's microbiotal flora vary by mode of delivery[3] and are further shaped by genetics, environment, and the mode of feeding.[4] Breast milk influences the infant's intestinal microbiota by contributing maternal skin organisms as well as components that nurture some microbes and offer protection from others .[4][5] Breast milk also directly influences development of the infant's immune system, [4][5] and breastfeeding impacts health in many positive ways.[2]

While breast milk can be a source of maternally derived commensal and pathogenic microorganisms,[5] there are very few maternal infectious diseases for which the cessation or interruption of breastfeeding is indicated.[2][4][5]

When a nursing mother presents with symptoms of an infectious disease, she has already exposed her infant to the pathogen. Cessation of breastfeeding does not prevent exposure, and may instead decrease the infant's protection that comes through specific maternal antibodies and other protective factors found in human milk. Therefore, common maternal bacterial, fungal and viral infections in which the mother's health is not compromised are not contraindications to breastfeeding (Table 1).

Table 1
Selected maternal infections and corresponding breastfeeding management for healthy term infants

Maternal infection/disease	Microbial agent(s)	Breastfeeding recommendation
Bacteria		
Mastitis and breast abscesses	Staphylococcus aureus Streptococcus species Gram negative species: Escherichia coli Rarely: Salmonella species, mycobacteria, Candida, Cryptococcus	Continue breastfeeding unless there is obvious pus, in which case pump milk and discard from the infected breast and continue to breastfeed from the other breast
Tuberculosis(TB)	Mycobacterium tuberculosis	Main route of transmission is airborne, not via organisms in milk. With active untreated TB, delay direct breastfeeding until mother has received 2 weeks of appropriate anti-TB therapy; provide TB prophylaxis for infant.* Infant can be fed expressed breast milk during the 2-week period.
Urinary tract infection	Gram negatives species: E coli, etc.	Continue breastfeeding
Bacterial infection abdominal wall post-cesarean section	Skin microbes	Continue breastfeeding
Diarrhea	Salmonella, Shigella, E coli, Campylobacter	Continue breastfeeding. Practice meticulous hand hygiene
Other bacterial infections where the mother's physical condition and general health is not compromised	Wide range of bacterial microbes	Continue breastfeeding
Brucellosis	Brucella abortus, Brucella melitensis, Brucella suis, rarely Brucella canis	Discontinue breastfeeding with untreated maternal brucellosis; infections might be passed through breast milk
Parasites		
Malaria	Plasmodium species	Continue breastfeeding
Fungi		
Candidal vaginitis	Candida	Continue breastfeeding. Practice meticulous hand hygiene
Viruses		
	Cytomegalovirus (CMV)	Continue breastfeeding with latent or active maternal CMV infection
Hepatitis	Hepatitis A virus	Continue breastfeeding; immunoglobulin prophylaxis for the infant. Practice meticulous hand hygiene
	Hepatitis B virus	Continue breastfeeding; routine prevention of infant HBV infection with HBIG at birth; immunization with HBV vaccine
	Hepatitis C virus	Continue breastfeeding; immunization with HBV vaccine

Herpes simplex virus	HSV-1, HSV-2	Continue breastfeeding. Practice meticulous hand hygiene. Cover oral labial lesions with a mask. If there are lesions on the breast/ HSV mastitis, verify that it is HSV not varicella-zoster virus. Interrupt direct breastfeeding until lesions are crusted over. Use expressed breast milk
Chickenpox, shingles	Varicella-zoster virus (VZV)	Continue breastfeeding. For perinatal VZV, give VZIG; for postpartum, consider VZIG
	Enterovirus	Continue breastfeeding. Practice meticulous hand hygiene
	HIV	Breastfeeding and expressed breast milk both contraindicated. See text for details.
	Human T-cell lymphotrophic virus type I or II	Breastfeeding and expressed breast milk both contraindicated
	Parvovirus	Continue breastfeeding
	West Nile virus	Continue breastfeeding

Data from references 2, 5-9. HBIG Hepatitis B immune globulin; VZIG Varicella-zoster immune globulin

*For prophylactic management of an infant exposed to a mother with active tuberculosis, see Canadian Tuberculosis Standards, 7th edition (2013), Chapter 12: www.respiratoryguidelines.ca/tb-standards-2013

Maternal bacterial infections are rarely complicated by transmission to the infant through breastfeeding, with the possible exception of brucellosis.[6][7] Mothers with mastitis or breast abscesses should be encouraged to continue breastfeeding.[2][5][8][9] In instances of breast abscess where pain interferes with breastfeeding, the infant can continue to breastfeed on the nonabscessed breast.[5] Similarly, maternal tuberculosis (TB) is compatible with breastfeeding, provided the mother is not contagious or she has received two weeks of appropriate TB treatment.[2][5] Because transmission of TB is airborne and the infection cannot be transferred in human milk, continuing to breastfeed while on TB therapy is not a problem. TB medications appear to be safe to use while breastfeeding.[10]-[12] The breastfed neonates of women on isoniazid therapy do not need pyridoxine supplementation, unless they are receiving isoniazid themselves.[11] If mother and infant are both taking isoniazid, there may be concerns about possible excessive drug concentration in the infant. Consultation with an expert is indicated.

With parasitic infections such as malaria, breastfeeding should be continued provided the mother's clinical condition allows for it. While the antimalarials chloroquine, hydroxychloroquine and quinine are found in variable quantities in breast milk, all three are regarded as compatible with breastfeeding unless the infant has glucose-6-phosphate dehydrogenase (G6PD) deficiency, in which case withdrawal of quinine is advised.[12] Similarly, primaquine should not be used unless both mother and infant have normal G6PD levels. Precautions to minimize insect-borne infections should be encouraged. Insect repellents help to reduce mosquito bites, which may transmit malaria or viruses such as West Nile. There are no reported adverse events following use of repellents containing diethyltoluamide or icaridin/picaridin in breastfeeding mothers.[13]

While maternal fungal infections such as candidal vaginitis can lead to infant colonization, this is not a contraindication to breastfeeding, nor is maternal treatment with topical or systemic antifungal agents such as fluconazole.[12]

For most maternal viral infections, ongoing breastfeeding is recommended with few exceptions (Table 1).[2][14][15] In cases of maternal HIV infection, breastfeeding is not recommended in resource-rich settings such as Canada, where a safe and culturally accepted replacement is available,[2] because HIV

transmission from mother to infant is well documented. Emotional support for the mother who cannot breastfeed may be required. In some instances, financial support for purchasing formula may also be necessary. In resource-limited regions of the world, and based on evaluation of current best evidence, the WHO recommends that HIV-positive mothers or their HIV-exposed infants take antiretroviral drugs throughout the period of breastfeeding and continue to breastfeed until the infant is 12 months old. The infant can reap the benefits of breastfeeding with minimal risk of becoming infected with HIV.[16][17]

Breastfeeding is also not advised for mothers with human T-lymphotropic virus type 1 or 2 infection.[2][15] In mothers with latent cytomegalovirus (CMV) infection, the virus reactivates in breast milk during the postpartum period and can be transmitted to the infant with breastfeeding . However, transmittal does not pose a risk to the term infant because serious disease is prevented by placentally transferred maternal antibody.[2] Even in preterm infants, the value of breastfeeding appears to outweigh the potential risks of severe disease from breast milk-acquired CMV infection in the neonatal period. A definitive association with delayed development or sensorineural hearing loss has not been proven.[2][18] Thus, breast feeding is recommended with both maternal latent and active CMV infection.

Maternal antimicrobial therapy and breastfeeding

There are very few instances in which maternal therapy with commonly used antimicrobial agents precludes continuation of breastfeeding.[2][12][19]-[22] Even maternal therapy with tetracycline, aminoglycosides or quinolones is not an indication to withhold breastfeeding. The National Library of Medicine in the United States provides a web-accessible, regularly updated database with drug information for breastfeeding mothers called LactMed at http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?LACT.

Table 2
Selected maternal antimicrobial therapies and corresponding breastfeeding management for healthy term infants

Maternal antimicrobial therapy	Breastfeeding recommendation
Antibiotics	
Group 1: Penicillins, cephalosporins, carbapenams, macrolides, aminoglycosides, quinolones	Continue breastfeeding
Group 2: High-dose metronidazole	Discontinue breastfeeding for 12 h to 24 h to allow excretion of dose
Group 3: Chloramphenicol	Caution: Possible idiosyncratic bone marrow suppression
Group 4: Trimethoprim/sulfamethoxazole, sulfisoxazole, dapsone	Proceed with caution if nursing infant has jaundice or G6PD deficiency, and also if the child is ill, stressed or premature
Antitubercular drugs	
Isoniazid, rifampin, streptomycin, ethambutol	Continue breastfeeding. Infants only need pyridoxine supplementation if receiving isoniazid themselves
Antiparasitics	
Group 1: Chloroquine, quinidine, ivermectin; maternal topical diethyltoluamide or icaridin/picaridin	Continue breastfeeding
Group 2: Primaquine, quinine	Contraindicated during breastfeeding unless both mother and baby have normal G6PD levels
Antifungals	
Fluconazole, ketoconazole	Continue breastfeeding
Antivirals	
Acyclovir, valacyclovir, amantadine	Continue breastfeeding. If considering prolonged use of amantadine, observe for milk suppression, as it can suppress prolactin production

Data from references 2,12,19 and LactMed. G6PD Glucose-6-phosphate dehydrogenase

Maternal immunization and breastfeeding

Breastfeeding is not a contraindication to the administration of routine recommended vaccines to the infant or the mother. Breastfeeding during immunization can help mitigate the infant's pain and should be encouraged.[23]

Acknowledgements

This document was reviewed by the Canadian Paediatric Society's Drug Therapy and Hazardous Substances Committee.

References

1. Jeffrey N Critch; Canadian Paediatric Society, Nutrition and Gastroenterology Committee. Nutrition of healthy term infants, birth to 6 months: An overview. Paediatr Child Health 2013;18(4):206-7.
2. Eidelman AI, Schanler RJ; American Academy of Pediatrics Section on Breastfeeding. Breastfeeding and the use of human milk. Pediatrics 2012;129(3):e827-41.
3. Dominguez-Bello MG, Costello EK, Contreras M, Magris M, Hidalgo G, Fierer N, Knight R. Delivery mode shapes the acquisition and structure of the initial microbiota across multiple body habitats in newborns. Proc Natl Acad Sci U S A 2010;107(26):11971-5.

4. Donovan SM, Wang M, Li M, Friedberg I, Schwartz SL, Chapkin RS. Host-microbe interactions in the neonatal intestine: Role of human milk oligosaccharides. Adv Nutr 2012;3(3):450S-5S.
5. American Academy of Pediatrics. Human milk. In: Pickering LK, Baker CJ, Kimberlin DW, Long SS, eds. Red Book: 2012 Report of the Committee on Infectious Diseases, 29th edn. Elk Grove Village, IL: AAP, 2012:126-33.
6. Ceylan A, Köstü M, Tuncer O, Peker E, Kirimi E. Neonatal brucellosis and breast milk. Indian J Pediatr 2012; 79(3):389-91.
7. Arroyo Carrera I, López Rodríguez MJ, Sapiña AM, López Lafuente A, Sacristán AR. Probable transmission of brucellosis by breast milk. J Trop Pediatr 2006;52(5): 380-1.
8. Schoenfeld EM, McKay MP. Mastitis and methicillin-resistant Staphylococcus aureus (MRSA): The calm before the storm? J Emerg Med 2010;38(4):e31-4.
9. Michie C, Lockie F, Lynn W. The challenge of mastitis. Arch Dis Child 2003;88(9):818-21.
10. Tran JH, Montakantikul P. The safety of antituberculosis medications during breastfeeding. J Hum Lact 1998;14(4):337-40.
11. American Academy of Pediatrics. Tuberculosis during pregnancy and breastfeeding. In: Pickering LK, Baker CJ, Kimberlin DW, Long SS, eds. Red Book: 2012 Report of the Committee on Infectious Diseases, 29th edn. Elk Grove Village, IL: AAP, 2012:754.
12. UNICEF, WHO. Department of Child and Adolescent Health and Development World Health Organization. Breastfeeding and maternal Medication: Recommendations for drugs in the eleventh WHO model list of essential drugs. 2002: http://whqlibdoc.who.int/hq/2002/55732.pdf?ua=1 (Accessed March 24, 2014).
13. Centers for Diseases Control and Prevention. FAQ: Insect repellent use and safety: www.cdc.gov/westnile/faq/repellent.html (Accessed March 24, 2014).
14. Zheng Y, Lu Y, Ye Q, et al. Should chronic hepatitis B mothers breastfeed? A meta analysis. BMC Public Health 2011;11:502.
15. Lairmore MD, Haines R, Anupam R. Mechanisms of human T-lymphotropic virus type 1 transmission and disease. Curr Opin Virol 2012;2(4):474-81.
16. WHO. HIV and infant feeding: Revised principles and recommendations. Rapid advice, November 2009: http://whqlibdoc.who.int/publications/2009/9789241598873_eng.pdf (Accessed March 24, 2014).
17. Lunney KM, Iliff P, Mutasa K, et al. Associations between breast milk viral load, mastitis, exclusive breast-feeding, and postnatal transmission of HIV. Clin Infect Dis 2010;50(5):762-9.
18. Lanzieri TM, Dollard SC, Josephson CD, Schmid DS, Bialek SR. . Breast milk-acquired cytomegalovirus infection and disease in VLBW and premature infants. Pediatrics 2013;131(6):e1937-45.
19. Rowe H, Baker T, Hale TW. Maternal medication, drug use, and breast feeding. Pediatr Clin N Am 2013;60(1): 275-94.
20. Sachs HC; American Academy of Pediatrics, Committee on Drugs. The transfer of drugs and therapeutics into human breast milk: An update on selected topics. Pediatrics 2013;132(3):e796-809.
21. Mathew JL. Effect of maternal antibiotics on breast feeding infants. Postgrad Med J 2004;80(942):196-200.
22. Public Health Agency of Canada. National Advisory Committee on Immunization. Immunization in pregnancy and breastfeeding. Canadian immunization guide: Evergreen edition: www.phac-aspc.gc.ca/publicat/cig-gci/p03-04-eng.php (Accessed June 24, 2014).
23. Taddio A, McMurtry CM, Shah V, et al. Reducing pain during vaccine injections: clinical practice guideline. CMAJ 2015;187(13):975-82.

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