NATIONAL INSTITUTE FOR HEALTH AND
CARE EXCELLENCE

Quality standards

Briefing paper: Neonatal infection update

**Quality Standards Advisory Committee meeting**: 18 May 2023

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1. Introduction

This briefing paper presents a structured overview of potential quality improvement areas for neonatal infection. It provides the committee with a basis for discussing and prioritising quality improvement areas for development into draft quality statements and measures for public consultation.

This briefing paper includes a brief description of the topic, a summary of each of the suggested quality improvement areas and supporting information.

Recommendations selected from the key development source are included to help the committee in considering potential statements and measures.

* 1. Development source

The key development source referenced in this briefing paper is:

[Neonatal infection: antibiotics for prevention and treatment. NICE guideline NG195](https://www.nice.org.uk/guidance/ng195) (2021).

NICE is currently reviewing the recommendations in this guideline on bacterial meningitis in babies in neonatal units as part of the [update of NICE's guideline on meningitis (bacterial) and meningococcal septicaemia in under 16s](https://www.nice.org.uk/guidance/indevelopment/gid-ng10149). When the update is complete (expected publication date December 2023) the meningitis recommendations in this guideline will be updated.

1. Overview
	1. Focus of quality standard

This quality standard will cover preventing infection in newborn babies (up to and including 28 days corrected gestational age), treating pregnant women whose babies are at risk of infection, and treating newborn babies with suspected or confirmed infection. It includes when to give antibiotics to prevent and treat neonatal infection.

It will replace the existing NICE quality standard for [neonatal infection](https://www.nice.org.uk/guidance/qs75) (QS75).

* 1. Definition

Neonatal infection (infection onset within 28 days of birth) is a significant cause of mortality and morbidity in newborn babies. It may be considered in terms of early-onset neonatal infection (infection arising within 72 hours of birth) and late-onset neonatal infection (infection arising after 72 hours of birth).

An infection is a host response to the presence of micro-organisms such as bacteria. Infection may cause sepsis (a life-threatening condition caused by the body over-reacting to an infection) by triggering an inflammatory response which can cause changes in the body resulting in multiple organ damage and failure (severe sepsis).

* 1. Incidence and prevalence

Neonatal infection is a significant cause of mortality and morbidity in newborn babies. Neonatal infection can lead to life-threatening sepsis, which accounts for 10% of all neonatal deaths.

Neonatal infection is present in 8 of every 1000 newborn babies and is responsible for 70 of every 1000 neonatal admissions. Of these infections, 82% occur in preterm babies (born before 37 weeks) and 81% in low birthweight babies (below 2500 grams).

Early-onset neonatal infection is less common than late-onset neonatal infection, but it is often more severe. It is present in 1 of every 1000 newborn babies and responsible for 9 of every 1000 neonatal admissions.

Group B Streptococcus (GBS) is the most frequently identified cause of severe infection in newborns. On average, at least one baby a week in the United Kingdom dies from GBS infection, and 70 babies a year are left with lifelong disabilities as a result of contracting meningitis or sepsis in their first days of life.[[1]](#footnote-1)

Late-onset neonatal infection is present in 7 of every 1000 newborn babies and responsible for 61 of every 1000 neonatal admissions.

In 2021, rates of late-onset bloodstream infection ranged from 2.5% to 7.6% across neonatal networks.[[2]](#footnote-2)

* 1. Management

Prompt antibiotic treatment for neonatal infection can save lives. Within the NHS there is variation in the criteria used for giving antibiotics. Widespread antibiotic use is associated with a risk of antimicrobial resistance.

Routine assessment for GBS colonisation status is not carried out in all pregnancies. In practice there is inconsistency around who receives intrapartum antibiotic prophylaxis. Some centres provide this to everyone with preterm prelabour prolonged rupture of membranes, but some only do so for those who also have proven GBS colonisation.

* 1. Resource impact

We do not expect this quality standard to have a significant impact on resources. When NICE’s guideline on [Neonatal infection: antibiotics for prevention and treatment](https://www.nice.org.uk/guidance/ng195/resources) was developed, a resource impact statement was produced which noted that:

* for any single guideline recommendation in England will be less than £1 million per year (or approximately £1,800 per 100,000 population, based on a population for England of 56.6m people) **and**
* for implementing the whole guideline in England will be less than £5 million per year (or approximately £8,800 per 100,000 population, based on a population for England of 56.6m people).

Where clinical practice changes as a result of this update to the previous NICE guideline, it is not anticipated that there will be a significant change in resource use.

This is because the population size is small, neonatal infection occurs in around 5,120 births per year. It is expected that any increase in cost as a result of increased antibiotic use is likely to be offset by reductions in neonatal intensive care admissions and length of stay in neonatal intensive care.

Neonatal services are commissioned by NHS England. Providers are NHS hospital trusts.

1. Summary of suggestions
	1. Responses

In total 9 registered stakeholders responded to the 2-week engagement exercise.

* 6 stakeholders suggested areas
* 3 stakeholders had no comments

6 specialist committee members suggested areas

The responses have been summarised in table 1 for further consideration by the committee.

Table 1 Summary of suggested quality improvement areas

| Area for improvement | Stakeholders  |
| --- | --- |
| **Prevention of neonatal infection*** Early-onset neonatal infection
* Late-onset neonatal infection
 | BSAC, GBSS, NHSE, SCM1, SCM5, SCM6, UKHSA |
| **Risk factors and clinical indicators of infection*** Clinical assessment – early-onset
* Clinical assessment – late-onset
* Kaiser-Permanente Sepsis Calculator
 | GBSS, HSIB, NHSE, SCM1, SCM2, SCM3, SCM4, SCM5, SCM6, UHB, UKHSA |
| **Antibiotic treatment*** Prompt antibiotic treatment
* Antibiotic treatment for early-onset
* Antibiotic treatment for late-onset
 | GBSS, SCM1, SCM2, SCM4, SCM6, UKHSA |
| **Information and support for parents and carers*** Pregnancy information about early-onset infection
* Information on recognising signs of infection and how to seek help
* Information on organisations providing support
 | GBSS, NHSE, SCM1, SCM4, SCM5, SCM6 |
| **Additional areas*** Ventilator-associated pneumonia (VAP) prevention bundles
* Genedrive
* Investigation of potential GBS clusters
* Inclusive language
 | NHSE, SCM3, UKHSA  |

Abbreviations:

* BSAC, British Society for Antimicrobial Chemotherapy
* GBSS, Group B Strep Support
* HSIB, Healthcare Safety Investigation Branch
* NHSE, NHS England’s Neonatal and Paediatric Critical Care Clinical Reference Groups. \*Note that Bliss contributed to this response.
* SCM, Specialist Committee Member
* UKHSA, UK Health Security Agency
* UHB, University Hospitals Birmingham - Birmingham Heartlands Hospital

Full details of all the suggestions provided are given in appendix 1 for information.

1. Suggested improvement areas

Section 4 presents a summary of the suggested improvement areas, with provisional recommendations that may support statement development and information on current UK practice.

* 1. Prevention of neonatal infection

### Early-onset neonatal infection

Stakeholders suggested that appropriate intrapartum antibiotics should be given as prophylaxis if babies are at risk of early-onset Group B streptococcal (GBS) infection. They noted that the first dose of antibiotics should be given as soon as possible after labour starts, or as soon as infection is suspected in the case of chorioamnionitis (an intrauterine infection) and continue until the birth of the baby.

Another stakeholder suggested that anyone in established preterm labour (less than 37 weeks) should receive intrapartum antibiotic prophylaxis to prevent early-onset GBS infection.

#### Selected recommendations

NICE’s guideline on neonatal infection (NG195):

1.2.1 Offer antibiotics during labour to women who:

* are in pre-term labour **or**
* have group B streptococcal colonisation, bacteriuria or infection during the current pregnancy **or**
* have had group B streptococcal colonisation, bacteriuria or infection in a previous pregnancy, and have not had a negative test for group B streptococcus by enrichment culture or PCR on a rectovaginal swab samples collected between 35 and 37 weeks' gestation or 3-5 weeks before the anticipated delivery date in the current pregnancy **or**
* have had a previous baby with an invasive group B streptococcal infection **or**
* have a clinical diagnosis of chorioamnionitis. **[2021]**

1.2.2 Use table 1 to decide which antibiotic to use when giving intrapartum antibiotics for neonatal infection.

**Table 1**

| **Allergies** | **Women without chorioamnionitis** | **Women with chorioamnionitis** |
| --- | --- | --- |
| No penicillin allergy | Use Benzylpenicillin. | Use Benzylpenicillin plus gentamicin plus metronidazole. |
| Penicillin allergy that is not severe | Use Cephalosporin with activity against group B streptococcus (for example cefotaxime).Use with caution.In April 2021 this was an off-label use of cephalosporins. See [NICE's information on prescribing medicines](https://www.nice.org.uk/about/what-we-do/our-programmes/nice-guidance/nice-guidelines/making-decisions-using-nice-guidelines#prescribing-medicines). | Use Cephalosporin with activity against group B streptococcus (for example cefotaxime) plus metronidazole.Use with caution.In April 2021 this was an off-label use of cephalosporins. See [NICE's information on prescribing medicines](https://www.nice.org.uk/about/what-we-do/our-programmes/nice-guidance/nice-guidelines/making-decisions-using-nice-guidelines#prescribing-medicines). |
| [Severe penicillin allergy](https://www.nice.org.uk/guidance/ng195/chapter/recommendations#severe-penicillin-allergy) | Consider:Vancomycin **or**An alternative antibiotic that would be expected to be active against group B streptococcus based on either sensitivity testing performed on the woman's isolate or on local antibiotic susceptibility surveillance data.In April 2021 this was an off-label use of vancomycin. See [NICE's information on prescribing medicines](https://www.nice.org.uk/about/what-we-do/our-programmes/nice-guidance/nice-guidelines/making-decisions-using-nice-guidelines#prescribing-medicines). | Consider:Vancomycin plus gentamicin plus metronidazole **or**An alternative antibiotic to vancomycin that would be expected to be active against group B streptococcus based on either sensitivity testing performed on the woman's isolate or on local antibiotic susceptibility surveillance data plus gentamicin plus metronidazole.In April 2021 this was an off-label use of vancomycin. See [NICE's information on prescribing medicines](https://www.nice.org.uk/about/what-we-do/our-programmes/nice-guidance/nice-guidelines/making-decisions-using-nice-guidelines#prescribing-medicines). |

1.2.4 Give the first dose of antibiotics as soon as possible after labour starts (or as soon as infection is suspected, in the case of chorioamnionitis), and continue until the birth of the baby. **[2021]**

#### Existing quality statements

[NICE’s quality standard on neonatal infection](https://www.nice.org.uk/Guidance/QS75) (QS75):

Statement 1: Pregnant women whose babies are at risk of early-onset neonatal infection are offered intrapartum antibiotic prophylaxis and given the first dose as soon as possible.

#### Current UK practice

No published studies on current practice were highlighted for this suggested area for quality improvement; this area is based on stakeholder’s knowledge and experience.

### Late-onset neonatal infection

Stakeholders suggested including a quality statement on infection prevention. A stakeholder noted there is variation in rates of late onset infection between units, indicating there is potential scope for improvement. They also noted that neonatal infection prevention bundles can lead to reduction in late onset infection.

A stakeholder suggested the prompt removal of umbilical arterial catheters, umbilical venous catheters and peripherally inserted central catheters to reduce the risk of central line-associated bloodstream infection. They suggested the use of central venous catheter “bundles” for insertion, maintenance and removal.

A stakeholder suggested antibiotic prophylaxis for all neonates identified as close contacts of Invasive Group A Streptococcal Disease (iGAS) cases.

#### Selected recommendations

NICE’s guideline on neonatal infection (NG195):

1.7.1 Do not use rifampicin-miconazole-impregnated catheters for newborn babies. **[2021]**

No NICE or NICE accredited recommendations were identified on neonatal infection prevention bundles, the removal of specific catheters for neonates, use of specific catheters for neonates or close contacts of iGAS cases.

#### Existing quality statements

[NICE’s quality standard on infection prevention and control](https://www.nice.org.uk/guidance/qs61) (QS61)

Statement 4: People who need a urinary catheter have their risk of infection minimised by the completion of specified procedures necessary for the safe insertion and maintenance of the catheter and its removal as soon as it is no longer needed.

Statement 5: People who need a vascular access device have their risk of infection minimised by the completion of specified procedures necessary for the safe insertion and maintenance of the device and its removal as soon as it is no longer needed.

#### Current UK practice

No published studies on current practice were highlighted for this suggested area for quality improvement; this area is based on stakeholder’s knowledge and experience.

### Issues for consideration

**For discussion:**

* What is the priority for improvement?
* What is the key action that will lead to improvement?
* No recommendations on Invasive Group A Streptococcal Disease (iGAS)
* Early-onset – antibiotics in labour?
* Late-onset
	+ quality statements relating to catheters and vascular access devices are included in the infection prevention and control quality standard
	+ limited recommendations on prevention
* Can we develop a specific, measurable statement?

**For decision:**

* Should this area be prioritised for inclusion in the quality standard?
* If so, which specific area or population should this focus on? Antibiotics to anyone in preterm labour? Antibiotics to anyone in labour whose baby is at risk of Group B streptococcal (GBS) infection?
	1. Risk factors and clinical indicators of infection

### Clinical assessment – early-onset

Stakeholders commented that everyone who is pregnant and all babies should be assessed for risk factors and clinical indicators of early-onset neonatal infection at the start of labour and throughout labour and birth. Babies should also be assessed after birth, particularly where there have been any risk factors or if there are any clinical indicators of possible early-onset infection.

A stakeholder noted the risk factors and clinical indicators for early-onset neonatal infection, including red flags in boxes in the guideline, and felt these should be highlighted to healthcare professionals for use during pregnancy, labour and birth.

A stakeholder noted that under-detection of early- and late-onset neonatal infection when assessing skin-colour has not been highlighted in the equality impact assessment for this quality standard update.

#### Selected recommendations

NICE’s guideline on neonatal infection (NG195):

1.3.1 For women in labour, identify and assess any risk factors for early-onset neonatal infection (see [box 1](https://www.nice.org.uk/guidance/ng195/chapter/recommendations#ID0ETMAC)). Throughout labour, monitor for any new risk factors. **[2021]**

1.3.3 If there are any risk factors for early-onset neonatal infection (see [box 1](https://www.nice.org.uk/guidance/ng195/chapter/recommendations#ID0ETMAC)), or if there are clinical indicators of possible early-onset neonatal infection (see [box 2](https://www.nice.org.uk/guidance/ng195/chapter/recommendations#ID0ENNAC)):

* perform an immediate clinical assessment
* review the maternal and neonatal history
* carry out a physical examination of the baby, including an assessment of vital signs. **[2021]**

1.3.4 If group B streptococcus is first identified in the mother within 72 hours after the baby's birth:

* ask those directly involved in the baby's care (for example, a parent, carer, or healthcare professional) whether they have any concerns in relation to the clinical indicators listed in [box 2](https://www.nice.org.uk/guidance/ng195/chapter/recommendations#ID0ENNAC), **and**
* identify any other risk factors present, **and**
* look for clinical indicators of infection.

Use this assessment to decide on clinical management (see recommendation

1.3.5). **[2021]**

**Box 1 Risk factors for early-onset neonatal infection, including 'red flags'**

Red flag risk factor:

* Suspected or confirmed infection in another baby in the case of a multiple pregnancy.

Other risk factors:

* Invasive group B streptococcal infection in a previous baby or maternal group B streptococcal colonisation, bacteriuria or infection in the current pregnancy.
* Pre-term 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 more than 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.

**Box 2 Clinical indicators of possible early-onset neonatal infection (observations and events in the baby), including 'red flags'**

Red flag clinical indicators:

* Apnoea (temporary stopping of breathing)
* Seizures
* Need for cardiopulmonary resuscitation
* Need for mechanical ventilation
* Signs of shock

Other clinical indicators:

* Altered behaviour or responsiveness
* Altered muscle tone (for example, floppiness)
* Feeding difficulties (for example, feed refusal)
* Feed intolerance, including vomiting, excessive gastric aspirates and abdominal distension
* Abnormal heart rate (bradycardia or tachycardia)
* Signs of respiratory distress (including grunting, recession, tachypnoea)
* Hypoxia (for example, central cyanosis or reduced oxygen saturation level)
* Persistent pulmonary hypertension of newborns
* Jaundice within 24 hours of birth
* Signs of neonatal encephalopathy
* Temperature abnormality (lower than 36°C or higher than 38°C) unexplained by environmental factors
* Unexplained excessive bleeding, thrombocytopenia, or abnormal coagulation
* Altered glucose homeostasis (hypoglycaemia or hyperglycaemia)
* Metabolic acidosis (base deficit of 10 mmol/litre or greater)

1.3.5 Use the following framework, based on the [risk factors in box 1](https://www.nice.org.uk/guidance/ng195/chapter/recommendations#ID0ETMAC) and the [clinical indicators in box 2](https://www.nice.org.uk/guidance/ng195/chapter/recommendations#ID0ENNAC), to make antibiotic management decisions as directed:

* In babies with any red flag, or with 2 or more 'non-red-flag' risk factors or clinical indicators:
	+ follow [recommendations 1.4.1 to 1.4.8 on investigations before starting antibiotics](https://www.nice.org.uk/guidance/ng195/chapter/recommendations#investigations-before-starting-antibiotics-in-babies-who-may-have-early-onset-infection), **and**
	+ start [antibiotic treatment according to recommendations 1.5.1 to 1.6.7](https://www.nice.org.uk/guidance/ng195/chapter/recommendations#antibiotics-for-suspected-early-onset-infection), **and**
	+ do not wait for the test results before starting antibiotics
* in babies without red flags and only 1 risk factor or 1 clinical indicator, use clinical judgement to decide:
	+ whether it is safe to withhold antibiotics, **and**
	+ whether the baby's vital signs and clinical condition need to be monitored. If monitoring is needed, continue for at least 12 hours using a newborn early warning system
* for babies without risk factors or clinical indicators of possible infection, continue routine postnatal care as covered in the [NICE guideline on postnatal care](https://www.nice.org.uk/guidance/ng194). **[2021]**

#### Existing quality statements

[NICE’s quality standard on neonatal infection](https://www.nice.org.uk/Guidance/QS75) (QS75):

Statement 2: Pregnant women and newborn babies receive a comprehensive clinical assessment for the risks or indicators of early-onset neonatal infection.

#### Current UK practice

No published studies on current practice were highlighted for this suggested area for quality improvement; this area is based on stakeholder’s knowledge and experience.

### Clinical assessment – late-onset

A stakeholder highlighted the need for detailed consideration of whether a baby is at increased risk from infection. Stakeholders noted that prompt clinical assessment of any baby who develops signs of possible late-onset infection would help identify babies who need antibiotic treatment or closer observation.

A stakeholder noted that inconsistent use of NEWS charts may have contributed to poor outcomes for babies.

A stakeholder noted that under-detection of early- and late-onset neonatal infection when assessing skin-colour has not been highlighted in the equality impact assessment for this quality standard update.

#### Selected recommendations

NICE’s guideline on neonatal infection (NG195):

1.8.1 When assessing or reviewing a baby:

* Check for, the possible clinical indicators of late-onset neonatal infection shown in table 2.
* take into account that prematurity, mechanical ventilation, history of surgery and presence of a central catheter are associated with greater risk of [late-onset neonatal infection](https://www.nice.org.uk/guidance/ng195/chapter/recommendations#late-onset-neonatal-infection).
* Think about infection in the other babies when one baby from a multiple birth has infection. **[2021]**

1.8.3 Refer to the [NICE guidelines on fever in under 5s](https://www.nice.org.uk/guidance/ng143) and [sepsis](https://www.nice.org.uk/guidance/ng51) when assessing babies for late-onset neonatal infection who have been admitted to the hospital from home. **[2021]**Be aware that some pulse oximeters can underestimate or overestimate oxygen saturation levels, especially if the saturation level is borderline. Overestimation has been reported in people with dark skin. See also the [NHS England Patient Safety Alert on the risk of harm from inappropriate placement of pulse oximeter probes](https://www.england.nhs.uk/2018/12/risk-of-harm-from-inappropriate-placement-of-pulse-oximeter-probes/).

**Table 2 Clinical indicators of possible late-onset neonatal infection (observations and events in the baby)**

| **Category** | **Indicators** |
| --- | --- |
| Behaviour | Parent or care-giver concern for change in behaviourAppears ill to a healthcare professionalDoes not wake, or if roused does not stay awakeWeak high-pitched or continuous cry |
| Respiratory | Raised respiratory rate: 60 breaths per minute or moreGruntingApnoeaOxygen saturation of less than 90% in air or increased oxygen requirement over baseline |
| Circulation and hydration | Persistent tachycardia: heart rate 160 beats per minute or morePersistent bradycardia: heart rate less than 100 beats per minute |
| Skin | Mottled or ashen appearanceCyanosis of skin, lips or tongueNon-blanching rash of skin |
| Other | Temperature 38°C or more unexplained by environmental factorsTemperature less than 36°C unexplained by environmental factorsAlterations in feeding patternAbdominal distensionSeizuresBulging fontanelle |

This table has been adapted from the high-risk criteria in [table 3 of the NICE guideline on sepsis](https://www.nice.org.uk/guidance/ng51/resources/table-3-risk-stratification-tool-for-children-aged-under-5-years-with-suspected-sepsis-2551487007).

No NICE or NICE accredited recommendations were identified on the use of NEWTT.

#### Current UK practice

No published studies on current practice were highlighted for this suggested area for quality improvement; this area is based on stakeholder’s knowledge and experience.

### Kaiser-Permanente Sepsis Calculator

Stakeholders noted that, if the Kaiser-Permanente Sepsis Calculator tool is used to assess the likelihood of early-onset sepsis, there should be evidence that this is actively audited and should only be used on babies born after 34+0 weeks of pregnancy.

Another stakeholder felt the use of the calculator and audit should be linked with a mandatory requirement for users to submit data to a national database so that the effectiveness of the calculator can be further understood.

A stakeholder commented that many trusts are still not using it in daily practice and that a number of others using it are deviating from the guidance, using their local adaptations of the calculator.

#### Selected recommendations

NICE’s guideline on neonatal infection (NG195):

1.3.6 The [Kaiser Permanente neonatal sepsis calculator](https://neonatalsepsiscalculator.kaiserpermanente.org/) can be used as an alternative to the framework outlined in recommendation 1.3.5 for babies born after 34+0 weeks of pregnancy who are being cared for in a neonatal unit, transitional care or postnatal ward. It should only be used if it is part of a prospective audit, which should record:

* total number of babies assessed using the calculator
* number of babies correctly identified by the calculator who develop a culture-confirmed neonatal infection
* number of babies incorrectly identified by the calculator who do not develop a culture-confirmed neonatal infection
* number of babies missed by the calculator who develop a culture-confirmed neonatal infection. **[2021]**

1.3.7 If using the Kaiser Permanente neonatal sepsis calculator (see recommendation 1.3.6) to assess the risk of early-onset neonatal infection, use the classification given by the calculator to direct management decisions. **[2021]**

No NICE or NICE accredited recommendations were identified on submitting data to a national database.

#### Current UK practice

No published studies on current practice were highlighted for this suggested area for quality improvement; this area is based on stakeholder’s knowledge and experience.

One of the specialist committee members commented at engagement that many trusts are using the Kaiser-Permanente sepsis calculator but many others are not. They noted that using the sepsis calculator in their trust has enabled the administration of intravenous antibiotics within 1 hour of the decision to treat, for a period of 6 consecutive weeks. Previous compliance with this was 23%.

### Issues for consideration

**For discussion:**

* What is the priority for improvement?
* What is the key action that will lead to improvement?
* Current quality statement on assessment for early-onset infection.
* Kaiser-Permanente sepsis calculator – recommendations focus on audit and using it to direct management decisions
* Note that the concerns regarding identification of infection when assessing skin-colour will be included in the equality and diversity considerations in the relevant sections of the quality standard and in the equality impact assessment.

**For decision:**

* Should this area be prioritised for inclusion in the quality standard?
* If so, should a statement be included on assessment for early-onset infection and another statement for assessment for late-onset as it may not be possible to develop a measurable statement addressing both?
	1. Antibiotic treatment

### Prompt antibiotic treatment

Stakeholders noted that once the decision for antibiotic treatment has been made, it should be given as soon as possible and always within 1 hour for both early- and late-onset infection.

#### Selected recommendations

NICE’s guideline on neonatal infection (NG195):

1.3.9 If a baby needs antibiotic treatment, give this as soon as possible and always within 1 hour of the decision to treat. **[2021]**

1.8.4 If a baby needs antibiotic treatment, give this as soon as possible and always within 1 hour of the decision to treat. **[2021]**

#### Existing quality statements

[NICE’s quality standard on neonatal infection](https://www.nice.org.uk/Guidance/QS75) (QS75):

Statement 3: Newborn babies who need antibiotic treatment receive it within 1 hour of the decision to treat. (Note: this statement focusses on early-onset neonatal infection.)

Statement 6 (placeholder): Antibiotic treatment for late-onset neonatal infection.

#### Current UK practice

An internal audit[[3]](#footnote-3) at Doncaster and Bassetlaw hospitals in 2021 found that, between July 2019 – June 2020, 89.6% (78) of babies with a red flag or 2+ risk factors or clinical indicators for early-onset neonatal infection were given antibiotics within 1 hour of the need being identified.

A retrospective review[[4]](#footnote-4) was carried out at Addenbrooke’s Hospital. This looked at neonates on the postnatal ward, born in September and November 2020 at over 35 weeks gestation and over 1.8kg, who underwent a partial septic screen. This found that, out of 100 babies analysed, 15% of the babies requiring treatment received antibiotics within the hour from decision time. The review notes the actions subsequently taken to reduce these delays.

### Antibiotic treatment for early-onset

A stakeholder noted that antibiotics should be stopped promptly (after 36 hours) if further assessment and blood results suggest a baby does not have infection. This would help reduce the chance of antimicrobial resistance, reduce the impact on neonatal gut flora and reduce costs in terms of hospital stay, drugs and monitoring. It would also help families by reducing separation and stress.

Another stakeholder commented that the current quality statement could be used, including both early- and late-onset neonatal infection.

#### Selected recommendations

NICE’s guideline on neonatal infection (NG195):

1.6.3 In babies given antibiotics because of risk factors for early-onset infection or clinical indicators of possible infection, consider stopping the antibiotics at 36 hours if:

* the blood culture is negative **and**
* the initial clinical suspicion of infection was not strong **and**
* the baby's clinical condition is reassuring, with no clinical indicators of possible infection **and**
* the levels and trends of C-reactive protein concentration are reassuring. **[2012]**

1.6.7 If continuing antibiotics for longer than 36 hours despite negative blood cultures, review the baby at least once every 24 hours. Consider at each review whether it is appropriate to stop antibiotic treatment, taking account of:

* the level of initial clinical suspicion of infection **and**
* the baby's clinical progress and current condition **and**
* the levels and trends of C-reactive protein concentration. **[2012]**

#### Existing quality statements

[NICE’s quality standard on neonatal infection](https://www.nice.org.uk/Guidance/QS75) (QS75):

Statement 4: Newborn babies who start antibiotic treatment for possible early-onset neonatal infection have their need for it reassessed at 36 hours.

#### Current UK practice

No published studies on current practice were highlighted for this suggested area for quality improvement; this area is based on stakeholder’s knowledge and experience.

### Antibiotic treatment for late-onset

Stakeholders noted that antibiotics should be stopped promptly (after 48 hours) if further assessment and blood results suggest a baby does not have infection. This would help reduce the chance of antimicrobial resistance, reduce the impact on neonatal gut flora and reduce costs in terms of hospital stay, drugs and monitoring. It would also help families by reducing separation and stress.

Stakeholders highlighted the importance of giving a combination of narrow-spectrum antibiotics as first-line treatment for babies with suspected late-onset neonatal infection who are already in a neonatal unit. They commented that many neonatal units start very broad-spectrum antibiotics as first line in late-onset infection

A stakeholder noted that a treatment duration of less than 7 days should be used when the baby makes a prompt recovery, and either no pathogen is identified or the pathogen identified is a common commensal (for example, coagulase negative staphylococcus).

A stakeholder noted that prophylactic antifungals should be given with antibiotics for suspected late-onset neonatal bacterial infection if the baby has a birthweight of up to 1,500g or was born at less than 30 weeks' gestation.

#### Selected recommendations

NICE’s guideline on neonatal infection (NG195):

1.10.1 For babies with suspected [late-onset neonatal infection](https://www.nice.org.uk/guidance/ng195/chapter/recommendations#late-onset-neonatal-infection) who are already in a neonatal unit:

* give a combination of narrow-spectrum antibiotics (such as intravenous flucloxacillin plus gentamicin) as first-line treatment
* use local antibiotic susceptibility and resistance data (or national data if local data are inadequate) when deciding which antibiotics to use
* give antibiotics that are effective against both Gram-negative and Gram-positive bacteria
* if necrotising enterocolitis is suspected, also include an antibiotic that is active against anaerobic bacteria (such as metronidazole). **[2021]**

1.11.3 For babies given antibiotics because of suspected late-onset infection, consider stopping the antibiotics at 48 hours if:

* the blood culture is negative **and**
* the initial clinical suspicion of infection was not strong **and**
* the baby's clinical condition is reassuring, with no clinical indicators of possible infection **and**
* the levels and trends of C‑reactive protein concentration are reassuring. **[2021]**

1.11.6 Use a shorter treatment duration than 7 days when the baby makes a prompt recovery, and either no pathogen is identified or the pathogen identified is a common commensal (for example, coagulase negative staphylococcus). **[2021]**

1.11.7 If continuing antibiotics for longer than 48 hours for suspected late‑onset neonatal infection despite negative blood culture, review the baby at least once every 24 hours. At each review, decide whether to stop antibiotics, taking account of:

* the level of initial clinical suspicion of infection **and**
* the baby's clinical progress and current condition **and**
* the levels and trends of C-reactive protein. **[2021]**

1.12.1 Give prophylactic oral nystatin to babies treated with antibiotics for suspected late-onset neonatal bacterial infection if they:

* have a birthweight of up to 1,500 g **or**
* were born at less than 30 weeks' gestation. **[2021]**If oral administration of nystatin is not possible, give intravenous fluconazole. In April 2021, this was an off-label use of fluconazole. See [NICE's information on prescribing medicines](https://www.nice.org.uk/about/what-we-do/our-programmes/nice-guidance/nice-guidelines/making-decisions-using-nice-guidelines#prescribing-medicines) and use clinical judgement to determine the dosage. **[2021]**

#### Existing quality statements

[NICE’s quality standard on neonatal infection](https://www.nice.org.uk/Guidance/QS75) (QS75):

Statement 6 (placeholder): Antibiotic treatment for late-onset neonatal infection.

#### Current UK practice

No published studies on current practice were highlighted for this suggested area for quality improvement; this area is based on stakeholder’s knowledge and experience.

### Issues for consideration

**For discussion:**

* What is the priority for improvement?
* What is the key action that will lead to improvement?
* Current quality statement on antibiotics being given 1 hour of the decision to treat. This could be adapted to include late-onset infection.
* Current quality statement on reassessment focusses on early-onset so reassessment is at 36 hours. Recommendation for late-onset is reassessment at 48 hours.
* Should an area for quality improvement focus specifically on late-onset: narrow-spectrum antibiotics, treatment duration of less than 7 days in specific cases or prophylactic antifungals with antibiotics for specific populations?
* Can we develop a specific, measurable statement?

**For decision:**

* Should this area be prioritised for inclusion in the quality standard?
* If so, which area?
* Reassessment of antibiotic treatment at 36 hours for early-onset and at 48 hours for late-onset infection?
* Specific focus on late-onset infection?
	1. Information and support for parents and carers

### Pregnancy information about early-onset infection

A stakeholder felt that everyone who is pregnant should be provided with information, in person and in writing, about early-onset neonatal infection that includes risk factors, signs of infection in the baby and the actions to take if they have concerns.

#### Selected recommendations

NICE’s guideline on antenatal care (NG201):

1.3.8 At the first antenatal (booking) appointment (and later if appropriate), discuss and give information on:

* what antenatal care involves and why it is important
* the planned number of antenatal appointments
* where antenatal appointments will take place
* which healthcare professionals will be involved in antenatal appointments
* how to contact the midwifery team for non-urgent advice
* how to contact the maternity service about urgent concerns, such as pain and bleeding
* screening programmes: what blood tests and ultrasound scans are offered and why
* how the baby develops during pregnancy
* what to expect at each stage of the pregnancy
* physical and emotional changes during the pregnancy
* mental health during the pregnancy
* relationship changes during the pregnancy
* how the woman and her partner can support each other
* immunisation for flu, pertussis (whooping cough) and other infections (for example, COVID‑19) during pregnancy, in line with the [NICE guideline on flu vaccination](https://www.nice.org.uk/guidance/ng103) and the [Public Health England Green Book on immunisation against infectious disease](https://www.gov.uk/government/publications/immunisation-against-infectious-disease-the-green-book-front-cover-and-contents-page)
* infections that can impact on the baby in pregnancy or during birth (such as group B streptococcus, herpes simplex and cytomegalovirus)
* reducing the risk of infections, for example, encouraging hand washing
* safe use of medicines, health supplements and herbal remedies during pregnancy
* resources and support for expectant and new parents
* how to get in touch with local or national peer support services.

No NICE or NICE accredited recommendations were identified on the content of the information.

#### Existing quality statements

[NICE’s quality standard on antenatal care](https://www.nice.org.uk/Guidance/QS22) (QS22):

Statement 2: Pregnant women have a risk assessment at routine antenatal appointments.

#### Current UK practice

No published studies on current practice were highlighted for this suggested area for quality improvement; this area is based on stakeholder’s knowledge and experience.

### Information on recognising signs of infection and how to seek help

Stakeholders noted that early recognition of signs of infection can lead to earlier and more effective treatment. They noted the importance of providing the parents and carers of all babies with information when the baby is transferred home, or in the immediate postnatal period in the case of babies born at home. This information should be written, verbal and electronic, and include lay explanations of the key signs of infection and how to seek urgent medical help if they are concerned that their baby shows signs infection. One stakeholder suggested a clear checklist for parents and carers should be provided.

A stakeholder noted that information on neonatal infection includes changes to skin colour, for example where the baby becomes very pale, blue/grey or dark yellow. They highlighted the importance of explaining how symptoms of infection may present differently on babies with black or brown skin colour, and how best to identify changes in skin colour on different skin tones, for example specific locations on the body to look for changes in colour.

#### Selected recommendations

NICE’s guideline on neonatal infection (NG195):

1.1.5 For babies who are considered to be at increased risk of early-onset infection, inform their parents and GP about this verbally and in writing:

* when the baby is discharged from the hospital or midwifery-led unit **or**
* in the immediate postnatal period, if the baby was born at home. **[2012]**

1.1.10 If a baby has been treated for suspected or confirmed neonatal infection:

* advise the parents and carers about potential long-term effects of the baby's illness and likely patterns of recovery, and reassure them if no problems are anticipated
* take account of parents' and carers' concerns when providing information and planning follow-up. **[2021]**

1.1.12 Before any baby is transferred home from the hospital or midwifery-led unit (or in the immediate postnatal period in the case of babies born at home), advise parents and carers to seek urgent medical help (for example, from NHS 111, their GP, or an accident and emergency department) if they are concerned that their baby:

* is showing abnormal behaviour (for example, inconsolable crying or listlessness), **or**
* is unusually floppy, **or**
* has an abnormal temperature unexplained by environmental factors (lower than 36°C or higher than 38°C), **or**
* has abnormal breathing (rapid breathing, difficulty in breathing or grunting), **or**
* has a change in skin colour (for example where the baby becomes very pale, blue/grey or dark yellow), **or**
* has developed new difficulties with feeding.

Give the advice both in person, and as written information and advice for them to take away. **[2021]**

#### Existing quality statements

[NICE’s quality standard on neonatal infection](https://www.nice.org.uk/Guidance/QS75) (QS75):

Statement 5: Parents or carers of newborn babies in whom early-onset neonatal infection has been a concern are given verbal and written information about neonatal infection before discharge.

[NICE’s quality standard on postnatal](https://www.nice.org.uk/Guidance/QS37) care (QS37):

Statement 3: Parents are given information and advice, before transfer to community care or before the midwife leaves after a home birth, about symptoms and signs of serious illness in the baby that require them to contact emergency services. [2013, updated 2022]

#### Current UK practice

The National Neonatal Audit Programme[[5]](#footnote-5) measures whether parents have been spoken to by a senior member of the neonatal team within the first 24 hours of their baby being admitted. This applies for all babies who require care on a neonatal unit. It noted that in 2021 there was a documented consultation with parents within 24 hours of admission in 96.36% (50,995 of 52,944) of cases, up from 95.5% in 2020. Neonatal units range in their achievement of this measure from 78.2% to 100%, with 24 units achieving 100%.

No published studies on current practice were highlighted for the type and content of information provided, this area is based on stakeholder’s knowledge and experience.

### Information on organisations providing support

Stakeholders noted the importance of including the contact details of organisations that provide information and support, counselling and advocacy to parents and carers. They felt this should include NHS organisations, relevant medical bodies, charities and other non-profit organisations and commented that this information should be provided in person, written and virtually.

#### Selected recommendations

NICE’s guideline on neonatal infection (NG195):

1.1.9 Offer parents and carers contact details of organisations that provide parent support, befriending, counselling, information and advocacy. **[2012]**

#### Current UK practice

No published studies on current practice were highlighted for this suggested area for quality improvement; this area is based on stakeholder’s knowledge and experience.

### Issues for consideration

**For discussion:**

* What is the priority for improvement?
* What is the key action that will lead to improvement?
* No strong recommendations on giving information on infection during pregnancy.
* Symptoms of concern for early- and late-onset infection are addressed in the quality statement in the postnatal care quality standard.
* Can we develop a specific, measurable statement?
* Note that the concerns regarding identification of infection when assessing skin-colour will be included in the equality and diversity considerations in the relevant sections of the quality standard and in the equality impact assessment.

**For decision:**

* Should this area be prioritised for inclusion in the quality standard?
* If so, which area? Note that there are overlaps with the antenatal and postnatal care quality standards.
	1. Additional areas

### Summary of suggestions

The improvement areas below were suggested as part of the stakeholder engagement exercise. However, they were felt to be either unsuitable for development as quality statements, outside the remit of this particular quality standard referral or need further discussion by the committee to establish potential for statement development.

There will be an opportunity for the committee to discuss these areas at the end of the Advisory Committee meeting.

Table 2 Summary of information available for additional areas

| Suggested area for improvement | Within remit of NICE QS | In scope | Guideline recs | Relevant existing QS  |
| --- | --- | --- | --- | --- |
| Ventilator-associated pneumonia (VAP) prevention bundles | Yes | No | No | No |
| Genedrive | Yes | Yes | No | No |
| Investigation of potential GBS clusters | No | No | No | No |
| Inclusive language | Yes | Yes | No | No |

**Ventilator-associated pneumonia (VAP) prevention bundles**

A stakeholder suggested the use of ventilator-associated pneumonia prevention bundles for inclusion in the quality standard.

This suggestion has not been progressed. There is a quality standard on [specialist neonatal respiratory care for babies born preterm](https://www.nice.org.uk/guidance/qs193) (QS193) which includes quality statements on ventilation. This specific area is within the remit of that quality standard, though it does not include a quality statement on this area.

### Genedrive

A stakeholder suggested a quality statement on the use of Genedrive MT-RNR1 Kit, based on NICE‘s [Early Value Assessment (EVA) guidance on the Genedrive MT-RNR1 ID Kit](https://www.nice.org.uk/guidance/hte6) for detecting a genetic variant to guide antibiotic use and prevent hearing loss in babies.

The NICE early value assessment guidance for Genedrive recommends that the MT‑RNR1 ID Kit can be used while further evidence is generated as an option for detecting the genetic variant m.1555A>G to guide antibiotic (aminoglycoside) use and prevent hearing loss in newborns who are being considered for treatment with aminoglycosides.

The positive recommendation is conditional on further evidence being generated, as such, at this time, this is not a suitable source of evidence to underpin a NICE quality standard.

### Investigation of potential GBS clusters

Investigation of potential clusters through surveillance and routine referral of isolates to microbiology laboratories, as per national requirements, to facilitate outbreak detection.

This area has not been progressed because this is outside of the remit of quality standards.

### Inclusive language

A specialist committee member suggested changing the language of the quality standard to be inclusive, for example using pregnant women and pregnant persons.

The NICE style guide is currently being updated and this will include the use of inclusive language. The wording used in the quality standard will be confirmed at the committee meeting.

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# Appendix 1: Suggestions from registered stakeholders

| ID | Stakeholder | Suggested key area for quality improvement | Why is this a key area for quality improvement? | **Supporting information** |
| --- | --- | --- | --- | --- |
| Prevention of neonatal infection  |
| 1 | British Society for Antimicrobial Chemotherapy | Key area for quality improvement 1 | The quality statements lack an infection prevention component for hospitalised newborns, in view of the high number of outbreaks and high antibiotic exposure in neonatal units. Otherwise they are reasonable. |  |
| 2 | Group B Strep Support (GBSS) | Key area for quality improvement 3 | Ensure that the appropriate intrapartum antibiotics are given against early-onset GBS infection when indicated and that the first dose of antibiotics is given as soon as possible after labour starts (or as soon as infection is suspected, in the case of chorioamnionitis), and continue until the birth of the baby. | This relates to recommendation 1.2.2 and 1.2.4 – we know clindamycin is still quite widely used even in those who say they are allergic to penicillin, and we regularly hear of situations where women are meant to receive intravenous antibiotics at the start of labour, but don’t receive them on time. Giving the right antibiotics at the time improves the effectiveness of preventing early-onset GBS infection, resulting in fewer infections, disabilities and deaths of newborn babies.  |
| 3 | NHS England’s Neonatal and Paediatric Critical Care CRGs | Key area for quality improvement 2 - intrapartum antibiotics | This should be updated to reflect the specific importance of ensuring this is given when a baby is expected to be delivered pre-term, in line with the BAPM antenatal optimisation toolkit: *All women in established preterm labour (<37 weeks) should receive intrapartum antibiotic prophylaxis to prevent early onset neonatal Group B Streptococcal (GBS) infection irrespective of whether they have ruptured amniotic membranes.* [https://www.bapm.org/pages/194-antenatal-optimisation-toolkit](https://gbr01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.bapm.org%2Fpages%2F194-antenatal-optimisation-toolkit&data=05%7C01%7Cfreddie.drew%40nhs.net%7C1cfc75100ca945d4ed7608db306e5282%7C37c354b285b047f5b22207b48d774ee3%7C0%7C0%7C638157022622082577%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=KxIh2ZnSYe8G7ZLJ%2B%2BS9C9w7UJecFw8UrHjD%2BBHP%2BWk%3D&reserved=0) |  |
| 4 | NHS England’s Neonatal and Paediatric Critical Care CRGs |  | Remove umbilical arterial catheters (UAC), umbilical venous catheters (UVC) and peripherally inserted central catheters (PICC) as soon as possible when they are not required due to the risk of CLABSI. Reduce access of central venous catheters in neonates – minimise blood sampling and administration of drugs and fluids that may be given via an alternate route. Use CVC (central venous catheter) “bundles” for insertion, maintenance and removal. |  |
| 5 | SCM1 | Key area for quality improvement 1Intrapartum antibiotics (aiming for reduction in early onset infection) | Intra-partum antibiotics given as prophylaxis to women whose babies are at risk of early onset infection, can prevent cases of early onset infection. | NG195 – 1.2 |
| 6 | SCM1 | Key area for quality improvement 2**Reduction of late onset infection/central line associated infection** | I have put this area in as I feel that it is a current gap that warrants discussion.National and international neonatal databases such as NNAP and Vermont oxford network show in their annual reports that there is variation in rates of late onset infection between units. This indicates that there is potential scope for improvement in units with higher infection rates. There is also evidence in the literature that neonatal infection prevention bundles can lead to reduction in late onset infection. There are more proven cases of late onset than early onset infection in babies within the neonatal unit setting. The impact of having a quality improvement target to reduce late onset infection could be expected to be greater. | QS61- statements 2, 5 and 6 are relevant hereThere are additional factors in preventing neonatal infection – appropriate patient placement, promotion of use of human breastmilk, prompt removal of indwelling plastic when no longer needed (not only lines), aseptic non touch technique/central line insertion bundles. Staff and parent/carer education on infection control is also important.[www.nipcm.hps.scot.nhs.uk](http://www.nipcm.hps.scot.nhs.uk) is the national infection prevention and control manual developed in Scotland – within this there is an addendum for infection prevention and control within neonatal settings.Data on late onset infection is gathered by the national neonatal audit programme (NNAP), data on central line associated infection is also gathered by the Scottish Patient Safety Programme. |
| 7 | SCM5 | Prompt administration of intrapartum antibiotic prophylaxis/treatment | Where a pregnant person is to be offered intravenous antibiotics in labour against early onset group B Strep infection, ensure these are given as soon as possible once labour has started (or as soon as infection is suspected in the case of chorioamnionitis) and continue them until the birth of the baby.  | Pregnant women and people with risk factors for their babies developing early onset GBS infection continue to be told to stay at home and delay coming to hospital, despite their labour starting or waters breaking. This delays the start of intrapartum antibiotics, which can impact their effectiveness at preventing early onset GBS infection, with severe consequences.  |
| 8 | SCM6 | Intrapartum antibiotics | I think this should remain a quality standard. The wording probably needs updating |  |
| 9 | UKHSA | Key area for quality improvement 3: **Prophylaxis treatment for iGAS for neonates** | National guidelines recommend antibiotic prophylaxis for all neonates identified as close contacts of iGAS cases. | [Invasive group A streptococcal disease: managing close contacts in community settings - GOV.UK (www.gov.uk)](https://www.gov.uk/government/publications/invasive-group-a-streptococcal-disease-managing-community-contacts) |
| 10 | UKHSA | Key area for quality improvement 1: **Strengthen IPC** | The quality statements lack an infection prevention component for hospitalised new-borns, in view of the high number of outbreaks and high antibiotic exposure in neonatal units. Recommend a quality statement on all aspects of IPC – clinical practice, device insertion and management, feeding, decontamination of reusable equipment and devices, environmental considerations (ventilation, water, cot spacing etc) etc. | Infection Prevention in the Neonatal Intensive Care Unit Clin Perinatol  2021 Jun;48(2):413-429. doi: 10.1016/j.clp.2021.03.011. Anthony, M., Bedford-Russell, A., Cooper, T., Fry, C., Heath, P. T., Kennea, N., . . . Wilson, P. (2013, Nov). Managing and preventing outbreaks of Gram-negative infections in  neonatal units. *Arch Dis Child Fetal Neonatal Ed, 98*(6), F549-53. doi:10.1136/archdischild-2012-303540Guidelines for prevention and control of group A streptococcal infection in acute healthcare and maternity settings in the UK: [Guidelines for prevention and control of group A streptococcal infection in acute healthcare and maternity settings in the UK (his.org.uk)](https://eur01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.his.org.uk%2Fmedia%2F1196%2Fguidelines_for_prevention_and_control_of_group_a_streptococcal_infection_in_acute_healthcare_and_maternity_settings_in_the_uk_a.pdf&data=05%7C01%7CHCAI%40ukhsa.gov.uk%7C1c34548ab7bd4236720c08db3a9b73b9%7Cee4e14994a354b2ead475f3cf9de8666%7C0%7C0%7C638168211551857636%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=uQHfMKxXVJlZXrKfEt1KQA9iCC%2BuBONtrDmY8nhfLT4%3D&reserved=0) |
| Risk factors and clinical indicators of infection  |
| 11 | Group B Strep Support (GBSS) | Key area for quality improvement 2 | Ensure that all women and babies are assessed for risk factors for and clinical indicators of possible early-onset neonatal infection at the start of labour and that they are then continuously monitored throughout labour and after birth for any new risk factors and/or clinical indicators that may arise.  | This would incorporate recommendation 1.3.1 about identifying the risk factors and clinical indicators, and then the ongoing monitoring. It would also incorporate recommendations 1.3.3 and 1.3.4 – we at GBSS hear so often of EOGBS babies with signs and/or whose mothers had risk factors were missed, resulting in the baby not being assessed or treated swiftly. Early assessment, identification and treatment will, for some babies, make the difference between recovering fully from their EOGBS infection and sadly either dying or recovering with long term sequelae.  |
| 12 | Group B Strep Support (GBSS) | Key area for quality improvement 4 | If the Kaiser-Permanente Sepsis Calculator tool is used to assess the likelihood of early-onset sepsis – there should be evidence that this is actively audited. | This would incorporate recommendation 1.3.5. The KP Sepsis Calculator tool has been adopted by a number of maternity units and, while it is clear that this reduces antibiotics use compared with using the NICE risk factor approach, it is unclear how many early-onset infection will be missed as a result. It is vital that the tool is only used as part of a prospective audit, and that the results of such an audit are widely shared.  |
| 13 | Group B Strep Support (GBSS) | Key area for quality improvement 5 | When a baby presents with potential late-onset infection, ensure that clinical indicators of possible late-onset neonatal infection are considered (Table 2 in section 1.8), considering potential risk factors for late-onset infection, and ensure antibiotic treatment is given as soon as possible and always within one hour of the decision to treat.  | This incorporates recommendations 1.8.1 and 1.8.3 and will assist in the timely recognition and treatment of late-onset infection, which should reduce death and disability caused by these infections.  |
| 14 | Healthcare Safety Investigation Branch | Key area for quality improvement 1Use of NEWS/NEWT charts to support recognition and escalation of babies that may require investigation or treatment for possible infection | HSIB maternity investigations have identified that inconsistent use of NEWS charts has contributed to/may have contributed to poor outcomes for babies. | BAPM: NEWTTA framework for practice [Microsoft Word - Framework final for website April15 (hubble-live-assets.s3.amazonaws.com)](https://hubble-live-assets.s3.amazonaws.com/bapm/file_asset/file/43/NEWTT_framework_final.pdf) |
| 15 | NHS England’s Neonatal and Paediatric Critical Care CRGs |  | The issue of under-detection when assessing skin-colour (including by health professionals) has not been highlighted in the Equality Impact Assessment which sits alongside this update ([accessible from here](https://gbr01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.nice.org.uk%2Fguidance%2Findevelopment%2Fgid-qs10173%2Fconsultation%2Fhtml-content&data=05%7C01%7Cfreddie.drew%40nhs.net%7C1cfc75100ca945d4ed7608db306e5282%7C37c354b285b047f5b22207b48d774ee3%7C0%7C0%7C638157022622082577%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=RicTeHeZMd7TD0LuJaRbXsH0v6TVlIILWMz6JnUiKos%3D&reserved=0)). |  |
| 16 | NHS England’s Neonatal and Paediatric Critical Care CRGs | Key area for quality improvement 4 - Use of Kaiser Permantente neonatal sepsis calculator |  |  |
| 17 | SCM1 | Key area for quality improvement 3**Clinical assessment for neonatal infection (early and late onset)** | Detailed consideration of whether a baby is at increased risk from infection, taking place prior to or around the time of birth, and prompt thorough clinical assessment of any baby who develops clinical signs of possible infection would facilitate prompt identification of babies who need antibiotic treatment or closer observation using monitoring scores. | NG195 - 1.3 and 1.8 |
| 18 | SCM2 | Units using the Kaiser Permanente neonatal sepsis calculator babies should only use it on babies born after 34+0 weeks of pregnancy and should be using it as part of a prospective audit | Need evidence that the KP calculator is safe |  |
| 19 | SCM3 | Key area for quality improvement 2KP sepsis calculator  | Many Trusts are now using the KP sepsis calculator to assess risk factors that may require babies to commence on IV antibiotics <https://neonatalsepsiscalculator.kaiserpermanente.org/> In the initial policy it was documented that Trusts should audit their use of the KP Sepsis calculator to allow useful data collection to be collated –  | Many Trusts are still not using the Sepsis calculator in daily practice. This would reduce their workload, the hospital stays for women and their baby’s plus all the risks this entails and the risk to the wide population for unnecessary antibiotic dosing. It is important to advise the public that although their baby may have risk factors associated with infection, many Trusts are now using the sepsis calculator to identify the risks, so although there may be risk factors present this does not automatically instigate IV antibiotic treatment, it may just be a period of observation. I think it is important that parents are aware of this.Has the audit data collated from the use of the Sepsis calculator being gathered nationally? Is there more up-to-date data available? This would give useful information. This is the most recent article found with the evidence.1. Mangesh Deshmukh, Shailender Mehta & Sanjay Patole (2021) Sepsis calculator for neonatal early onset sepsis – a systematic review and meta-analysis, The Journal of Maternal-Fetal & Neonatal Medicine, 34:11, 1832-1840, DOI: [10.1080/14767058.2019.1649650](https://doi.org/10.1080/14767058.2019.1649650)

Has identified a huge reduction in the imperial use of IV antibiotics for those baby’s identified to have risk factors of EOS. We need to identify how we can collate the data from all the Trusts. From the Trust I work in with the implementation of the sepsis calculator it has been possible to administer IV antibiotics within the 1 hour of the decision to treat for 6 consecutive weeks, which considering we were only 23% compliant at the start of the QI project this is a huge improvement. It has reduced the workload for the neonatal team, reduced the hospital stay for women and their baby’s which in turn has released the pressure for beds on the postnatal ward. The latest evidence has shown a reduction by half for IV antibiotic use with no increased mortality and morbidity.NICE should be promoting the use of the Sepsis calculator in all Trust’s throughout the UK and start collecting meaningful data to back up the evidence that is being seen in local units.  |
| 20 | SCM4 | Key area for quality improvement 2Risk factors for and clinical indicators possible early-onset neonatal infection (S.1.3) | This section of NG 195 has two important new ‘boxes’ in terms of risk factors and clinical indicators for early-onset neo-natal infection, including 'red flags'. This should be promoted as a useful and timely ready-reference for all healthcare professionals, covering pregnancy and labour, and in days immediately after birth.  | NG 195:Risk factors for and clinical indicators possible early-onset neonatal infection S.1.3.1-5Box 1 Risk factors for early-onset neonatal infectionBox 2 Clinical indicators of possible early-onset neonatal infection (observations and events in the baby) |
| 21 | SCM4 | Key area for quality improvement 3Kaiser Permanente neonatal sepsis calculator | This is an established and well-respected methodology, with the potential to assist in clinical decision-making in an NHS context. Given that potential, the opportunity to make use of the calculator should be highlighted, but, being newly introduced in the 2021 Guideline, it should be used only as part of a prospective audit, (as the NG195 makes clear). This should be linked with a mandatory requirement for users to submit data to a national database so that the effectiveness of the calculator can be further understood.  | NG195:Kaiser Permanente neonatal sepsis calculatorS.1.3.6-7 |
| 22 | SCM4 | Key area for quality improvement 4Late-onset neonatal infection (S.1.8 – S1.11) | The 2021 Guideline covers, for the first time, late-onset neo-natal infection. As such there is much important new material, ranging from risk-factors and clinical indicators, to investigations, to the choice and duration of antibiotics. Given the inclusion of late-onset neo-natal infection, in the Guideline then it is important for it to be highlighted.  | NG 195:S.1.8 – S1.11 |
| 23 | SCM5 | Ongoing risk assessment for early onset infection  | Assess the risk of early onset infection after birth, particularly where there have been any risk factors or if there are any clinical indicators of possible early onset infection. | In my day job (CEO at GBSS) too often we hear from families whose babies have developed who have received little or no information about what late onset GBS infection is, what the key signs of infection are, what to do should any arise, and how it can be treated. Having this information, being empowered to use it, and knowing how to escalate would reduce death and disability caused by delayed identification and treatment.  |
| 24 | SCM5 | Identifying late onset infection | Ensure that when a baby is assessed or reviewed that they are checked for possible clinical indicators of late onset infection, especially if any known risk factors are present | This is a new recommendation in the 2021 guidance, and needs to be highlighted to ensure that all relevant clinicians, including outside of a hospital setting, are aware of these.  |
| 25 | SCM6 | Clinical assessment | It is reasonable to keep this standard, but it needs to be refined and reworded. It will also need to take into account the recommendation in the guideline that sanctions the use of the Kaizer Permanente sepsis risk calculator. |  |
| 26 | University Hospitals Birmingham- Birmingham Heartlands Hospital | Key area for quality improvement 1Adoption of Kaiser Permanente Sepsis Risk Calculator (KPSRC) as a national guidance | A no. of UK units ( London, Wales, West Midlands, Southampton) are already using KPSRC and are deviating from current NICE guidance.All these units are using their local adaptations of the calculator- it would be really sensible to use a standardised national guidance on use of KPSRC | [Implementation of an adapted **Sepsis** Risk **Calculator** algorithm to reduce antibiotic usage in the management of early onset **neonatal** **sepsis**: a multicentre initiative in **Wales**, UK.](https://pubmed.ncbi.nlm.nih.gov/34551917/) Goel et al .Arch Dis Child Fetal Neonatal Ed. 2022 May;107(3):303-310[Impact of **neonatal** **sepsis** **calculator** in West Midlands (UK).](https://pubmed.ncbi.nlm.nih.gov/33293276/)van Hasselt et al; Paediatric Research Across the Midlands (PRAM) Network. Arch Dis Child Fetal Neonatal Ed. 2021 Sep;106(5):568-569. doi: 10.1136/archdischild-2020-320862.  |
| 27 | UKHSA | Key area for quality improvement 4: **Pregnant women and newborn babies receive a comprehensive assessment for the risks or indicators of early-onset neonatal infection** | Early onset sepsis is a significant cause of mortality and morbidity in newborn babies. It should be recognised that sepsis is a relatively rare event and that the practice of treating a large proportion of babies with antibiotics is not without risk. The use of current NICE guidance for risk factors or the Kaiser Permanente screening tool has been recommended at national level and in regional quality improvement schemes. | See NICE guidance:[Overview | Neonatal infection: antibiotics for prevention and treatment | Guidance | NICE](https://eur01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.nice.org.uk%2Fguidance%2Fng195&data=05%7C01%7CHCAI%40ukhsa.gov.uk%7C1c34548ab7bd4236720c08db3a9b73b9%7Cee4e14994a354b2ead475f3cf9de8666%7C0%7C0%7C638168211551857636%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=vpMNFo%2Bfo3YyqXtReiYRcQvaT6oQA6KnRt04ReYtCII%3D&reserved=0)Kaiser Permanente risk score: https://neonatalsepsiscalculator. kaiserpermanente.orgDhudasia MB et al. Implementation of the sepsis risk calculator at an academic birth hospital. Hosp Pediatr. 2018 May;8(5):243-250. |
| Antibiotic treatment  |
| 28 | Group B Strep Support (GBSS) | Key area for quality improvement 5 | When a baby presents with potential late-onset infection, ensure that clinical indicators of possible late-onset neonatal infection are considered (Table 2 in section 1.8), considering potential risk factors for late-onset infection, and ensure antibiotic treatment is given as soon as possible and always within one hour of the decision to treat.  | This incorporates recommendations 1.8.1 and 1.8.3 and will assist in the timely recognition and treatment of late-onset infection, which should reduce death and disability caused by these infections.  |
| 29 | SCM1 | Key area for quality improvement 5**Reassessment of antibiotic treatment for neonatal infection (early and late onset)** | If with time and further assessment (including review of blood results), it looks as though a baby does not have infection, antibiotics should be stopped promptly. This would help reduce the chance of antimicrobial resistance, reduce the impact on neonatal gut flora (including the increased risk of developing necrotising enterocolitis, reference: Journal of antimicrobial chemotherapy 2017,72(7): 1858-1870.) and reduce costs in terms of hospital stay, drugs and monitoring. It would also reduce the burden that separation and hospital stays would have on a family. | NG 195 – 1.6.3 and 1.11.3(36 and 48 hours respectively) |
| 30 | SCM1 | Key area for quality improvement 4**Prompt treatment for neonatal infection (early and late onset)** | Once the decision for antibiotic treatment has been made, the antibiotics should be given as soon as possible and always within 1 hour. This is a widely accepted and clinically important standard of practice. Delay in antibiotic administration can lead to worse outcomes for babies. | NG 195 – 1.3.9 and 1.8.4 |
| 31 | SCM2 | For babies given antibiotics because of suspected late-onset infection, consider stopping the antibiotics at 48 hours if the blood culture is negative, etc. | This could make a major contribution to antibiotic stewardship. I believe that very few babies have their antibiotics stopped this early |  |
| 32 | SCM2 | Use a shorter treatment duration than 7 days (for suspected or confirmed late-onset infection) when the baby makes a prompt recovery, and either no pathogen is identified or the pathogen identified is a common commensal (for example, coagulase negative staphylococcus). | Another opportunity for antibiotic stewardship.  |  |
| 33 | SCM2 | For babies with suspected late-onset neonatal infection who are already in a neonatal unit give a combination of narrow-spectrum antibiotics (such as intravenous flucloxacillin plus gentamicin) as first-line treatment | I think that there is considerable variation in practice |  |
| 34 | SCM2 | Give prophylactic antifungals with antibiotics for suspected late-onset neonatal bacterial infection if they have a birthweight of up to 1,500 g or were born at less than 30 weeks' gestation | I do not think that this recommendation has been widely adopted. |  |
| 35 | SCM4 | Key area for quality improvement 4Late-onset neonatal infection (S.1.8 – S1.11) | The 2021 Guideline covers, for the first time, late-onset neo-natal infection. As such there is much important new material, ranging from risk-factors and clinical indicators, to investigations, to the choice and duration of antibiotics. Given the inclusion of late-onset neo-natal infection, in the Guideline then it is important for it to be highlighted.  | NG 195:S.1.8 – S1.11 |
| 36 | SCM6 | Prompt antibiotic treatment | I think this should also remain a quality standard. However, treatment within an hour of ‘decision to treat’ is equally important for late onset as early onset infection. Therefore, I think this standard should be for both early onset and late onset infection. It is the most important standard for late onset infection and could be used as the ‘placeholder’ for this aspect of the guideline. |  |
| 37 | SCM6 | Reassessing antibiotic treatment  | This standard could also potentially remain a quality standard. If anything, reassessing antibiotics treatment and stopping treatment where there is no strong evidence of infection is even more important for late onset infection as for early onset infection. Therefore, if it is to be retained, I think this standard should be for both early onset and late onset infection.  |  |
| 38 | SCM6 |  | The use of narrow spectrum antibiotics is also an important facet of treatment in neonatal sepsis, particularly for late onset infection. Many NNUs start very broad spectrum antibiotics as first line in late onset infection. A quality standard around this might be worth considering. |  |
| 39 | UKHSA | Key area for quality improvement 5: **New-born babies who need antibiotic treatment receive it within 1 hour of the decision to treat** | Sepsis can develop quickly with potentially devastating effects if not treated early. | [“Golden Hour” quality improvement intervention and short-term outcome among preterm infants | Journal of Perinatology (nature.com)](https://eur01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.nature.com%2Farticles%2Fs41372-018-0254-0&data=05%7C01%7CHCAI%40ukhsa.gov.uk%7C1c34548ab7bd4236720c08db3a9b73b9%7Cee4e14994a354b2ead475f3cf9de8666%7C0%7C0%7C638168211551857636%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=RzMwDlO3WmWRZ07oAw%2FVt%2FScjOe0e%2FBD2ftfjC7whRI%3D&reserved=0) |
| Information and support for parents and carers |
| 40 | Group B Strep Support (GBSS) | Key area for quality improvement 1 | Ensure that all parents and carers of all babies are provided with information when any baby is transferred home from the hospital or midwifery-led unit (or in the immediate postnatal period in the case of babies born at home), both written and verbally, to seek urgent medical help (and how and where to do this - for example, from NHS 111, their GP, or an accident and emergency department) if they are concerned that their baby shows key signs of EO or LO infection. Include lay explanations of what the key signs are. Include contact details of organisations that provide parent support, befriending, counselling, information and advocacy. Give the information in person, and as written information and advice for them to take away (hard copies and/or virtual).  | This would incorporate recommendation 1.1.12 for information for all, recommendation 1.1.5 for information to parents/carers of babies at risk of EO infection, and recommendation 1.9 for information for parents/carers of babies treated for neonatal infection. Ensuring parents and carers have the information about the key signs of early and late-onset infection will empower them to seek early treatment where necessary. Early treatment will save lives, and reduce long-term sequelae caused by these infections in babies. Knowledge of what signs of infection to be alert for, what actions to take should they arise and where to go for more information, advice and support, will help parents and carers feel more confident in looking after their young babies |
| 41 | NHS England’s Neonatal and Paediatric Critical Care CRGs | Key area for quality improvement 1 - quality standard dedicated to parental information and support | Noted addition to the updated source guidance relating to a recommendation on advice for parents/carers of all babies, giving advice on symptoms to look out for that may indicate neonatal infection.While it does make reference to changes to skin colour  - *“(for example where the baby becomes very pale, blue/grey or dark yellow)”* – it could do much more in terms of quality improvement to explicitly highlight how specific symptoms of infection may present differently on babies with black or brown skin colour, and how best to identify changes in skin colour on different skin tones (e.g. specific locations on the body to look for changes in colour)In addition, the issue of under-detection when assessing skin-colour (including by health professionals) has not been highlighted in the Equality Impact Assessment which sits alongside this update ([accessible from here](https://gbr01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.nice.org.uk%2Fguidance%2Findevelopment%2Fgid-qs10173%2Fconsultation%2Fhtml-content&data=05%7C01%7Cfreddie.drew%40nhs.net%7C1cfc75100ca945d4ed7608db306e5282%7C37c354b285b047f5b22207b48d774ee3%7C0%7C0%7C638157022622082577%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=RicTeHeZMd7TD0LuJaRbXsH0v6TVlIILWMz6JnUiKos%3D&reserved=0)); nor is it mentioned in the equality and diversity considerations for Quality Standard 5, where it is also relevant – there is a forthcoming [https://www.nhsrho.org/](https://gbr01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.nhsrho.org%2F&data=05%7C01%7Cfreddie.drew%40nhs.net%7C1cfc75100ca945d4ed7608db306e5282%7C37c354b285b047f5b22207b48d774ee3%7C0%7C0%7C638157022622082577%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=yzhcn82jZLnbUoAS8lsfxajhWRA7V6H4x6PCvL42PEc%3D&reserved=0) report which focuses more on jaundice / cyanosis et al in relation to care of Black and Asian newborns, but which covers well the limitations of use of skin colour / detection by eye in babies from minority ethnic groups. |  |
| 42 | SCM1 | Key area for quality improvement 6**Information and support for parents/carers regarding neonatal infection (signs, prompt action, implications)** | Early recognition of signs of infection can lead to earlier and more effective treatment. It is therefore important to support parents with clear, easily understandable and accessible information on when and how to seek medical help for their baby. Parents and carers should also be supported in understanding the treatment and prognosis of infection in newborn babies.To my knowledge it is not currently known what proportion of parents receive verbal/written information and if it is consistent/standardised. | NG 195 – 1.1Whilst not specific to infection, NNAP 2021 report shows 96.3% of babies admitted to NNU have a consultation with senior staff within 1 hour. What is said and whether written info is given is not captured in this data. It also does not capture communication with families where infection risk is present but their baby is never admitted to a NNU. |
| 43 | SCM4 | Key area for quality improvement 1 Information and support for parents and carers, verbal and written, before, during and after childbirth | NICE Guideline NG 195 makes various references to the provision of timely information to parents and carers, whether in writing or verbally. Some of this was in the original 2012 Guideline, but there is also important new material from the 2021 update, which should be highlighted and promoted. This should include, in particular, the production of a clear guide or ‘checklist’ for parents and carers, in leaflet form and via electronic media, setting out what to look out for by way of warning signs of infection in their baby. This should recognise that, as time passes after childbirth, parents and carers with likely have less immediate access to healthcare professionals, and therefore need a means to make effective and immediate judgements about the health of their babv. Any checklist should therefore be based upon the risk factors and clinical indicators for both early- and late-onset infection as set out in NG195, and include a clear message about the importance of seeking medical help as soon as possible if parent and carers have any concerns (as per S.1.1.12).  | NG 195:Information and Support S.1.1.1-13 Plus: S.1.3.8, S.1.8.2/Table 2 Clinical indicators of possible late-onset neonatal infection (observations and events in the baby) |
| 44 | SCM5 | Information & support – early onset infection | Provide information both in person and in writing to all pregnant people about early onset neonatal infection, including risk factors, signs of infection in the baby and what actions to take should any arise. Include contact details of organisations where families can find more information and support, both online and in person, including NHS organisations, relevant medical bodies, charities and other non-profit organisations.  | Providing all pregnant women and people with information relating to early onset infection should improve uptake of current prevention measures for early onset group B Strep infection, as well as improve identification and early treatment of babies with early onset infection. All babies can develop early onset infection – risk factors are poor predictors of which babies will actually develop infection, so providing the information to all expectant families will help to empower them to seek medical advice sooner, which will save little lives. In my day job (CEO at GBSS) we hear all the time from families who have received little or no information about what early onset GBS infection is, how it can potentially be prevented, what the key signs of early onset GBS infection is in newborn babies, what to do should any arise, and how it can be treated.  |
| 45 | SCM6 | Information & support | I think that the standard around providing information & support to parents should also remain |  |
| Additional areas |
| 46 | NHS England’s Neonatal and Paediatric Critical Care CRGs | Use VAP prevention bundles – reduced length of ventilation – proactive assessment for extubation – spontaneous breathing trials and sedation holds, head of bed elevation, attention to hand hygiene and sterile handling of endotracheal tubes – intubation and suction, maintain hygiene of ventilator circuits, mouth care and oropharyngeal suction. |  |  |
| 47 | NHS England’s Neonatal and Paediatric Critical Care CRGs | Key area for quality improvement 3 - 2)Use of Genedrive MT RNR1 kit | Dependent on what NICE recommend in [Project information | Genedrive MT RNR1 ID Kit for detecting a genetic variant to guide antibiotic use and prevent hearing loss in babies: early value assessment | Guidance | NICE](https://gbr01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.nice.org.uk%2Fguidance%2Findevelopment%2Fgid-hte10009&data=05%7C01%7Cfreddie.drew%40nhs.net%7C22f960f756524631982908db2f7f3b29%7C37c354b285b047f5b22207b48d774ee3%7C0%7C0%7C638155995712876660%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=cFqdT2U7x5uzoNF10mk2hXGM4AUPC7Tgeh0rIA639Ts%3D&reserved=0)Lower impact expected catheterisation of neonates is infrequent |  |
| 48 | SCM3 | Key area for quality improvement 1Language  | The language should change inline with the NICE guidelines  | For example, Pregnant women & pregnant persons  |
| 49 | UKHSA | Key area for quality improvement 2: **Investigation of potential clusters through surveillance and routine referral of isolates to reference micro labs (as per national requirements\*) to facilitate outbreak detection.** | UKHSA work on GBS identified many cryptic clusters in neonatal units, with 1 in 12 late onset GBS infections gnomically and epidemiologically linked to other cases suggesting cross-infection. Routine referral of isolates is inconsistent between laboratories making the likelihood of detection in some hospitals low.  Routine referral of isolates is important, rather than only as a result of suspected outbreak.  | [Uncovering Infant Group B Streptococcal (GBS) Disease Clusters in the United Kingdom and Ireland Through Genomic Analysis: A Population-based Epidemiological Study - PubMed (nih.gov)](https://eur01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fpubmed.ncbi.nlm.nih.gov%2F32766850%2F&data=05%7C01%7CHCAI%40ukhsa.gov.uk%7C1c34548ab7bd4236720c08db3a9b73b9%7Cee4e14994a354b2ead475f3cf9de8666%7C0%7C0%7C638168211551857636%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=2JsSEycP9l59YvVhaHza5D7uIeh3N6iLJmelTt1PAMM%3D&reserved=0) \*[Bacteriology reference department user manual - GOV.UK (www.gov.uk)](https://www.gov.uk/government/publications/bacteriology-reference-department-brd-user-manual) |
| General comments |
| 50 | SCM4 | Key area for quality improvement 5Other material new to the 2021 Guideline  | Interspersed around the substantive new sections of guidance, there are important additions and modifications to the 2012 Guideline. As a Lay Member, I feel that it would be wrong for me to apply particular weighting to scenarios which are properly for clinicians and other healthcare professionals to gauge.  | NG195 in entirety  |
| No comments |
| 51 | RCGP | N/A | We have reviewed the documentation for this quality standard and do not have any comments on this occasion. |  |
| 52 | RCN | N/A | Thank you for the opportunity to contribute to the above consultation, we received no member comments this time. |  |
| 53 | RCOG | N/A | Unfortunately we didn’t receive any comments for this. |  |

1. House of Commons Health and Social Care Committee (2021) [The safety of maternity services in England](https://committees.parliament.uk/publications/6578/documents/73151/default/) [↑](#footnote-ref-1)
2. [National Neonatal Audit Programme summary report on 2021 data](https://www.hqip.org.uk/a-z-of-nca/national-neonatal-audit-programme-nnap/#.ZEJmD_zMK70) (2022) [↑](#footnote-ref-2)
3. [Neonatal Infection (Early Onset) Antibiotics for Prevention and Treatment - NICE CG149 at Doncaster and Bassetlaw Hospitals](https://www.dbth.nhs.uk/wp-content/uploads/2021/10/1405-Neonatal-Antibiotics-Audit-2020.pdf) [↑](#footnote-ref-3)
4. [Audit assessing antibiotic administration for suspected early-onset neonatal sepsis on the postnatal wards in Addenbrooke’s Hospital, UK,](https://adc.bmj.com/content/106/Suppl_1/A203) BMJ Journals [↑](#footnote-ref-4)
5. [National Neonatal Audit Programme](https://www.rcpch.ac.uk/work-we-do/quality-improvement-patient-safety/national-neonatal-audit-programme) (2022), Royal College of Paediatrics and Child Health [↑](#footnote-ref-5)