When Breast May Not Be Best

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Objectives

1. Synthesize guidance describing the infectious disease related and other contraindications against human milk consumption.

2. Discuss situations when maternal immunization of lactating women is indicated.

3. Review current guidance regarding human milk consumption and/or breastfeeding in situations where a woman may have an infection with a high consequence pathogen such as Ebola virus or Zika virus.
Contraindications to Breastfeeding: Overview

- Few absolute contraindications to breastfeeding or use of human milk
- Relative contraindications: theoretical or potential risks to infant or mother-infant
  - Discussion weighing scientific evidence, specific situation of mother-infant, cultural perceptions
  - Risks of breastfeeding versus risks of not breastfeeding
  - Assess risk of breastfeeding versus risk of human milk consumption
Contraindications to Breastfeeding: Infectious Diseases in Mother

- Infant may already be exposed once diagnosis of infection made
  - Little benefit to discontinuation for upper or lower respiratory infections and gastroenteritis in mother. Greater benefit from secretory immunoglobulin A and anti-inflammatory substances generated by infection into breastmilk

- (Temporary) physical separation of mother and infant and provision or discarding (if indicated) of expressed breastmilk may allow maintenance of supply
Temporary Suspension of Breastfeeding: Infectious Diseases in Mother – Serious Invasive Infections

- Blood stream infections, meningitis, osteomyelitis, septic arthritis due to:
- Consider temporary suspension of breastfeeding until maternal improvement
Utilizing Expressed Breastmilk: Infectious Diseases in Mother

- Lesions of nipple or breast due to herpes simplex virus lesions
- Maternal infection with pulmonary tuberculosis disease until mother is non-infectious
- Consider infant prophylaxis for mothers with pertussis, influenza, varicella, hepatitis A
Contamination of Expressed Human Milk

- Expressed milk may become contaminated with bacteria due to improper collection and/or storage
- Staphylococci and Gram negative bacteria have been associated with outbreaks of infections in infants who consumed human milk
Contamination of Human Milk Additives

- Powdered human milk fortifiers and powdered infant formula receipt have been associated with bacteremia and meningitis
- Contamination with Cronobacter sakazakii
- Significant (40%-50%) mortality and morbidity
- Since November 1, 2011, four infants infected with Cronobacter bacteria have been reported to CDC residing in 4 states: Florida, Illinois, Missouri, and Oklahoma
- One infant was late preterm; all infants became infected during the first five weeks of age; 3 developed meningitis, 1 developed bacteremia
- Two infants died; two are recovering
- No specific exposures common to all identified. All infants consumed powdered infant formula; however, they did not all consume the same brand of formula. No new cases since mid-December 2011.

https://www.cdc.gov/cronobacter/investigation.html
#description
Cronobacter Cluster

- Genetic fingerprints of *Cronobacter* bacteria from the infants in Illinois and Missouri were not identical. *Cronobacter* bacteria from the infants in Florida and Oklahoma were not available.

- **Florida.** None of the products given to the infant in Florida were available for testing.

- **Illinois.** No *Cronobacter* bacteria were found in an opened container of powdered infant formula. *Cronobacter* bacteria were found in an opened container of bottled nursery water but genetic fingerprints of the *Cronobacter* from the infant and from the water differed.

- **Missouri.** *Cronobacter* bacteria were found in an opened container of powdered infant formula, two prepared bottles of powdered infant formula, and an opened bottle of nursery water. The genetic fingerprints of the *Cronobacter* bacteria obtained from the infant, the formula, and the water were indistinguishable from each other. This genetic fingerprint differed from both that of the *Cronobacter* bacteria from the infant and from that of the bottled water from Illinois.

- **Oklahoma.** No *Cronobacter* bacteria were found in 3 opened cans of powdered infant formula or in tap water, which was used to prepare the infant's formula, obtained from the infant's home.

https://www.cdc.gov/cronobacter/investigation.html#description
Culturing Expressed Breastmilk

• Usually not beneficial
• Not a sterile site – need midstream collection after cleaning nipple and areola
• Consider ramifications of results and how it may impact further breastfeeding
• May be indicated in an outbreak setting or an epidemiologic investigation
• No microbiological laboratory standards for organism presence
Postpartum Mastitis / Breast Abscess

- Local infections of the breast generally are not contraindications to breastfeeding
  - Potential to rupture into ductal system → organisms into milk
- Target staphylococci, streptococci, *E. coli* and risk factors for stasis
- Consider pumping and discard with known GBS mastitis/abscess
- Avoid contact of mouth of infant with abscess discharge

Mammary Candidiasis

- Unknown clinical significance of detection of *Candida* in expressed breastmilk
- *Candida* has been detected in frozen, thawed human milk
- Consideration of treatment (topical or systemic) of both mother and infant when one is symptomatic
- Eliminate risk factors
- Breastfeeding can continue in term infant

http://images.agoramedia.com/ugcphotoservice/100/58571114/91738201-41cf-43dd-94b9-56c4f4d70b03.jpg
Brucellosis

- Breastfeeding possible rare source of person to person transmission.
- Cultured from animal milk but rarely from human milk.
- More likely to acquire from infected animal contact or consumption contaminated animal milk. Intrauterine infection has been described.
- Interrupt breastfeeding until mother stabilized on treatment 3-4 d
Tuberculosis

- Women with pulmonary tuberculosis disease who have received 2 weeks of treatment and who have negative sputa may breastfeed without risk of transmission to the infant.
- Women who are considered to be infectious may express milk and have it given to their infant by another person.
- Women with tuberculous-associated breast abscesses or mastitis should refrain from breastfeeding or expressing milk until not considered to be contagious.
Cytomegalovirus (CMV)

- May be intermittently shed and detected without known clinical correlation in preterm infants > 32 weeks
- VLBW infants have greater risk of symptomatic disease and sequelae after acquisition of CMV, including via human milk consumption
- Balance risk of CMV infection with benefits of human milk
- Screening women and their breastmilk prospectively is challenging
- Holder pasteurization (62.5°C 30 minutes) and short-term pasteurization (72°C 5 seconds) both inactivate CMV although short-term may preferentially preserve immune-protective factors.
- Freezing milk - 20°C for 24-72 hours decreases CMV viral titers but may not inactivate CMV
Hepatitis B Virus

- Hepatitis B surface antigen (HBsAg) detected in milk of HBsAg+ women.
- Infants who breastfeed from HBsAg+ women do not have an increased risk for hepatitis B infection compared with HBsAg- women (studies from Taiwan and the United Kingdom).
- Infants born to HBsAg+ women should receive a hepatitis B vaccine within 12 hours of birth with HBIG at another anatomical site, preferably concurrently with vaccine.
- Do not need to delay initiation of breastfeeding until vaccine/HBIG has been given, however best protection against transmission occurs with timely (<12 hours after birth) administration.
- Consider hepatitis B vaccine and HBIG <12 hours birth if maternal HBsAg status will not be known by end of optimal dosing window.
Hepatitis C Virus

- Hepatitis C virus (HCV) RNA and hepatitis C antibody (hepC Ab) detected in breastmilk from hepatitis C infected mothers.
- Transmission of hepatitis C via breastfeeding has not been documented from hepatitis C+, HIV antibody – women.
- Theoretical risk of transmission and interruption of breastfeeding may be recommended for women with cracked or bleeding nipples, until resolved.
Human Immunodeficiency Virus (HIV)

- HIV has been isolated from human milk and can be transmitted during breastfeeding.
- Risk of transmission greatest for post-partum acquisition compared with pre-partum infection.
- In resource-endowed settings where safe alternatives to breastfeeding exist, HIV-infected women should not breastfeed or donate their breastmilk.
- Infant prophylaxis and maternal treatment reduces, but does not eliminate, the risk of postnatal HIV transmission via human milk.
- Antiretroviral levels in human milk vary with agent, dose, and compliance, and may predispose to development of resistance if incomplete compliance.
Which Virus Distribution Does this Map Depict?
Human T-Lymphotrophic Virus Type 1

- HTLV-1 endemic in Japan, Caribbean, parts of South America associated with malignancy and degenerative neurological disease.
- Mother to child transmission occurs via breastfeeding.
- Freezing/thawing expressed milk may decrease infectivity of human milk from HTLV-1 infected women.
- HTLV-1 infected women in resource endowed settings should not breastfeed their infants nor should they donate their expressed breastmilk.
Human T-Lymphotrophic Virus Type 2

- HTLV-2 is a retrovirus common among U.S. and U.K. injection drug users and American Indian/Native Alaskan persons.
- Unknown if mother to child transmission occurs via breastfeeding.
- HTLV-2 infected women in resource endowed settings should not breastfeed their infants nor should they donate their expressed breastmilk.
- Routine screening for HTLV-1 and HTLV-2 is not recommended during pregnancy.
Herpes Simplex Virus (HSV) Type 1 and 2

- Women with herpetic lesions may transmit HSV to their infants.
- Transmission may be reduced by hand hygiene and covering lesions with which the infant could have contact.
- Women with herpetic lesions on a breast should breastfeed from the alternate breast, covering lesions on the affected breast.

Varicella and Rubella

• Transmission of varicella vaccine virus from mother to infant via human milk has not been observed.
• Varicella vaccine may be given to a women who is breastfeeding as post-exposure prophylaxis.
• Wild and vaccine strains of rubella have been detected in human milk. Not associated with infant disease.
• Women with rubella or who have received a rubella vaccine may breastfeed.
West Nile Virus (WNV)

- WNV RNA has been isolated from the breastmilk of a woman with WNV disease.
  - Infant developed WNV IgM antibodies but was asymptomatic.
- WNV transmission via human milk unknown and extent of infant infection unknown
  - Therefore, women residing in WNV-endemic area should continue to breastfeed.
Ebola and HFV

- Symptomatic maternal infection with Ebola Virus (EV) or Marburg hemorrhagic fever (MHF)
- Weigh risk of transmitting EV or MHF virus through breastfeeding against the risk of stopping.
- Donor breast milk or Ready to Use Infant Formula (RUIF), if available, may be an acceptable substitute.
- Ebola virus has been detected in breast milk from 6-26 days after symptom onset.
- Not is not known whether EV can be transmitted through human milk. However, close contact is risk for transmission.
- Ebola survivors who have a subsequent pregnancy may breastfeed
Zika Virus

- Transmission of Zika virus through breastmilk consumption has not been documented.
- Benefits of breastfeeding outweigh theoretical risk of transmission through breast milk.
- Infants born to women with confirmed or suspect Zika virus infections should be breastfed according to local standards.
Maternal Immunization During Lactation

- Immunization with certain live-virus vaccines (varicella, MMR, influenza) not a contraindication to continued breastfeeding
- If necessary, Japanese encephalitis vaccine, rabies, oral typhoid may be given
- Avoid yellow fever and smallpox vaccines
- Study: LAIV versus TIV
Inadvertent Human Milk Exposure

1. Inform donor mother of exposure and ask whether she has had a recent HIV test.
   a. If so, could results be shared anonymously with parents of recipient of infant.
   b. If not, would she agree to HIV testing?

2. Inform parents of recipient infant that risk of transmission of HIV via human milk exposure is low due to time and temperature inactivation of HIV in frozen/thawed cycle.
   a. HIV transmission never previously documented from single exposure.

3. Consider baseline HIV testing from blood of recipient infant.
Antimicrobials in Human Milk

• **General principle:** If antimicrobial agent is safe to administer for an infant, safe for lactating women to take.

• Dose received by infant through breastfeeding depends on multiple factors related to distribution of the antimicrobial.

• Infant dosing of an antimicrobial should be independent of the dose acquired through human milk.

• **Reference:** Toxicology Data Network (LactMed)
LactMed
A TOXNET DATABASE

SEARCH LACTMED

Search Term: e.g. sertraline, SSRIs

Records with: all of the words

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About LactMed
What is LactMed?
The LactMed® database contains information on drugs and other chemicals to which breastfeeding mothers may be exposed. It includes information on the levels of such substances in breast milk and infant blood, and the possible adverse effects in the nursing infant. Suggested therapeutic alternatives to those drugs are provided, where appropriate. All data are derived from the scientific literature and fully referenced. A peer review panel reviews the data to assure scientific validity and currency.

Updates: LactMed is updated monthly.

Did you know
How do I obtain the full TOXNET dataset?
The following TOXNET datasets are available: ChemIDplus, CCRIS, GENE-TOX, HSDB, LactMed, and TOXLINE.

For further information visit the NLM Data Distribution Program from the National Library of Medicine.

More FAQs
Quiz Summary

1. Maternal infectious contraindications to breastfeeding in U.S.:
   a. 
   b. 
   c. 

2. Immunizations that are contraindications to breastfeeding:
   a. 
   b. 