

Chapter 14

Maternal—Child Health

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Key Points

- Infection prevention and control strategies for the mother and child are based on the principle of combined care.
- Prevention strategies include hand hygiene, patient hygiene, environmental cleaning, and immunization.
- Common infections for full term newborns are superficial infections of the skin, eye and mucous membranes.
- Healthcare-associated maternal infections are those infections acquired during the obstetrical patient's hospital stay and did not exist prior to admission to the hospital. Most infections are attributable to the health care setting up to 10 days post-partum.

Background

Infection prevention and control strategies for the mother and child are based on the principle of combined care. In many birthing centres, the obstetrical patient most often labours, delivers, and recovers in the same room. Wherever possible the mother and child are cared for together.

For neonates requiring intensive care, the newborn's environment must be clearly delineated, with spatial separation between isolettes. The sharing of equipment and supplies must be preceded by thorough cleaning and appropriate disinfection/sterilisation.

The blood and body fluids of mother and child are assumed to be potentially infectious and Routine Practices/Standard Precautions¹ which incorporates Universal Precautions should be applied for all patient care. Prevention strategies include hand hygiene, patient hygiene, environmental cleaning, and immunisation.

According to a 2013 report² it is estimated that the global maternal mortality ratio is 230 per 100,000 live births. The WHO estimates that approximately 210 million women become pregnant each year and that 289,000 women die from complications. In the immediate postpartum period, sepsis and haemorrhage are the most common causes of maternal death. 99% of these maternal deaths occur in developing countries.

Similarly, 99% of the estimated 4 million annual neonatal deaths occur in developing countries. Severe infections cause more than one-third of the newborn deaths. Because neonatal deaths are not always carefully recorded, particularly in developing countries, it is estimated that the most common types of infections include sepsis, pneumonia, tetanus, and diarrhea.³ Preventing and treating infections in developing countries remains one of the greatest public health challenges.^{4,5}

Neonatal infections¹

Neonatal infections are those infections that occur in the first 28 days of life. Infections can be spread:

- In utero, by the transplacental route.
- Intra-partum, when in contact with the maternal genital tract, blood, or stool.
- Post-partum, when in contact with the mother, family and visitors, other neonates in the nursery, healthcare workers, or contaminated equipment.

Risk factors for neonatal infections include:

- Maternal infections and the foetal gestational age at the time of the infection.
- Complications of delivery
 - * Invasive procedures and interventions, such as foetal monitoring devices or premature rupture of membranes >24 hours.
 - * Caesarean section delivery is associated with respiratory distress syndrome and possible infection.
- Premature infants are at risk for infection due to:
 - * The absence of normal flora which increases risk of colonisation with other pathogenic microorganisms.
 - * The colonisation of gastrointestinal flora which differs from breast fed babies versus formula-fed babies.
 - * Abnormal colonisation that occurs most often in newborns in neonatal intensive care units (NICU)
 - * Fragile, underdeveloped organs that typically provide barriers to infectious pathogens, such as the skin and lining of the lung
 - * A poor immune (antibody) response.
- Common infections for full term newborns are superficial infections of the skin, eye, and mucous membranes.

- For the neonate in critical care settings, there are additional infections, such as bacteremia associated with central lines, pneumonia, and gastrointestinal infections.
- Microorganisms associated with neonatal infections include *Staphylococcus aureus*, coagulase negative staphylococci, *Escherichia coli* and *Candida*. Other pathogens often associated with outbreaks in the nursery include *Klebsiella*, *Serratia*, *Enterobacter*, *Citrobacter*, and *Pseudomonas* species.

Maternal Infections

Healthcare-associated maternal infections are those infections acquired during the obstetrical patient's hospital stay and did not exist prior to admission to the hospital. Most infections are attributable to the health care setting up to 10 days postpartum and most surgical site infections are considered healthcare-associated up to 30 days post procedure.⁶ Maternal risk factors for infection include:

- Prolonged rupture of membranes (>24 hours)
- Obesity – interferes with wound healing
- Diabetes mellitus
- Invasive tests and procedures

Common Infections include:

- Endometritis – infection of the lining and wall of the uterus (endometrium and myometrium).
- Mastitis – inflammation and infection of the breast
- Caesarean surgical site infections
- Episiotomy site infections – infection at the site of incision of perineum
- Sepsis - bloodstream infection which causes a systemic inflammatory response (e.g., temperature >38⁰C or < 36⁰C, heart rate >90 beats per minute, elevated white blood cell count, respirations >20 per minute).

Microorganisms associated with endometritis are often poly microbial with both anaerobic and aerobic bacteria (e.g., Group A *streptococcus*, Group B *streptococcus*, *Staphylococcus* species, *Escherichia coli*, *Bacteroides*, and *Clostridium* species). *Staphylococcus aureus* is the pathogen most often associated with mastitis. The pathogens associated with surgical site infections are typically endogenous to the patient, most often skin flora or bacterial flora of the lower genital tract.⁷

Prevention Strategies

Surveillance

Monitoring for Symptoms of infection

Syndromic surveillance provides the Infection Control Professional (ICP) with early detection of acute infections, such as healthcare-associated infections (HAI), or clusters of cases of a communicable disease, such as influenza.

Daily surveillance can detect:

- new onset of fever,
- foul smelling lochia,
- redness /swelling/ purulent drainage from surgical site,
- dysuria,
- febrile respiratory illness

Monitoring for HAIs

When determining the types of infections to monitor, consider the frequency of the infection, the impact of the infection (including percent case fatality and excess associated costs), and the preventability of the infection.⁶ Common health care acquired infections that are monitored in obstetrical patients are:

- Endometritis
- Bloodstream infections
- Surgical site infections
- Pneumonia

Monitor for significant microorganisms

Consider screening high-risk patients at triage or in prenatal visits for antibiotic resistant organisms, such as Methicillin Resistant *Staphylococcus aureus* (MRSA), Vancomycin Resistant *Enterococcus* (VRE) and extended spectrum beta lactamase producers (ESBL). If possible, provide single room or spatial separation for patients with antibiotic resistant organisms. If space is an issue, patients with the same documented resistant microorganism can be cohorted.

Patients at high risk for antibiotic resistant organisms are those who:

- are a direct transfer from another health care institution
- have been admitted to a health care institution in the past year
- are receiving home care services or those who receive haemodialysis
- are communal living
- have frequent use of antibiotics

Monitoring for surgical site infections

See [National Healthcare Surveillance Network \(NHSN\) case definition for surgical wound infection](#).

Rates per 100 procedures can be calculated by the following formula:

of Caesarean surgical site infections (for a specific time period) divided by the total # of Caesarean surgical procedures performed (during that same time period). The number is multiplied by 100 to create a percentage rate.

(# of SSI's ÷ # of surgical procedures performed) X 100.

General Principles for the Prevention of Infection Transmission

1. **Standard Precautions** refers to the infection prevention measures that are to be used by health care workers for all patients.¹ Standard Precautions include hand hygiene, use of protective apparel when the health care worker anticipates exposure, splash, or splatters from blood and body fluids. When there is copious blood or other body fluids that are difficult to contain, Standard Precautions also includes the risk assessment for placement of the patient into a single room.
2. **Hand hygiene** using soap and running water **or** alcohol based hand rubs (70-90%) should occur:
 - before and after contact:
 - * with the mother,
 - * with the neonate,
 - * or with their immediate environment
 - before an aseptic procedure
 - after handling blood and body fluids
 - after removal of gloves
3. The **health care worker** should assess their activity or interaction with the infant or mother to anticipate their risk of exposure to **blood and other body** fluids and determine additional protective apparel re-

quired:

- a. **Clean Gloves** are worn for all contact with mucous membranes, non-intact skin, and moist body substances.
 - 1) Gloves are changed after each infant and/or procedure
 - 2) Gloves are **not** necessary for contact with the intact skin of any infant
 - 3) Gloves are to be worn for all diaper changes
 - 4) Gloves are worn when handling the infant after delivery prior to bath or adequate removal of mother's body fluids
 - 5) Gloves are worn when a rash, lesion, or non-intact skin is present
 - 6) Hands are washed after gloves are removed and in between glove change
 - 7) Wear sterile gloves for the delivery
 - 8) Wear clean gloves for handling soiled linen and waste
 - b. **Masks** and/or **protective eyewear** or face shields are worn when body substances are likely to splash skin or mucous membrane.
 - c. **Gowns** and/or **plastic aprons** are worn when body substances are likely to soil clothing or skin. Gowns are to be worn for holding infant to the uniform.
4. **Soiled reusable articles, linen, and garbage** are contained securely enough to prevent leakage. Double bagging is not necessary unless the outside of the bag is visibly soiled.
 5. Recapping, bending, or breaking **needles** is not recommended. Where recapping is unavoidable, only approved safety methods are employed. Used syringes, needles, sharps, and disposable instruments are discarded in designated puncture resistant containers.
 6. Cohorting of infants with the same infection helps prevent spread of nursery infections.
 7. Physical contact between the parent and the neonate/infant is to be promoted and should only be modified on those rare occasions when there is a risk of transmitting infection.
 8. Labouring mothers may shower or bath. Post partum, instruct patient on daily perineal care after toileting. Reviewing good hygienic policies with parents is vital in protecting both parent and infant from acquiring or spreading infections.
 9. Additional precautions may be indicated for infants colonised or infected with microorganism(s) epidemiologically significant to the facility.
 10. Suspected or confirmed infections should be handled according to the guidelines listed in Table 14.1. Contact your local public health unit for those infectious diseases that are deemed reportable.
 11. Infants and/or mothers with diagnosed or suspected infections transmitted by the airborne route must be placed in a single room with negative pressure and the door closed. Masks or respirators are worn according to hospital policies.
 12. Priority for a single room accommodation will be given to mothers who soil articles in the environment with body substances, and those colonised or infected with microorganism(s) epidemiologically significant to the facility.
 13. Surgical Instruments and other items used in procedures are managed between patient uses.
 - a. Reusable critical instruments or equipment (instruments that penetrate the skin): clean and sterilise.
 - b. Semi-critical instruments or equipment that touches skin or mucous membranes: clean and disinfect.
 14. Environmental cleaning – Use a hospital grade disinfectant for the cleaning of clinical areas. For labour and delivery suites, post-delivery, remove soiled linens using gloved hands. The delivery table/bed and the immediate patient environment should be cleaned after each use.
 - Bleach solutions can be used for disinfection, using 5% bleach and diluting 10ml of bleach to 90ml of clean water. **Note to be effective, the cleaning of equipment must be done prior to soaking the equipment in the bleach solution.**
 15. Wipe down communal equipment (e.g., commode chair or blood pressure cuff) between patients using a hospital grade disinfectant.
 16. For neonatal equipment, open bassinets, and isolettes, use disinfectants that are non-toxic, such as hydrogen peroxide based disinfectants. Disinfectants using quaternary ammonium compounds should be

rinsed off surfaces using clean water after the allotted disinfection time to avoid toxicity to the neonates and infants. Neonatal hyperbilirubinemia has been associated with the use of phenolic based disinfectants and should not be used.⁸ Sterile water should be used for humidifiers in isolettes.

17. Medications:

- a. Hand hygiene is performed immediately prior to preparation of injectable products (e.g., vials, needles, syringes).
- b. Once medication is drawn up, the needle is IMMEDIATELY withdrawn from the vial. A needle is NEVER left in a vial to be attached to a new syringe.
- c. The multi-dose vial is labelled with the date it was first used, to facilitate discarding at the appropriate time.
- d. If a multidose vial is used for a single patient, the vial is labelled with the patient's name.
- e. The multi-dose vial is discarded immediately if sterility is compromised or in question.
- f. Opened multi-dose vials are discarded according to the manufacturer's instructions or within 28 days, whichever is shorter.
- g. All needles and all syringes are SINGLE PATIENT USE ONLY.

18. Prenatal assessment – to identify risk factors for maternal / newborn infection and provide opportunity to implement prevention strategies prior to delivery.

- a. Screen women for Group B *streptococcus* (GBS) at 35-37 weeks gestation. GBS positive mothers should receive treatment if they are symptomatic. Colonised mothers and mothers with unknown GBS status, should receive prophylactic antibiotics at the time of delivery (ante partum).⁹
- b. Screen for human immunodeficiency virus (HIV) and Hepatitis B. For hepatitis B surface antigen (HBsAg) positive mothers and mothers with unknown HBsAg status, the infant should receive hepatitis B immune globulin (HBIG) and first dose of Hepatitis B vaccine within the first 12 hours of life.¹⁰
- c. HIV positive mothers should refrain from breastfeeding unless safe nutritional options for breast-feeding are not available.
- d. Influenza vaccine and tetanus-diphtheria-pertussis vaccine should be offered to all pregnant women. All live vaccines are contraindicated until the post-partum period.

19. Antepartum - Carry out simple syndromic surveillance: Screen mothers upon admission for symptoms of infection, such as new onset of fever and other respiratory symptoms, e.g., new onset of cough, rash, or diarrhoea. If the patient responds "yes" to the any of the questions, initiate the appropriate additional precautions and spatial separation from other patients (>2 metres). If airborne transmitted infections are suspected, e.g., pulmonary *Mycobacterium tuberculosis* or varicella, then place patient in a single room with the door closed and initiate Airborne Precautions.

20. Postpartum

- a. Ensure that ophthalmic prophylaxis (single dose of antibiotic ointment or drops) has been given to the newborn and documented in the delivery suite.
- b. Maintain proper hand washing technique. Teach and assess parent's knowledge of proper hand washing. Teach parents to avoid the use of scented soaps.
- c. Administer injections (HBIG and vaccine, vitamin K) as indicated and perform heel sticks using aseptic technique.
- d. Maintain proper cleaning of equipment between neonates, such as baby weighing scales and thermometers. Inspect skin daily for rashes or breaks in skin integrity.
- e. The umbilical cord stump will change from bluish white to black as it dries out and eventually falls off - usually within three weeks after birth. Clean the umbilical cord after bath and with each diaper change and keep it dry. There remains little evidence that antiseptic treatments are either routinely necessary or efficacious.¹¹ In settings where the risk of bacterial infection is high, it may be prudent to use an antiseptic as per local preferences until the end of hospital stay.
- f. Mothers should contact their health care provider if the umbilical area oozes pus or the surrounding skin becomes red and swollen. If the infant has an umbilical cord infection prompt

- treatment is needed to stop the infection from spreading.
- g. If the neonate is circumcised, teach the parents about proper care of the surgical site.
 - h. Document and report any skin breakdown, exudate, or discharge.
 - i. Assess and document any signs of infection, such as tachypnea, apnea, tachycardia, temperature instability, poor feeding, hypothermia, lethargy, mottling, or pallor. Notify care provider and monitor lab results as indicated. Administer antibiotics as ordered.
 - j. Breast milk is protective as it provides specific IgA antibody and helps establish normal flora in the neonate. Please see Table 14.1 for maternal/newborn infections and recommendations for breastfeeding. See also the WHO infant schedule of immunisation for vaccine preventable diseases¹² at www.who.int/immunization/policy/immunization_tables.
21. Expressed Breast Milk (EBM) may be required for neonates.
- a. Healthcare workers (HCW) are to use Standard Precautions, including proper hand hygiene, when handling EBM.
 - b. Instruct mothers on hand hygiene immediately before expressing their milk. Provide a sterile bottle with sterile lid to the mother for each pumping session. Provide mother with pre-printed labels to avoid breast milk errors.
 - c. EBM should be obtained using:
 - 1) Fresh breast milk which must remain cold while transported; e.g., using coolers with waterless cool packs inside the cooler or by placing waterless freezer packs around the container of EBM.
 - 2) Fresh EBM must be kept in a refrigerator and used within 48 hours or frozen within 24 hours. Ensure that all individual containers are labelled, dated, and timed.
 - 3) Unrefrigerated fresh EBM must be used within 4 hours or discarded.
 - 4) EBM must be stored in individual containers for each patient.
 - 5) EBM is a body fluid and must not be stored in the same refrigerator as food, medications, or laboratory specimens.
 - 6) Frozen EBM is thawed in the refrigerator or the waterless milk warmer (or using sterile water) and used within 24 hours.
 - 7) Tap water must not be used for warming or thawing purposes.
 - 8) Thawed or warmed EBM can remain at the bedside for up to 1 hour, at which time it must be discarded.¹³
22. For facilities with little room and overcrowding, consider kangaroo mother care. This includes skin to skin positioning of the baby on the mother's chest; adequate nutrition through breastfeeding; ambulatory care as a result of early discharge; and support of the mother and family for the care of her baby.
23. Antepartum, intrapartum and postpartum: Maintain Standard Precautions with designated areas for bathing, toilet, and hand washing facilities for patients. Staff should have separate hand washing stations from those of the patients. All surfaces in the labour and delivery suite are to be cleaned and disinfected between patients including any tubs used in the delivery process.
24. Refrain from the communal use of ointments and lotions. Mother should bring in her own lotions and creams.

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Further Reading

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Table 14.1 Maternal—Child Infection Prevention and Control Precautions

	Maternal Precautions	Newborn Precautions	Mother/Infant Contact	Breast Feeding	Comments
Acquired Immune Deficiency Syndrome (AIDS)	Standard Precautions	Standard Precautions	Permitted	No	HIV infection in the mother, notify the infant’s attending physician
Amnionitis	Standard Precautions	Standard Precautions	Permitted	Permitted	
Antibiotic Resistant Organisms (ARO) Mother VRE	Contact Precautions <ul style="list-style-type: none"> • Single room • Gloves • Gown 	Contact Precautions	Permitted	Permitted	Notify Infection Prevention & Control and chart will be flagged. Infant to room with mother. If infant needs to go to NICU, then the infant should be kept on Contact precautions.
MRSA	Contact Precautions <ul style="list-style-type: none"> • Single room • Gloves • Gown 	Contact Precautions	Permitted	Permitted	
ESBL	Contact Precautions <ul style="list-style-type: none"> • Single room • Gloves • Gown 	Contact Precautions	Permitted	Permitted	
CPE	Contact Precautions <ul style="list-style-type: none"> • Single room • Gloves • Gown 	Contact Precautions	Permitted	Permitted	
Antibiotic Resistant Organisms (ARO) Infant VRE	Mother uses Standard Precautions	Contact Precautions <ul style="list-style-type: none"> • Gloves • Gown 	Permitted	Permitted	
MRSA	Mother uses Standard Precautions	Contact Precautions <ul style="list-style-type: none"> • Gloves 	Permitted	Permitted	
ESBL	Mother uses Standard Precautions	Contact Precautions <ul style="list-style-type: none"> • Gloves 	Permitted	Permitted	
CPE	Mother uses Standard Precautions	Contact Precautions <ul style="list-style-type: none"> • Gloves 	Permitted	Permitted	

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Campylobacter (See “Diarrhoea”)					
Candida	Standard Precautions	Standard Precautions	Permitted	Permitted	
Mother					
Infant	Standard Precautions	Standard Precautions	Permitted	Permitted	
Chickenpox	Airborne precautions <ul style="list-style-type: none"> • Single room • Negative pressure • Only immune staff may care for patient 	Infant room-in with mother	Permitted	Permitted	Provide Varicella-zoster immune globulin (VarIZIG) to infants where onset of maternal disease is <5 days prior to delivery or within 48 hours after delivery. ¹⁴
Mother ill – healthy term infant					
Mother ill – Infant in NICU	Airborne Precautions <ul style="list-style-type: none"> • Single room • Negative pressure • Only immune staff may care for patient • Mother may not go to NICU 	Standard Precautions until day 10. As of day 10 to and including day 28 start Airborne Precautions <ul style="list-style-type: none"> • Single room • Negative pressure • Only immune staff may care for patient 	NOT Permitted	Permitted (as expressed breast milk)	Timing of VarIZIG administration – as soon as possible after exposure to varicella-zoster virus and within 10 days. Precautions remain in place until lesions are crusted. Personnel: Exclude susceptible personnel. Personnel who have been vaccinated against Chickenpox may still be susceptible.
Infant in NICU – chickenpox or contact with chicken pox	Only parents & visitors who are immune may visit	Airborne Precautions <ul style="list-style-type: none"> • Single room • Negative pressure • Only immune staff may care for patient 	Permitted if mother is immune	Permitted	Families & Visitors: Immunity is defined as a previous history of chickenpox or having received chickenpox vaccine. Chickenpox vaccine is 70% - 90% effective. Therefore, parents and visitors who have been vaccinated against chickenpox must be counselled that they may develop chickenpox.
Mother susceptible-contact with chicken pox	Airborne Precautions from day 10 up to, and including day 21 if VarIZIG not given, or up to and including day 28 if VarIZIG given. Only immune staff may care for patient.	Standard Precautions	Permitted	Permitted	
Chlamydia	Standard Precautions	Standard Precautions	Permitted	Permitted	Treat mother and her partner before discharge.
Newborn conjunctivitis and/or pneumonia	Standard Precautions	Standard Precautions	Permitted	Permitted	
Cold Sore (see “Herpes simplex”)					

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Conjunctivitis	Standard Precautions	Standard Precautions	Permitted	Permitted	Emphasise hand hygiene.
Bacterial					Check for Chlamydia, viral and bacterial pathogens.
Adenovirus	Contact Precautions	Standard Precautions	Healthy Term Infant:	Permitted	If in doubt as to aetiology use Contact Precautions until aetiology defined.
Mother	<ul style="list-style-type: none"> • Single room • Gloves • No sharing of towels, face clothes, pillows, etc. 		<ul style="list-style-type: none"> • Room-in • Extreme care with hand hygiene • No sharing of towels, linens, etc. 		
Infant	Standard Precautions	Contact Precautions	Infant in NICU: Mother NOT to go to NICU for 14 days after onset in 2 nd eye	Permitted as expressed breast milk.	
		<ul style="list-style-type: none"> • Single room • Gloves • No sharing of patient care items 	Permitted	Permitted	
Cytomegalovirus	Standard Precautions	Standard Precautions	Permitted	Permitted	<i>Emphasise careful hand hygiene.</i>
Mother					
Infant	Standard Precautions	Standard Precautions	Permitted	Permitted	
Diarrhoea	Standard Precautions	Standard Precautions	Healthy Term Infant:	Permitted	If outbreak of bacterial or viral diarrhoea is suspected in the mother or the infant, inform local public health unit
Mother	<ul style="list-style-type: none"> • Single room with toilet 		Permitted with Standard Precautions		
Bacterial (suspected or confirmed)			Infant in NICU: Not permitted until asymptomatic for 48 hours	Permitted as expressed breast milk.	Emphasise hand hygiene Precautions in place until asymptomatic for 48 hours.

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Diarrhoea Mother Antibiotic associated <i>C. difficile</i>	Contact precautions <ul style="list-style-type: none"> • Gloves • Gowns • Single room with toilet 	Standard Precautions	Permitted	Permitted	Bacterial spores may persist in the environment; therefore, special attention must be paid to the daily cleaning of the environment. Precautions in place until asymptomatic for 48 hours. Room must be terminally cleaned before precautions can be discontinued.
Diarrhoea Mother Viral (e.g., norovirus)	Contact precautions <ul style="list-style-type: none"> • Gloves • Gowns • Single room with toilet 	Contact precautions <ul style="list-style-type: none"> • Gloves • Gowns • Single room with toilet 	Healthy Term Infant: Permitted with Routine Practices/ Standard Precautions Infant in NICU: Mother is not permitted in the NICU until asymptomatic for 48 hours	Permitted Permitted as expressed breast milk.	Precautions remain in place until asymptomatic for 48 hours.
Diarrhoea Infant Bacterial (suspected or confirmed)	Standard Precautions	Contact precautions <ul style="list-style-type: none"> • Gloves • Gowns 	Permitted	Permitted	Bacterial spores may persist in the environment; therefore, special attention must be paid to the daily cleaning of the environment. Precautions in place until asymptomatic for 48 hours. Room must be terminally cleaned before precautions can be discontinued.
Diarrhoea Infant Viral (e.g., norovirus)		Contact precautions <ul style="list-style-type: none"> • Gloves • Gowns • Ensure immediate disposal of diapers into leak-proof bag 	Permitted	Permitted	Precautions remain in place until asymptomatic for 48 hours.
Endometritis	Standard Precautions	Standard Precautions	Permitted	Permitted	If infection is due to Group A Streptococcus, see “Streptococcal Disease - Group A”

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Enterovirus Mother	Standard Precautions	Standard Precautions for healthy term infant Contact Precautions if infant in NICU <ul style="list-style-type: none"> • Gloves • Gowns • Single room 	Healthy Term Infant: Permitted with Standard Precautions. Infant in NICU: Mother is not permitted in the NICU until asymptomatic.	Permitted Permitted as expressed breast milk	
Enterovirus Infant	Standard Precautions	Contact Precautions <ul style="list-style-type: none"> • Gloves • Gowns • Ensure immediate disposal of diapers into leak-proof bag 	Permitted	Permitted	
Gonococcal Infections Mother Untreated or <24 hours of treatment	Standard Precautions	Standard Precautions	Permitted	Permitted	Mother has gonococcal infection: notify the infant's physician. Treat mother and her partner before discharge. Examine infant for clinical and/or laboratory evidence of infection. If there is no evidence of infection, treat infant prophylactically with a single dose of ceftriaxone 25 – 50 mg/kg IV or IM (max. 125 mg); give cautiously to hyperbilirubinemic infants, especially premature infants. ¹⁵
Infant Conjunctivitis, scalp abscess, sepsis	Standard Precautions	Standard Precautions	Permitted	Permitted	
Hand, Foot and Mouth Disease (See "Enterovirus")					
Hepatitis Mother Hepatitis A (HAV)	Standard Precautions	Standard Precautions	After prophylaxis of infant	After prophylaxis of infant	Perinatal transmission of HAV is rare. Some experts advise giving IG (0.02 ml/kg) to the infant if the mother's symptoms began between 2 weeks before and 1 week after delivery. Efficacy in this circumstance has not been established. Severe disease in healthy infants appears rare. ¹⁵ Asymptomatic HAV infection in infants can occur. Excretion of virus in stool can be prolonged.

Table 14.1 Maternal—Child Infection Prevention and Control Precautions

	Maternal Precautions	Newborn Precautions	Mother/Infant Contact	Breast Feeding	Comments
Hepatitis Hepatitis B (HBsAg+)	Standard Precautions	Standard Precautions	Permitted	Permitted – see Comments	Infant must receive HBIG and Hepatitis B vaccine within 12 hours of life
Hepatitis C (HCV)	Standard Precautions	Standard Precautions	Permitted	Permitted – see Comments	Immune serum globulin is of no benefit to prevent transmission. Children born to HCV positive mother should be tested for HCV infection after 18 months of age. If earlier diagnosis is required, NAAT testing to detect HCV RNA may be performed when the infant is 1 – 2 months of age. ¹⁵ Transmission of Hepatitis C via breast milk has not been documented. ¹⁵
Herpes simplex Mother Genital – delivered by Caesarean section	Standard Precautions	See Infant – Asymptomatic	Permitted	Permitted – see Comments	Mother has genital herpes, notify the infant's physician.
Mother Genital – vaginal delivery	Standard Precautions	See Infant – Asymptomatic	Permitted	Permitted	
Oral or mucocutaneous (i.e., cold sore)	Standard Precautions	Standard Precautions	Permitted. Total rooming-in preferred	Permitted if there are no herpetic lesions on the breast	Instruct the mother on hand hygiene, to wear a mask or cover lesion when around her infant, not kiss infant while lesion is present and to avoid touching affected area.
Whitlow	Standard Precautions	See Infant - Asymptomatic	Direct/hands-on contact is NOT permitted	May pump and discard milk until lesions are gone or may nurse if the mother does not touch her infant (i.e., someone else holds and positions the infant)	
Infant of mother with active genital herpes Asymptomatic	Standard Precautions	Contact Precautions <ul style="list-style-type: none"> • Gloves • Gown • For duration of incubation period (up to 6 weeks) 	Permitted	Permitted	
Symptomatic	Standard Precautions	Contact Precautions <ul style="list-style-type: none"> • Gloves • Gown 	Permitted	Permitted	

Table 14.1 Maternal—Child Infection Prevention and Control Precautions

	Maternal Precautions	Newborn Precautions	Mother/Infant Contact	Breast Feeding	Comments
Herpes zoster (shingles) Mother – localized	Standard Precautions in single room Only immune staff may care for patient	Standard Precautions	Permitted. Total rooming-in preferred. Mother may not go into NICU unless lesions are covered or fully crusted.	Permitted if lesions are not on breast	Care must be provided by immune staff only. Only immune visitors/siblings to visit. Precautions remain in place until lesions are crusted.
Mother – disseminated	Airborne Precautions <ul style="list-style-type: none"> • Single room • Negative pressure • Immune staff only 	Term Infant Rooming-in: Standard Precautions	Permitted. Total rooming-in preferred. Infant in NICU: mother may NOT go to the NICU until lesions are crusted.	Permitted if lesions are not on breast Infant in NICU: Provide expressed milk.	VariZIG is not indicated for infant born after 28 weeks gestation if the mother has zoster. ¹⁵ However, if infant is <28 weeks VariZIG is to be given. No special precautions are needed for the newborn as the newborn has passive immunity to the virus by maternal transfer of antibodies (only applies if newborn is >28 weeks gestation)
		Infant in NICU: Airborne Precautions from day 10 - 1 st exposure to day 21 of last exposure (or day 28 if infant has been given VariZIG). <ul style="list-style-type: none"> • Single room • Negative pressure • Immune staff only 			
HIV Infection	Standard Precautions	Standard Precautions	Permitted	No	Mother has HIV infection, notify infant's physician Assess each mother individually according to possibility of other infections.
Human T-Cell Lymphotropic Virus I/II (HTLV I/II)	Standard Precautions	Standard Precautions	Permitted	No	
Influenza Mother	Droplet Precautions <ul style="list-style-type: none"> • Gown • Gloves • Mask • Eye protection • Single room preferred 	Standard Precautions	Healthy Term Infant: Permitted. Mother must wear a surgical mask when within 2 metres of infant. Infant in NICU: Mother is not permitted to go to NICU.	Permitted Permitted as expressed breast milk.	Consider febrile respiratory illnesses to be influenza during influenza season. Pregnant women and newborns are at high risk for complications of influenza Women who are or will be pregnant or who will deliver during influenza season are a priority group for receiving inactivated influenza vaccine Provide education to mothers in contact with their newborn and instructions in ways to reduce transmission (e.g., hand hygiene, respiratory etiquette, wearing a mask)

Table 14.1 Maternal—Child Infection Prevention and Control Precautions

	Maternal Precautions	Newborn Precautions	Mother/Infant Contact	Breast Feeding	Comments
Influenza Infant	Standard Precautions	Droplet/ Contact Precautions <ul style="list-style-type: none"> Gown Gloves Mask Eye protection 	Permitted	Permitted	During outbreak situations, additional precautions and cohorting of infants may be required
Listeria Mother and Infant	Standard Precautions	Standard Precautions	Permitted	Permitted	Careful hand hygiene by mother and all personnel.
Mastitis (See “ <i>Staphylococcus aureus</i> ”)					
Measles (Rubeola) Mother ill – Term healthy infant	Airborne Precautions <ul style="list-style-type: none"> Single room Negative pressure Immune staff only Only immune family and visitors permitted 	Standard Precautions	Room-in with mother	Permitted if rooming-in with mother. May provide expressed breast milk if not rooming in.	Infant should receive immune globulin as soon as possible. Immunity to measles is a condition of employment.
Mother ill – infant in NICU	Airborne Precautions <ul style="list-style-type: none"> Single room Negative pressure Immune staff only Only immune family and visitors permitted 	Airborne Precautions From 7 days after 1 st exposure to 21 days after last exposure <ul style="list-style-type: none"> Single room Negative pressure Immune staff only Only immune family and visitors permitted 	Mother not permitted in NICU until 4 days after the appearance of the rash or if immune-compromised for duration of illness	Only permitted as expressed breast milk after the appearance of the rash or if immune-compromised for duration of illness.	Infant should receive immune globulin as soon as possible. Families & Visitors: Immunity is defined as previous history of measles or having received measles vaccine.
Infant ill or exposed (i.e., exposed in NICU)	Standard Precautions	Airborne Precautions <ul style="list-style-type: none"> Single room Negative pressure Immune staff only Only immune family and visitors permitted 	Mother immune – permitted to see infant Mother susceptible – mother not permitted to see infant until immunised	Permitted Permitted as expressed breast milk only until infant no longer infectious	
Meningococcal disease – consider infant a contact					
Multi-resistant Microorganisms (See “Antibiotic Resistant Organisms (ARO)”)					
Mumps Mother	Droplet Precautions <ul style="list-style-type: none"> Single room Mask Immune Staff only Only immune family and visitors permitted 	Standard Precautions	Term Infant: Permitted Infant in NICU: Mother is not to go in the NICU until 5 days after the onset of the parotid swelling	Term Infant: Permitted Infant in NICU: Expressed breast milk until 5 days after the onset of the parotid swelling	Non-immune persons are to stay out of the room. Precautions are to remain in place until 5 days after the onset of parotid swelling. ¹⁵ Families & Visitors: Immunity is defined as a previous history of mumps or having received mumps vaccine.

Table 14.1 Maternal—Child Infection Prevention and Control Precautions

	Maternal Precautions	Newborn Precautions	Mother/Infant Contact	Breast Feeding	Comments
Mumps Infant in NICU Exposed or ill	Standard Precautions	Droplet Precautions starting from 10 days from first exposure to 26 days from last exposure. <ul style="list-style-type: none"> • Single room • Mask • Immune Staff only • Only immune family and visitors permitted 	Mother immune – permitted to see infant Mother susceptible –Permitted if mother uses Droplet Precautions. Susceptible mother should be vaccinated	Permitted Permitted as expressed breast milk	Non-immune persons are to stay out of the room. Precautions are to remain in place until 5 days after the onset of parotid swelling. ¹⁵ Families & Visitors: Immunity is defined as a previous history of mumps or having received mumps vaccine.
Pediculosis (Head Lice) Mother	Contact Precautions <ul style="list-style-type: none"> • Single room • Gloves • Gowns Precautions remain in place until after mother has been treated.	Standard Precautions	Healthy Term Infant: Permitted Infant in NICU: Permitted once mother has been treated	Permitted Permitted as expressed breast milk until mother has been treated.	Combs and hairbrushes can be washed with pediculicide shampoo or soaked in hot water. Temperatures greater than 53.5°C for 5 minutes are lethal for lice and eggs. ¹⁵ Laundry bedding using hot water and dry in a hot dryer. After treatment, provide
Pertussis Mother	Droplet Precautions <ul style="list-style-type: none"> • Single room • Mask • Eye protection Precautions remain in place until 5 days of appropriate antibiotic treatment has been completed.	Standard Precautions	Healthy Term Infant: Not permitted until 5 days of effective therapy or infant on chemoprophylaxis. Infant in NICU: Not permitted in NICU until 5 days of appropriate antibiotic treatment has been completed.	Permitted if infant on chemoprophylaxis or as expressed breast milk if not on prophylaxis. Permitted as expressed breast milk.	No staff, family members or visitors are to enter facility with a respiratory illness. Prompt use of chemoprophylaxis in household contacts is effective in limiting secondary transmission. ¹⁴ Persons who have been in contact with an infected individual should be monitored for 21 days after last contact with the infected individual. ¹⁵
Infant	Standard Precautions	Droplet Precautions <ul style="list-style-type: none"> • Single room • Mask Precautions remain in place until 5 days of appropriate antibiotic treatment has been completed.	Permitted	Permitted	Consider chemoprophylaxis for mothers of newborns with pertussis. All mothers who have not previously received a dose of acellular pertussis vaccine should be offered a dose postpartum to protect the mother and her infant.

Table 14.1 Maternal—Child Infection Prevention and Control Precautions

	Maternal Precautions	Newborn Precautions	Mother/Infant Contact	Breast Feeding	Comments
Respiratory Virus Infections Mother ill	Droplet/ Contact Precautions <ul style="list-style-type: none"> • Single room • Gloves • Gown • Mask • Eye protection 	Standard Precautions	Healthy Term Infant: Permitted. Reinforce hand hygiene and wear a surgical mask when within 2 metres of infant. Infant in NICU: Not permitted in NICU until symptoms improved	Infant rooming-in: Permitted Infant in NICU: Permitted as expressed breast milk.	No staff, family members or visitors are to enter facility with a respiratory illness.
Infant ill	Standard Precautions	Droplet/ Contact Precautions <ul style="list-style-type: none"> • Gloves • Gowns • Mask • Eye protection 	Permitted	Permitted	During outbreak situations, additional precautions and cohorting of infants may be required.
Rubella Mother	Droplet Precautions <ul style="list-style-type: none"> • Single room • Mask • Eye protection • Immune staff only 	Droplet/ Contact Precautions: assume infant may be congenitally infected <ul style="list-style-type: none"> • Single room • Gloves • Gown • Mask • Eye protection • Immune Staff only 	Healthy Term Infant: Permitted Infant in NICU: Mother cannot go into the NICU until 7 days after the onset of the rash.	Healthy Term Infant: Permitted Infant in NICU: Expressed breast milk as the mother cannot go into the NICU until 7 days after the onset of the rash.	Notify Infection Prevention and Control. Additional precautions remain in place for mother until 7 days after the onset of the rash. Immunity to rubella is a condition of employment. No susceptible persons to enter room. Pregnant staff, in first or second trimester, is not to provide care regardless of immune status. Families & Visitors: Immunity is defined as having received rubella vaccine or laboratory evidence of immunity.
Infant (Congenital)	Standard Precautions	Droplet / Contact Precautions <ul style="list-style-type: none"> • Single room • Gloves • Gowns • Mask • Eye protection • Immune staff only 	Permitted	Permitted	Congenitally infected infants may shed virus for up to 2 years.

Table 14.1 Maternal—Child Infection Prevention and Control Precautions

	Maternal Precautions	Newborn Precautions	Mother/Infant Contact	Breast Feeding	Comments
Scabies Mother	Contact Precautions <ul style="list-style-type: none"> • Single room • Gloves • Gowns Precautions remain in place until after mother has been treated.	Standard Precautions	Healthy Term Infant: Permitted once mother has been treated.	Permitted once mother has been treated or may provide expressed breast milk.	Bedding and clothing worn next to the skin during the 3 days before treatment must be laundered using hot water and dried in a hot dryer. After treatment, provide mother with fresh clean clothes and bedding. ¹⁵
<i>Staphylococcus aureus</i> Mother Mastitis	Standard Precautions	Standard Precautions	Permitted	Permitted— see Comments.	For premature infants it may be prudent to withhold milk from the breast with mastitis
Mother Breast Abscess	Standard Precautions	Standard Precautions	Permitted	Healthy Term Infant: Permitted Infant in NICU: Permitted on the unaffected breast	
Mother Minor wound infection (contained) or Toxic Shock Syndrome	Contact Precautions until 24 hours of effective therapy	Standard Precautions	Permitted if draining lesion is adequately contained	Permitted	Notify Infection Prevention and Control. Change dressing and mother's gown, and have mother perform hand hygiene prior to contact with infant.
Mother Major wound (not contained)	Contact Precautions <ul style="list-style-type: none"> • Single room • Gloves • Gown 	Standard Precautions	Permitted if drainage can be adequately contained – see Comments.	Permitted	
Infant Pneumonia	Standard Precautions	Standard Precautions	Permitted	Permitted	During outbreak situations, additional precautions and cohorting of infants may be required.
Infant Skin lesions (localised or scalded skin)	Standard Precautions	Contact Precautions <ul style="list-style-type: none"> • Single room • Gloves • Gown 	Permitted	Permitted	
<i>Staphylococcus epidermidis</i> and other coagulase negative staphylococcal infections	Standard Precautions	Standard Precautions	Permitted	Permitted	

Table 14.1 Maternal—Child Infection Prevention and Control Precautions

	Maternal Precautions	Newborn Precautions	Mother/Infant Contact	Breast Feeding	Comments
Streptococcal Disease Group A (GAS) Mother Minor wound infection (contained)	Single room until 24 hours of effective treatment.	Standard Precautions	Permitted	Permitted	Notify Infection Prevention and Control Notify infant's physician. It may be advisable to withhold milk from breast with mastitis until 24 hours of effective treatment.
Mother Major wound infection or endometritis	Single room until 24 hours of effective treatment.	Standard Precautions	Permitted	Permitted	Chemoprophylaxis should only be offered to close contacts confirmed severe case GAS if the close contacts have been exposed to the case during the period from 7 days prior to onset of symptoms in the case to 24 hours after the case's initiation of antimicrobial therapy. Chemoprophylaxis should be administered as soon as possible – preferably within 24 hours of case identification but is still recommended for up to 7 days after the last contact with an infectious case. Close contacts of all confirmed cases of GAS regardless of severity, should be alerted to signs and symptoms of invasive GAS disease and be advised to seek medical attention immediately should they develop febrile illness or any other clinical manifestations of GAS infection within 30 days of diagnosis in the index case. ¹⁶
Mother Invasive disease	Single room and Droplet Precautions until 24 hours of effective treatment.	Standard Precautions	Permitted after 24 hours of effective treatment.	Permitted after 24 hours of effective treatment.	
Mother Pharyngitis (strep throat)	Droplet Precautions <ul style="list-style-type: none"> • Single room • Mask • Eye protection Precautions remain in place until 24 hours of effective treatment.	Standard Precautions	Permitted after 24 hours of effective treatment.	Permitted after 24 hours of effective treatment.	
Infant	Standard Precautions	Contact Precautions <ul style="list-style-type: none"> • Gowns • Gloves Precautions remain in place until 24 hours of effective treatment.	Permitted	Permitted	

Table 14.1 Maternal—Child Infection Prevention and Control Precautions

	Maternal Precautions	Newborn Precautions	Mother/Infant Contact	Breast Feeding	Comments
Streptococcal Disease Group B (GBS) Mother Colonisation	Standard Precautions	Standard Precautions	Permitted	Permitted	Invasive GBS in the mother, notify the infant’s physician.
Endometritis (see “Endometritis”)	Standard Precautions	Standard Precautions	Permitted	Permitted	
Infant Colonisation	Standard Precautions	Standard Precautions	Permitted	Permitted	
Sepsis or Meningitis	Standard Precautions	Standard Precautions	Permitted	Permitted	
Syphilis Mother Mucocutaneous	Contact Precautions <ul style="list-style-type: none"> • Gloves • Gowns Until 24 hours of effective treatment	Standard Precautions	Permitted after 24 hours of effective treatment.	Permitted after 24 hours of effective treatment.	Mother has syphilis, notify the infant’s physician.
Infant Congenital	Standard Precautions	Contact Precautions <ul style="list-style-type: none"> • Gloves • Gowns Until 24 hours of effective treatment	Permitted	Permitted	
Toxic Shock Syndrome (See “ <i>Staphylococcus aureus</i> ”)					
Toxoplasmosis Mother	Standard Precautions	Standard Precautions	Permitted	Permitted	
Infant	Standard Precautions	Standard Precautions	Permitted	Permitted	
Tuberculosis (TB) Mother Positive skin test – asymptomatic	Standard Precautions	Standard Precautions	Permitted	Permitted	
Pulmonary or laryngeal on effective treatment	Standard Precautions	Standard Precautions	Permitted	Permitted	

Table 14.1 Maternal—Child Infection Prevention and Control Precautions

	Maternal Precautions	Newborn Precautions	Mother/Infant Contact	Breast Feeding	Comments
Tuberculosis (TB) Mother Pulmonary or laryngeal – newly diagnosed, on inadequate treatment or noncompliant	Airborne Precautions <ul style="list-style-type: none"> • Single room • Negative air pressure • N95 respirator Facilities to smoke test room on admission to room	Standard Precautions	Not permitted until mother is no longer infectious	Mother may provide expressed breast milk.	Notify Infection Prevention and Control. Continue Airborne Precautions until mother no longer considered infectious. Discharge of Infant: If an infant is going home to a household where there is a potential for exposure to TB, the discharge should be delayed until consultation with Public Health has been done to ensure the household will not present a risk to the infant.
Extrapulmonary	Standard Precautions	Standard Precautions	Permitted	Permitted unless the extrapulmonary TB is causing a breast abscess: not permitted until TB abscess is treated.	Newborn of mothers with endometrial tuberculosis should be assumed to be infected, assessed and managed on Airborne Precautions until infection is ruled out.
Newborn- maternal source	Airborne Precautions until non-infectious	Airborne Precautions	Permitted	Permitted	Notify Infection Prevention and Control
Urinary Tract Infection	Standard Precautions	Standard Precautions	Permitted	Permitted	
Varicella (see “Chickenpox”)					
West Nile Virus	Standard Precautions	Standard Precautions	Permitted	Permitted	
Wound Infections Mother Minor or limited	Standard Precautions	Standard Precautions	Permitted	Permitted	See “Streptococcal Disease”, “Staphylococcus aureus”
Major	Standard Precautions	Standard Precautions	Permitted	Permitted	
Infant	Standard Precautions	Standard Precautions	Permitted	Permitted	Drainage from umbilical stump, circumcision site or scalp monitor site should be cultured.
Yeast	Standard Precautions	Standard Precautions	Permitted	Permitted	

CPE = carbapenam producing Enterobacteriaceae

HBIG = hepatitis B immune globulin

MRSA = methicillin – resistant *S. aureus*

VRE = vancomycin – resistant Enterococcus

ESBL = extended spectrum beta - lactamase

HIV = human immunodeficiency virus

NICU = neonatal intensive care unit

Adapted from: Perinatal Policies and Procedures, Sunnybrook Health Sciences Centre (2013) and Provincial Infectious Diseases Advisory Committee, *Best Practices for Infection Prevention and Control in Perinatology* (2015)