Early Onset Sepsis Risk Assessment for Infants ≥34 weeks. Adopted All Wales Neonatal Network Guideline

Guideline information

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Summary of document:
Adopting the All Wales Neonatal Network Guideline Early Onset Sepsis Risk Assessment for Infants ≥34 weeks to be aligned in of assessment and use of the Kaiser Permanente Sepsis Risk Calculator (SRC)in clinical use for management of EOS with Health Boards across Wales.

Scope:
To provide guidance for the maternity and neonatal teams on the risk assessment and management of early onset sepsis (EOS) in neonates of ≥ 34 weeks gestation, including the use of the Kaiser Permanente Sepsis Risk Calculator (SRC).

The guidance below uses the term 'woman' (pronouns she or her) to describe individuals whose sex assigned at birth was female, whether they identify as female, male or non-binary. It is important to

acknowledge it is not only people who identify as women for whom it is necessary to access women's health and reproductive services. Therefore, this should include people who do not identify themselves as women but who are pregnant or have recently given birth.

Obstetric and Midwifery services and delivery of care must therefore be appropriate, inclusive and sensitive to the needs of those individuals whose gender identity does not align with the sex that they were assigned at birth.

To be read in conjunction with:

Patient information:
Include links to Patient Information Library

Owning group:
Maternity Guideline, Audit and Research Group
29/05/2025

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Andrew Carruthers, Chief Operating Officer

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Version 1 - new guideline – 29.05.2025
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Keywords
Early Onset Sepsis Risk Assessment

Contents

Scope

To provide guidance for the maternity and neonatal teams on the risk assessment and management of early onset sepsis (EOS) in neonates of ≥ 34 weeks gestation, including the use of the Kaiser Permanente Sepsis Risk Calculator (SRC).

Aim

Midwifery team to be able to risk assess the mother risk factors and the baby's clinical state after birth prompting early assessment and response by neonatal team using the SRC.

Objectives

- Midwifery team to recognise maternal risk factors and baby's clinical state to prompt neonatal review at,or following birth.
- Neonatal team to appropriately assess babies and apply NICE criteria (indications for EONS screening and treatment of infants) when required.

All Wales Neonatal Network Guideline. Early Onset Sepsis Risk Assessment for Infants ≥34 weeks.

(Please see below)

The midwife should **contact the neonatal team if any ONE criterion of the following** in the two boxes applies either at birth or during routine observations for any reason for infants ≥34 weeks gestation:

- Rupture of membranes: > 18 hours in preterm OR >24 hours in term
- Preterm < 37 weeks Gestation
- Highest maternal pyrexia in labour > 38 °C
- Maternal GBS in current pregnancy
- Maternal antibiotics (other than prophylaxis for LSCS)

OR

- HR >160/min
- Baby temp <36 °C or ≥ 38 °C (not environmental)
- RR >60/min or apnoea
- Grunting, nasal flaring or recession
- Oxygen saturations <95%
- Altered responsiveness, persistent hypotonia, seizures, signs of shock
- Early jaundice within 24 hours of birth
- Suspected/confirmed infection in another baby with multiple pregnancy

Neonatal team should then thoroughly examine the baby and follow the steps as below:

Step 1:

Apply the NICE criteria (see Appendix 1) for treatment

a) If NICE **does not** recommend treatment or observations –> ROUTINE CARE

b) If NICE recommends antibiotic treatment or observations, then proceed to **Steps 2 & 3**

Step 2:

Assign the infant to one of the following three clinical status using the guide in this table:

Clinical Exam	Description
Well appearing	No persistent physiologic abnormalities
Equivocal	Any one persistent physiologic abnormality ≥ 4 hrs ** • Tachycardia (HR ≥ 160) • Tachypnoea (RR ≥ 60) • Temperature instability (<36.4 OR ≥ 38°C) • Respiratory distress (grunting, nasal flaring or chest recessions) not requiring supplemental oxygen Two or more physiologic abnormalities lasting ≥2 hours ** • Tachycardia (HR ≥ 160) • Tachypnoea (RR ≥ 60) • Temperature instability (<36.4 OR ≥ 38°C) • Respiratory distress (grunting, nasal flaring or chest recessions) not requiring supplemental oxygen ***Abnormalities can be intermittent* *Equivocal state persisting beyond 6 hours should be classed as 'clinical illness'. Late onset symptoms beyond the first few hours and in particular after an asymptomatic period should also be classed as 'clinical illness'*
Clinical Illness	1. Need for mechanical ventilation (outside delivery room) 2. Haemodynamic instability requiring fluid bolus or inotropes 3. Persistent need for CPAP/HFNC (must be designated by 4 hours of age) 4. Need for supplemental oxygen ≥ 2 hours to maintain oxygen saturation >90% 5. Neonatal encephalopathy / Perinatal depression • Neonatal seizure • Apgar score < 5 @ 5 minutes 6. Any other symptoms of serious illness – clinician determined

Step 3: Calculate Sepsis Risk Score to determine individual infant's risk for EOS.

The Sepsis Risk Score can be accessed at the following websites

- https://kp.org/eoscalc
- https://neonatalsepsiscalculator.kaiserpermanente.org
- Guidance on how to enter the risk factors used in to determine the Sepsis Risk Score can be found in Appendix 2.
- In the unlikely scenario that the SRC tool is not available, follow NICE guideline

Step 4: Please follow the management plan as below based on the sepsis risk score @ birth and clinical status:

- Apply the **EOS Risk score @ birth** and baby's '**Clinical Status**' in the table below to make action plan.

  Please note: If following calculation, there is a yellow coded clinical recommendation on the SRC website, make a note of the two possibilities No culture, no antibiotics OR Blood culture

  If blood culture is recommended for the clinical status, treat the baby with antibiotics until culture results are available (Wales's modification of SRC)

Clinical status in first 12 hours	Sepsis Risk Score @ birth		
	< 0.65	0.65 - 1.54	> 1.54
Well-Appearing	Observe for minimum of 24 hours on postnatal ward; Follow observation guidance using NEWTTS chart	If SRC recommends 'no culture', observe for a minimum of 24 hours on postnatal ward; Follow observation guidance using NEWTTS chart	Sepsis screen and treat empirically
		If SRC recommends 'blood culture', then start antibiotics, continue observations	
Equivocal	If SRC recommends 'no culture', observe for minimum of 24 hours in postnatal ward; Follow observation guidance using NEWTTS charts	Sepsis screen and treat empirically	
	If SRC recommends 'blood culture', then start antibiotics, continue observations		
Clinical Illness	Sepsis screen and treat empirically		
If at any point during observations, there is clinical worsening then perform sepsis screen and treat with antibiotics and further management as per your current practice			

Observations:

Clinical Status	Well Appearing	Equivocal	Unwell
Observation schedule	Routine observations at 1 hour, 2 hours and then every 2-hourly until 12 hours of age. Thereafter continue observations every 4 hourly until the end of observation period (24 hours).	Hourly until all observations within normal range X 2 Thereafter, follow guidance for well appearing child	Admit to NICU and observation as directed by clinician

Use guidance for NEWTTS chart. The SRC can be re-applied based on infant's clinical status at any time up to 12 hours of age.

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Discharge: All infants on observation pathway should be re-examined by the neonatal team or newborn examination midwives before discharge to confirm well-being. Parents should be given the ***'Screening for infection in newborn babies -information for parents'*** leaflet.

Appendix 1: NICE guidance:

Indications for EONS screening and treatment of infants

Maternal risk factors – 2 Non-red flags OR 1 red flag
Infant clinical indicators – 2 Non-red flags OR 1 red flag
If only one non-red flag present, then observe and keep low threshold for screening

Maternal risk factors are:

Maternal Risk Factors for Early-Onset Neonatal Infection - 'red flags'
Suspected or confirmed infection in another baby in the case of a multiple pregnancy

Maternal Risk Factors for Early-Onset Neonatal Infection - 'non-red flags'
Invasive group B streptococcal infection in a previous baby or Maternal group B streptococcal colonisation, bacteriuria or infection in the current pregnancy
Preterm birth following spontaneous labour (before 37 weeks' gestation)
Confirmed rupture of membranes for more than 18 hours before a pre-term birth
Confirmed prelabour rupture of membranes at term for > 24 hours before the onset of labour
Intrapartum fever higher than 38°C, if there is suspected or confirmed bacterial infection
Clinical diagnosis of chorioamnionitis

Infant risk factors are:

Clinical Indicators of possible Early-Onset Neonatal Infection (observations and events in the baby)	
'Red Flags'	
Apnoea (temporary stopping of breathing)	
Seizures	
Need for cardiopulmonary resuscitation	
Need for mechanical ventilation	
Signs of shock	
'Non-Red Flags'	
Altered behaviour or responsiveness	Persistent pulmonary hypertension of newborns
Altered muscle tone (for example, floppiness)	Temperature abnormality (lower than 36°C or higher than 38°C) unexplained by environmental factors
Feeding difficulties (for example, feed refusal)	Unexplained excessive bleeding, thrombocytopenia, or abnormal coagulation
Feed intolerance, including vomiting, excessive gastric aspirates and abdominal distension	Altered glucose homeostasis (hypoglycaemia or hyperglycaemia)
Abnormal heart rate (bradycardia or tachycardia)	Metabolic acidosis (base deficit of ≥ 10 mmol/litre)
Signs of respiratory distress (including grunting, recession, tachypnoea)	
Hypoxia (for example, central cyanosis or reduced oxygen saturation level)	
Jaundice within 24 hours of birth	
Signs of neonatal encephalopathy	

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Appendix 2:

Calculator Input	Value to be entered	Notes
Incidence of Early-Onset Sepsis	0.5/1000 live births	Based on UK national incidence – NeoNIN data
Gestational Age (GA)	GA at birth, in weeks and days	"Weeks" value range 34-43 "Days" value range 0-6
Highest Maternal Intrapartum Temperature (°C)	Enter the value and remember to choose "**Celsius**" for the temperature unit. ***Note***: Highest intrapartum maternal temperature including up to 1 hour following delivery	Value may be whole number or number with single decimal place ***Examples***: 37, 37.1, 37.0 are all acceptable entry values ***Note*: Midwives to document and flag up to the neonatal team, if postpartum temperature taken within 1 hour of birth is at least 0.5°C higher than intrapartum temperature so that the correct figure is used in calculation.**
ROM (hours)	Duration of time between rupture of membrane and birth, in hours ***Please enter for SRC the actual duration of rupture of membranes till birth and not just pre-labour duration**	Value may be whole number rounded up to the nearest 0.5 hours (single decimal place) ***Example***: ROM time 4 hours and 30 minutes should be entered as 4.5 hours. ***Example***: ROM time 4 hours and 55 minutes can be entered as 5.0 hours
GBS	Enter maternal GBS screening result if available. If not known enter 'unknown'	
Type of Intrapartum Antibiotics And Interval from first dose to birth	***GBS-specific antibiotics*** are defined ONLY as Penicillin G. This should apply only to mothers who are GBS positive or GBS unknown. **If erythromycin, clindamycin or vancomycin ALONE are given for GBS prophylaxis, choose the option "No antibiotics or any antibiotics given < 2 hours prior to delivery."** ***Broad-spectrum antibiotics (BSAB)*** are defined as two or more antibiotics given in combination when there is concern for the mother developing chorioamnionitis. ***Timing*** of administration of **GBS-specific antibiotics** or ***BSAB administration*** = interval between the first dose of Penicillin G or the second antibiotic in the combination to the time of birth. **Example**: Cefuroxime is given at 2:00 PM; Metronidazole is given at 3:30 PM. Birth is at 4:30 PM. Because the second antibiotic of the combination was given 1 hour prior to delivery, choose option **"No antibiotics or any antibiotics given < 2 hours prior to delivery."** ***If a mother has been given BOTH GBS-specific antibiotics and BSAB – of the 4 possible options, select the category with the longest duration of treatment.*** **Example**: Mother is given Penicillin G at 8:00 AM and 12:00 PM for GBS +ve. She develops a fever to 38.3° C at 2:00 PM, and Cefuroxime is given at 3:00 PM. Penicillin G is given at 4:00 PM. Birth is at 4:30 PM. In this case, GBS-specific antibiotics were given > 4 hours prior to delivery, but BSAB were given only 1 ½ hours prior to delivery. For calculating the SRS, in this case choose **"GBS specific antibiotics given > 2 hours prior to birth."**

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Appendix 3:
Possible systemic signs and symptoms of sepsis:

System	Signs and Symptoms
Respiratory	Grunting, flaring, retracting, cyanosis, oxygen requirement, apnoea, tachypnoea
Neurological	Hypotonia, hypertonia, lethargy, irritability, bulging/full/tense fontanels, seizures (associated with meningitis)
Cardiovascular	Bradycardia, tachycardia, hypotension, hypertension, decreased perfusion
Gastrointestinal	Feeding intolerance, abdominal distention, visible loops of bowel, gastric aspirates, emesis, diarrhoea, bloody stools
Other	Temperature instability, unexplained blood glucose instability, metabolic acidosis, rash, petechiae, purpura, unexplained jaundice

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1. Puopolo KM, Benitz WE, Zaoutis TE. Committee On Fetus And Newborn, Committee On Infectious Diseases. Management of Neonates Born at ≥35 0/7 Weeks' Gestation With Suspected or Proven Early-Onset Bacterial Sepsis. Paediatrics. Volume 142, number 6, December 2018:e20182894

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Appendix 4: Midwifery led Addendum

All Wales Neonatal Network Guideline

Early Onset Sepsis Risk Assessment for Infants >37 Weeks Gestation Born in Midwifery led settings with total duration rupture of membranes >24 hours.

Where a woman is in established labour within 24 hours of rupture of membranes (ROM) and is otherwise suitable for midwifery led intrapartum care, a midwifery led setting is a safe birthing environment and no additional monitoring is recommended during labour or in the postnatal period. The chance of early onset neonatal sepsis (EOS) is very low[1,2].

Where a woman is not in established within 24 hours of ROM (pre-labour rupture of membranes) obstetric led care is appropriate with birth recommended in a unit where there is access to neonatal services[1]. This is standard care and women should be informed of this recommendation in the antenatal period.

When birth occurs in a midwifery led setting and total duration rupture of membranes is more than 24 hours, the EOS risk assessment will not be applied to these infants. Current routine postnatal care will be provided in line with national guidance[1,2,3,4], this will include routine neonatal observation and early discharge at 2-3 hours of age where appropriate. Parents will need to be informed of the different EOS risk assessment that would be applied when compared to birth in obstetric led secondary care environment, and provided with the opportunity to make an informed choice about the sepsis risk assessment and newborn observations.

Midwifery actions in the case of total duration of rupture membranes of more than 24 hours at birth, with no co-existing complication:

- Babies with this history will be identified at birth.
- Parents of identified babies will be provided with the Parent Information leaflet, and should be informed that; in a healthy term baby the risk of EOS in this instance is low < 1/1000. In healthy babies where no red flag/non red flag events are identified as per NICE (2021) 'enhanced' neonatal observation, screening or antibiotic therapy would not be required, the guideline would recommend routine postnatal care (NICE 2021b). Within the EOS risk assessment guideline initial review by the neonatal team would be recommended and observation for 24 hours would be offered.
- If parents wish to be referred to the neonatal team for initial assessment as per EOS risk assessment guideline,
- Transfer to nearest obstetric / neonatal hospital unit should be arranged in after discussion with the neonatal /midwifery team.
- Observation of the baby will be completed, in the midwifery setting, and documented on a NEWTTS chart at 1 and 2 hours of age.
- Where all observations are within normal parameters, transportation will be via parents own car or hospital taxi, a midwife will not need to accompany the baby during transfer from the FMU or home birth.

Reference list

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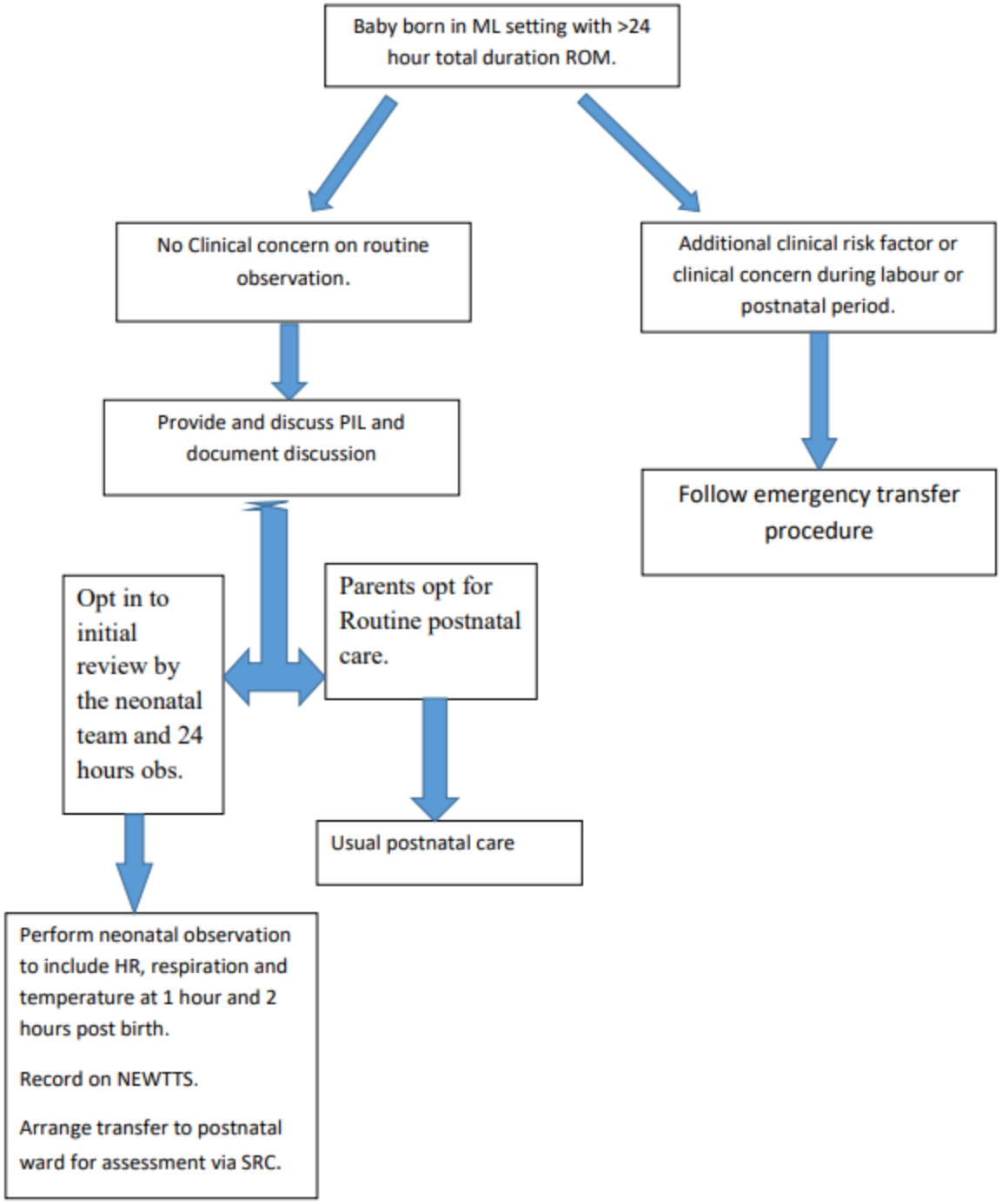
Appendix 4 Flowchart: Identification of a baby born in midwifery led setting with RoM > 24 hours



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All Wales Maternity & Neonatal Network Screening for infection in newborn babies – Information for parents

Wales Maternity & Neonatal Network

Screening for infection in newborn babies – Information for parents

- Unusual jerking movements
- Becoming floppy
- Breathing quickly or having difficulty breathing

If any of these things happen, or if you are concerned for any other reason, please let the nurses, midwives or doctors know.

Unless your baby becomes more unwell he/she will stay with you on the ward. You can feed, change, and care for your baby as you would normally. Your baby may need to be taken elsewhere briefly to have their antibiotics but then will be brought straight back to you.

Time to head home

Once the team are happy that your baby does not have an infection, they will stop the antibiotics. We may advise you to stay with your baby for another 24 hours but in most cases, we will aim to let you go home on the same day the antibiotics are stopped.

Once you get home, please try to remember the signs of infection shown in the list above. If you are concerned, ask for advice about what to do next.

You can contact your GP, call NHS 111 or go to your local Accident and Emergency department.

Any questions

If there is anything you are not sure about, please feel free to ask one of the doctors, midwives or nurses looking after your baby

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This information leaflet is for parents of babies who may need additional observations or treatment for infection in the first days following birth.

Why is my baby being observed or treated for infection?

A small number of babies become unwell after birth because of infection from bacteria. Fortunately, this is rare, occurring in only 1 in 2000 babies. There are a number of things that can put a baby at higher risk of having an infection, such as:

- The mother's waters broke more than 24 hours before the baby was born
- The mother is a carrier for a bacteria called Group B Streptococcus
- The mother has an infection at the time of delivery
- The baby is premature (born before 37 weeks)

It can be difficult to predict which babies will get an infection and become unwell, but the midwives, nurses and doctors caring for you and your baby will be able to decide whether your baby's vitals should be monitored more closely for 24 hours, and sometimes babies may need blood tests and antibiotics.

What happens if my baby is 'being monitored more closely'?

Your baby will be observed for 24 hours in the postnatal ward and will stay with you. The midwifery team will monitor for any early signs of infection at regular intervals and will inform the neonatal team if they are concerned. If your baby remains well, the regular vital observations can be stopped. However, if your baby shows any of the signs shown below, a member of the neonatal team will be asked to see your baby and to decide if he/she should have blood tests and antibiotic treatment.

Signs of an infection after birth include:

- Having difficulty with breathing
- Having too high or too low a temperature
- Being lethargic or floppy
- Feeding poorly
- Having a poor colour

Starting antibiotics

If your baby needs antibiotics, a small plastic tube (Cannula) will be passed into a vein in your baby's hand or foot. This is used to give the antibiotics as an injection. It is better for newborn babies to get their antibiotics in this way, rather than as a medicine to swallow, because their stomachs may not absorb medicines very well.

The antibiotics we usually use are called Gentamicin and Benzylpenicillin. At the same time as putting the cannula in place, blood samples will be taken to test for infection. If your baby remains well, and the blood tests are negative for infection, then the antibiotics are usually stopped after 36-48 hours. However, if the results show signs of infection, your baby may need to stay on antibiotics, and may also need more tests to try to find out where the infection has come from. A course of antibiotics usually last for 5-7 days but can sometimes last longer. Please discuss this with your Neonatal team or midwife.

Your stay on the postnatal ward

As your baby will be with you most of the time it's worth bearing in mind some things you may notice which may alert you to seek help for your baby:

- Behaving different to normal, such as being irritable or tired
- Not interested in feeding, or not taking feeds as well as they used to
- Vomiting
- Becoming too hot or too cold
- Looking pale