IF YOUR BABY WAS INFECTED WITH GBS

We are very sorry your baby has developed a serious infection caused by group B streptococcus (GBS). No words can make this easier for you or your family.

You probably have lots of questions. We'll try to answer many of them and tell you how most GBS infection in newborn babies can be stopped. You will need to talk to your medical professionals about your own circumstances. This leaflet means you can benefit from the knowledge and experience of our medical experts and of other families who have had a baby infected with GBS. However, this is not a substitute for discussions with your doctors.

This leaflet gives information on:

- what the symptoms of GBS infections in babies are;
- background information on what GBS is and what it does; and
- what is currently the most effective method of preventing GBS infections in newborn babies.

Sadly, many busy health-care professionals are unaware just how successful the preventative measures our medical advisors recommend can be so some babies suffer from preventable GBS infections. You can help change this! Please get our poster (call us for copies, or download them from our website) pinned to appropriate notice boards in hospitals, GP’s surgeries, etc. And please do make copies of our leaflets and posters and give them to your health professionals.

**Group B Strep Support** is a national charity offering information and support to parents affected by GBS and to health care professionals. We raise awareness of how most GBS infections in newborn babies can be prevented and are generating funds for continued research into GBS prevention. We rely on grants and donations from parents and other interested parties to fund our activities.

Please contact us if you would like:

- to make a donation;
- to join GBSS, be kept up to date with developments and receive our 6-monthly newsletter; or
- to receive more information.

**Group B Strep Support**

_preventing GBS infection in newborn babies_

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Contents

WHAT IS GROUP B STREPTOCOCCUS? .........................3
  GBS colonisation .........................................................................................................................3
  GBS infection .............................................................................................................................3
  Incidence of GBS infection in babies in the UK ........................................................................3
  How does a baby get a GBS infection? .......................................................................................4
  Types of GBS infection ..............................................................................................................4
  Treatment of GBS infection .......................................................................................................6
  Risk factors for GBS infection in newborn babies .....................................................................6
  Preventing most GBS infection in babies ..................................................................................7
  Current UK Guidelines ..............................................................................................................10
  UK Tests for GBS carriage ........................................................................................................11
  Future prevention ......................................................................................................................12

GBSS VIEW ................................................................................14
  Information Provision: ................................................................................................................14
  Medical intervention: ...............................................................................................................14

YOUR BABY WHO HAD A GBS INFECTION .............15
  Talking to your obstetrician/paediatrician .................................................................................15
  After effects of GBS infection ....................................................................................................16
  Reinfection in babies ..................................................................................................................16
  Subsequent babies ....................................................................................................................16

USEFUL ORGANISATIONS .................................................................17

ANOTHER PREGNANCY ................................................................19
  Your baby has arrived - congratulations! ..................................................................................24

FREQUENTLY ASKED QUESTIONS ........................................28

MEDICAL ..........................................................................................36

LEAFLET ORDER FORM .................................................................37

MEMBERSHIP APPLICATION FORM ........................................39
WHAT IS GROUP B STREPTOCOCCUS?

GBS stands for Group B Streptococcus (Streptococcus agalactiae), which is a common type of the Streptococcus bacterium. Up to a third of all men and women in the UK carry GBS in their intestines without symptoms. GBS is a normal body commensal (an organism that lives on another without harming it) that, once present, cannot be eradicated from the body. Carrying GBS is perfectly natural and normal.

GBS often colonises the vagina, although carriage here may be intermittent. At any one time, the vaginas of approximately a quarter of all women of childbearing age are colonised with GBS. The most common source of the bacteria causing GBS infection in newborn babies is the mother’s vagina before or, less frequently, during delivery.

Thousands of newborn babies are exposed to GBS without ill effects - why some babies are susceptible to the bacteria and develop infection (typically septicaemia, pneumonia and/or meningitis) and others don’t is not fully understood.

GBS COLONISATION

GBS is a very common naturally occurring bacterium – it lives in the intestines of about a third of the population (men and women) and, once present, cannot reliably be eradicated. GBS colonisation is when the bacteria live in the body without causing any harm or symptoms. Colonisation with GBS is normal and needs no treatment. People who have the bacteria in their bodies in this way are described as being ‘colonised’ or ‘carriers.’

GBS colonises the vagina in up to 25% of women, again without causing any symptoms - it does not cause increased vaginal discharge, soreness, painful intercourse, etc. Around 5% of the time, GBS may colonise the back of the throat.

GBS colonisation may be intermittent and the duration of carriage is unpredictable. Outside of the intestines, GBS colonisation may appear to be cleared by antibiotics but these areas will usually become recolonised, as antibiotics do not eradicate the GBS in the gut.

GBS may be passed from one person to another through hand contact, kissing, close physical contact, etc. As GBS is often found in the vagina and rectum of colonised women, it is commonly passed through sexual contact. There are no known harmful effects of carriage itself and the GBS bacteria do not cause genital symptoms or discomfort. GBS is not a sexually transmitted disease, nor is GBS carriage a sign of ill health or poor hygiene. No-one should ever feel guilty or dirty for carrying GBS – it’s normal.

GBS INFECTION

GBS occasionally causes infection, most commonly in newborn babies around the time of birth, in the elderly, people with serious underlying medical conditions that impair the immune system and women during pregnancy or after birth. Around half of all GBS infections occur in babies aged less than one month and nearly all of the remainder occur in adults.

GBS infection is when the bacteria are actively causing disease directly by damage to cells or indirectly by the toxins (poisonous substances) they release and is diagnosed when GBS is grown.

INCIDENCE OF GBS INFECTION IN BABIES IN THE UK

GBS infection in newborn babies is relatively uncommon although the actual incidence of GBS infection in newborn babies in the UK is unclear - it is unlikely now that we will ever know the true figure, given the difficulty both of obtaining full actual incidence data and of knowing how much prevention is already occurring which is reducing the actual incidence figures. However, realistic estimates of the total incidence of GBS infection in babies in the UK are needed so that realistic estimates of the risks of newborn babies developing GBS infection can be made.
The British Paediatric Surveillance Unit of the Royal College of Paediatricians and Child Health undertook a study (Heath PT, Balfour G, Weisner AM, Efstratiou A, Lamagni TL, Tighe H, O’Connell LAF, Cafferkey M, Verlander NQ, Nicoll A & McCartney AC on behalf of the PHLS GBS Working Group. Group B streptococcal disease in UK and Irish Infants <90 days of age. Lancet 2004 Jan 24, Vol 363(9405):292.) to determine the number of babies born in the UK and Republic of Ireland who develop GBS infection under age 90 days between 1 February 2000 and 28 February 2001. This found 0.7 per 1,000 babies born in the UK and Republic of Ireland developed culture-proven GBS infection, although the researchers admitted their figures under-reported the situation by up to 40%, suggesting a true incidence of culture-proven cases of at least 0.9/1000 babies born. Another recent London study (Luck S, Torny M, d’Agapeyeff K, Pitt A, Heath P, Breathnach A & Bedford Russell A. Estimated early-onset group B streptococcal neonatal disease. Lancet, 2003 Jun 07; 361(9373): 1953-1954) estimated the incidence of culture-proven plus suspected cases of GBS infection to be 3.6 per 1,000 babies born, increasing the incidence of infection figure significantly – and both of these studies were conducted at a time when increasingly hospitals either had or were introducing protocols against GBS infection in babies.

GBSS’ medical advisory panel has looked at the available data for the UK and considers an incidence of GBS infection in newborn babies, where no preventative action is taken, of one in every 1,000 babies born to be a conservative estimate of the situation in the UK. Assuming an annual birth rate of approximately 700,000 babies for the UK, we estimate that GBS causes infection in at least 700 babies each year in the UK … but most of these infections are preventable.

Thousands of healthy babies are born every year to women who carry GBS, with no ill effects. However, carrying GBS at delivery does increase the risk of the baby developing GBS infection to around one in every 300 babies born (where no preventative measures are taken): 299 times out of 300, the mother’s and baby’s defence mechanisms successfully prevent infection developing. The risk of the baby developing a GBS infection really is quite small.

**HOW DOES A BABY GET A GBS INFECTION?**

A baby develops GBS infection after it has been exposed to the bacterium. Where this exposure comes from may vary: if a baby has symptoms within first six days of birth (early-onset GBS infection), the GBS bacteria will most probably have been passed from the mother to her baby before or during delivery. Such transmission occurs if the mother is carrying GBS in her vagina at the time of delivery, and the bacteria either crossed the amniotic membranes or was passed to the baby during delivery.

If a baby shows symptoms of GBS infection after age six days (late onset GBS infection), the bacteria may have been passed to the baby from the mother, but not necessarily. Some research showed that over 50% of cases of late-onset GBS infection were the same strain of GBS as the mother was carrying. Where the rest came from was unclear, but since GBS is passed from one person to another through skin to skin contact, someone who touched him/her will have exposed the baby to GBS.

Being exposed to GBS is perfectly normal and most babies exposed to GBS do not develop infection – they successfully fight off the bacteria. But there is no way of knowing which babies will be able to do this and which won’t.

**TYPES OF GBS INFECTION**

**Early onset GBS infection**

Roughly 80-90% of all GBS infection in babies occurs in the first six days of life and is usually apparent at birth. This ‘early-onset’ GBS infection is most common after obstetric complications, such as low birth weight, prematurity, prolonged rupture of membranes and maternal fever. Early-onset GBS infection most commonly presents as sepsicaemia, followed by pneumonia and meningitis.

At least 60% of early-onset GBS infection is preventable using the risk-factor based prevention strategy recommended by our medical advisory panel, and significantly more if intravenous antibiotics in labour were offered to all GBS carriers identified by universal reliable testing of women late in pregnancy.
Typical Symptoms of Early Onset GBS Infection in Babies Include:

- grunting
- poor feeding
- lethargy (being abnormally drowsy)
- irritability
- abnormal (high or low) temperature, heart rates or breathing rates
- low blood sugar and/or
- low blood pressure

Early-onset GBS infection is characterised by the rapid development of respiratory distress (breathing problems) and/or sepsis (blood poisoning). Early-onset GBS infection has a higher mortality rate than late-onset infection - approximately 15% of babies die.

Typically at delivery or within a few hours, an infected baby shows symptoms of mild respiratory distress and needs additional oxygen; the baby’s oxygen requirements increase, the baby may stop breathing and need artificial ventilation (a breathing machine). Early-onset GBS infection may very closely mimic the clinical presentation and chest X-ray appearance of respiratory distress syndrome (RDS) and be confused with this condition.

Late-Onset GBS Infection

Approximately 10-20% of GBS infection in babies occurs after the baby is 2 days old, most commonly presenting as GBS meningitis, followed by sepsis, focal infection and pneumonia. This ‘late-onset’ GBS infection normally develops by age one month, but rarely up to age 3 months. Late-onset GBS infection in newborn babies is associated with prematurity, prolonged rupture of membranes, multiple births and the mother carrying GBS.

Around 90% of cases of late-onset infection include meningitis with sepsis. Up to a half of the survivors of GBS meningitis suffer long-term mental or physical problems and, in approximately one out of every 8 survivors of GBS meningitis, the problem is severe. As yet, there are no known methods of preventing late-onset GBS infection in babies.

Typical Symptoms of Late Onset GBS Infection

Your baby is at a little less risk of developing GBS infection as each day passes, but you may like to know the usual symptoms of late-onset infection (developing after day 6). Typical symptoms of late-onset GBS infection are:

- fever;
- poor feeding &/or vomiting;
- impaired consciousness.

Typical Symptoms of Meningitis

GBS can cause meningitis in babies. Typical symptoms of meningitis, any of which could develop and some may not be present at all, include:

- fever, which may include the hands and feet feeling cold, and/or diarrhoea;
- refusing feeds or vomiting;
- shrill or moaning cry or whimpering;
- floppy body;
- dislike of being handled, fretful;
- tense or bulging fontanelle (soft spot on the head);
- involuntary body stiffening or jerking movements;
- pale and/or blotchy skin.
- blank, staring or trance-like expression;
- abnormally drowsy, difficult to wake or withdrawn;
- altered breathing patterns; &
- turns away from bright lights.
Trust your instincts – it is your baby! If your baby shows signs consistent with GBS infection or meningitis, call your GP immediately. If your GP isn’t available, go straight to the nearest PAEDIATRIC Accident & Emergency Department. Early diagnosis and treatment are essential to combat late-onset GBS infection – delay can be fatal...

Adult GBS infection

GBS is a rare cause of infection in adults, most often affecting the elderly or those with underlying medical problems that impair the immune system. GBS infection can develop in women during pregnancy or after birth, typically as urinary tract infection, chorioamnionitis (chorioamnionitis is an infection of the membranes and amniotic fluid), post-delivery endometritis (inflammation of the lining of the uterus following birth), septicaemia (blood poisoning) after delivery and infection after Caesarean sections. These infections usually respond quickly to speedy antibiotic therapy.

Treatment of GBS infection

GBS infection needs to be treated promptly and aggressively: high doses of intravenous (through a vein) antibiotics should be given as soon as possible and antibiotic therapy shouldn’t be stopped prematurely (i.e. intravenous antibiotic therapy should be continued for at least 10 days or 14 days if meningitis is present). Given this, the majority of babies with GBS infection can be treated successfully with penicillin, although some will require all the expertise of a neonatal intensive care unit (and sick babies may have to be transferred to a different hospital with specialised facilities). Sadly, even with full intensive care, between 1 and 2 out of every 10 infected babies will die from their GBS infection (around 15% of babies from early-onset and around 5% from late-onset infection).

Before discharge, a full work up should be done for a baby who has recovered from GBS infection comprising:

<table>
<thead>
<tr>
<th>BABY WORK UP</th>
<th>Review of clinical parameters</th>
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<tbody>
<tr>
<td>Full examination by paediatrician</td>
<td>FBC (full blood count) and differential</td>
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<tr>
<td>CRP (C reactive protein)</td>
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Twins, triplets or more

If a baby develops GBS infection and is one of a multiple birth, then the same antibiotics should be given intravenously to the other baby/babies as a preventative measure, even if they appear well.

Risk of reinfection

Reports indicate a baby who has recovered from a GBS infection is at low but slightly increased risk of re-infection (around 1 - 3%).

There is no established evidence to recommend any specific treatments to prevent recurrent GBS. A few practitioners may prescribe a daily penicillin dose for the baby for the first 3 months of life, in the belief that it may prevent GBS infection. There is no evidence to support this practice, although Penicillin given in this way has been shown to reduce the risk of infection with another related bacterium, called pneumococcus, in individuals who have lost their spleens.

Risk factors for GBS infection in newborn babies

There are five situations where a baby is more likely to be exposed to GBS and run the risk of possible early-onset GBS infection.

Each of the risk factors shown below increases the risk of GBS infection in a newborn baby.

- Mothers who have previously had a baby infected with GBS – risk is increased 10 fold
- Mothers who have been shown to carry GBS in this pregnancy or GBS has been found in the urine at any time during this pregnancy – risk is increased 4 fold
Any of the following clinical risk factors – risk of GBS infection is increased 3 fold
- Labour starts or membranes rupture before 37 weeks of pregnancy is completed (i.e. preterm).
- Where rupture of the membranes is prolonged: more than 18 hours before delivery.
- Where the mother has a raised temperature* during labour of 37.8°C or higher.

*If a woman has an epidural, a slightly raised temperature may be of less significance than in a woman with no epidural.

Most cases of early-onset GBS infection follow deliveries with one or more of the above risk factors.

Without preventative medicine, the chance a newborn baby will develop a GBS infection in the UK is around 1 in every 1,000 babies. For a woman who has had a baby who developed a serious GBS infection, the chance is multiplied by 10 to around 1 in 100 if there are no additional clinical risk factors present. If, however, that same woman is given the intravenous antibiotics in accordance with our medical advisory panel’s recommendations, the risk can reduce dramatically to less than 1 in 2,000.

PREVENTING MOST GBS INFECTION IN BABIES

Preventing GBS infection is better than treating it – waiting to give antibiotics to the baby until after delivery will sadly sometimes be too late. Clinical randomised trials have proven that most GBS infections in newborn babies can be prevented by giving intravenous antibiotics to women whose babies are at increased risk from the onset of labour or waters breaking until delivery.

The data on the time it takes for the intravenous antibiotics to be effective is limited. Research shows that antibiotic penetration of the amniotic fluid seems only to reach a maximum at two hours and, preferring to be conservative, GBSS therefore recommends at least four hours of the intravenous antibiotics before delivery, where possible and, ideally, the pregnant woman will have received two or more doses before delivery. However, lesser times have proved beneficial: something is better than nothing. If only two hours administration is possible, this may be sufficient and should give considerable reassurance.

To stop as many cases of GBS infection in newborn babies as possible, pregnant women in all of the above higher-risk situations should be given intravenous antibiotics to women whose babies are at increased risk from the onset of labour or waters breaking until delivery. Some women will prefer not to have the antibiotics, especially if their baby’s risk is only slightly increased, as the intravenous antibiotics would inevitably complicate an otherwise natural birth, plus antibiotics are associated with rare but significant side-effects (see page 32). The risk of a GBS infection in the baby must be balanced against the wishes and beliefs of the woman in labour and against the risk of her having an adverse reaction to the antibiotics.

As yet, there are no proven methods for preventing late-onset GBS infections, developing after age 6 days.

Adopting the following key recommendations for preventing GBS infection in newborn babies – even without widespread reliable testing women for GBS carriage late in pregnancy - could stop at least 60% of GBS infection in newborn babies and 70% of resulting deaths:

Key recommendations for preventing GBS infection in newborn babies:

Women at risk
- Women at high risk should be strongly advised to have intravenous antibiotics immediately at onset of labour until delivery. At high risk means:
  - Women with GBS and another risk factor
  - Women who may/may not have GBS, but have multiple risk factors
  - Women who have had a previous baby infected with GBS
  - Women with a fever during labour
Women at increased risk should be offered intravenous antibiotics immediately at onset of labour through to delivery. At increased risk means:
  o Women who are known to carry GBS and do not have other risk factors
  o Women who do not know whether they carry GBS but have one other risk factor not mentioned above

Treatment approaches

  - Intravenous antibiotics against GBS infection in the baby should be given to the mother for at least 4 hours before delivery if possible (if only 2 hours is possible, this may be sufficient and should give considerable reassurance)
  - Intravenous antibiotics recommended for women in labour are:
    o Penicillin G: given as 3g (or 5MU) intravenously at first and then 1.5g (or 2.5MU) at 4-hourly intervals until delivery
    o For women allergic to penicillin: Clindamycin 900 mg intravenously every 8 hours until delivery

Where infection of the membranes is diagnosed or suspected or where there is preterm prolonged rupture of membranes, broad-spectrum intravenous antibiotics should be given which include adequate GBS cover.

IF YOU ARE ALLERGIC TO PENICILLIN OR ANY OTHER ANTIBIOTIC, YOU MUST TELL YOUR HEALTH PROFESSIONALS

Care after birth

  - Babies born to mothers at increased/high risk who HAVE received antibiotics for 4 hours before delivery should be:
    o Carefully assessed by a paediatrician – if completely healthy no antibiotics for the baby are required. A period of monitoring (12-24 hours) may be appropriate for those at highest risk of infection.
  - Babies born to mothers at increased/high risk who HAVE NOT received antibiotics for 4 hours before delivery should be:
    o Examined thoroughly and investigated by a paediatrician as appropriate.
    o Started on intravenous antibiotics until it is known that the baby is not infected, unless the baby is completely well as determined following a robust baby examination carried out by a trained individual.

Implementing these recommendations could reduce GBS infection in newborn babies by 60% and deaths from GBS in babies by 70%.

GBSS believes low-risk pregnant women should be offered sensitive testing for GBS at 35-37 weeks of pregnancy and, where GBS is detected, then intravenous antibiotics should be offered in labour to these women, plus to those with other recognised risk factors as above. This approach has been shown to be both more effective at preventing GBS infection in newborn babies, as well as potentially saving over £37 million a year, compared with current practice (Preventive strategies for group B streptococcal and other bacterial infections in early infancy: cost effectiveness and value of information analyses BMJ. 2007 Sep 29;335(7621):655. Epub 2007 Sep 11. Colbourn TE, Asseburg C, Bojke L, Philips Z, Welton NJ, Claxton K, Ades AE, Gilbert RE).

Unfortunately, sensitive testing is currently only available from a handful of NHS hospitals, although it is available privately (see Private Testing on page 12). Until sensitive testing is available routinely, GBSS supports the above risk-based approach to preventing GBS infection in newborn babies.
These recommendations will need periodic reappraisal to incorporate advances in technology, new research or other refinements but we believe the most appropriate for Britain in the light of all data available at present.

**Postnatal paediatric prevention**

With any policy that involves treating some women with antibiotics to prevent GBS infection following the start of labour, a strategy for the subsequent management of the newborn baby is required.

The flowchart below shows our medical advisory panel’s recommended paediatric prevention strategy to stop GBS infection developing in newborn babies:

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**Paediatric Prevention – EOGBS**

With any policy that involves treating some women with antibiotics following the start of labour to prevent GBS infection, a strategy for the subsequent management of the newborn baby is required. This flowchart shows GBS’s recommended paediatric prevention strategy against early-onset GBS infection:

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**Baby Work Up Tests:**

**Essential:**
- Full blood count (FBC);
- C reactive protein (CRP) two tests, 12–24 hours apart;
- Blood culture: end
- Twin weeks (e.g. thrush and perinatalitis)

**Optional:**
- A urine antigen test
CURRENT UK GUIDELINES

National Institute for Clinical Excellence (NICE)

NICE’s Guidelines CG6 “Antenatal Care – Routine care for health pregnant women”, October 2003 (http://www.nice.org.uk/guidance/index.jsp?action=byID&o=11947 point 10.9) recommend that “pregnant women should be offered evidence based information and support to enable them to make informed decisions regarding their care … addressing women’s choices should be recognised as being integral to the decision making process.” And yet information on GBS is not routinely given to pregnant women – Most women are not informed about GBS (a survey conducted by Pregnancy & birth magazine found only 5% of the 1,000 pregnant women and new mothers surveyed had been informed about GBS either at an ‘antenatal class’ or ‘by their GP’) as part of their routine antenatal care, nor are most involved in deciding whether they should be tested for GBS carriage – they are simply not told it is possible.

The guidelines also recommend antenatal appointments for all pregnant women at 36 weeks’ gestation – ideal for reliable testing for GBS colonisation. But NICE don’t recommend such testing, saying “evidence of its clinical effectiveness and cost effectiveness remains uncertain.” However, all the evidence clearly demonstrates the clinical effectiveness of testing pregnant women for GBS and offering intravenous antibiotics in labour to higher-risk women – such interventions dramatically reduce the incidence of GBS infection in newborn babies and countries which have introduced such programmes have seen in their incidence of GBS infection fall dramatically, including in the USA, Australia, New Zealand, Belgium, France, Spain and Italy. The cost effectiveness issue is less clear though a cost benefit study published in September 2007 indicated testing low risk women, plus giving antibiotics given to high-risk women and those found to carry GBS was a more cost-effective option than current practice.

Disappointingly, although a review of the guidelines was published in March 2008, no updates were made to the sections relating to GBS, despite this being suggested by a variety of clinicians, health professionals’ organisations and by GBSS. This guideline is next due for review in March 2011.

Royal College of Obstetricians & Gynaecologists (RCOG)

RCOG issued their Green Top Guideline No 36 “Prevention of early onset neonatal Group B streptococcal disease” in November 2003 (http://www.rcog.org.uk/files/rcog-corp/uploaded-files/GT36GroupBStrep2003.pdf). This important document is similar in many respects to the guidelines GBSS has been promoting since 1996, in that they quote likely incidences of GBS infection based on the presence of recognised risk factors and recommend intravenous antibiotics in labour for women in higher risk groups. However, the guidelines use the minimum incidence figures quoted in the Heath paper mentioned on page 6 and, therefore, not only underestimate the true incidence of GBS infection but, inevitably, also underestimate the risks to babies from GBS infection. GBSS was happy to endorse these guidelines which, when fully implemented in the UK, will prevent the majority of lethal cases of GBS infection in newborn babies. GBSS views the guidelines as a key starting position as even more GBS infections could be prevented through adopting a culture-testing approach to GBS prevention as described below.

The Royal College of Obstetricians & Gynaecologists has recently (March 2008) started its review process of the Green Top GBS Guideline issued in November 2003 (due for review November 2006). The review should be completed within approximately two years.

In 2007, RCOG published the findings of an audit to evaluate practice in UK obstetric units against their recommendations (see http://www.rcog.org.uk/index.asp?PageID=1301). The audit started out by comparing international guidelines for early-onset GBS disease; highlighting the fact that, in contrast to the UK and New Zealand guidelines, most of the other countries surveyed recommended identifying women for intravenous antibiotics in labour by offering sensitive tests to all pregnant women. The audit reviewed hospitals’ protocols against GBS infection in newborn babies – of the 161 UK units which submitted their protocol, 4 units didn’t even have a protocol for GBS, of those that did, 35% didn’t mention the 2003 RCOG guideline and even when some of the recommendations were consistent with the RCOG guideline, only a minority of units had protocols that were entirely consistent with the guideline.

The audit reviewed hospitals’ practice as well - significant variation in practice was identified between different hospitals, between the three professions (obstetrics, midwifery and neonatology) and even between clinicians in...
the same unit! Variation was found in all aspects of the care offered to pregnant women, particularly with regard to which risk factors were used to identify who would be offered a bacteriological swab for GBS, the timing of swabs and the site(s) from which it/they are taken, which risk factors were used to identify who should be offered intravenous antibiotics in labour, which antibiotics and in what doses/timings are used and how newborn babies at risk of early-onset GBS disease are managed. Furthermore, most staff did not know if the Enriched Culture Medium (ECM) method of processing the swabs taken to detect GBS colonisation – which is recognised as optimal by both the RCOG and the Health Protection Agency) was used in their laboratories. At GBSS, we know of only a very few NHS hospitals that use the ECM method.

It is very disappointing that, in nearly 4 years since the RCOG Green Top Guideline on preventing early-onset GBS infection was published, more hospitals haven’t incorporated the recommendations into their own protocols. And, although the audit report made a series of recommendations to improve the situation, no detail was given as to how these would be achieved.

In March 2008, the Royal College of Obstetricians & Gynaecologists started its review process of the Green Top GBS Guideline issued in November 2003 (due for review in November 2006). The review should be completed by 2010.

National Screening Committee

The National Screening Committee’s current policy position on group B Strep is that screening for this condition should not be offered (www.screening.nhs.uk/groupbstreptococcus).

In May 2006, the UK National Screening Committee launched their GBS online learning package. This learning package has been developed to raise awareness of GBS amongst health care professionals. Developed by the Women’s Health Specialist Library (part of the National Library for Health), the learning package is based upon the current UK guidelines published by the Royal College of Obstetricians & Gynaecologists. It is divided into three sections - antenatal; delivery; and postnatal. Within each section there is the option to access an introduction to GBS, different clinical scenarios, a series of quiz questions to test knowledge and a FAQs section. You can access the GBS learning pack, which is primarily aimed at health care professionals, at www.whsl.org.uk/gbs.

UK TESTS FOR GBS CARRIAGE

Colonisation of the vagina with GBS produces no symptoms and can be intermittent. To predict with the best accuracy the chances of carrying GBS at delivery, the best time to test for it is between 35–37 weeks of pregnancy. Carrying GBS in the vagina does not automatically mean a baby will develop GBS infection. Even more GBS infections in newborn babies could be prevented by offering all pregnant women sensitive testing at 35-37 weeks and also offering intravenous antibiotics to those found to carry GBS.

There are three tests for GBS carriage available to mothers – one is available on the NHS, usually called an HVS (High Vaginal Swab) or LVS (Low Vaginal Swab) test. Another – the ECM (Enriched Culture Medium) test is available from a handful of NHS hospitals and privately. The Polymerase Chain Reaction (PCR) test is available from one UK website.

Currently, neither the HVS nor LVS test is routinely used to detect GBS carriage in the NHS. Moreover, these tests only detect carriage in up to 50% of women carrying the germ. The ECM test is considered the “Gold Standard” and is the best GBS test available. It may miss a very small number of women who carry GBS, although it will not give a false positive result. The PCR test has not been validated for use in the UK and therefore GBSS cannot recommend its use.

What are the tests for GBS carriage?

The HVS/LVS test involves taking a swab from the vagina. A positive result with the HVS test is very reliable – however it can give a falsely negative result for up to 50% of women carrying GBS when the test is done – leaving them under the false impression that they are not carrying GBS and their baby is at no risk. An LVS is slightly more likely to detect colonisation than a HVS, but it is still gives many false negatives.
**The ECM (or Enriched Culture Medium) test** is much more sensitive test at detecting GBS colonisation and is available and from a handful of NHS hospitals and privately (it currently costs around £32 for a postal service).

The test involves taking a swab from the vagina and rectum at 35–37 weeks of pregnancy, and posting them back to the laboratory. Earlier testing is not good at predicting GBS colonisation at delivery, and later testing increases the chance that the baby will be born before the result is available. It is important that you discuss this test with your health professional, and ensure they receive a copy of the test results. If done within five weeks of delivery, this test is very sensitive: if you have a positive result for GBS, there is an 87% chance that you will carry GBS at delivery. Similarly, if you have a negative result this is 96% predictive that you will not be carrying GBS at delivery.

**The Polymerase Chain Reaction or PCR test** is being offered in the UK through one website. Although this is believed to be a highly accurate and fast method of detecting GBS colonisation, it not been validated in the UK and therefore GBSS is unable to recommend its use.

**Why test?**

Testing is not essential, but it is the only way to know which babies are more likely to develop GBS infection, so that it can be prevented effectively.

Up to 40% of babies who develop early-onset GBS infection will be born to women whose only risk factor was unknown carriage of GBS around delivery – as GBS carriage is asymptomatic, without testing, these women whose babies are at higher risk can’t be identified. Research has shown that significantly more early-onset GBS infections can be prevented by using a bacteriological testing strategy, rather than a risk-factor strategy alone.

If a woman carries GBS during her current pregnancy, she can be offered intravenous antibiotics in labour to minimise the risk of GBS infection in her newborn baby. And, if she chooses not to have the intravenous antibiotics, then knowledge of her GBS carriage status can still inform the management of her labour and delivery, and the baby’s first hours of life.

**Private Testing**

If a woman would like to have a private ECM test for GBS carriage, we know of only two laboratories in the UK from which this is available.

**Mullhaven Medical Laboratory**
Tel 01234 831115
Email: info@mullhaven.co.uk

**The Doctors Laboratory**
Tel: 020 7307 7373
E-mail: tdl@tdlpathology.com

The pregnant woman contacts either laboratory by phone, fax or e-mail and asks for a GBS Testing Pack. This is usually sent out the same day by first-class post. Once the test pack is received, then the swabs can be taken either by the pregnant woman herself, or by her health professional. Either way, the pregnant woman’s health professional should authorise the test and it is important to ensure that the health professional is also sent a copy of the results!

The vaginal and rectal swabs should be taken (by the health professional or the pregnant woman) at 35-37 weeks of pregnancy – they can be done earlier but then they may not be as reliable in predicting GBS carriage at delivery. They may be done later, but then there’s an increasing risk that the baby will be born before the test result is available! The swabs are then sent direct to the laboratory (with payment) in the envelope provided as part of the GBS Testing Pack.

The laboratories undertake to have the results available within three working days of receipt of the swabs and to post out the results on that day to the health professional, with if requested a copy to the pregnant woman.

**Future prevention**

GBS have been a recognised cause of serious infection in babies since the 1960s in the USA and the 1970s in Europe. Research in the decades following has shed considerable light on how GBS causes this particular type of infection.
Testing

Babies at greatest risk of developing GBS disease are those born to women who carry GBS during labour. Testing women during pregnancy for GBS is currently not done in the UK, largely because of the costs and logistics involved.

Scientific evidence clearly shows testing low-risk women for GBS, using reliable culture methods (not routinely available on the NHS at present, though they are recognised as optimal both by the Royal College of Obstetricians & Gynaecologists and the Health Protection Agency) at 35-37 weeks’ gestation and then offering intravenous antibiotics from the onset of labour or waters breaking to all women where GBS is detected during the current pregnancy, plus to those women delivering prematurely, with prolonged rupture of membranes, with a fever in labour or with a history of GBS, is a more effective way of preventing neonatal GBS infections than relying on risk factors alone.

One paper estimated that a risk-factor approach would prevent 50-60% of GBS infection in babies, whereas a culture testing approach giving intravenous antibiotics in labour to women where GBS had been detected during the current pregnancy, plus to those with recognised risk factors, would prevent 80-90% of GBS infection in babies.

The charity’s view is that reliable testing should be introduced urgently.

Until it is, the charity support the RCOG’s risk factor approach which if implemented, although not as effective as a culture testing approach, would still prevent the majority of GBS infections developing in newborn babies.

GBS Vaccine

Most GBS infections in newborn babies can be prevented and the focus in this paper is on stopping the preventable infections developing in higher-risk babies and their mothers. However, GBS infection also strikes babies who appear not to be ‘at risk’ at birth – approximately 40% of all cases of neonatal GBS infection occur in babies where there are no apparent risk factors, apart from GBS colonisation in the mother.

Significant effort around the world is being put into the development of a vaccine which, one day, will prevent almost all GBS infections in babies - not just those in ‘high-risk’ babies. Advances have been made in the vaccine field but a vaccine is still not ready for use: all the existing candidates still have significant technical problems associated with them.

GBSS VIEW

We want to see a two-pronged approach to preventing GBS infection in newborn babies:

**INFORMATION PROVISION:**

- **Fully inform health professionals about GBS**

  - Ensure the subject is covered as part of the training in obstetrics, general practice, midwifery and health visiting, as well in ongoing training. Incentivise health professionals to update their knowledge about GBS. Informing health professionals is key - only if health professionals are fully informed will they be able to provide good quality information on to the families in their care.

  - **Provide relevant health professionals with information leaflets**, setting out the pros and cons of action/inaction

  - **Fully inform expectant parents about GBS in a proactive way** at an antenatal appointment so they can make an informed decision about what’s best for them & baby

**MEDICAL INTERVENTION:**

- **Recommend intravenous antibiotics in labour to women whose babies are at higher risk of developing GBS infection**, namely those who have previously had a baby with GBS infection, where GBS has been found in the urine during the pregnancy, or where a woman has multiple risk factors

- **Offer sensitive testing to women not at higher risk** – and ensure health professionals and parents are aware it is available and give women the choice to have a sensitive test for GBS late in pregnancy if they want to.

- **Offer intravenous antibiotics in labour to women whose babies are at raised risk**, those where GBS has been found during the current pregnancy or where there is another risk factor (risk factors are where labour has started or membranes ruptured before 37 completed weeks of pregnancy, where the membranes have ruptured more than 18 hours before delivery, or where the mother has a raised temperature during labour of 37.8°C or higher).

In our view, this is the best approach for preventing GBS infection in newborn babies.
YOUR BABY WHO HAD A GBS INFECTION

If your baby is one of the very small minority who has suffered long-term problems as a result of GBS infection, or has even died from it, please try to take heart from the information in this leaflet. Some of it may be difficult for you to read, but it is our hope and intention to help you understand what happened to your baby. And, should you decide to have another baby, this document will provide you with information you need for that pregnancy.

You may need answers to specific questions relating to your baby and his/her GBS infection. You may keep thinking “if only ...” and go over what happened again and again. What happened before, during and after your baby’s birth can only really be clarified by your obstetrician and your baby’s paediatrician - doctors rarely mind being asked questions and it’s better to ask than spend your time worrying.

Once you have read this document, please contact us with any general queries about GBS, or to be put in touch with another family whose baby was infected with GBS.

TALKING TO YOUR OBSTETRICIAN/PAEDIATRICIAN

If you have specific questions, then make appointments to see the obstetrician and/or your baby’s paediatrician (as appropriate) to discuss what happened. Expect to wait about 6 weeks or so from the day you make the appointment, longer if your doctors are away for any reason. This gives you time to prepare your questions for the meeting.

Write to confirm the dates and times of meetings.

Some doctors’ offices make appointments in the name of the consultant in charge and, on the day, allocate cases amongst several doctors in that consultant’s area. If this is not acceptable to you, clearly state in writing the name of the person you wish to see and that you do not wish to see a colleague. Explain in the letter the purpose of the meeting and what you want to discuss (e.g. your recent pregnancy, the baby’s medical history, another pregnancy, GBS and how it affected you and your baby, etc.).

Give your health professionals a copy of this leaflet (or our ‘GBS & Pregnancy’ leaflet)

Most medical professionals don’t have as much knowledge or experience of GBS as those who contributed to this leaflet. So it might be helpful for you to send them a copy of this leaflet or our little ‘GBS & Pregnancy’ leaflet in advance.

Take a list of all your questions with you to the meeting(s).

The questions will probably fall broadly into two categories: firstly, what has happened to you and your baby (e.g. clarify whether any risk factors for GBS infection were present during your labour and, if so, how they were acted upon; ask about the course of your and your baby’s treatment, why were various decisions made, whether your baby is likely to suffer long-term effects and, if so what, etc.) and, secondly, what the implications are for a future pregnancy (e.g. what would be done differently and why).

At the meeting(s), ask all your questions, asking for further explanations if necessary.

Make sure you fully understand the answers. Medical professionals respect the opinions of parents and will be concerned that your questions are answered. It might be useful to make brief notes of the answers, particularly if you have a lot of questions.

You may find the meetings with the obstetrician and your baby’s paediatrician stressful and may want someone with you (e.g. your partner, a close friend or family member). It can be useful to have someone there to make sure all your questions are asked, answered and understood and, afterwards, to go over what was said.
AFTER EFFECTS OF GBS INFECTION

Most babies make a full recovery from their GBS infection, although sadly up to 75 babies each year will die as a result of their GBS infection.

Unfortunately, a small number of babies who recover from GBS infection, and up to a half of the survivors of GBS meningitis, will be left with long-term mental or physical problems and in one out of every 8 of these babies, the problem is severe. Brain damage can occur for two reasons. One is meningitis, and the other is in response to a number of stimuli including lack of oxygen and infection. This is much more common in preterm than full-term babies and can occur indirectly as a result of any infection, including GBS.

There is no evidence that GBS infection leaves a legacy of extra vulnerability to other illnesses, such as coughs, colds, allergies, colic, etc but there is not a lot of information available on this.

If you have any concerns or questions about your baby’s medical care or expected long-term outcome, please ask the doctors or nurses caring for your baby. However, general information about meningitis and its after effects and on prematurity and its after effects is available from the charities listed on page 16, as are charities which provide support to bereaved parents and siblings.

REINFECTION IN BABIES

Reports indicate a baby who has recovered from a GBS infection is at low but slightly increased risk of re-infection (around 1–3%).

There is no established evidence to recommend any specific treatments to prevent recurrent GBS. A few practitioners may prescribe a daily penicillin dose for the baby for the first 3 months of life, in the belief that it may prevent GBS infection. There is no evidence to support this practice, although Penicillin given in this way has been shown to reduce the risk of infection with another related bacteria, called pneumococcus, in individuals who have lost their spleens.

SUBSEQUENT BABIES

Babies born after an older sibling developed GBS infection are at raised risk of developing GBS infection themselves – it is estimated the risk increases perhaps ten-fold or more. In this circumstance, intravenous antibiotics are strongly recommended to be given to the mother any subsequent labour as being highly effective preventative medicine against early-onset GBS infection in the baby.

There is no evidence that continuing to give penicillin to a well baby after delivery is effective at preventing GBS infection after birth. However, where a family has suffered the trauma of a baby being seriously ill with GBS infection, a few practitioners may consider prescribing a daily penicillin dose for the baby, for the first 3 months of life in the belief that it may prevent GBS infection and so reduce understandable anxiety. There is no evidence to support this practice, although Penicillin given in this way has been shown to reduce the risk of infection with another related bacteria, called pneumococcus, in individuals who have lost their spleens.
USEFUL ORGANISATIONS

**Pregnancy, childbirth & general**

- **BLISS**, 2nd Floor, Camelford House, 89 Albert Embankment, LONDON SE1 7TP (0207 820 9471. [www.bliss.org.uk](http://www.bliss.org.uk)). For parents of babies in intensive & special care.
- **La Leche League**, BM3424, London WC1N 3XX (020 7242 1278. [www.laleche.org.uk](http://www.laleche.org.uk)). Local support groups.
- **Maternity Alliance**, 45 Beech Street, LONDON EC2P 2LX (0207 588 8583. [www.maternityalliance.org.uk](http://www.maternityalliance.org.uk)). Information on maternity care & rights.
- **Tommy's Campaign**, 1 Kennington Road, LONDON SE1 7RR (0207 620 0188. [www.tommys-campaign.org](http://www.tommys-campaign.org)). Support and research into problem pregnancies.

**Organisations linked to specific medical conditions**

- **Cerebral Palsy Helpline**, P.O. Box 833, Milton Keynes, MK12 5NY (Helpline: 0808 800 3333 [www.scope.org.uk](http://www.scope.org.uk)). Support for people affected by cerebral palsy.
- **Contact-A-Family**, 209-211 City Road, LONDON EC1V 1JN. (0207 608 8700. [www.cafamily.org.uk](http://www.cafamily.org.uk)) For parents of children born with disabilities and rare and/or handicapping conditions. Links with local and national groups.
- **In-Touch Trust**, 10 Norman Road, SALE, Cheshire M33 3DF (0161 905 2440). Provides individual links, contact and information for parents of children with all special needs and rare medical conditions.
- **Meningitis Research Foundation**, Midland Way, Thornbury, Bristol BS12 2BS (24-hour helpline: 0808 800 3344 [www.meningitis.org](http://www.meningitis.org)).
- **Meningitis Trust**, Fern House, Bath Rd, Stroud, Glos. GL5 3TJ (01453 768000; Helpline: 045 6000 800 [www.meningitis-trust.org.uk](http://www.meningitis-trust.org.uk)).

**Counselling, advice & support**

- **AVMA** (Action for Victims of Medical Accidents), 44 High Street, CROYDON, Surrey, CR0 1YB (020 8686 8333. [www.avma.org.uk](http://www.avma.org.uk)). Legal advice about medical treatment.
- **AIMS** (Association for Improvements in the Maternity Service), 21 Iver Lane, IVER, Bucks SL0 9LH (01753 652781. [www.aims.org.uk](http://www.aims.org.uk)). Advice on rights, complaints procedures and choices in maternity care.
- **British Association for Counselling**, 1 Regent Place, RUGBY, Warwickshire CV21 2Pj (01788 578328/9. [www.counselling.co.uk](http://www.counselling.co.uk)). Information on where to get counselling locally.
- **Patients’ Association**, 8 Guildford Street, London WC1N 1DT (020 7242 1524. [www.patients-association.com](http://www.patients-association.com)). National pressure group.
For parents whose baby has died

**Baby MPS**, FREEPOST 29 LON20771, London W1E 9ZT (0845 703 4599 [www.mpsonline.org.uk](http://www.mpsonline.org.uk)) Baby MPS is a free service which allows you to register not to receive baby related mailings.

**Child Bereavement Trust**, Aston House, High Street, West Wycombe, High Wycombe, Bucks HP14 3AG (01494 446648. [www.childbereavement.org.uk](http://www.childbereavement.org.uk)) Resources for bereaved families and professionals.

**Child Death Helpline** (0800 282986. [www.childdeathhelpline.org.uk](http://www.childdeathhelpline.org.uk)) For anyone affected by the death of a child. Based at Great Ormond Street Hospital, staffed by bereaved parents (Monday, Wednesday, Friday, 10 am to 1 pm. Every weekday evening 7pm-10pm).

**FSID** (Foundation for the Study of Infant Deaths), Artillery House, 11-19 Artillery Row, LONDON, SW1P 1RT (020 7222 8001 [www.sids.org.uk](http://www.sids.org.uk)) For families affected by sudden infant death.

**Miscarriage Association**, c/o Clayton Hospital, Northgate, Wakefield, West Yorks. WF1 3JS (01924 200795, answer phone out of hours. [www.miscarriageassociation.org.uk](http://www.miscarriageassociation.org.uk)). Support and information on miscarriage.

**Multiple Birth Foundation**, Queen Charlotte’s & Chelsea Hospital, Goldhawk Road, London W6 0XG (020 8740 3519/3520. [www.multiplebirths.org.uk](http://www.multiplebirths.org.uk)). Support for parents who have lost one or more of their babies from a multiple pregnancy or at birth.


**Society of Compassionate Friends**, 53 North Street, Bristol BS3 1EN (Helpline: 0117 953 9639; admin: 0117 966 5202. [www.tcf.org.uk](http://www.tcf.org.uk)). Support for parents of children who have died.

**Stillbirth & Neonatal Death Society** (SANDS), 28 Portland Place, London W1N 4DE (Helpline: 0207 436 5881. [www.uk-sands.org](http://www.uk-sands.org)). For parents whose babies die at or around the time of birth.

**Organisations of faith**

**Asian Family Counselling Service**, 76 Church Road, Hanwell, London W7 1LB (020 8567 5616 or e-mail afcs99@hotmail.com) Offers caring, personal and confidential counselling (though not bereavement counselling) in the client’s language with an awareness of their cultural and ethnic backgrounds.

**Bereaved Parents Network**, Care for the Family, P O Box 488, Cardiff CF15 7YY (029 2081 0800. [www.care-for-the-family.org.uk/services/services_menu.asp?cat=1](http://www.care-for-the-family.org.uk/services/services_menu.asp?cat=1)) Supports families and friends of a child who has died. Staffed by bereaved parents who, although committed Christians, provide support to people of all faiths and no faith.

**Jewish Bereavement Counselling Services**, P O Box 6748, London N3 3BX (020 8349 0839. [www.jvisit.org.uk](http://www.jvisit.org.uk)) Counselling and support for members of the Jewish community. Visits available in the London area and referrals to support outside London if needed.

**Muslim Women’s Helpline**, (020 8908 6715/020 8904 8193. [www.amrnet.demon.co.uk/related/mwhl/mwhlmainsub.htm](http://www.amrnet.demon.co.uk/related/mwhl/mwhlmainsub.htm)) A telephone counselling service providing support for Muslim women.
ANOTHER PREGNANCY

It may seem insensitive to raise the issue of a future pregnancy but it is vital you know that a future baby may be at risk from GBS infection – and that effective prevention strategies exist. We want to give you the information you need about GBS, and confidence for the future. This section has been put together so you can benefit from the knowledge and experience of our medical experts and the experiences of other parents.

Carrying GBS is normal and very common, and GBS infection in babies is, thankfully, relatively uncommon. Thousands and thousands of healthy babies are born every year to women who carry GBS. The fact that your baby developed GBS infection does not mean a future baby will too, although it does mean that any babies you have in the future have an increased risk of developing GBS infection. The risk of a future baby also developing GBS infection is approximately a 1 in 100 (a 1%) chance if no preventative action is taken. Our medical advisory panel therefore strongly recommends mothers who have previously had a baby who had serious GBS infection should be given intravenous antibiotics from the onset of labour or waters breaking until delivery for any subsequent children.

Given what happened to your baby, you’re bound to want to know how to prevent GBS affecting a future baby. However, there really is nothing that can be done during pregnancy that has been proven to prevent GBS infection in babies until labour starts or membranes rupture. Once this happens, having intravenous antibiotics at 4 hourly intervals throughout labour until your baby is born (and ideally for at least 4 hours before birth) will stop most GBS infection developing in newborn babies.

If given antibiotics in accordance with our medical advisory panel’s recommendations, we estimate that the risk for a baby born to a woman who has previously had a baby infected with GBS (and who has no other clinical risk factors) reduces from around a 1 in every 100 chance of developing GBS infection to less than 1 in 2,000. That’s less than the risk for a woman not known to carry GBS!

Women at increased risk of premature labour and birth

Along with many other bacteria found in the vagina, GBS can cause infection of the baby in the womb, which can result in preterm birth, stillbirth and late miscarriage. However, these are usually caused by a variety of factors other than GBS: genetic defects, gynaecological problems, other infections, etc. If a woman has had any of these problems in the past, she should ensure these possibilities are investigated fully by a consultant obstetrician at booking (or before) regardless of whether or not she has a history of GBS. GBS is a rare cause of these complications.

We are sometimes asked if there’s anything that can be done during a subsequent pregnancy for women who have had a preterm delivery, which may have been caused by GBS. Unfortunately, no antibiotics tested so far can prevent a mother going into premature labour for any reason, including because of GBS. Current opinion is that a substantial proportion of premature labours may be associated with infection, including perhaps as many as 50% of spontaneous labours (i.e. when the baby is not being delivered prematurely for medical reasons). However, it appears that almost any organism that normally lives in the vagina (and there are many that do) can cause this problem. There is no way of ‘sterilising’ the vagina, or knowing in advance which organism will cause trouble, which probably explains why antibiotic treatment has not been shown to be effective (we don’t know which antibiotic to give in any specific case, before the infection has actually occurred). Techniques to improve the ability of the cervix to keep infection out (such as special stitching techniques) may prove to be more effective in future.

Most obstetricians would agree that a woman who has had a premature labour which may have been caused by infection (with symptoms such as silent dilation or spontaneous premature rupture of membranes) and not caused by other unrelated complications (e.g. severe hypertension, placental abruption, etc.) is at raised risk of having another premature delivery in a future pregnancy.

On a theoretical basis, a course of antibiotics during pregnancy when the baby is at its most vulnerable may be beneficial. The idea that antibiotics may reduce vaginal colonisation with GBS and so reduce the risk of GBS causing preterm labour seems logical, since studies suggest a relationship between heavy vaginal colonisation and premature labour. However, there is actually no data to support this. Indeed, a large UK study, the ORACLE trial¹, produced no evidence that oral antibiotics prevent preterm labour. [The exception to this is erythromycin
given to women whose waters ruptured prematurely: in this circumstance, the erythromycin both delayed delivery and reduced adverse outcomes in the babies.]

Research suggests that oral antibiotics given for periods of longer than a week may be harmful to the mother and baby, increasing antibiotic resistance and colonisation by resistant bacteria. However, there is no evidence that oral antibiotics given for up to a week are harmful.

If on theoretical grounds you want to try to reduce vaginal colonisation with GBS during the period when the baby may be at greatest risk then, in agreement with your doctor, a one-week course of oral antibiotics may be considered. Appropriate drugs include erythromycin (250 mg 4 times a day for a maximum of 7 days or, amoxycillin1 (500 mg 3 times a day for a maximum of 7 days). There is no evidence this will be effective, but neither is there any evidence that this will be harmful to you or the baby.

1The ORACLE trial was a randomised, multicentre trial to establish whether oral antibiotics for women in spontaneous preterm labour or with preterm prelabour rupture of membranes would have health benefits for the babies. The ORACLE trial found amoxiclav increased the risk of necrotising enterocolitis, a serious bowel disease, in babies and this antibiotic is therefore not recommended during pregnancy. Amoxiclav is a combination of amoxycillin and clavulanic acid. It is the combination that appears to cause problems, there is no evidence at present to suggest that amoxycillin on its own is harmful in this way. Kenyon SL, Taylor DJ, Tarnow-Mordi W; ORACLE Collaborative Group. Broad-spectrum antibiotics for spontaneous preterm labour: the ORACLE II randomised trial. Lancet 2001 Mar 31; 357(9261):973-4. Kenyon SL, Taylor DJ, Tarnow-Mordi W; ORACLE Collaborative Group. Broad-spectrum antibiotics for preterm, prelabour rupture of fetal membranes: the ORACLE I randomised trial. Lancet 2001 Mar 31; 357(9261):979-88.

Is there anything else I could do?

One small study1 showed that giving intramuscular penicillin eradicated GBS colonisation for a period of 6 weeks or more in 75% of women known to carry GBS. However, this is only one small study (only 50 of 78 women received intramuscular antibiotics), which so far has not been repeated. So it is difficult to reach conclusions based upon this data.

It may be that for women who have previously had a baby who developed GBS infection, an injection of intramuscular Penicillin G at around 35 weeks of pregnancy may be useful in an effort to eradicate GBS colonisation until after delivery. (They may also be worth considering earlier in the pregnancy for women with a history of preterm labour where GBS may have been a factor, and for women who carry GBS and have a history of fast labours where it is unlikely intravenous antibiotics can be given for at least 4 hours before delivery.)

There are downsides of the intramuscular penicillin, not least that the injection is painful and there is a small risk associated with taking antibiotics, including of a sudden allergic reaction, antibiotic resistance developing, etc. These risks are repeated with the intravenous antibiotics recommended during labour and delivery.

Regardless of whether you receive intramuscular antibiotics in an effort to eradicate GBS colonisation, our medical advisers recommend you should be offered intravenous antibiotics from the onset of labour or waters breaking and at 4 hourly intervals until delivery.

There are no known alternatives to the intramuscular penicillin for women known to be allergic to penicillin.


Caesarean sections

Caesarean sections do not eliminate the risk of GBS to a baby of developing GBS infection since the bacteria can cross intact amniotic membranes and set up an infection in the baby, although they do reduce the risk. However, Caesareans are not recommended as a method of preventing GBS infection in babies: there are significant risks associated with a Caesarean section; and the recommended intravenous antibiotics during labour are both low risk and highly effective.

Our medical panel’s recommended course of action with regard to GBS and Caesarean sections is as follows:
Elective Caesareans

There is no evidence to show intravenous antibiotics are indicated against GBS when given to a woman known to carry GBS or who previously had has a baby infected with GBS before an elective Caesarean unless she is in labour or her membranes have ruptured. If a baby is at higher risk of developing GBS infection and the mother is having an elective Caesarean AND is in labour or her waters have broken, she should be offered the recommended intravenous antibiotics as soon as possible after labour has started, ideally for at least 4 hours before delivery.

The baby would only need intravenous antibiotics against GBS infection if born prematurely or if there are signs of possible infection in either the mother or the baby.

Emergency Caesareans

If a woman has a history of GBS and needs an emergency Caesarean, she should be treated as for an elective Caesarean – no intravenous antibiotics are indicated against GBS unless she is in labour. If she is in labour, she should be treated as for a normal labour up until the time when an emergency Caesarean section becomes necessary, when she should be delivered immediately.

The treatment of the baby for GBS would follow the charity’s normal paediatric recommendations.

Prelabour & preterm rupture of membranes

Prelabour and preterm rupture of membranes (PPROM) are not usually related to GBS but, as PPROM is a risk factor for GBS infection, the GBS risk must be addressed. Management of PPROM may be complex and requires the input and judgment of the obstetric team. It may or may not include the administration of antibiotics for reasons other than the prevention of GBS infections.

PPROM is a signal that the chance of the baby contracting GBS infection is increased. It is therefore recommended that the mother receive intravenous antibiotics at the onset of labour, which is the only time that research has demonstrated such an intervention is effective. This may be in addition to other oral antibiotics given for other reasons.

This situation is a complex one medically where a number of different approaches can be taken. Our experts suggest the following as a typical approach against GBS infections developing in newborn babies for women whose membranes rupture without other signs of labour, based on their experience and available research, but please remember other interventions may be more appropriate based on the individual case:

Where the pregnant woman is at less than 36 completed weeks of pregnancy:

- Give the pregnant women intravenous penicillin as soon as a diagnosis of labour is made, continuing them for the next 48 hours, regardless of other oral antibiotics that may be administered;
- Discontinue the intravenous penicillin after 48 hours if labour has stopped or the diagnosis turns out not to have been correct; and
- Resume intravenous penicillin if any sign of infection appears or the woman is once again diagnosed to be in labour.

Where the pregnant woman is at 36 or more completed weeks of pregnancy and is known to carry GBS or one or more clinical risk factors are present:

- Administer intravenous penicillin to the pregnant woman immediately, continuing them until the baby is born; and
- Induce labour.

Where the pregnant woman is at 36 or more completed weeks of pregnancy, is not known to carry GBS and no other clinical risk factors are present:

As soon as it’s apparent that the membranes will have been ruptured for more than 18-24 hours before delivery:

- Recommend the induction of labour; and
- Offer intravenous antibiotics to the pregnant woman.
If the woman is allergic to penicillin, then alternatives should be given as stated in the prevention strategy (see page Error! Bookmark not defined. at the recommended doses.

**What you can do during pregnancy**

**AGREE YOUR CARE REGARDING GBS**

When you know you are pregnant, ensure the obstetrician in charge of your pregnancy is aware of your full medical history (especially relating to GBS). If you want intravenous antibiotics in labour (whether only in certain circumstances or regardless of other risk factors), establish that you can have them. And remember to **tell your health professionals if you have ever had an allergic reaction to penicillin or any other antibiotic**.

Make sure your hospital notes clearly detail the circumstances in which you are to receive the intravenous antibiotics and ask your obstetrician to add this to your notes (he/she may not be available when you actually need the antibiotics!) and include the details in your birth plan.

Your obstetrician may be willing to complete the necessary hospital form authorising the intravenous antibiotics immediately on your arrival at hospital in labour to keep in your notes. This will help ensure you receive the antibiotics as soon as possible, rather than waiting for a doctor to authorise the drugs after you arrive.

If you’re not satisfied with your obstetrician’s response, you may wish to seek a second opinion or even change your obstetrician: your GP can advise you on this. Seeking a second opinion is an accepted practice within the medicine.

Find out the name(s) of the paediatrician(s) who will look after your baby after birth and give him/her a copy of this leaflet or our little ‘GBS & Pregnancy’ leaflet. You might want to ask whether they will use our paediatric prevention strategy for treating your baby.

**INFORM YOUR HEALTH PROFESSIONALS ABOUT GBS**

Give all of your health professionals a copy of this leaflet or our little ‘GBS & Pregnancy’ leaflet, and make sure they know you carry GBS. (Keep several with your birth plan, so they’re handy to give out.) You’ll be helping yourself and you may be helping others too!

Place one of our ‘GBS Alert’ stickers on the front of your hand-held notes to alert any health professionals seeing them to the fact you carry GBS, and that you should be offered intravenous antibiotics as soon as possible once your labour has started. If you haven’t got one of our stickers, contact us and we’ll send one to you. Or ask your midwife or obstetrician – they may have some.

**SWABS FOR GBS**

Routine swabbing for GBS during your pregnancy using the conventional tests is not helpful.

Firstly, because you have had a baby who developed serious GBS infection, a swab result won’t change the recommendation for intravenous antibiotics during labour/after waters break.

Secondly, the conventional tests used in the UK aren’t very reliable (giving a falsely negative result 40% to 50% of the time when it should be positive – for information about highly reliable tests, see page 13. Remember that, as a higher-risk mother, it is recommended that you be offered the intravenous antibiotics in labour irrespective of any test result).

Thirdly, GBS colonisation can come and go – so the situation one time could be different the next (though research has shown that, if using optimal tests, the results are highly predictive of colonisation status for a period of five weeks).

And finally, there’s no treatment required if your vagina is colonised with GBS, so why bother?

**URINE TESTS FOR GBS**

As you have had a baby who developed serious GBS infection, our medical advisers suggest you have monthly urine cultures (not just the dip-stick test) during another pregnancy, starting at around 18 weeks of pregnancy.
Urine is supposed to be sterile and, if GBS is found in your urine, it should be treated with oral antibiotics and your urine retested 7-10 days after treatment. If the urine is not clear of GBS, the treatment should be repeated until it is.

Treatment for a GBS positive urine sample, whether you have symptoms of a urine infection or not, is essential during pregnancy since, if left untreated, such infections can cause kidney damage and have been linked to preterm labour.

**Membrane Sweeps**

Using a gloved finger passed through the cervix (neck of the womb) to separate the baby’s membranes from the lower part of the uterus is known as a ‘membrane sweep’. In women who are at or beyond the due date, it encourages spontaneous labour and can enable about 10% of women to avoid an artificial induction of labour.

There is currently no good evidence that membrane sweeps are harmful in women known to carry GBS. Indeed the results of trials of membrane sweeps don’t show any increase in problems caused by GBS in women having sweeps, and it is highly likely these trials would have included many women carrying GBS at the time.

However, there remains a theoretical risk that a membrane sweep might occasionally introduce GBS into the uterus, and so **our medical advisory panel advises caution in using a membrane sweep for women known to carry GBS when there are other acceptable alternatives** (for example, induction of labour with prostaglandin gel introduced into the vagina).

**Vaginal Examinations**

Research has shown that digital (by hand) vaginal examinations should be kept to a minimum where a baby is at raised risk of GBS infection. Clearly, if they have to be done, they have to be done – although perineal vaginal ultrasounds can be alternatives at most hospitals.

**Induction**

If you need to be induced, our medical advisers recommend that the intravenous antibiotics should be given as soon as possible once labour has started or waters have broken (and that's whether the waters break naturally or are artificially broken) and that they are repeated at 4 hourly intervals (or 8 hourly for clindamycin) until the baby is born.

**If in doubt, check it out!**

Your midwife, obstetrician and GP will understand if you are more nervous than other pregnant women. So, if there is anything you are unsure of during your pregnancy, check it out with them.

**Once labour starts or your waters break (or leak)**

**When to go to hospital**

If the circumstances arise in which you want intravenous antibiotics, for best protection, you should receive them for at least 4 hours before delivery. However, the earlier the antibiotics are given the better once labour starts or membranes rupture.

Go to hospital as soon as you suspect your waters have broken (or are leaking) or you’re in labour - it would be reasonable to get to the hospital within an hour of this happening, although quicker if you can. Give your notes and a copy of your birth plan to the midwife on arrival.

If possible, phone the Labour Ward to let them know you’re on your way … and that you’ll need intravenous antibiotics as preventative medicine against GBS when you get there.

**Preterm labour**

Although other causes are more common, GBS can be a rare cause of preterm labour (labour before 37 weeks’ gestation). The symptoms of preterm labour are generally subtler than those of full-term labour.
In the unlikely event that you need this information, the following are the most common signs of preterm labour:

- tightenings (can feel like the baby moving)
- vaginal spotting
- lower back pain
- change or increase in vaginal discharge
- loss of mucous plug
- pelvic pressure
- loose stools
- menstrual-like cramps
- the most common symptom, in addition to the above, is that the pregnant woman simply feels something is not quite right.

We suggest you have a low ‘let’s check this out’ threshold with regard to any of these symptoms: if in doubt, contact your midwife or labour ward and explain your concerns.

If you are in premature labour, the hospital may be able to give you drugs that may halt your labour but you need to have the intravenous antibiotics for your baby as soon as possible.

So get to the hospital as quickly as you can, taking your notes with you. If your labour is very premature (before about 34 weeks’ gestation), your local hospital may need to send you to another hospital that has better facilities for dealing with babies born very early.

**Once you get to hospital**

If you want them, the recommended intravenous antibiotics should be given to you immediately upon your arrival at hospital. Tell everyone who looks after you in hospital (or get your partner to) that you carry GBS and (if you do) that you want intravenous antibiotics immediately to protect your unborn baby - and keep telling them until you get them.

But do remember to tell your health professionals if you have ever had an allergic reaction to any antibiotic, including penicillin.

Nothing is totally without risk but, even if it were a false alarm, it would be reasonable for you to have them ... and then again when it’s for real! If it’s not a false alarm, precious time is being wasted which could be used to protect your baby.

Once you’ve had 2 doses of intravenous antibiotics at 4-hourly intervals before your baby’s birth, s/he has had the best protection available from GBS infection. Remind your medical staff you need the antibiotics every 4 hours until your baby arrives. It’s unlikely you’ll need to be a nuisance but if necessary do: it’s your baby you’re protecting.

**The birth you’d planned**

Having intravenous antibiotics shouldn’t prevent you from having the birth you’d originally planned. What normally happens is that a cannula (a thin tube) is inserted into a vein, usually in the back of your hand, and remains there until after the baby is born. The antibiotics can then be given to you through this cannula at the required intervals, either by slow injection (over several minutes) or by drip (over half an hour or so). You don’t have to be attached to a drip the whole time – when the antibiotics have gone through, the cannula can be detached from the drip and you’re then free to move around as you wish and to have (almost) the birth you’d planned.

**Your baby has arrived - congratulations!**

The chance of your baby developing a GBS infection is very small. However, remind the medical staff about your GBS history (especially the paediatrician(s) looking after your baby and the midwife looking after you) as your new
baby has a higher risk of developing GBS infection than other babies. Your baby needs to be monitored especially carefully by a paediatrician and needs a low threshold for being given intravenous antibiotics.

**In Hospital**

**IF YOU’VE RECEIVED AT LEAST FOUR HOURS OF INTRAVENOUS ANTIBIOTICS BEFORE YOUR BABY’S BIRTH.**

The risk of your baby developing a GBS infection is still small, but remind the medical staff, especially the paediatrician looking after your baby and the midwife looking after you, that you have previously had a baby who developed GBS infection and so your baby has a higher risk of developing GBS infection.

- **Babies born to mothers at increased/high risk who HAVE received antibiotics for 4 hours before delivery should be** carefully assessed by a paediatrician – if completely healthy, no antibiotics for the baby are required. A period of monitoring (12-24 hours) may be appropriate for those at highest risk of infection.

And remind them of this when there is a change of staff.

**IF YOU DIDN’T RECEIVE AT LEAST FOUR HOURS OF INTRAVENOUS ANTIBIOTICS BEFORE DELIVERY.**

The risk of your baby developing a GBS infection is still small, but remind the medical staff, especially the paediatrician looking after your baby and the midwife looking after you, that you have previously had a baby who developed GBS infection and so your baby has a higher risk of developing GBS infection.

- **Babies born to mothers at increased/high risk who HAVE NOT received antibiotics for 4 hours before delivery should be:**
  - Examined thoroughly and investigated by a paediatrician as appropriate.
  - Started on intravenous antibiotics until it is known that the baby is not infected, unless the baby is completely well as determined following a robust baby examination carried out by a trained individual.

And remind them of this when there is a change of staff.

**ANTIBIOTICS FOR YOU**

You don’t need antibiotics after the birth for GBS colonisation provided you are well. The intravenous antibiotics during labour and delivery are for your baby, not you – GBS colonisation does not need to be treated. It’s normal!

**Breastfeeding**

Our medical advisory panel strongly recommends that you should be encouraged to breastfeed your baby. Although there have been isolated cases describing GBS infection possibly related to breast milk contamination, the advantages of breast feeding will, in our medical advisory panel’s opinion, greatly outweigh the remote risk of transmitting GBS through breast feeding. High hygiene standards need to be maintained for all breastfeeding mothers, with the hands and nipple areas being kept clean.

The intravenous antibiotics recommended during labour are safe for breast-feeding mothers; although you should make sure your medical professionals know you intend to breast-feed your baby anyway!

If you develop mastitis or a breast abscess, you should seek medical advice regarding breast-feeding.

**If GBS is grown from a surface swab taken from your baby**

If GBS is grown from a surface swab (e.g. ear, nose and/or tummy button) taken from your baby AND he/she shows no sign of infection, this indicates the baby is colonised with GBS, not infected. (GBS infection would be identified from the bacteria grown from a blood, spinal fluid or urine culture). You and your baby’s health professionals (GP, midwife and health visitor) should all be informed of this. In the unlikely event that your baby shows any symptom of late-onset GBS infection during the next 3 months (see page 5), you should contact your
GP urgently. If he/she is unavailable, you should take your baby to Casualty for an urgent medical review, explaining why you are particularly concerned about GBS.

**Going home**

If you have had at least 4 hours of intravenous antibiotics before delivery and the baby is full-term and healthy, then there is no reason why you could not have an early discharge if you want one, although it’s a good idea to remind yourself of the signs and symptoms of GBS infection in babies so you know what to look out for!

**Antibiotics for your baby at home**

Babies born after an older sibling developed GBS infection are at raised risk of developing GBS infection themselves — it is estimated the risk increases perhaps ten-fold or more. In this circumstance, intravenous antibiotics are strongly recommended in any subsequent labour as being highly effective preventative medicine against early-onset GBS infection in the baby.

There is no evidence that continuing to give penicillin to a well baby after delivery is effective at preventing GBS infection after birth. However, where a family has suffered the trauma of a baby being seriously ill with GBS infection, a few practitioners may consider prescribing a daily penicillin dose for the baby, for the first 3 months of life in the belief that it may prevent GBS infection and so reduce understandable anxiety. There is no evidence to support this practice, although Penicillin given in this way has been shown to reduce the risk of infection with another related bacterium, called pneumococcus, in individuals who have lost their spleens.

**If your baby needs medical treatment**

If you need to contact a doctor about your baby during the first 3 months, make sure the doctor is aware of your history of GBS. And in the unlikely event that your baby has had a GBS infection, make sure the doctor knows that too since a baby who has had a GBS infection is at slightly increased risk of reinfection.

**General points for the baby’s first 3 months:**

The following suggestions apply to all newborn babies, not only those where there is a history of GBS:

**Handling your (or anyone else’s) newborn baby**

GBS can be found on the hands and in the respiratory tract of a colonised person and may be passed to the baby from repeated exposure after birth (e.g. from family members, other parents, hospital staff, etc.). Everyone, (including the parents), whether they know they’re colonised with GBS or not, should wash their hands and carefully dry them for the first 3 months of a baby’s life (soap and water are perfectly adequate), and it is very important to dry the hands as well as wash them thoroughly. These are normal good hygiene measures for a young baby, irrespective of GBS.

**Visitors**

As long as visitors are well and without upper respiratory infections, coughs, colds, etc., there is no need to limit visitors or their handling of the baby (although, again, it’s a good idea for people to wash and dry their hands thoroughly before doing so in the early days – this is good paediatric hygiene, irrespective of the issue of GBS).

**Going out**

The baby may be taken out, although ideally probably not for the first 2-3 weeks, especially if the weather is bad. If possible, the baby shouldn’t be taken to very crowded areas where there might be close contact with respiratory viruses and other illnesses, for example, to shopping centres, supermarkets, etc.

**Rare post-birth GBS infections**

Over half of all GBS infections in babies are apparent at birth, with up to 90% developing in the baby’s first 2 days of life so they should be detected and treated in hospital. Study your baby carefully yourself for any sign that he or
she is not well. Unfortunately, in the most severe cases, infection can take hold very quickly so draw the health professionals’ attention to anything that concerns you.

**SYMPTOMS OF EARLY ONSET GBS INFECTION IN BABIES**

Just in case you need this information, remind yourself of the typical symptoms (see page 4).

You may opt to stay in hospital for a couple of days, after which time GBS infection in babies becomes increasingly uncommon – up to 9 out of 10 GBS infections in babies develop in the first 2 days of life. GBS infection in babies is rare after age 1 month, and after age 3 months is virtually unknown.

**SYMPTOMS OF LATE ONSET GBS INFECTION IN BABIES**

Your baby is at a little less risk of developing GBS infection as each day passes, but you might like to remind yourself of the symptoms of late-onset GBS infection (developing after day 2) and of meningitis (see page 5).

**Trust your instincts – it is your baby!** If your baby shows signs consistent with GBS infection or meningitis, call your GP immediately. If your GP isn’t available, go straight to the nearest PAEDIATRIC Accident & Emergency Department. Early diagnosis and treatment are essential to combat late-onset GBS infection – delay can be fatal...

**TREATMENT OF GBS INFECTION IN BABIES**

In the unlikely event your baby develops a GBS infection; he or she should be given intravenous antibiotics as soon as possible and for at least 10 days (or 14 days if meningitis is present). For more information about treatment, see page 6.
FREQUENTLY ASKED QUESTIONS

How can people become carriers of GBS?
GBS may be passed from one person to another through hand contact, kissing, close physical contact, etc. As GBS is often found in the vagina and rectum of colonised women, it is commonly passed through sexual contact.

There are no known harmful effects of carriage itself and, since the GBS bacteria do not cause genital symptoms or discomfort, GBS is not a sexually transmitted disease, nor is GBS carriage a sign of ill health or poor hygiene.

No-one should ever feel guilty or dirty for carrying GBS – it’s normal.

What are the chances of my baby developing a GBS infection?

The following are estimates of the chances a baby in Britain will become infected with GBS if no preventative measures are taken and no other clinical risk factors are present:

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Woman is not known to be a carrier of GBS</td>
<td>1 in 1,000*</td>
</tr>
<tr>
<td>Woman is carrying GBS during the pregnancy</td>
<td>1 in 400</td>
</tr>
<tr>
<td>Woman is carrying GBS at delivery; and</td>
<td>1 in 300</td>
</tr>
<tr>
<td>Woman has had a previous baby infected with GBS</td>
<td>1 in 100</td>
</tr>
</tbody>
</table>

*This is a broadly accepted estimate of the number of GBS infections in newborn babies that would occur if no preventative intravenous antibiotics in labour were given. Some recent UK research has suggested this may be a serious underestimate of the incidence of GBS infection in newborns, which could be as high as 3.6 per 1,000.

If a woman who has previously had a baby with GBS infection is given antibiotics during labour in accordance with our medical advisory panel’s recommendations (see Error! Bookmark not defined.), the baby’s risk is reduced significantly … to less than that of a woman not known to carry GBS who is not given antibiotics in labour:

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother carries GBS during pregnancy;</td>
<td>1 in 8,000</td>
</tr>
<tr>
<td>Mother carries GBS at delivery; and</td>
<td>1 in 6,000</td>
</tr>
<tr>
<td>Mother has previously had a baby infected with GBS</td>
<td>1 in 2,200</td>
</tr>
</tbody>
</table>

The vast majority of pregnancies can be managed so that babies are protected and born free of GBS infection.

I carry GBS in my vagina. Do I need antibiotics to get rid of it?

No. Antibiotics for GBS carriage are not required. GBS grown from a vaginal swab shows colonisation with GBS, not that you have a GBS infection. Colonisation is normal and does not need treatment.

Oral antibiotics are not recommended for women for GBS carriage during pregnancy or labour – there’s simply, no evidence that they prevent GBS infections in babies. And, so far, no antibiotics have been shown to eradicate GBS reliably from the intestines so, even if antibiotics clear the GBS colonisation of the vagina (and they may not), recolonisation from the intestines will occur.

Studies have shown no substantial difference in GBS carriage at delivery between women treated with antibiotics during pregnancy, and those not treated. (In one study, nearly 70% of colonised women given antibiotics for 12 to 14 days during the last 12 weeks of pregnancy were colonised 3 weeks later and again at delivery.)

The time when antibiotics have been shown to be highly effective at stopping GBS infections in newborn babies is when they are given intravenously to the pregnant woman once her membranes have ruptured or labour has started.

Should I take antibiotics before I get pregnant to get rid of the GBS?

No antibiotics tested so far seem able to do this reliably. Antibiotics may temporarily eradicate vaginal colonisation with GBS, but colonisation in the intestines will remain and recolonisation of the vagina will occur.
I carry GBS in my vagina. Does my partner need to be tested?

No. Colonisation with GBS is normal and does not need treatment. A third of the adult population carries GBS, without symptoms – you don’t need to be tested for it, nor do you (or he) need antibiotics for it. **GBS is not a sexually transmitted disease.**

Will antibiotics get rid of GBS colonisation from my vagina during pregnancy?

Antibiotics won’t necessarily get rid of colonisation in the vagina and, even when they do, they will do so only temporarily - recolonisation will occur. Evidence shows taking antibiotics before labour does not reliably eradicate GBS carriage - and there’s no evidence that it reduces the incidence of GBS infection in newborn babies either. Studies have shown no substantial difference in GBS carriage at delivery between women treated with antibiotics during pregnancy and those not treated. In one study, nearly 70% of colonised women treated with antibiotics for 12 to 14 days during the third trimester (28 to 40 weeks of pregnancy) were colonised three weeks later and again at delivery.

**Antibiotics during pregnancy for GBS carriage are not indicated.** GBS cultured from a vaginal swab show the vagina is colonised with GBS, not infected. No antibiotics tested so far have been shown to eradicate GBS reliably from the body so, even if antibiotics clear the GBS colonisation of the vagina (and they may not), recolonisation from the intestines will occur. Evidence shows taking antibiotics neither gets rid of GBS carriage nor reduces the incidence of GBS infection in newborn babies. Antibiotics have been proven to be highly effective at stopping GBS infections in newborn babies when given intravenously to the pregnant woman as soon as her membranes have ruptured or labour has started.

Does having the IV antibiotics during labour mean that the GBS will be eradicated?

GBS is a very common naturally occurring bacterium, which lives in the intestines of about a third of the population (men and women) and, once present, cannot reliably be eradicated.

Once labour starts, intravenous (through a vein) antibiotics given to the mother until her baby is born are the best known way to prevent most GBS infections in newborn babies. They work in two ways. Firstly, the antibiotics start to cross to the baby within minutes of their being given to the mother – this means that, ideally, the baby will be born with fighting doses of antibiotics in his or her system which will help to stop any infection from starting. Secondly, they may temporarily reduce the level of GBS carriage in the mother’s vagina, which may mean the baby is exposed to fewer GBS bacteria during delivery. However, antibiotics won’t eradicate the mother’s GBS carriage; although they may suppress it for this crucial period.

Do I need antibiotics if GBS is found in my urine?

Yes, though remember to tell your health professionals if you have ever had an allergic reaction to penicillin or any other antibiotic. Urine is supposed to be sterile so, if GBS is found in your urine, you should be treated with oral antibiotics when diagnosed and this treatment repeated until urine tests come back clear. A 5-day course would be appropriate and it’s important the urine is retested 7-10 days after finishing the antibiotics.

Treatment for a GBS positive urine sample, whether you have symptoms of a urine infection or not, is essential during pregnancy since, if left untreated, such infections can cause kidney damage and have been linked to preterm labour.

Should I be tested regularly for GBS?

No. If you have previously had a baby infected with GBS or if you have had a positive test result for GBS at any time during your pregnancy, you should be offered intravenous antibiotics from the start of your labour, until delivery.

The conventional test available on the NHS is unreliable – it misses up to 50% of GBS carriers. There is a reliable test but this is only available privately (see the next question).
If you get a positive result from the conventional test, all it tells you is that you are carrying GBS. If you get a negative result, all it tells you is that you may not be still carrying GBS (but the negative test results aren’t very reliable). Neither of these results should make any difference to your being offered intravenous antibiotics in labour.

**Are the tests for GBS colonisation reliable?**

The conventional tests available are not very reliable when they give a negative result – they give a falsely negative result up to 50% of the time when they should be positive! On the other hand, if you get a positive conventional test result, that is very reliable.

There is more information about the different tests available in the UK on page 15.

Any positive result (conventional, ECM or PCR) means you should be offered intravenous antibiotics as soon as possible after the start of your labour or membrane rupture to protect your baby from GBS infection.

[GBSS fully endorses the availability of reliable antenatal GBS testing but has no links to nor receives any money from any particular laboratory. Indeed we hope many other laboratories will follow The Doctors Laboratory’s example in offering this test and, as they do, we’ll provide details of their service too.]

I am on a course of antibiotics for a chest infection. Will that affect the results for the GBS test?

The antibiotics may make it more difficult to grow the GBS so, in an ideal world, you should not take the swabs for the GBS test until at least seven days after you’ve finished the course of antibiotics; the longer the delay, the more reliable the result.

It should be remembered that even a negative result from a swab test done at 35-37 weeks of pregnancy can’t be 100% predictive that you won’t be carrying GBS at delivery (although it is highly likely you won’t), since a very small proportion of women will acquire carriage in the intervening weeks. A positive result however does mean that you should be offered the recommended intravenous antibiotics in labour.

I carried GBS in my last pregnancy - my baby was fine. Do I need IV antibiotics this time?

GBS can quite naturally come and go from the vagina so the bacteria can be there one month and not the next ... and back again at some other time (though research has shown that, using sensitive tests, the results are highly predictive of colonisation status for around five weeks). There is currently no good data that can predict carriage of GBS over periods of a year or more. However, since there may be some increased chance of a woman carrying GBS in a pregnancy if GBS has been isolated previously, it is the view of our medical panel that, if possible the pregnant woman should be offered a reliable (ECM) test at 35-37 weeks of pregnancy to establish whether she is still carrying GBS. If the test is positive, then she should be offered intravenous antibiotics as soon as possible once labour has started.

If a reliable ECM test result is not available and labour starts after 37 weeks of pregnancy, then the view of our medical panel is that previous carriage status should be treated as an additional risk factor (increasing the risk of a baby developing GBS infection where preventative antibiotics in labour are not given from an estimated one in 1,000 in the general population, to approximately one in 500 for a woman whose current GBS status is unknown, but where GBS was isolated before the current pregnancy). Our medical panel's view is that the 'previous carrier' risk factor alone is insufficient to recommend offering intravenous antibiotics in labour against GBS infection in the baby, unless another clinical risk factor was also present.

I had a GBS infection after the birth of my last baby. Will any babies I have in the future be more at risk of GBS infection?

There’s no research on which to answer this. Our medical panel’s view is that a postnatal GBS infection is unlikely to increase the risk of any future babies developing GBS infection above that of simply being a carrier. In this
situation they would recommend you have a sensitive test for GBS carriage late in your next pregnancy to find out your status at that time.

**What happens if I get a Negative Enriched Culture Method (ECM) test result?**

A woman who has a negative ECM (enriched culture medium) test result at 35 plus weeks of pregnancy does NOT need to be offered intravenous antibiotics in labour to prevent GBS infection in her baby (but antibiotics may be indicated for other reasons). Research shows that, if performed within five weeks of delivery, an ECM test giving a negative result is 96% predictive of GBS not being carried at delivery (4% of women acquired carriage between testing and delivery) so the risk of acquiring carriage between doing the test and giving birth is very small.

If a woman has not had an ECM test result OR the less reliable conventional test has been negative during the pregnancy, she should be offered intravenous antibiotics from the onset of labour if one or more risk factors listed above (see page 6) is present.

A woman who has previously had a baby who developed GBS infection should **ALWAYS** be offered intravenous antibiotics in subsequent pregnancies, from the onset of labour or membrane rupture until delivery, regardless of any test results.

And a woman who has had any positive test result (from the urine, vagina or rectum) during the current pregnancy should also be offered intravenous antibiotics from the onset of her labour or membrane rupture until delivery.

**I had a positive result early in my pregnancy. Should I be tested again?**

If you have had a positive GBS test result (from the vagina or rectum) during the current pregnancy, and no further tests, you should be offered intravenous antibiotics from the onset of labour or membrane rupture until delivery (antibiotics are recommended if the positive result was from the urine).

However, if the positive result was early in your pregnancy, you may have lost carriage by the time your baby is born. If you want to find out whether you are still carrying GBS, you can have a sensitive test at 35-37 weeks. If the sensitive test result is negative, then intravenous antibiotics are probably not indicated, since research shows that a sensitive test giving a negative result within 5 weeks of delivery is highly predictive of the mum not carrying GBS at delivery. The risk of acquiring carriage between doing the test and giving birth is very small.

**Must I have intravenous antibiotics if I’ve had a positive result during this pregnancy?**

If you have had any positive GBS test result from the vagina or rectum during the current pregnancy, you should be **offered** intravenous antibiotics from the onset of labour or membrane rupture until delivery. However, you may choose not to have them if there are no additional risk factors - only a small percentage of babies born to colonised mothers will develop GBS infection. However, if you decide against antibiotics, it would be prudent for the baby to be observed by trained staff for at least 24 hours (and ideally for 48 hours). If the positive test was from the urine, this means that the GBS was more invasive, and so antibiotics will be recommended even if a vaginal swab is subsequently negative.

**I’m at risk of premature labour, should I take long-term antibiotics?**

Along with many other bacteria found in the vagina, GBS can cause infection of the baby in the womb, which can result in preterm birth, stillbirth and late miscarriage. However, these are usually caused by a variety of factors other than GBS: genetic defects, gynaecological problems, other infections, etc. If a woman has had any of these problems in the past, she should make sure these possibilities are investigated fully by a consultant obstetrician at booking (or before) regardless of whether or not she is colonised with GBS. Such complications are uncommon and GBS is a rare cause of them. And this paper tells you what you can do to make sure your baby is best protected from GBS.

For the antibiotics tested so far, their use throughout pregnancy does not prevent preterm delivery due to any cause, including GBS. Also, the effects of long-term antibiotics on the baby during pregnancy have not been
assessed, although we know that short courses of, for example, amoxycillin, seem to be exceptionally safe (see our medical advisory panel’s view on pages 19 and 20)).

I’m worried I won’t get 4+ hours of IV antibiotics before my baby is born.

A very small study1 showed giving intramuscular penicillin eradicated GBS colonisation for at least six weeks in 75% of women known to carry GBS. So far, this very small study (50 of 78 women received intramuscular antibiotics) has not been repeated, so it is difficult to give advice based upon this data.

For women known to carry GBS where it is not expected that the intravenous antibiotics can be given for at least four hours before delivery, an intramuscular injection of 4.8 MU (2.9 g) of Penicillin G at about 35 weeks of pregnancy may be useful in addition to intravenous antibiotics given from the onset of labour or membranes rupturing until delivery to try to eradicate GBS colonisation until after delivery.

Regardless of whether you have intramuscular antibiotics to try to eradicate GBS colonisation, it is recommended that all women in higher risk categories be offered intravenous antibiotics from the onset of labour or waters breaking, plus at four hourly intervals until delivery.

There are downsides of intramuscular penicillin - the injection is painful, there is a small risk of an allergic reaction and of antibiotic resistance developing (see below). These risks are repeated with the intravenous antibiotics given in labour.

For intramuscular antibiotics, there are no known alternatives to penicillin for penicillin-allergic women.


Should I be induced, with the intravenous antibiotics starting as I’m induced?

Carrying, or being at risk of, GBS is not a reason to be induced and our medical advisers don’t recommend induction for anyone as a way of combating GBS infection in babies.

If you live a long way from the hospital or have a history of very fast labours, then an induction is one way to try and ensure you get sufficient intravenous antibiotics in labour. However, induction is not without risk itself, especially before the due date. You should discuss the potential risks and benefits of an induction with your obstetrician, because they will vary dependent upon your personal circumstances.

If you need to be induced for an obstetric or medical reason, the recommended intravenous antibiotics should be started as soon as possible once labour has started or waters have broken, whichever happens first (and that’s whether the waters break naturally or are artificially broken) and should be repeated 4-hourly until delivery, and ideally for at least 4 hours before delivery.

What are the potential risks of taking antibiotics?

Taking antibiotics should not be done lightly – they can have side effects that need to be considered in relation to the potential benefits and it is important that you tell your health professionals if you have ever had an allergic reaction to penicillin or any other antibiotic.

Although good data is hard to find on this subject, the generally quoted estimated risks for penicillin are:

- 1 in 10 of the mother developing a mild allergic reaction, such as a rash;
- 1 in 10,000 of the mother developing a severe allergic reaction (anaphylaxis); and
- 1 in 100,000 of the mother developing fatal anaphylaxis, resulting in her death.

And severe complications can occur in the unborn baby even when the anaphylaxis developed by the mother is not life threatening, although this risk is probably overstated.

Although often quoted, these figures are generally accepted as being a significant over-estimate of the risk - a recent paper stated that, in the US between 1997 (the year after the CDC recommended intravenous antibiotics in labour for women whose babies were at higher risk of developing GBS infection) and 2001, an estimated 1.8 million women were given penicillin in labour and no deaths occurred, so an estimate of a 1 in 100,000 risk of

Whenever antibiotics are taken, there are always risks of antibiotic resistance developing. When antibiotics are given to pregnant women, this could affect the mother and her baby. When antibiotics are given around birth and in the early weeks of life, there is the chance they may increase the likelihood of the baby developing allergies. Although a lot of press space is given to this, unfortunately data are lacking on whether it’s the giving of antibiotics that causes the allergies, or whether there are other reasons (for example, genetics, environment, disease, etc.). This is yet another area where more research is needed!

Bearing all this in mind, you need to weigh up whether you consider the risks are acceptable in comparison with the potential benefits and, if so, in what circumstances you would want to be offered antibiotics.

What are the signs that GBS is affecting my unborn baby?
If your pregnancy is progressing normally, then there is no reason to suspect GBS is infecting your baby. If a GBS infection is present, you’ll usually go into labour or your membranes will rupture. And that’s the time to get to hospital as quickly as you can to receive the intravenous antibiotics to give your baby the best protection possible.

Will a Caesarean prevent GBS infecting my baby?
Caesarean sections do not eliminate the risk of GBS to a baby of developing GBS infection since the bacteria can cross intact amniotic membranes to set up an infection in the baby, although they do reduce the risk.

However, Caesareans are not recommended as a method of preventing GBS infection in babies: there are significant risks associated with a Caesarean section; and the recommended intravenous antibiotics during labour are both low risk and highly effective. See page 21 for our medical panel’s recommendations regarding Caesareans.

Are membrane sweeps safe for women who carry GBS?
Using a gloved finger passed through the cervix (neck of the womb) to separate the baby’s membranes from the lower part of the uterus is known as a ‘membrane sweep’. In women who are at or beyond the due date, it encourages spontaneous labour and can enable about 10% of women to avoid an artificial induction of labour.

There is currently no good evidence that membrane sweeps are harmful in women known to carry GBS. Indeed the results of trials of membrane sweeps don’t show any increase in problems caused by GBS in women having sweeps, and it is highly likely these trials would have included many women carrying GBS at the time.

However, there remains a theoretical risk that a membrane sweep might occasionally introduce GBS into the uterus, and so our medical advisory panel advises caution in using a membrane sweep for women known to carry GBS when there are other acceptable alternatives (for example, induction of labour with prostaglandin gel introduced into the vagina).

I want a water birth
There are no known contra-indications for a woman known to carry GBS having a water birth. As for all women carrying GBS during the current pregnancy, our medical advisory panel recommends they should be offered intravenous antibiotics from the onset of labour until delivery. It is not a good idea to get the cannula (which delivers the intravenous antibiotics to the mother) wet, but this can be managed - specially designed waterproof dressings are available which keep the site sterile and dry whilst still enabling the health professional to monitor the site visually.
I was GBS positive and had a water birth at home; can someone else “catch” GBS from the pool?

No. Research suggests that standard hygiene measures need to be taken in the cleaning of the pool before or after use by GBS carriers (and anyone else!). So please do pass the pool onto your friend but – as you would anyway – please clean it properly before you do.

I want a home birth

Our medical advisory panel’s recommendations for stopping GBS infections in newborn babies are the same for home births as for hospital births - women whose babies are at higher risk of developing GBS infection should be offered intravenous antibiotics from the start of labour until delivery.

Home births are becoming increasingly popular and, if you want a home birth with intravenous antibiotics during labour until delivery, it may be possible for your midwife to give you intravenous antibiotics prescribed for you by your GP. This is not widely available. Some areas won’t permit intravenous antibiotics to be given at home - there is a small risk that you would get a severe allergic reaction to the antibiotics (see What are the potential risks of taking antibiotics? on page 32) and, obviously, there is no intensive care unit nearby. The risk is small but your health professionals may be anxious. Of course, around 25% of women having home births probably carry GBS in their vagina at delivery without knowing it. This issue needs to be discussed with your medical team.

Oral antibiotics are not recommended for women for GBS carriage during pregnancy or labour – quite simply, there’s no evidence that they prevent GBS infections in babies. If you have set your heart on a home birth, you may wish to consider having intramuscular antibiotics as outlined in I’m worried I won’t get 4+ hours of IV antibiotics before my baby is born. on page 32, though our medical advisory panel do not recommend them in lieu of intravenous antibiotics during labour, but they may be better than nothing if that really is the only alternative.

I want to breastfeed my baby

Our medical advisory panel strongly recommends you should be encouraged to breastfeed your baby. Although there have been isolated cases describing GBS infection possibly related to breast milk contamination, the advantages of breast feeding will, in our medical advisory panel’s opinion, greatly outweigh the remote risk of transmitting GBS via breast feeding. High hygiene standards need to be maintained for all breastfeeding mothers, with the hands and nipple areas being kept clean.

The intravenous antibiotics recommended above (see page 7) for pregnant women during labour through to delivery to protect her unborn baby from GBS infection are safe for breastfeeding mothers, although you should make sure your medical professionals know you intend to breastfeed your baby.

If you develop mastitis or a breast abscess, you should seek medical advice regarding breast-feeding.

Is it safe to breastfeed my baby just after birth as my milk will contain antibiotics?

Any antibiotics that are safe to give to mothers during pregnancy are also safe in themselves in relation to breastfeeding.

The intravenous antibiotics recommended above for pregnant women during labour through to delivery to protect their unborn babies from GBS infection will already have passed in significant amounts to the baby while it was in the womb, and they provide important protection for the baby during labour and in the first few hours after birth. In comparison, the amounts passed in breast milk are small.

However, the continuing exposure to antibiotics in the milk can change the way the baby acquires its gut flora (the bugs the baby gets from its mother that help to digest food) and this can affect the way that the baby’s poo changes in the first days of life. So you should make sure your medical professionals know you intend to breastfeed your baby.
Can my baby have the normal immunisations?

If a baby has recovered from a GBS infection, then the GBS infection is not a factor in the decision to immunise the child. This is also true for subsequent children.

Is strep throat caused by the same bug as GBS?

No. Strep throat is caused by group A Streptococcus (GAS or Streptococcus pyogenes) which, although it has a similar name and is from the same family of bacteria, is a bug with very different characteristics. Group A Strep is carried by many perfectly healthy people and most commonly causes mild sore throats or skin infections (impetigo), although for every thousand such mild infections there are one or two that are more serious and can affect pregnant or recently delivered women – for example, toxic shock syndrome or necrotising fasciitis. Fortunately, these severe conditions are very rare.
MEDICAL

Key medical references


GBSS medical advisory panel

The information in this leaflet is based upon our medical advisory panel’s knowledge and on recent research (published and unpublished). Your medical professionals may not have as comprehensive knowledge or experience in this specialised area, so please make sure they have (and read) this leaflet or our little ‘GBS & Pregnancy’ leaflet. Sharing our information with people who can make a difference in preventing GBS infection is vital.

This leaflet has been checked for medical accuracy by our medical advisory panel, comprising:

- Prof Philip Steer (Chairman), Emeritus professor at Imperial College and consultant obstetrician at the Chelsea and Westminster Hospital in London
- Dr Christine McCartney OBE, FRCPath, Director of the Health Protection Agency’s Regional Microbiology Network
- Dr Alison Bedford-Russell MRCP, Consultant Neonatologist at Birmingham Heartlands Hospital
LEAFLET ORDER FORM

To order leaflets, please complete this form and send it to GBSS, PO Box 203, Haywards Heath, West Sussex RH16 1GF, or e-mail it to info@gbss.org.uk or order on 01444 416176. All of our current leaflets can be downloaded free of charge from our website at www.gbss.org.uk. You are welcome to photocopy our leaflets, but please photocopy them in their entirety.

We don’t charge for our leaflets, but GBSS is a small charity with limited funds and relies on donations to help defray costs. The cost of printing each leaflet excluding postage & packing (including p&p in brackets) is shown below for one of each item:

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<td>GBS &amp; pregnancy (introduction to GBS for pregnant women)</td>
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<td>Poster – Labour &amp; Delivery Prevention Guidelines for Neonatal Early Onset GBS Disease</td>
<td>£0.15 (£ 1.30)</td>
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<td>Poster – Understanding your baby’s GBS infection. For Special Care Baby Units</td>
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<td>Poster – Group B Strep Support “helping to save babies’ lives” A2 general poster</td>
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| OTHER MATERIALS:                     | |
|---------|----------------------------------|---------------------|
|         | Medical information pack (Folder containing small supply of introductory leaflets, plus GBS The Facts, one of each poster, a sheet of stickers & back issue of GBSS newsletter) | £7.50 (£10.00) |
|         | GBS Alert Stickers – 35 colour stickers for pregnant women’s notes | £0.35 (£ 0.90) |
|         | GBS Aware Stickers – 35 colour stickers for pregnant women’s notes | £0.35 (£ 0.90) |
|         | PowerPoint presentation for PC on CD – for health professionals | £5.00 (£ 7.40) |
|         | GBSS Balloons | |

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Please share our information with others interested in GBS.
If you would like to provide us with any further information, or would like to make any comments, please do so here:
____________________________________________________________________
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MEMBERSHIP APPLICATION FORM

Please complete and return to Group B Strep Support, P O Box 203, HAYWARDS HEATH, West Sussex RH16 1GF. If you have any queries, phone us on 01444 416176, or e-mail us at info@gbss.org.uk.

Name(s)

Parent / Grandparent / Obstetrician / Paediatrician / Midwife / GP / Health Visitor / Other (please state)

Address (including postcode please)

Tel/Fax no:

E-mail address:

Please tick as appropriate:

☐ I/We enclose our cheque for my/our first year’s membership of the charity (see below)

☐ I/We would like to donate by Banker’s Order (please complete form on the reverse & return it to GBSS)

☐ I/We are the parents of a GBS baby

Baby’s name ____________________________________________

☐ Baby’s date of birth _____ / _____ / _____ My baby developed GBS infection Yes/No

☐ I/We would like to speak to other parents about GBS

☐ Please send me/us volunteer guidelines on

☐ fund-raising ☐ raising awareness ☐ becoming a contact person

☐ I/We would like to help Group B Strep Support by:

We charge a minimum annual membership fee. For this, you receive our 6-monthly newsletter and any updates. If you can afford a larger donation to help us achieve our aims of informing and supporting more families; raising awareness and improving practice within the medical profession; and funding medical research, that would be greatly appreciated and it would be put to good use!

I/We enclose a cheque or postal order payable to Group B Strep Support for a year’s membership:

| £9.00  | £15.00  | £24.00  | £…………………… |
| student/unwaged | individual/family | overseas | voluntary donation |

☐ If you are a UK taxpayer, charities can claim back 28% of tax on donations made since April 2000, increasing our funds at the government’s expense! If you can help in this way, please tick the box and we will claim back some of your tax.

Signature

Date
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To: The Manager
Your Bank Name:

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Sort code: 40 – 52 – 40
For the credit of: Group B Strep Support
Account No: 00091056
The sum of (in words and numbers please):

Commencing (date):

Every (frequency): Year / Month

Until (final payment date): further notice/..............................................................................
(delete as applicable)

Name of account to be debited: (full name of your account) ............................................................

Name and Address of Account Holder: (your full name and address)

Account No: (Your Bank Account No) ............................................................................................

Bank Sort Code: (Your Bank’s Sort Code) ......................................................................................

Signature_____________________________________________________ Date_______________

Please complete and return this form to Group B Strep Support at P O Box 203, Haywards Heath, RH16 1GF or by e-mail to us at info@gbss.org.uk