The use of antibiotics to prevent and treat early-onset bacterial infection in newborn babies

Information for the public
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About this information

NICE clinical guidelines advise the NHS on caring for people with specific conditions or diseases and the treatments they should receive. The information applies to people using the NHS in England and Wales.

This information explains the advice about the use of antibiotics to prevent and treat early-onset bacterial infections in newborn babies that is set out in NICE clinical guideline 149.

'Early-onset' means infections that arise within 72 hours of the baby's birth. 'Bacterial' means any type of infection caused by bacteria, rather than an infection caused by a virus, fungus or parasite (such as rubella, thrush or toxoplasmosis).

Does this information apply to me?

Yes, if:

- you are a pregnant women whose unborn baby may be at a higher risk than average of developing a bacterial infection within 72 hours of birth.

- your baby was born before 37 weeks (premature birth); because they have a higher than average risk of getting an infection.
• your newborn baby has a suspected or confirmed bacterial infection, or has a high risk of infection because of possible transmission from the mother.

The information does not cover:

• screening tests to identify pregnant women whose unborn babies are at higher risk of early-onset bacterial infection.

• newborn babies with a suspected or confirmed non-bacterial infection, or a suspected or confirmed bacterial infection if they are more than 3 days (72 hours) old.

• babies with a suspected or confirmed bacterial infection that happened after a medical procedure, such as an operation.

• babies with suspected or confirmed syphilis.

Care and communication

If you think that your care or your baby's care does not match what is described in this information, please talk to a member of your healthcare team.

In the NHS, patients and healthcare professionals have rights and responsibilities as set out in the NHS Constitution (www.dh.gov.uk/en/DH_132961). All NICE guidance is written to reflect these. You have the right to be involved in discussions and make informed decisions about your baby’s treatment and care, and your own treatment and care, with your healthcare team. Your choices are important and healthcare professionals should support these wherever possible. You and your baby should be treated with dignity and respect.

To help you make decisions, healthcare professionals should explain early-onset bacterial infections and the possible treatments for your baby (or for you, where relevant). They should cover possible benefits and risks related to your personal circumstances, and what might happen if you choose not to have the treatment. You should be given relevant information that is suitable for you, and reflects any religious, ethnic, or cultural needs you have. It should also take into account whether you have any physical or learning disability, sight or hearing problem or language difficulties. You should have access to an interpreter or advocate (someone who helps you put your views across) if needed. Your partner, family and/or carers should be given their own information and support. You should be able to discuss or review the care given to you and/or your baby as treatment progresses, or the circumstances change.
All information and support to help with making decisions should be given in line with the Department of Health's advice on consent ([www.dh.gov.uk/en/DH_103643](http://www.dh.gov.uk/en/DH_103643)) and the code of practice for the Mental Capacity Act. Information about the Act and consent issues is available from [www.nhs.uk/CarersDirect/moneyandlegal/legal](http://www.nhs.uk/CarersDirect/moneyandlegal/legal). In Wales healthcare professionals should follow advice on consent from the Welsh Government ([www.wales.nhs.uk/consent](http://www.wales.nhs.uk/consent)).

If you are pregnant and are under 16, your parents or carers will need to agree to any treatment that you need, unless it is clear that you fully understand the treatment and can give your own consent.

Sometimes if a baby appears to have a serious illness that could indicate the need for urgent treatment, the medical staff may not have time to fully discuss what is involved in that treatment beforehand. In an emergency, if the person with parental responsibility cannot be contacted, healthcare professionals may give treatment immediately if it is in the baby's best interests.

**Early-onset bacterial infection in newborn babies**

Bacterial infections that happen within 72 hours of birth can be extremely dangerous for newborn babies. The medical name for this is 'early-onset neonatal bacterial infection'. These infections are particularly dangerous if there are any delays in recognising that the baby is ill and starting treatment.

This information explains what NICE has said about how the risk of infection can be managed in healthy babies, the treatment that pregnant women should be offered if their baby is at risk, and the care and treatment that should be given to babies who have a suspected or confirmed infection.

### Identifying risk factors for infection

There are several reasons why your newborn baby might have a higher than average risk of bacterial infection (these are called risk factors), for example:

- you have previously had a baby who had a group B streptococcal infection
- you are carrying the group B streptococcus bacterium, or you have had a group B streptococcal infection (including a group B streptococcus urine infection) during this pregnancy
- your membranes broke before the start of labour
• your baby is born before 37 weeks (premature birth) following labour that was not started artificially

• your baby is born before 37 weeks and your membranes broke more than 18 hours before the birth

• you have a fever with a temperature higher than 38°C, or you have a confirmed or suspected infection of the membranes or amniotic fluid called chorioamnionitis

• you have antibiotics for a bacterial infection such as blood poisoning (septicaemia) 24 hours before the birth, at any time during labour, or within 24 hours of the birth

• you had twins or more and an infection is suspected or confirmed in one of the babies.

Before the birth

If you had group B streptococcus in a previous pregnancy and the baby did not have an infection, this will not affect the birth in this pregnancy.

During labour, your healthcare team should look for and assess any risk factors for infection. They should also look out for any new risk factors which arise during your labour, for example, if you develop a fever. Some of these are particularly important, and are called red flags because they mean there is a high risk of infection in your baby (see After your baby has been born).

If your membranes break before you go into labour and you are at 37 weeks or more, your healthcare team should follow NICE’s guideline on the care of women and their babies during labour and birth (intrapartum care). NICE has produced information for the public explaining this guideline, see http://publications.nice.org.uk/IFP55.

Minimising the risk of your baby having an infection

Once your labour has started, your healthcare team should offer you an antibiotic called benzylpenicillin (or an alternative such as clindamycin if you are allergic to penicillin) to reduce the risk of your newborn baby having an infection if:

• you have previously had a baby who had a group B streptococcal infection
• you are carrying the group B streptococcus bacterium, or you have had a group B streptococcal infection during your pregnancy.

You should have the first dose as soon as possible, and should continue with the antibiotics until your baby is born.

Your healthcare team may talk to you about whether to have antibiotic treatment if you are in premature labour (before 37 weeks) and your membranes have broken.

**Information and support before your baby is born**

If your healthcare team has concerns about a possible infection or risk of infection in your baby, they should tell you and your partner. They should explain the reason for their concern and explain what an early-onset neonatal infection is. They should discuss with you the preferred treatment and care (this may be keeping a close eye on you, doing tests or starting antibiotic treatment). They should give you time to think about the information you have been given. You should be able to have further discussions with your healthcare team if you wish to.

If antibiotics are being considered, your healthcare team should talk to you about why they are being considered, the risks and benefits for you and your baby, how you and your baby will be monitored and what tests will be done. They should discuss which antibiotics will be used and for how long, and whether antibiotic treatment will affect where you or your baby are cared for (that is, in hospital, a birthing unit or at home).

When you are in labour, if there is a change of staff or if your healthcare team ask the advice of a specialist, your healthcare team should involve you in the handover of care and provide an update about any infection. NICE has produced separate guidance on the care you should receive during labour and birth (intrapartum care). NICE has produced information for the public explaining this guideline, see [http://publications.nice.org.uk/IFP55](http://publications.nice.org.uk/IFP55).

**After your baby has been born**

After you have given birth, the care and treatment your baby should receive depends on whether there are, or whether there have been, any risk factors for infection (see Early-onset bacterial infection in newborn babies), or symptoms or signs (see box below) that your baby may have an infection.
Symptoms and signs of a possible early-onset neonatal bacterial infection that your baby's doctors will look for

- Your baby starts to behave or respond in a different way, or feels limp or 'floppy'.

- Your baby has feeding difficulties, for example refuses to take milk, vomits or has abdominal bloating after feeding.

- Your baby's heart rate speeds up or slows down.

- Your baby shows signs of breathing difficulties more than 4 hours after birth, or the level of oxygen in their blood decreases (for example, because of breathing problems).

- Your baby feels unusually hot or cold, or shows signs of poor circulation (signs of shock).

- Your baby has signs of jaundice (yellowing of the skin and eyes) within 24 hours of birth.

- Your baby has signs of neurological problems (problems with breathing, reflexes and consciousness).

- Your baby has one or more seizures (fits).

- Your baby was born at full term and needs a ventilator to help them breathe.

- Your baby needs to be resuscitated.

- Blood tests show that your baby has an unexplained bleeding disorder (for example, if their blood does not clot normally), abnormal levels of blood sugars, or too much acid in their blood.

- Your baby passes only a small amount of urine, and this persists beyond 24 hours after the birth.

- Your baby has a localised infection, for example, of the skin or eye.

If there are any risk factors or symptoms and signs, your baby's healthcare team should perform a detailed health check (called a clinical assessment) without delay. In the clinical assessment they should look carefully at your medical history and your baby's medical history, and examine your baby for any signs of infection. This should include measuring your baby's heart rate, temperature and breathing.
Some of the risk factors and symptoms and signs suggest a high risk of an infection. Doctors call these 'red flags'. Your healthcare team will watch out for any red flags.

### 'Red flags' that suggest a high risk of infection

- You had antibiotics for a bacterial infection such as blood poisoning (septicaemia) at any time during labour or within 24 hours before or after the birth.
- You had twins or more and an infection is suspected or confirmed in one of the babies.
- Your baby starts to show signs of breathing difficulties more than 4 hours after they were born.
- Your baby has one or more seizures (fits).
- Your baby was born full term (at 37 weeks or more) but needs a ventilator to help them breathe.
- Your baby shows signs of shock (signs of poor circulation).

### Care and treatment

<table>
<thead>
<tr>
<th>Risk factors, symptoms or signs and red flags</th>
<th>What should happen</th>
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<tbody>
<tr>
<td>If there are:</td>
<td>The healthcare team should carry out tests and start antibiotic treatment.</td>
</tr>
<tr>
<td>• one or more red flags or</td>
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<tr>
<td>• two or more other risk factors, symptoms</td>
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<td>or signs.</td>
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</tbody>
</table>
If there are:
- no red flags
- and
- one other risk factor, symptom or sign.

<table>
<thead>
<tr>
<th>The healthcare team should use their judgement to decide:</th>
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<tr>
<td>- whether or not to treat your baby with antibiotics</td>
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<tr>
<td>- whether the baby should be monitored; if monitoring is needed it should be continued for at least 12 hours from birth (at 1 hour, 2 hours and then once every 2 hours for 10 hours).</td>
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If any concerns arise, your baby's healthcare team should carry out tests and start antibiotic treatment.

If there are no concerns, your baby's healthcare team should reassure you and, if the baby is to be discharged, give you information about what to look out for after leaving hospital.

If there are:
- no red flags
- and
- no other symptoms, signs or other risk factors.

<table>
<thead>
<tr>
<th>Healthcare professionals should not give your baby antibiotics, and your baby should have routine care as described in NICE's guideline on postnatal care.</th>
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<tbody>
<tr>
<td>NICE has produced information for the public explaining this guideline, see <a href="http://publications.nice.org.uk/IFP37">http://publications.nice.org.uk/IFP37</a>.</td>
</tr>
</tbody>
</table>

If you are found to have the group B streptococcus bacterium within 72 hours of your baby's birth, the healthcare team should ask whether you have any concerns about the baby, and they should check for any other risk factors and signs of infection in the baby. If there are no symptoms, signs or risk factors in the baby, your healthcare team should reassure you and give you information about what to look out for.

If your baby is suspected to have bacterial meningitis (and is not already in a neonatal unit) or a urinary tract infection, they should be treated according to guidance that NICE has already published in these areas. To find out more or to read the information for the public on the ‘Bacterial meningitis and meningococcal septicaemia’ guideline, see www.nice.org.uk/guidance/CG102. To find out more or to read the information for the public on the ‘Urinary tract in children' guideline, see www.nice.org.uk/guidance/CG54

Questions you might like to ask your healthcare team

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• Please tell me what you are going to do and why.
• How serious is this?
• Please tell me what the treatment will involve.
• How long will the treatment last?
• Does my baby need to be transferred to another hospital?
• Can I check that I’ve understood what you’ve said?

Information and support after the baby is born

If your baby has an infection, your healthcare team should reassure you that you will be able to continue caring for and holding your baby as you wish. If your baby is too ill to allow this, your healthcare team should discuss with you other ways in which you can care for your baby.

It is usually possible for mothers to breastfeed their babies if they have received antibiotics in labour and while the baby is being treated with antibiotics. Your healthcare team should make every effort to help you with this. If your baby is temporarily unable to breastfeed, your healthcare team should help you express breast milk if you would like to.

If antibiotics are being considered for your baby, the healthcare team should discuss with you why they are being considered, the risks and benefits, how your baby will be monitored during the treatment and what tests will be done. They should discuss which antibiotics will be used and for how long, and whether this will affect where your baby will be cared for (that is, in hospital or at home).

Your healthcare team should offer details of organisations providing support for parents that you may find helpful. You can also get more information from the organisations listed in More information.

Antibiotic treatment for the baby

Some treatments may not be suitable for your baby, depending on the exact circumstances. If you have questions about specific treatments and options covered in this information, please talk to a member of your baby’s healthcare team.
Before starting antibiotic treatment in newborn babies

If a baby needs antibiotic treatment, it should be started as soon as possible and always within 1 hour of the decision to start antibiotics. Blood tests should be carried out before starting antibiotics.

A lumbar puncture should be carried out if the doctors strongly suspect an infection or if your baby has symptoms or signs of meningitis. If the result of the lumbar puncture suggests or confirms that your baby has meningitis, see Diagnosing and treating meningitis in babies in a neonatal unit.

If your baby has conjunctivitis, your baby's healthcare team should look out for pus being discharged from the eyes because this may indicate a more serious infection. If this happens they should send swab samples to the laboratory as soon as possible. While they are waiting for the results, they should start antibiotic treatment.

If your baby shows symptoms or signs of an infection in the umbilical cord area (for example, more redness than usual, swelling or increased skin warmth, or pus being discharged), your baby's healthcare team should send blood and swab samples to the laboratory as soon as possible. While they are waiting for the results, they should start antibiotic treatment.

The first 36 hours of antibiotic treatment

If your baby has a suspected infection, the healthcare team should treat the infection with antibiotics.

Tests and investigations

During the first 36 hours of antibiotic treatment, the healthcare team should take blood samples to check whether there is an infection. If antibiotics will be given for more than 36 hours, they should also check the level of antibiotics remaining in the blood to help them decide when to give the next dose and how much to give.

Depending on the results of blood tests and how your baby's infection is responding to treatment, they may talk to you about doing a lumbar puncture.

The healthcare team should regularly assess your baby during antibiotic treatment. They may wish to add another antibiotic or change to a different antibiotic, for example, if your baby's condition is not improving, or if results of laboratory tests or advice from microbiology experts suggest that other treatments might be more effective.
Antibiotic treatment and tests after the first 36 hours

Your baby's healthcare team may decide to stop antibiotic treatment after 36 hours. This will depend on the results of the blood tests (that is, if the laboratory tests do not show a bacterial infection), if your baby seems well, and if there are no symptoms or signs of infection.

If the laboratory tests show there is a bacterial infection, antibiotic treatment usually lasts 7 days, but it may be continued for longer if your baby has not yet fully recovered, or depending on what the laboratory tests show.

If your baby is on antibiotics for longer than 36 hours and the laboratory tests do not show a bacterial infection, the baby should be checked at least once every 24 hours. At each check, the healthcare team should check the baby's progress and blood test results and consider whether it would be appropriate to stop antibiotic treatment.

Questions you might like to ask your baby's healthcare team

- Please tell me more about this treatment.
- What are the pros and cons of having this treatment?
- Please tell me what the treatment will involve.
- How long will it take for the treatment to have an effect?
- How will you know the treatment is working?
- Are there any risks or serious side effects associated with this treatment?
- How long will the treatment last for?
- Is there some written material (like a leaflet) about the treatment that I can have?

Diagnosing and treating meningitis in babies in a neonatal unit

This section is only about newborn babies who have suspected or confirmed meningitis who are in a neonatal unit. For information about bacterial meningitis (for babies not in neonatal units) or to
read the information for the public about the bacterial meningitis and meningococcal septicaemia guideline, see www.nice.org.uk/guidance/CG102

If the results of the lumbar puncture indicate that your baby could have meningitis, he or she will need antibiotics. Tests may also show which types of bacteria are causing any infection, and the healthcare team will use this information to decide which type of antibiotic to use and for how long.

Caring for your baby at home

On completing antibiotic treatment, your baby will be discharged from hospital. You should be given support and details of who to contact for advice.

If there has been any concern about infection, your healthcare team should put together a management plan for after discharge that should take into account the level of the initial concern, the risk factors that were present, and any concerns you or your family may have.

When to seek medical help

You should seek medical help (for example, from NHS Direct, your GP surgery, or a hospital accident and emergency department) if you are worried that your baby shows signs of:

- changes in behaviour (for example, inconsolable crying), or
- being listless or unusually floppy, or
- problems feeding or tolerating feeds, or
- abnormal temperature unexplained by the environment (being unusually cold or hot), or
- rapid breathing, or
- change in skin colour.

If your baby is considered to be at increased risk of bacterial infection after being discharged, your baby’s healthcare team should talk to you about this and confirm it in writing to you and your GP.
Your healthcare team should tell you whether there could be any long-term effects of your baby's illness, talk to you about how your baby is likely to recover, and reassure you if no problems are anticipated.

In some cases, babies may be able to complete their course of antibiotics outside hospital (for example, at home or through visits to a midwife-led unit).

If your baby has been treated for a group B streptococcal infection, your healthcare team should advise you that any babies you have in the future will also be at increased risk of early-onset neonatal bacterial infection. You should tell the maternity care team that a previous baby has had a group B streptococcal infection, and you will be advised to have antibiotics during labour. The healthcare team should also write to your GP about the small risk of the infection recurring in the baby, and also about the risk of group B streptococcus affecting future babies.

If you have had group B streptococcus in this pregnancy but the baby did not have an infection, this will not affect the birth if you become pregnant again.

Medical terms

**Bacterial meningitis**

Meningitis is an infection of the brain that is caused either by bacteria or a virus. In bacterial meningitis, the bacteria responsible can usually be identified by lumbar puncture and then treated with antibiotics. Babies may refuse feeds, be irritable with a high-pitched cry, have a stiff body and have a bulging soft spot on the top of their head.

**Conjunctivitis**

A usually minor infection of the eye that causes a crusty discharge to form around the eyelids.

**Group B streptococcus, group B streptococcal infection**

A type of bacteria found in the gut and reproductive organs in 20–40% of women. The presence of the bacteria is not normally associated with any symptoms or problems. Group B streptococcal infections can be dangerous and, when a baby picks up the bacteria around the time he or she is being born, it can sometimes lead to a serious infection.
**Lumbar puncture**

A procedure that involves taking a sample of the fluid surrounding the brain and spinal cord using a thin, hollow needle. The sample is usually taken from the lower back and is then tested in a laboratory.

**Neonatal unit**

A unit of a hospital that provides additional care and treatment for newborn babies until they go home for the first time.

**Urinary tract infection**

The urinary tract is made up of the kidneys, the bladder, the tubes that link them, and the tube that carries urine out of the body. A urinary tract infection is a bacterial infection of the urinary tract.

**More information**

The organisations below can provide more information and support. NICE is not responsible for the quality or accuracy of any information or advice provided by these organisations.

- Bliss, 0500 618140 [www.bliss.org.uk](http://www.bliss.org.uk)
- Group B Strep Support, 01444 416176 [www.gbss.org.uk](http://www.gbss.org.uk)
- NCT, 0300 330 0700 [www.nct.org.uk](http://www.nct.org.uk)
- National Breastfeeding Network, 0300 100 0212 (operated with the Association of Breastfeeding Mothers) [www.breastfeedingnetwork.org.uk](http://www.breastfeedingnetwork.org.uk)

NHS Choices ([www.nhs.uk](http://www.nhs.uk)) may be a good place to find out more.
Accreditation

Health & care information you can trust

The Information Standard Certified Member