

## 1

# Infection prevention and control

## Box 1.1 Infections may:

- Be transmitted person to person (e.g. mother to baby, staff to patient, baby to mother)
- Be as a result of a communicable disease/infection in pregnancy e.g. chickenpox
- Originate as a direct result of a healthcare intervention
- Occur naturally as a result of displacement of bacteria present on or in the body (endogenous infection)
- Be as a result of an outbreak or infection in a healthcare setting e.g. Group A Streptococcal infection

## Box 1.2 Common infections associated with childbirth.

- Urinary tract infections
- Mastitis
- Wound infections (LSCS and perineal)
- Epidural site infection
- Vascular access device related infections
- Bacteraemia/fungaemia
- Respiratory infection/pneumonia
- Influenza

## Box 1.3 Key recommendations for best practice around infection prevention and control.

- Compliance with organisational policies
- Documentation of the need for practices in place to mitigate the spread of infection
- Information to the woman and visitors re precautions required
- Specimens as required and action on results
- Attention to cleanliness of the physical environment (room or incubator)
- Focus on hand hygiene before and after leaving the room/incubator/cot
- Observation of any negative psychological effects of isolation

## Box 1.4 Signs and symptoms of neonatal sepsis.

- An infant who is irritable, continuously crying, has a weak cry or is lethargic and difficult to rouse
- Poor tone, flat frog-like posture/hypotonic, the so called 'Floppy baby'
- Not interested in feeds, or who has feeding difficulties, infants who are vomiting and not tolerating their feeds
- Hypoglycaemia or hyperglycaemia
- Hypothermia or hyperthermia measured at lower than 36°C or higher than 38°C
- Cold peripheries and prolonged capillary refill time (greater than 2 seconds)
- Tachypnoea: rate over 60 breaths per minutes and signs and symptoms of respiratory distress, grunting, sternal and intercostal retractions – pneumonia is much more common in early onset sepsis
- Deviation from expected heart rate
- Bradycardia, is a sign unique to neonates and infants who were developing septic shock when compared to older children
- Hypoxia: saturations less than 90% in air
- Infant a poor colour appears ashen, has cyanosis, a non-blanching rash or has skin mottling
- There may be local signs of infection such as septic spots, omphalitis, umbilical flare, sticky eyes
- Oliguria, few or no wet nappies
- Diarrhoea and distended abdomen sometimes clinically suggestive of necrotising enterocolitis

## Key points

- The midwife has a key role to play in preventing and controlling infection.
- Midwives should always deem the development of infection as an adverse event, whilst monitoring and investigating and managing all infections as part of good practice.



The prevention of infection is a core element of safe and effective midwifery practice. Midwives and other healthcare professionals should consider the development of infection as an 'adverse' event, and monitor and investigate all infections as part of their organisation's patient safety systems and learning culture. Box 1.1 indicates how infections may occur.

As knowledge of microbiology and the epidemiology of multiresistant organisms has increased, prevention now also includes the avoidance of colonisation of bacteria of clinical importance including (but not limited to):

- *Staphylococcus aureus* (including PVL strains)
- Meticillin-resistant *Staphylococcus aureus* (MRSA)
- *Pseudomonas aeruginosa*
- Multidrug-resistant Gram-negative bacteria (MDR GNB) such as *Klebsiella pneumoniae* and *Escherichia coli* (*E. coli*)
- *Mycobacterium tuberculosis*
- Fungi and yeasts.

Viruses can also be problematic, in particular blood-borne viruses (hepatitis B and C, HIV) and chickenpox.

Box 1.2 provides examples of common infections associated with pregnant and postnatal women.

A number of different practice interventions are described supporting the midwife to prevent or interrupt the development of infection or colonisation, which may lead to risks specifically in-patient care setting. They are:

- The use of standard precautions (see Chapter 4)
- Knowledge and compliance of organisational infection prevention and control policies and guidance
- Active laboratory surveillance and reporting of cases of infection
- Screening of women/babies
- Vaccination of staff, women and babies
- High standards of cleanliness
- Education and information on hygiene, infection and prevention methods.

Many women and babies who develop an infection recover well; a small proportion go on to develop sepsis, a potentially life-threatening condition (Chapter 5). The importance of sepsis as a cause of maternal death has been recognised in reports such as MBRRACE UK.

Sepsis cannot be transmitted from person to person. It is a condition that occurs due to overwhelming infection, resulting in an immune cascade leading to septic shock. It can affect both mothers and neonates. Information on neonatal sepsis is detailed below. See Chapter 5 for the management of sepsis in adults.

**Isolation:** Physical (source) isolation has traditionally been used to separate people receiving hospital care from others due to a risk of spread of infection. In midwifery and neonatal care, isolation may be through the provision of single room accommodation (for mother or mother and baby) or an incubator/cot in the neonatal setting.

The route of transmission for the infection must always be known; this identifies which specific practice precautions are required. Box 1.3 indicates the requirements when source isolation is used.

## Identifying neonatal infection, and preventing and managing neonatal sepsis

Midwives are uniquely placed to identify deviations from the normal in the newborn they care for as part of holistic family-centred care. There are some factors that can predispose to a higher risk of early-onset neonatal sepsis. The neonate may be exposed to organisms from the mother during pregnancy as well as vaginal delivery and in many cases of early-onset neonatal sepsis there have been intrapartum complications identified. Identifying these babies and providing the appropriate management will save lives.

### Assessment of the neonate

NICE (2014a) recommends that all infants born to women who had prelabour rupture of the membranes at term are closely observed for the first 12 hours of life (at 1, 2, 6 and 12 hours).

The assessments recommended are:

- Temperature
- Heart rate
- Respiratory rate
- Presence of respiratory grunting
- Significant subcostal recession
- Presence of nasal flare
- Presence of central cyanosis, confirmed by pulse oximetry if available
- Skin perfusion assessed by capillary refill
- Floppiness, general wellbeing and feeding.

If any of the above are present, a neonatologist assesses the baby and advises the family of any need for transfer to appropriate neonatal services if required. In the absence of a neonatal assessment (e.g. non-hospital settings) an urgent referral or transfer to a hospital will be required.

Neonatal sepsis can present with subtle and non-specific symptoms. By the time sepsis is considered the infant may already be very ill. NICE recommendations (2014b) include the use of the red flag to support clinical decision making and British Association of Perinatal Medicine (BAPM) have developed a Newborn Early Warning Trigger and Track (NEWTT) framework to alert midwives to babies who need further help. The framework provides a visual prompt, aiding the identification of abnormal parameters by using a colour code.

Signs and symptoms of sepsis are provided in Box 1.4.

The diagnosis of shock does not require that a neonate be hypotensive. This is a late finding in septic shock and when it occurs confirms progression towards decompensated shock (Robinson *et al.* 2008). A tense or bulging anterior fontanelle is suggestive of meningitis, common in late-onset sepsis. The assessment of the infant's fontanelles should be made with the infant held and supported in an upright position.

Temperature instability can be an indication of infection. An neonate who is difficult to keep warm is a concern, as too is a baby who develops pyrexia due to pyrogens secreted by the bacteria.